PROOF OF THE CONTINUED FRACTION CONJECTURE FOR $(a, b) = (z^2 + 1, z^5 + z^4 + z^3 + z + 1)$

GUO-NIU HAN* AND YINING HU*

Abstract. The continued fraction conjecture claims that the continued fraction defined by the (a, b)-Thue-Morse sequence is algebraic over $\mathbb{F}_2(x)$ for all pairs of distinct elements (a, b) in $\mathbb{F}_2[x] \setminus \mathbb{F}_2$. In this paper we prove the conjecture for $(a, b) = (z^2 + 1, z^5 + z^4 + z^3 + z + 1)$.

1. Introduction

Let $\mathbb{F}_2$ be the finite field of cardinality 2. Given a sequence of polynomials $\mathbf{a} = (a_0(z), a_1(z), a_2(z), \ldots)$ of elements from $\mathbb{F}_2[z] \setminus \mathbb{F}_2$, we define the infinite continued fraction

$$\mathrm{CF}(\mathbf{a}(z)) = \cfrac{1}{a_0(z) + \cfrac{1}{a_1(z) + \cfrac{1}{a_2(z) + \cfrac{1}{\ddots}}}} \tag{1.1}$$

as the limit of the finite continued fractions

$$\mathrm{CF}_n(\mathbf{a}(z)) = \cfrac{1}{a_0(z) + \cfrac{1}{a_1(z) + \cfrac{1}{\ddots + \cfrac{1}{a_n(z)}}}} \in \mathbb{F}_2((1/z)). \tag{1.2}$$

Conversely, each power series in $\mathbb{F}_2[[1/z]]$ without constant term

$$c_{-1}z^{-1} + c_{-2}z^{-2} + c_{-3}z^{-3} + \cdots \tag{1.3}$$

admits a continued fraction expansion of form (1.1).

Let a and b be two distinct elements from $\mathbb{F}_2[z] \setminus \mathbb{F}_2$. We consider the continued fraction (1.1) associated with the (a, b)-Thue-Morse sequence

$$\mathbf{t} = (t_0(z), t_1(z), t_2(z), \ldots) = (a, b, b, a, b, a, a, b, \ldots)$$

that we shall denote

$$\mathrm{CF}(a, b) := \mathrm{CF}(\mathbf{t}). \tag{1.4}$$

Date: runone at : 30/04/2020 03:41:14 .

2010 *Mathematics Subject Classification.* 11B85, 11J70, 11B50, 11Y65, 05A15.

Key words and phrases. automatic sequence, continued fraction, Thue-Morse sequence.

* This paper was automatically generated from a computer program developed by the authors, with 1.4 hours CPU time used.

Theorem 1.1. *When $(a,b)=(z^2+1, z^5+z^4+z^3+z+1)$, the two power series $\mathrm{CF}(a,b)$ and $\mathrm{CF}(b,a)$ are algebraic over $\mathbb{F}_2(z)$, with minimal polynomials of the form*

$$p_4(z)y^4+p_3(z)y^3+p_2(z)y^2+p_1(z)y+p_0(z)=0$$

where, for $\mathrm{CF}(a,b)$,

$$\begin{aligned}
p_0(z)&=z^{21}+z^{19}+z^{17}+z^{15}+z^{12}+z^{11}+z^4+z+1,\\
p_1(z)&=z^{26}+z^{24}+z^{23}+z^{15}+z^{13}+z^{11}+z^{10}+z^8+z^6+z^4+z^3+z,\\
p_2(z)&=z^{28}+z^{18}+z^{14}+z^{12}+z^6+z^4+z^2+1,\\
p_3(z)&=z^{26}+z^{24}+z^{23}+z^{15}+z^{13}+z^{11}+z^{10}+z^8+z^6+z^4+z^3+z,\\
p_4(z)&=z^{24}+z^{21}+z^{20}+z^{19}+z^{18}+z^{17}+z^{15}+z^{14}+z^{12}+z^{11}+z^6+z^2+z\\
&\quad+1,
\end{aligned}$$

and for $\mathrm{CF}(b,a)$,

$$\begin{aligned}
p_0(z)&=z^{21}+z^{20}+z^{19}+z^{17}+z^{16}+z^{15}+z^{11}+z^8+z+1,\\
p_1(z)&=z^{26}+z^{24}+z^{23}+z^{15}+z^{13}+z^{11}+z^{10}+z^8+z^6+z^4+z^3+z,\\
p_2(z)&=z^{28}+z^{18}+z^{14}+z^{12}+z^6+z^4+z^2+1,\\
p_3(z)&=z^{26}+z^{24}+z^{23}+z^{15}+z^{13}+z^{11}+z^{10}+z^8+z^6+z^4+z^3+z,\\
p_4(z)&=z^{24}+z^{21}+z^{19}+z^{18}+z^{17}+z^{16}+z^{15}+z^{14}+z^{11}+z^8+z^6+z^4+z^2\\
&\quad+z+1.
\end{aligned}$$

2. Proof

Define the sequences of polynomials $(P_n(z))_{n\geq 0}$ and $(Q_n(z))_{n\geq 0}$ by

$$\begin{pmatrix} P_n(z) & Q_n(z)\\ P_{n-1}(z) & Q_{n-1}(z)\end{pmatrix} := \begin{pmatrix} t_n(z) & 1\\ 1 & 0\end{pmatrix}\begin{pmatrix} t_{n-1}(z) & 1\\ 1 & 0\end{pmatrix}\cdots\begin{pmatrix} t_0(z) & 1\\ 1 & 0\end{pmatrix}\begin{pmatrix} 0 & 1\\ 1 & 0\end{pmatrix}.$$

By the basic properties of continued fractions, we have

$$\mathrm{CF}_n(a,b)=\frac{P_n(z)}{Q_n(z)}\in\mathbb{F}_2((1/z)). \tag{2.1}$$

As formula (2.1) is not efficient for calculating $\mathrm{CF}_n(a,b)$, a fast method is to be derived and described as follows. Define

$$\begin{aligned}
M_n(x)&=x^{\deg(t_{2^n-1})}\begin{pmatrix} t_{2^n-1}(1/x) & 1\\ 1 & 0\end{pmatrix}\times x^{\deg(t_{2^n-2})}\begin{pmatrix} t_{2^n-2}(1/x) & 1\\ 1 & 0\end{pmatrix}\times\\
&\qquad\cdots\times x^{\deg(t_0)}\begin{pmatrix} t_0(1/x) & 1\\ 1 & 0\end{pmatrix},\\
W_n(x)&=x^{\deg(\bar t_{2^n-1})}\begin{pmatrix} \bar t_{2^n-1}(1/x) & 1\\ 1 & 0\end{pmatrix}\times x^{\deg(\bar t_{2^n-2})}\begin{pmatrix} \bar t_{2^n-2}(1/x) & 1\\ 1 & 0\end{pmatrix}\times\\
&\qquad\cdots\times x^{\deg(\bar t_0)}\begin{pmatrix} \bar t_0(1/x) & 1\\ 1 & 0\end{pmatrix},
\end{aligned}$$

where $\bar{\mathbf{t}}$ is the (b,a)-Thue-Morse sequence. By the properties of the Thue-Morse sequence, we have for $n\geq 0$

$$M_{n+1}(x)=W_n(x)\cdot M_n(x),$$

$$W_{n+1}(x) = M_n(x) \cdot W_n(x).$$

Let $x := 1/z$. For each non-zero polynomial $P(z)$, define $\tilde{P}(x)$ to be $P(1/x)$. Then,

$$\mathrm{CF}_n(a,b) = \frac{P_n(z)}{Q_n(z)} = \frac{\tilde{P}_n(x)}{\tilde{Q}_n(x)} \in \mathbb{F}_2((x)) = \mathbb{F}_2((1/z)).$$

Comparing the definition of $M_n(x)$ with the definition of $P_n(x)$ and $Q_n(x)$, we see that

$$M_n(x)_{0,1} = x^{d_n}\tilde{P}_{2^n-1}(x),$$
$$M_n(x)_{0,0} = x^{d_n}\tilde{Q}_{2^n-1}(x),$$

for some positive integer d_n. Hence,

$$\mathrm{CF}_{2^{2n}-1}(a,b) = \frac{\tilde{P}_{2^{2n}-1}(x)}{\tilde{Q}_{2^{2n}-1}(x)} = \frac{M_{2n}(x)_{0,1}}{M_{2n}(x)_{0,0}}. \tag{2.2}$$

Therefore, by the convergence theorem of continued fraction, the algebraicity of $\mathrm{CF}(a,b)$ will be established if it is shown that both $M_{2n}(x)_{0,1}$ and $M_{2n}(x)_{0,0}$ converge to algebraic series in $\mathbb{F}_2[[x]]$.

Actually, we will prove that for all $0 \le i,j \le 1$ the four sequences $(M_{2n}(x)_{i,j})_n$, $(M_{2n+1}(x)_{i,j})_n$, $(W_{2n}(x)_{i,j})_n$, and $(W_{2n+1}(x)_{i,j})_n$ converge to algebraic series in $\mathbb{F}_2[[x]]$. For this purpose, we define four 2×2 matrices M^e, M^o, W^e, W^o as follows: For each $T \in \{M^e, M^o, W^e, W^o\}$ and $0 \le i,j \le 1$, $T_{i,j}$ is defined to be the unique solution in $\mathbb{F}_2[[x]]$ of the polynomial $\phi(T,i,j)$ under certain initial conditions; the polynomials $\phi(T,i,j)$ and initial conditions are given in Section 3. We will prove that these four matrices, whose components are algebraic by definition, are the limits of $(M_{2n}(x))_n$, $(M_{2n+1}(x))_n$, $(W_{2n}(x))_n$, and $(W_{2n+1}(x))_n$.

Let us explain how the polynomials $\phi(T,i,j)$ and initial conditions are found, and why the solutions exist and are unique. For $0 \le i,j \le 1$, the the coefficients of the polynomial $\phi(M^e,i,j)$ (resp. $\phi(M^o,i,j)$, $\phi(W^e,i,j)$, and $\phi(W^o,i,j)$) are the Padé-Hermite approximants of type

$$(175, 175, 175, 175, 175)$$

of the vector

$$(1, T^3, T^6, T^9, T^{12}),$$

where $T = M_{12,i,j}$ (resp. $M_{11,i,j}$, $W_{12,i,j}$, and $W_{11,i,j}$), found by the Derksen algorithm. We take the first 8 terms of $M_{12,i,j}$ (resp. $M_{11,i,j}$, $W_{12,i,j}$, and $W_{11,i,j}$) as initial conditions for $\phi(M^e,i,j)$ (resp. $\phi(M^o,i,j)$, $\phi(W^e,i,j)$, and $\phi(W^o,i,j)$). The following fact will be used to ensure that the solution exists and is unique: let $P(x,y) \in \mathbb{F}_2[x,y]$ and for each series $f(x) = \sum_{n=0}^{\infty} a_n x^n \in \mathbb{F}_2[[x]]$ denote the partial sum $\sum_{j=0}^{n-1} a_j x^j$ by $f_n(x)$ for $n \ge 0$. If for some $n \ge 0$ and $a_0, a_1, \ldots, a_{n-1} \in \mathbb{F}_2$ $P(x, \sum_{j=0}^{n-1} a_j x^j) = O(x^n)$ and $Q(x,y) := P(x, \sum_{j=0}^{n-1} a_j x^j + x^n y)$ can be written as $x^m \sum_{j=0}^{\infty} q_j(x) y^j$ where $q_j(x)$ are polynomials for $j \ge 0$, $q_1(0) = 1$, and $q_j(0) = 0$ for $j > 1$, then there exists a unique solution $f(x) \in \mathbb{F}_2[[x]]$ of $P(x, f(x)) = 0$ that satisfies the initial condition $f_n(x) = \sum_{j=0}^{n-1} a_j x^j$.

We state two lemmas concerning the four matrices M^e, M^o, W^e, W^o. The first one is about relations between them; the second, about the structure of the each matrix.

Lemma 2.1. *We have*

$$M^e = W^o \cdot M^o, \tag{2.3}$$

$$M^o = W^e \cdot M^e, \tag{2.4}$$

$$W^e = M^o \cdot W^o, \tag{2.5}$$

$$W^o = M^e \cdot W^e. \tag{2.6}$$

Proof. We give the proof of the identity

$$M^e_{0,0} = W^o_{0,0} M^o_{0,0} + W^o_{0,1} M^o_{1,0},$$

the proofs of the others being similar.

First, we compute the minimal polynomials of $W^o_{0,0}M^o_{0,0}$ and $W^o_{0,1}M^o_{1,0}$. We know that

$$P(x,y) = \mathrm{Res}_z\left(\phi(W^o,0,0)(x,z),\ z^{12}\cdot\phi(M^o,0,0)(x,y/z)\right)$$

is an annihilating polynomial of $W^o_{0,0}M^o_{0,0}$. We use Padé-Hermite approximation to find a candidate for the minimal polynomial of $W^o_{0,0}M^o_{0,0}$, that will be called $\phi_0(x,y)$. To prove that $\phi_0(x,y)$ is indeed the minimal polynomial, it suffices to prove that it is an irreducible factor of $P(x,y)$ of multiplicity m and that $Q(x,y) := P(x,y)/\phi_0(x,y)^m$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0}$. We verify the first point directly. For the second point, we truncate $W^o_{0,0}M^o_{0,0}$ to order 630 and substitute it for y in $Q(x,y)$. We get a series of valuation less than 630, which proves that $Q(x,y)$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0}$. We find the minimal polynomial $\phi_1(x,y)$ of $W^o_{0,1}M^o_{1,0}$ in a similar way.

Now we prove that $\phi(M^e,0,0)$ is the minimal polynomial of $W^o_{0,0}M^o_{0,0}+W^o_{0,1}M^o_{1,0}$. We know that

$$S(x,y) = \mathrm{Res}_z\left(\phi_0(x,z),\ \phi_1(x,y+z)\right)$$

is an annihilating of $W^o_{0,0}M^o_{0,0} + W^o_{0,1}M^o_{1,0}$. We verify that $\phi(M^e,0,0)$ is an irreducible factor of $S(x,y)$ of multiplicity μ, and that $Q(x,y) := S(x,y)/\phi(M^e,0,0)^\mu$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0}+W^o_{0,1}M^o_{1,0}$. To see the last point, we truncate $W^o_{0,0}M^o_{0,0} + W^o_{0,1}M^o_{1,0}$ to order 770 and substitute it for y in $Q(x,y)$. We get a series of valuation less than 770, and therefore $Q(x,y)$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0} + W^o_{0,1}M^o_{1,0}$.

Finally, the first 16 terms of $M^e_{0,0}$ and $W^o_{0,0}M^o_{0,0} + W^o_{0,1}M^o_{1,0}$ coincide. As these first terms determine a unique solution of $\phi(M^e,0,0)$, we know that the two series are one and the same. □

Define

$$R^e = \begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix} \qquad \text{and} \qquad R^o = \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix}.$$

Lemma 2.2. *For all integers $k \geq 2$ and $u = 2^{2k-1}$, the following identities hold.*

$$\begin{aligned} M^e[:14u] = {} & M^e[:7u] + x^u M^e[:6u] + x^{3u} M^e[:4u] + x^{4u} M^e[:3u] + x^{6u} M^e[:u] \\ & + x^u M^e[:7u] + x^{2u} M^e[:6u] + x^{4u} M^e[:4u] + x^{5u} M^e[:3u] \\ & + x^{7u} M^e[:u] + x^{2u} M^e[:7u] + x^{3u} M^e[:6u] + x^{5u} M^e[:4u] \\ & + x^{6u} M^e[:3u] + x^{8u} M^e[:u] + x^{7u} M^e[:7u] + x^{8u} M^e[:6u] \\ & + x^{9u} M^e[:5u] + x^{10u} M^e[:4u] + x^{11u} M^e[:3u] + x^{12u} M^e[:2u] \\ & + x^{13u} M^e[:u] + (x^{7u} + x^{8u} + x^{9u}) R^e, \end{aligned}$$

$$\begin{aligned} W^e[:14u] &= W^e[:7u] + x^u W^e[:6u] + x^{3u} W^e[:4u] + x^{4u} W^e[:3u] + x^{6u} W^e[:u] \\ &\quad + x^u W^e[:7u] + x^{2u} W^e[:6u] + x^{4u} W^e[:4u] + x^{5u} W^e[:3u] \\ &\quad + x^{7u} W^e[:u] + x^{2u} W^e[:7u] + x^{3u} W^e[:6u] + x^{5u} W^e[:4u] \\ &\quad + x^{6u} W^e[:3u] + x^{8u} W^e[:u] + x^{7u} W^e[:7u] + x^{8u} W^e[:6u] \\ &\quad + x^{9u} W^e[:5u] + x^{10u} W^e[:4u] + x^{11u} W^e[:3u] + x^{12u} W^e[:2u] \\ &\quad + x^{13u} W^e[:u] + (x^{7u} + x^{8u} + x^{9u}) R^e. \end{aligned}$$

For all integers $k \geq 2$ and $u = 2^{2k}$, the following identities hold.

$$\begin{aligned} M^o[:14u] &= M^o[:7u] + x^u M^o[:6u] + x^{3u} M^o[:4u] + x^{4u} M^o[:3u] + x^{6u} M^o[:u] \\ &\quad + x^u M^o[:7u] + x^{2u} M^o[:6u] + x^{4u} M^o[:4u] + x^{5u} M^o[:3u] \\ &\quad + x^{7u} M^o[:u] + x^{2u} M^o[:7u] + x^{3u} M^o[:6u] + x^{5u} M^o[:4u] \\ &\quad + x^{6u} M^o[:3u] + x^{8u} M^o[:u] + x^{7u} M^o[:7u] + x^{8u} M^o[:6u] \\ &\quad + x^{9u} M^o[:5u] + x^{10u} M^o[:4u] + x^{11u} M^o[:3u] + x^{12u} M^o[:2u] \\ &\quad + x^{13u} M^o[:u] + (x^{7u} + x^{8u} + x^{9u}) R^o, \\ W^o[:14u] &= W^o[:7u] + x^u W^o[:6u] + x^{3u} W^o[:4u] + x^{4u} W^o[:3u] + x^{6u} W^o[:u] \\ &\quad + x^u W^o[:7u] + x^{2u} W^o[:6u] + x^{4u} W^o[:4u] + x^{5u} W^o[:3u] \\ &\quad + x^{7u} W^o[:u] + x^{2u} W^o[:7u] + x^{3u} W^o[:6u] + x^{5u} W^o[:4u] \\ &\quad + x^{6u} W^o[:3u] + x^{8u} W^o[:u] + x^{7u} W^o[:7u] + x^{8u} W^o[:6u] \\ &\quad + x^{9u} W^o[:5u] + x^{10u} W^o[:4u] + x^{11u} W^o[:3u] + x^{12u} W^o[:2u] \\ &\quad + x^{13u} W^o[:u] + (x^{7u} + x^{8u} + x^{9u}) R^o. \end{aligned}$$

Proof. To prove Lemma 2.2 we first construct an automaton for each sequence concerned, and then transform the conditions on infinitely many k's into finitely many conditions on the states of the automaton. In the following, we will prove that for $T = M^o_{0,0}$, for all integer $k \geq 2$ and $u = 2^{2k}$,

$$\begin{aligned} T[:14u] &= T[:7u] + x^u T[:6u] + x^{3u} T[:4u] + x^{4u} T[:3u] + x^{6u} T[:u] + x^u T[:7u] \\ &\quad + x^{2u} T[:6u] + x^{4u} T[:4u] + x^{5u} T[:3u] + x^{7u} T[:u] + x^{2u} T[:7u] \\ &\quad + x^{3u} T[:6u] + x^{5u} T[:4u] + x^{6u} T[:3u] + x^{8u} T[:u] + x^{7u} T[:7u] \\ &\quad + x^{8u} T[:6u] + x^{9u} T[:5u] + x^{10u} T[:4u] + x^{11u} T[:3u] + x^{12u} T[:2u] \\ &\quad + x^{13u} T[:u] + (x^{7u} + x^{8u} + x^{9u}). \end{aligned}$$

The proof of the other 15 cases are similar. We break down the above identity into 7 parts:

$$\begin{aligned} x^7 u &= x^{6u} T[u:2u] + x^{4u} T[3u:4u] + x^{3u} T[4u:5u] + x^u T[6u:7u] \\ &\quad + T[7u:8u], \\ x^8 u &= x^{7u} T[u:2u] + x^{6u} T[2u:3u] + x^{5u} T[3u:4u] + x^{3u} T[5u:6u] \\ &\quad + x^{2u} T[6u:7u] + T[8u:9u], \\ x^9 u &= x^{9u} T[:u] + x^{8u} T[u:2u] + x^{7u} T[2u:3u] + T[9u:10u], \\ 0 &= x^{10u} T[:u] + x^{9u} T[u:2u] + x^{8u} T[2u:3u] + x^{7u} T[3u:4u] \end{aligned}$$

$$
\begin{aligned}
&\quad + T[10u\!:\!11u],\\
0 &= x^{11u}T[:u] + x^{10u}T[u\!:\!2u] + x^{9u}T[2u\!:\!3u] + x^{8u}T[3u\!:\!4u]\\
&\quad + x^{7u}T[4u\!:\!5u] + T[11u\!:\!12u],\\
0 &= x^{12u}T[:u] + x^{11u}T[u\!:\!2u] + x^{10u}T[2u\!:\!3u] + x^{9u}T[3u\!:\!4u]\\
&\quad + x^{8u}T[4u\!:\!5u] + x^{7u}T[5u\!:\!6u] + T[12u\!:\!13u],\\
0 &= x^{13u}T[:u] + x^{12u}T[u\!:\!2u] + x^{11u}T[2u\!:\!3u] + x^{10u}T[3u\!:\!4u]\\
&\quad + x^{9u}T[4u\!:\!5u] + x^{8u}T[5u\!:\!6u] + x^{7u}T[6u\!:\!7u] + T[13u\!:\!14u],
\end{aligned}
$$

which can be rewritten as

$$0 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.7}$$

$$0 = T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1000w]_2], \tag{2.8}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[1001w]_2], \tag{2.9}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[1010w]_2], \tag{2.10}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.11}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.12}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.13}$$

for all binary word w of length $2k$ and $w \neq 0^{2k}$, and

$$1 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.14}$$

$$1 = T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1000w]_2], \tag{2.15}$$

$$1 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[1001w]_2], \tag{2.16}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[1010w]_2], \tag{2.17}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.18}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.19}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.20}$$

for $w = 0^{2k}$.

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 3462 states; its transition function and output function can be found in the annex. Let $A(s, w)$ denote the state reached after reading w from right to left starting from the state s, and τ the output function. Define

$$E_{2k} = \{A(i, w) : |w| = 2k, w \neq 0^{2k}\}.$$

Identities (2.7) through (2.20) can be written as

$$0 = \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,110)) + \tau(A(s,111)), \tag{2.21}$$

$$0 = \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1000)), \tag{2.22}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,1001)), \tag{2.23}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,1010)), \tag{2.24}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,1011)), \tag{2.25}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1100)), \tag{2.26}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1101)), \tag{2.27}$$

for all $s \in E_{2k}$, and

$$1 = \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,110)) + \tau(A(s,111)), \tag{2.28}$$

$$1 = \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1000)), \tag{2.29}$$

$$1 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,1001)), \tag{2.30}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,1010)), \tag{2.31}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,1011)), \tag{2.32}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1100)), \tag{2.33}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1101)), \tag{2.34}$$

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{26}), E_{26}) = (A(i, 0^{20}), E_{20})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 13$, which turns out to be true. $\square$

In the following lemma, we express M_{2k}, M_{2k+1}, W_{2k}, and W_{2k+1} in terms of M^e, M^o, W^e, and W^o.

Lemma 2.3. *For all integer $k \ge 2$, and $u = 2^{2k-1}$,*

$$M_{2k} = M^e[:7u] + x^u M^e[:6u] + x^{3u} M^e[:4u] + x^{4u} M^e[:3u] + x^{6u} M^e[:u] + x^{7u} R^e,$$

$$W_{2k} = W^e[:7u] + x^u W^e[:6u] + x^{3u} W^e[:4u] + x^{4u} W^e[:3u] + x^{6u} W^e[:u]$$

$$+ x^{7u}R^e.$$

For all integer $k \geq 2$, and $u = 2^{2k}$,

$$\begin{aligned}
M_{2k+1} &= M^o[:7u] + x^u M^o[:6u] + x^{3u}M^o[:4u] + x^{4u}M^o[:3u] + x^{6u}M^o[:u] \\
&\quad + x^{7u}R^o, \\
W_{2k+1} &= W^o[:7u] + x^u W^o[:6u] + x^{3u}W^o[:4u] + x^{4u}W^o[:3u] + x^{6u}W^o[:u] \\
&\quad + x^{7u}R^o.
\end{aligned}$$

Proof. We call the four identities in Lemma 2.3 also by the name M_{2k}, W_{2k}, M_{2k+1}, and W_{2k+1}. For $n = 2$, the identities can be verified directly. For $n \geq 2$, we claim that

$$\begin{aligned}
M_{2k} \wedge W_{2k} &\Rightarrow M_{2k+1} \wedge W_{2k+1}, \\
M_{2k+1} \wedge W_{2k+1} &\Rightarrow M_{2k+2} \wedge W_{2k+2}.
\end{aligned}$$

We give the proof of

$$M_{2k} \wedge W_{2k} \Rightarrow M_{2k+1},$$

the other ones being similar. Set $u = 2^{2k}$ and $v = 2^{2k-1}$. By definition and induction hypothesis, the left side of identity M_{2k+1} is equal to

$$\begin{aligned}
W_{2k}M_{2k} &= \big(W^e[:7v] + x^v W^e[:6v] + x^{3v}W^e[:4v] + x^{4v}W^e[:3v] + x^{6v}W^e[:v] \\
&\quad + x^{7u}R^e\big) \times \big(M^e[:7v] + x^v M^e[:6v] + x^{3v}M^e[:4v] + x^{4v}M^e[:3v] \\
&\quad + x^{6v}M^e[:v] + x^{7u}R^e\big); \qquad (2.35)
\end{aligned}$$

Call this expression lhs. Note that both sides of identity M_{2k+1} have the same term of highest degree $x^{14v}R^o$. Therefore we only need to prove that their difference is $O(x^{14v})$. Using Lemma 2.1 it can be seen that the right side of identity M_{2k+1} is congruent, modulo x^{14v}, to

$$\begin{aligned}
&W^e[:14v]M^e[:14v] + x^{2v}W^e[:12v]M^e[:12v] + x^{6v}W^e[:8v]M^e[:8v] \\
&\qquad\qquad + x^{8v}W^e[:6v]M^e[:6v] + x^{12v}W^e[:2v]M^e[:2v].
\end{aligned}$$

For all $n \leq 14$, replace the occurrences of $W^e[:n \cdot v]$ and $M^e[:n \cdot v]$ in the above expression by the reduction modulo $x^{n \cdot v}$ of the right side of the corresponding identity in Lemma 2.2 and get a new expression, which we call rhs. Define

$$\begin{aligned}
X &:= x^v, \\
a_n &:= W^e[n \cdot v : (n+1) \cdot v]/X^n, \\
b_n &:= M^e[n \cdot v : (n+1) \cdot v]/X^n, \\
c &:= R^e.
\end{aligned}$$

Using the notation introduced above, we can represent the expressions lhs (2.35) and rhs as polynomials in $\mathbb{F}_2[a_1, ..., a_{14}, b_1, ..., b_{14}, c][X]$. Note that it is not a problem that a_j commutes with b_k while W^e does not commute with M^e, because in the expressions concerned, the products of W^e-terms and M^e-terms are always in the same order. We let the computer do the simplification and check that the difference between these two polynomials is indeed $O(X^{14})$, which completes the proof. $\square$

Proof of Theorem 1.1. We prove the theorem for $\mathrm{CF}(a,b)$; for $\mathrm{CF}(b,a)$, the proof is similar. By Lemma 2.3, we have For all $0 \le j,k \le 1$,

$$\lim_{n\to\infty} M_{2n,j,k} = M^e_{j,k},$$
$$\lim_{n\to\infty} M_{2n+1,j,k} = M^o_{j,k},$$
$$\lim_{n\to\infty} W_{2n,j,k} = W^e_{j,k},$$
$$\lim_{n\to\infty} W_{2n+1,j,k} = W^o_{j,k}.$$

Let $z = 1/x$. By the convergence theorem and identity (2.2),

$$\mathrm{CF}(a,b) = \frac{M^e_{0,1}(x)}{M^e_{0,0}(x)}.$$

By definition, $\phi(M^e,0,1)$ and $\phi(M^e,0,0)$ are minimal polynomials of $M^e_{0,1}$ and $M^e_{0,0}$. Therefore

$$P(x,y) = \mathrm{Res}_t\left(\phi(M^e,0,1)(x,t), y^{12}\phi(M^e,0,1)(x,t/y)\right)$$

is an annihilating polynomial of $f(x) = M^e_{0,1}/M^e_{0,0}$.

Define

$$Q(x,y) = q_4(x)y^4 + q_3(x)y^3 + q_2(x)y^2 + q_1(x)y + q_0(x),$$

where

$$\begin{aligned}
q_0(x) &= x^{28} + x^{27} + x^{24} + x^{17} + x^{16} + x^{13} + x^{11} + x^9 + x^7,\\
q_1(x) &= x^{27} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17} + x^{15} + x^{13} + x^5 + x^4 + x^2,\\
q_2(x) &= x^{28} + x^{26} + x^{24} + x^{22} + x^{16} + x^{14} + x^{10} + 1,\\
q_3(x) &= x^{27} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17} + x^{15} + x^{13} + x^5 + x^4 + x^2,\\
q_4(x) &= x^{28} + x^{27} + x^{26} + x^{22} + x^{17} + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} + x^9 + x^8\\
&\quad + x^7 + x^4.
\end{aligned}$$

The polynomial $Q(x,y)$ is the candidate for the minimal polynomial of $f(x)$ found by Padé-Hermite approximation. To prove that it is indeed the minimal polynomial of $f(x)$, we only need to prove that it is an irreducible factor of $P(x,y)$ of multiplicity m and $R(x,y) := P(x,y)/Q(x,y)^m$ is not an annihilating polynomial of $f(x)$. We verify the first point directly. For the second point, we find that when we truncate $f(x)$ to order 216, and substitute it for y in $R(z,y)$, we get a series with valuation smaller than 216, which proves that $R(z,y)$ is not an annihilating polynomial of $f(x)$. Finally, $z^{12}Q(1/z,y)$ is the minimal polynomial of $\mathrm{CF}(a,b) = f(1/z)$. □

3. Annexe

All 16 polynomials are of the form

$$p_0(x) + p_3(x)y^3 + p_6(x)y^6 + p_9(x)y^9 + p_{12}(x)y^{12}.$$

The coefficients $p_j(x)$ and the 16 initial terms to determine the solutions uniquely are given below.

For $\phi(M^e,0,0)$:

$$\begin{aligned}
p_0(x) &= x^{156} + x^{154} + x^{152} + x^{142} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{128}\\
&\quad + x^{126} + x^{124} + x^{122} + x^{114} + x^{108} + x^{106} + x^{102} + x^{96} + x^{92} + x^{90}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{88} + x^{86} + x^{84} + x^{76} + x^{74} + x^{72} + x^{70} + x^{62} + x^{58} + x^{46} + x^{44} \\
&+ x^{42} + x^{36} + x^{32} + x^{30} + x^{28} + x^{24}, \\
p_3(x) &= x^{154} + x^{152} + x^{150} + x^{148} + x^{146} + x^{142} + x^{140} + x^{136} + x^{134} + x^{132} \\
&+ x^{126} + x^{124} + x^{120} + x^{118} + x^{116} + x^{114} + x^{110} + x^{94} + x^{86} + x^{84} \\
&+ x^{82} + x^{76} + x^{70} + x^{68} + x^{64} + x^{62} + x^{60} + x^{52} + x^{50} + x^{42} + x^{38} \\
&+ x^{34} + x^{30} + x^{28} + x^{26} + x^{22} + x^{18} + x^{16}, \\
p_6(x) &= x^{154} + x^{150} + x^{146} + x^{142} + x^{140} + x^{138} + x^{130} + x^{128} + x^{122} + x^{120} \\
&+ x^{116} + x^{114} + x^{108} + x^{100} + x^{98} + x^{96} + x^{94} + x^{90} + x^{88} + x^{84} \\
&+ x^{78} + x^{76} + x^{72} + x^{70} + x^{64} + x^{56} + x^{52} + x^{50} + x^{38} + x^{36} + x^{32} \\
&+ x^{30} + x^{26} + x^{24} + x^{20} + x^{16} + x^{10} + 1, \\
p_9(x) &= x^{154} + x^{152} + x^{148} + x^{144} + x^{138} + x^{134} + x^{128} + x^{126} + x^{122} + x^{116} \\
&+ x^{114} + x^{110} + x^{104} + x^{102} + x^{98} + x^{92} + x^{88} + x^{86} + x^{84} + x^{82} \\
&+ x^{80} + x^{78} + x^{76} + x^{72} + x^{70} + x^{68} + x^{64} + x^{62} + x^{58} + x^{52} + x^{48} \\
&+ x^{46} + x^{44} + x^{38} + x^{30} + x^{28} + x^{20} + x^{16} + x^{14} + x^{10} + x^{8} + x^{4}, \\
p_{12}(x) &= x^{156} + x^{152} + x^{148} + x^{144} + x^{132} + x^{128} + x^{124} + x^{120} + x^{116} + x^{112} \\
&+ x^{108} + x^{104} + x^{100} + x^{96} + x^{84} + x^{80} + x^{60} + x^{56} + x^{36} + x^{32} + x^{28} \\
&+ x^{24} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

and the initial terms are [1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0].

For $\phi(M^e, 0, 1)$:

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{145} + x^{144} + x^{141} + x^{139} + x^{133} + x^{131} + x^{125} + x^{124} \\
&+ x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110} \\
&+ x^{109} + x^{106} + x^{105} + x^{104} + x^{102} + x^{99} + x^{97} + x^{94} + x^{91} + x^{85} \\
&+ x^{84} + x^{83} + x^{77} + x^{72} + x^{70} + x^{69} + x^{66} + x^{64} + x^{59} + x^{57} + x^{56} \\
&+ x^{53} + x^{51} + x^{49} + x^{48} + x^{44} + x^{43} + x^{42} + x^{40} + x^{37} + x^{36} + x^{35} \\
&+ x^{34} + x^{33}, \\
p_3(x) &= x^{138} + x^{137} + x^{134} + x^{132} + x^{130} + x^{128} + x^{125} + x^{124} + x^{122} + x^{121} \\
&+ x^{120} + x^{119} + x^{118} + x^{112} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106} \\
&+ x^{105} + x^{103} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{86} + x^{84} \\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{74} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{59} \\
&+ x^{58} + x^{56} + x^{55} + x^{52} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41} \\
&+ x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{22} + x^{21} \\
&+ x^{20} + x^{19} + x^{18}, \\
p_6(x) &= x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} \\
&+ x^{125} + x^{123} + x^{121} + x^{120} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} \\
&+ x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{91} + x^{90} + x^{89} + x^{87} + x^{82} + x^{78}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{77} + x^{76} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63}\\
&+ x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{54} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46}\\
&+ x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{34} + x^{32} + x^{31} + x^{26}\\
&+ x^{25} + x^{24} + x^{23} + x^{22} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12},\\
p_9(x) = {}& x^{144} + x^{143} + x^{139} + x^{137} + x^{136} + x^{135} + x^{133} + x^{130} + x^{128} + x^{126}\\
&+ x^{123} + x^{122} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109}\\
&+ x^{107} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{96} + x^{93} + x^{91} + x^{90}\\
&+ x^{89} + x^{88} + x^{82} + x^{81} + x^{77} + x^{76} + x^{72} + x^{71} + x^{67} + x^{66} + x^{62}\\
&+ x^{61} + x^{57} + x^{55} + x^{52} + x^{49} + x^{48} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38}\\
&+ x^{37} + x^{34} + x^{31} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{20} + x^{18} + x^{16}\\
&+ x^{14} + x^{11} + x^{9} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) = {}& x^{147} + x^{146} + x^{145} + x^{142} + x^{140} + x^{138} + x^{136} + x^{135} + x^{133} + x^{132}\\
&+ x^{131} + x^{130} + x^{129} + x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121}\\
&+ x^{118} + x^{116} + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92}\\
&+ x^{90} + x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{77} + x^{76}\\
&+ x^{75} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56}\\
&+ x^{55} + x^{53} + x^{52} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38}\\
&+ x^{37} + x^{35} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{25} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{18} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4}\\
&+ x^{3} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0].

For $\phi(M^e, 1, 0)$:

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{146} + x^{145} + x^{144} + x^{141} + x^{139} + x^{133} + x^{131} + x^{125} + x^{124}\\
&+ x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110}\\
&+ x^{109} + x^{106} + x^{105} + x^{104} + x^{102} + x^{99} + x^{97} + x^{94} + x^{91} + x^{85}\\
&+ x^{84} + x^{83} + x^{77} + x^{72} + x^{70} + x^{69} + x^{66} + x^{64} + x^{59} + x^{57} + x^{56}\\
&+ x^{53} + x^{51} + x^{49} + x^{48} + x^{44} + x^{43} + x^{42} + x^{40} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{33},\\
p_3(x) = {}& x^{138} + x^{137} + x^{134} + x^{132} + x^{130} + x^{128} + x^{125} + x^{124} + x^{122} + x^{121}\\
&+ x^{120} + x^{119} + x^{118} + x^{112} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106}\\
&+ x^{105} + x^{103} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{86} + x^{84}\\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{74} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{59}\\
&+ x^{58} + x^{56} + x^{55} + x^{52} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41}\\
&+ x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{22} + x^{21}\\
&+ x^{20} + x^{19} + x^{18},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) = {} & x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} \\
& + x^{125} + x^{123} + x^{121} + x^{120} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} \\
& + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{91} + x^{90} + x^{89} + x^{87} + x^{82} + x^{78} \\
& + x^{77} + x^{76} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} \\
& + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{54} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} \\
& + x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{34} + x^{32} + x^{31} + x^{26} \\
& + x^{25} + x^{24} + x^{23} + x^{22} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12}, \\
p_9(x) = {} & x^{144} + x^{143} + x^{139} + x^{137} + x^{136} + x^{135} + x^{133} + x^{130} + x^{128} + x^{126} \\
& + x^{123} + x^{122} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{96} + x^{93} + x^{91} + x^{90} \\
& + x^{89} + x^{88} + x^{82} + x^{81} + x^{77} + x^{76} + x^{72} + x^{71} + x^{67} + x^{66} + x^{62} \\
& + x^{61} + x^{57} + x^{55} + x^{52} + x^{49} + x^{48} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38} \\
& + x^{37} + x^{34} + x^{31} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{20} + x^{18} + x^{16} \\
& + x^{14} + x^{11} + x^{9} + x^{8} + x^{7} + x^{6}, \\
p_{12}(x) = {} & x^{147} + x^{146} + x^{145} + x^{142} + x^{140} + x^{138} + x^{136} + x^{135} + x^{133} + x^{132} \\
& + x^{131} + x^{130} + x^{129} + x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} \\
& + x^{118} + x^{116} + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92} \\
& + x^{90} + x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{77} + x^{76} \\
& + x^{75} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} \\
& + x^{55} + x^{53} + x^{52} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} \\
& + x^{37} + x^{35} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{25} + x^{24} + x^{23} \\
& + x^{22} + x^{21} + x^{18} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} \\
& + x^{3} + x + 1,
\end{aligned}$$

and the initial terms are [0, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0].

For $\phi(M^e, 1, 1)$:

$$\begin{aligned}
p_0(x) = {} & x^{138} + x^{132} + x^{130} + x^{124} + x^{112} + x^{106} + x^{104} + x^{102} + x^{100} + x^{94} \\
& + x^{92} + x^{90} + x^{84} + x^{78} + x^{76} + x^{74} + x^{64} + x^{62} + x^{54} + x^{50} + x^{48} \\
& + x^{44} + x^{42}, \\
p_3(x) = {} & x^{136} + x^{128} + x^{120} + x^{116} + x^{110} + x^{108} + x^{98} + x^{82} + x^{80} + x^{78} \\
& + x^{74} + x^{60} + x^{56} + x^{52} + x^{50} + x^{48} + x^{44} + x^{36} + x^{34} + x^{32} + x^{30} \\
& + x^{28} + x^{26} + x^{16} + x^{14} + x^{12}, \\
p_6(x) = {} & x^{136} + x^{130} + x^{124} + x^{122} + x^{120} + x^{118} + x^{116} + x^{100} + x^{98} + x^{94} \\
& + x^{92} + x^{88} + x^{84} + x^{72} + x^{66} + x^{64} + x^{60} + x^{58} + x^{54} + x^{46} + x^{40} \\
& + x^{34} + x^{32} + x^{26} + x^{24} + x^{22} + x^{18} + x^{10} + x^{8} + x^{6} + x^{2} + 1, \\
p_9(x) = {} & x^{136} + x^{126} + x^{118} + x^{116} + x^{110} + x^{106} + x^{104} + x^{90} + x^{88} + x^{84}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{80} + x^{78} + x^{76} + x^{72} + x^{66} + x^{60} + x^{54} + x^{52} + x^{42} + x^{36} + x^{32}\\
&+ x^{28} + x^{24} + x^{22} + x^{20} + x^{18} + x^{14} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4},\\
p_{12}(x) &= x^{138} + x^{136} + x^{132} + x^{130} + x^{128} + x^{122} + x^{120} + x^{116} + x^{114} + x^{112}\\
&+ x^{90} + x^{88} + x^{84} + x^{82} + x^{80} + x^{74} + x^{72} + x^{68} + x^{66} + x^{64} + x^{58}\\
&+ x^{56} + x^{52} + x^{50} + x^{48} + x^{10} + x^{8} + x^{4} + x^{2} + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0].

For $\phi(W^e, 0, 0)$:

$$
\begin{aligned}
p_0(x) &= x^{138} + x^{134} + x^{130} + x^{126} + x^{124} + x^{118} + x^{112} + x^{106} + x^{104} + x^{102}\\
&+ x^{98} + x^{96} + x^{94} + x^{92} + x^{88} + x^{86} + x^{82} + x^{76} + x^{74} + x^{64} + x^{62}\\
&+ x^{58} + x^{56} + x^{50} + x^{48} + x^{46} + x^{44} + x^{40} + x^{32} + x^{30} + x^{28} + x^{26}\\
&+ x^{24},\\
p_3(x) &= x^{136} + x^{132} + x^{130} + x^{128} + x^{122} + x^{120} + x^{118} + x^{114} + x^{106} + x^{104}\\
&+ x^{98} + x^{92} + x^{90} + x^{88} + x^{86} + x^{76} + x^{74} + x^{68} + x^{66} + x^{60} + x^{58}\\
&+ x^{52} + x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{34} + x^{22} + x^{16},\\
p_6(x) &= x^{136} + x^{134} + x^{128} + x^{124} + x^{122} + x^{120} + x^{116} + x^{114} + x^{112} + x^{110}\\
&+ x^{104} + x^{102} + x^{98} + x^{92} + x^{86} + x^{82} + x^{76} + x^{74} + x^{70} + x^{60} + x^{52}\\
&+ x^{36} + x^{34} + x^{28} + x^{22} + x^{18} + x^{14} + x^{6} + x^{2} + 1,\\
p_9(x) &= x^{136} + x^{126} + x^{118} + x^{116} + x^{110} + x^{106} + x^{104} + x^{90} + x^{88} + x^{84}\\
&+ x^{80} + x^{78} + x^{76} + x^{72} + x^{66} + x^{60} + x^{54} + x^{52} + x^{42} + x^{36} + x^{32}\\
&+ x^{28} + x^{24} + x^{22} + x^{20} + x^{18} + x^{14} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4},\\
p_{12}(x) &= x^{138} + x^{136} + x^{132} + x^{130} + x^{128} + x^{122} + x^{120} + x^{116} + x^{114} + x^{112}\\
&+ x^{90} + x^{88} + x^{84} + x^{82} + x^{80} + x^{74} + x^{72} + x^{68} + x^{66} + x^{64} + x^{58}\\
&+ x^{56} + x^{52} + x^{50} + x^{48} + x^{10} + x^{8} + x^{4} + x^{2} + 1,
\end{aligned}
$$

and the initial terms are [1, 0, 0, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0].

For $\phi(W^e, 0, 1)$:

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{145} + x^{144} + x^{140} + x^{136} + x^{135} + x^{129} + x^{126} + x^{125}\\
&+ x^{123} + x^{122} + x^{120} + x^{119} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110}\\
&+ x^{109} + x^{106} + x^{105} + x^{103} + x^{101} + x^{99} + x^{98} + x^{94} + x^{91} + x^{90}\\
&+ x^{89} + x^{85} + x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{69} + x^{68}\\
&+ x^{65} + x^{64} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{52} + x^{50} + x^{49}\\
&+ x^{48} + x^{46} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{33},\\
p_3(x) &= x^{138} + x^{137} + x^{134} + x^{132} + x^{130} + x^{128} + x^{125} + x^{124} + x^{122} + x^{121}\\
&+ x^{120} + x^{119} + x^{118} + x^{112} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106}\\
&+ x^{105} + x^{103} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{86} + x^{84}\\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{74} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{59}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{58} + x^{56} + x^{55} + x^{52} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41} \\
&+ x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{22} + x^{21} \\
&+ x^{20} + x^{19} + x^{18}, \\
p_6(x) &= x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} \\
&+ x^{125} + x^{123} + x^{121} + x^{120} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} \\
&+ x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{91} + x^{90} + x^{89} + x^{87} + x^{82} + x^{78} \\
&+ x^{77} + x^{76} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} \\
&+ x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{54} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} \\
&+ x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{34} + x^{32} + x^{31} + x^{26} \\
&+ x^{25} + x^{24} + x^{23} + x^{22} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12}, \\
p_9(x) &= x^{144} + x^{143} + x^{139} + x^{137} + x^{136} + x^{135} + x^{133} + x^{130} + x^{128} + x^{126} \\
&+ x^{123} + x^{122} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} \\
&+ x^{107} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{96} + x^{93} + x^{91} + x^{90} \\
&+ x^{89} + x^{88} + x^{82} + x^{81} + x^{77} + x^{76} + x^{72} + x^{71} + x^{67} + x^{66} + x^{62} \\
&+ x^{61} + x^{57} + x^{55} + x^{52} + x^{49} + x^{48} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38} \\
&+ x^{37} + x^{34} + x^{31} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{20} + x^{18} + x^{16} \\
&+ x^{14} + x^{11} + x^{9} + x^{8} + x^{7} + x^{6}, \\
p_{12}(x) &= x^{147} + x^{146} + x^{145} + x^{142} + x^{140} + x^{138} + x^{136} + x^{135} + x^{133} + x^{132} \\
&+ x^{131} + x^{130} + x^{129} + x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} \\
&+ x^{118} + x^{116} + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92} \\
&+ x^{90} + x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{77} + x^{76} \\
&+ x^{75} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} \\
&+ x^{55} + x^{53} + x^{52} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} \\
&+ x^{37} + x^{35} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{25} + x^{24} + x^{23} \\
&+ x^{22} + x^{21} + x^{18} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} \\
&+ x^{3} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 0].

For $\phi(W^e, 1, 0)$:

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{145} + x^{144} + x^{140} + x^{136} + x^{135} + x^{129} + x^{126} + x^{125} \\
&+ x^{123} + x^{122} + x^{120} + x^{119} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} \\
&+ x^{109} + x^{106} + x^{105} + x^{103} + x^{101} + x^{99} + x^{98} + x^{94} + x^{91} + x^{90} \\
&+ x^{89} + x^{85} + x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{69} + x^{68} \\
&+ x^{65} + x^{64} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{52} + x^{50} + x^{49} \\
&+ x^{48} + x^{46} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{33}, \\
p_3(x) &= x^{138} + x^{137} + x^{134} + x^{132} + x^{130} + x^{128} + x^{125} + x^{124} + x^{122} + x^{121}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{120} + x^{119} + x^{118} + x^{112} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106} \\
&+ x^{105} + x^{103} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{86} + x^{84} \\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{74} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{59} \\
&+ x^{58} + x^{56} + x^{55} + x^{52} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41} \\
&+ x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{22} + x^{21} \\
&+ x^{20} + x^{19} + x^{18}, \\
p_6(x) &= x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} \\
&+ x^{125} + x^{123} + x^{121} + x^{120} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} \\
&+ x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{91} + x^{90} + x^{89} + x^{87} + x^{82} + x^{78} \\
&+ x^{77} + x^{76} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} \\
&+ x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{54} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} \\
&+ x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{34} + x^{32} + x^{31} + x^{26} \\
&+ x^{25} + x^{24} + x^{23} + x^{22} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12}, \\
p_9(x) &= x^{144} + x^{143} + x^{139} + x^{137} + x^{136} + x^{135} + x^{133} + x^{130} + x^{128} + x^{126} \\
&+ x^{123} + x^{122} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} \\
&+ x^{107} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{96} + x^{93} + x^{91} + x^{90} \\
&+ x^{89} + x^{88} + x^{82} + x^{81} + x^{77} + x^{76} + x^{72} + x^{71} + x^{67} + x^{66} + x^{62} \\
&+ x^{61} + x^{57} + x^{55} + x^{52} + x^{49} + x^{48} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38} \\
&+ x^{37} + x^{34} + x^{31} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{20} + x^{18} + x^{16} \\
&+ x^{14} + x^{11} + x^{9} + x^{8} + x^{7} + x^{6}, \\
p_{12}(x) &= x^{147} + x^{146} + x^{145} + x^{142} + x^{140} + x^{138} + x^{136} + x^{135} + x^{133} + x^{132} \\
&+ x^{131} + x^{130} + x^{129} + x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} \\
&+ x^{118} + x^{116} + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92} \\
&+ x^{90} + x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{77} + x^{76} \\
&+ x^{75} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} \\
&+ x^{55} + x^{53} + x^{52} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41} + x^{40} + x^{39} + x^{38} \\
&+ x^{37} + x^{35} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{25} + x^{24} + x^{23} \\
&+ x^{22} + x^{21} + x^{18} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} \\
&+ x^{3} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 0, 1, 1, 0].

For $\phi(W^e, 1, 1)$:

$$
\begin{aligned}
p_0(x) &= x^{156} + x^{154} + x^{148} + x^{146} + x^{138} + x^{134} + x^{130} + x^{122} + x^{120} + x^{114} \\
&+ x^{112} + x^{108} + x^{106} + x^{102} + x^{96} + x^{92} + x^{88} + x^{80} + x^{74} + x^{68} \\
&+ x^{66} + x^{64} + x^{58} + x^{56} + x^{52} + x^{50} + x^{46} + x^{44} + x^{42}, \\
p_3(x) &= x^{154} + x^{152} + x^{148} + x^{144} + x^{136} + x^{126} + x^{122} + x^{120} + x^{118} + x^{116}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{112}+x^{106}+x^{102}+x^{100}+x^{98}+x^{96}+x^{92}+x^{86}+x^{80}+x^{76}\\
&+x^{72}+x^{70}+x^{68}+x^{66}+x^{62}+x^{60}+x^{54}+x^{52}+x^{46}+x^{44}+x^{38}\\
&+x^{36}+x^{34}+x^{32}+x^{28}+x^{26}+x^{24}+x^{20}+x^{16}+x^{12},\\
p_6(x)&=x^{154}+x^{152}+x^{148}+x^{144}+x^{140}+x^{138}+x^{134}+x^{130}+x^{120}+x^{112}\\
&+x^{110}+x^{108}+x^{106}+x^{102}+x^{96}+x^{90}+x^{82}+x^{80}+x^{78}+x^{70}\\
&+x^{68}+x^{66}+x^{64}+x^{54}+x^{52}+x^{46}+x^{42}+x^{38}+x^{28}+x^{26}+x^{24}\\
&+x^{22}+x^{20}+x^{18}+x^{16}+x^{10}+x^{8}+1,\\
p_9(x)&=x^{154}+x^{152}+x^{148}+x^{144}+x^{138}+x^{134}+x^{128}+x^{126}+x^{122}+x^{116}\\
&+x^{114}+x^{110}+x^{104}+x^{102}+x^{98}+x^{92}+x^{88}+x^{86}+x^{84}+x^{82}\\
&+x^{80}+x^{78}+x^{76}+x^{72}+x^{70}+x^{68}+x^{64}+x^{62}+x^{58}+x^{52}+x^{48}\\
&+x^{46}+x^{44}+x^{38}+x^{30}+x^{28}+x^{20}+x^{16}+x^{14}+x^{10}+x^{8}+x^{4},\\
p_{12}(x)&=x^{156}+x^{152}+x^{148}+x^{144}+x^{132}+x^{128}+x^{124}+x^{120}+x^{116}+x^{112}\\
&+x^{108}+x^{104}+x^{100}+x^{96}+x^{84}+x^{80}+x^{60}+x^{56}+x^{36}+x^{32}+x^{28}\\
&+x^{24}+x^{12}+x^{8}+x^{4}+1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 1, 0].

For $\phi(M^o,0,0)$:

$$
\begin{aligned}
p_0(x)&=x^{147}+x^{146}+x^{144}+x^{142}+x^{140}+x^{138}+x^{135}+x^{134}+x^{133}+x^{132}\\
&+x^{129}+x^{128}+x^{127}+x^{126}+x^{125}+x^{124}+x^{123}+x^{121}+x^{120}\\
&+x^{119}+x^{118}+x^{116}+x^{115}+x^{112}+x^{106}+x^{105}+x^{104}+x^{103}\\
&+x^{102}+x^{94}+x^{93}+x^{92}+x^{91}+x^{90}+x^{89}+x^{88}+x^{87}+x^{86}+x^{84}\\
&+x^{83}+x^{81}+x^{80}+x^{78}+x^{77}+x^{76}+x^{74}+x^{71}+x^{70}+x^{68}+x^{67}\\
&+x^{65}+x^{63}+x^{62}+x^{60}+x^{58}+x^{57}+x^{54}+x^{53}+x^{51}+x^{49}+x^{47}\\
&+x^{46}+x^{45}+x^{44}+x^{41}+x^{35}+x^{34}+x^{32}+x^{31}+x^{29}+x^{27}+x^{25}\\
&+x^{24},\\
p_3(x)&=x^{143}+x^{142}+x^{140}+x^{139}+x^{135}+x^{134}+x^{131}+x^{129}+x^{128}+x^{124}\\
&+x^{122}+x^{119}+x^{118}+x^{116}+x^{113}+x^{112}+x^{111}+x^{110}+x^{109}\\
&+x^{107}+x^{106}+x^{103}+x^{102}+x^{100}+x^{99}+x^{97}+x^{96}+x^{95}+x^{90}\\
&+x^{84}+x^{83}+x^{82}+x^{80}+x^{78}+x^{77}+x^{75}+x^{71}+x^{69}+x^{66}+x^{58}\\
&+x^{57}+x^{50}+x^{49}+x^{48}+x^{47}+x^{45}+x^{44}+x^{42}+x^{41}+x^{35}+x^{33}\\
&+x^{31}+x^{28}+x^{26}+x^{25}+x^{23}+x^{21}+x^{19}+x^{17}+x^{16},\\
p_6(x)&=x^{145}+x^{144}+x^{136}+x^{132}+x^{128}+x^{127}+x^{125}+x^{123}+x^{122}+x^{120}\\
&+x^{119}+x^{116}+x^{115}+x^{114}+x^{113}+x^{112}+x^{111}+x^{110}+x^{108}\\
&+x^{106}+x^{105}+x^{103}+x^{102}+x^{101}+x^{96}+x^{94}+x^{93}+x^{91}+x^{89}\\
&+x^{87}+x^{86}+x^{81}+x^{79}+x^{77}+x^{76}+x^{75}+x^{73}+x^{70}+x^{68}+x^{67}\\
&+x^{66}+x^{64}+x^{63}+x^{62}+x^{61}+x^{60}+x^{58}+x^{55}+x^{53}+x^{52}+x^{51}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{46} + x^{44} + x^{43} + x^{42} + x^{39} + x^{38} + x^{36} + x^{33} + x^{29} + x^{23} + x^{22}\\
&+ x^{17} + x^{16} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4} + x^{3} + x + 1,\\
p_9(x) &= x^{143} + x^{142} + x^{141} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{126}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{95} + x^{94} + x^{93} + x^{90} + x^{88} + x^{86}\\
&+ x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{63} + x^{62} + x^{61}\\
&+ x^{58} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{43} + x^{42}\\
&+ x^{41} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25}\\
&+ x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{11} + x^{9} + x^{8},\\
p_{12}(x) &= x^{147} + x^{146} + x^{145} + x^{143} + x^{141} + x^{140} + x^{135} + x^{134} + x^{133} + x^{131}\\
&+ x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116}\\
&+ x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{95} + x^{93} + x^{92} + x^{87} + x^{86}\\
&+ x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{70} + x^{68}\\
&+ x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{55} + x^{54} + x^{53} + x^{50} + x^{48} + x^{46}\\
&+ x^{44} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30} + x^{28}\\
&+ x^{26} + x^{24} + x^{23} + x^{21} + x^{20} + x^{15} + x^{14} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4}\\
&+ x^{3} + x + 1,
\end{aligned}
$$

and the initial terms are [1, 0, 0, 0, 1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0].

For $\phi(M^o, 0, 1)$:

$$
\begin{aligned}
p_0(x) &= x^{148} + x^{145} + x^{144} + x^{142} + x^{140} + x^{135} + x^{134} + x^{133} + x^{132} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{125} + x^{123} + x^{120} + x^{119} + x^{116} + x^{113}\\
&+ x^{111} + x^{110} + x^{108} + x^{106} + x^{104} + x^{103} + x^{102} + x^{99} + x^{98} + x^{95}\\
&+ x^{94} + x^{92} + x^{90} + x^{89} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{76} + x^{73}\\
&+ x^{72} + x^{71} + x^{70} + x^{68} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59} + x^{55} + x^{53}\\
&+ x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{37}\\
&+ x^{36} + x^{35} + x^{33},\\
p_3(x) &= x^{139} + x^{136} + x^{132} + x^{131} + x^{129} + x^{128} + x^{125} + x^{124} + x^{121} + x^{120}\\
&+ x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{112} + x^{108} + x^{107} + x^{105}\\
&+ x^{104} + x^{101} + x^{100} + x^{97} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{88}\\
&+ x^{84} + x^{81} + x^{77} + x^{72} + x^{70} + x^{68} + x^{67} + x^{66} + x^{62} + x^{59} + x^{58}\\
&+ x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{45} + x^{40} + x^{38} + x^{36} + x^{35} + x^{34}\\
&+ x^{30} + x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{142} + x^{136} + x^{134} + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{100} + x^{98}\\
&+ x^{96} + x^{94} + x^{92} + x^{86} + x^{78} + x^{76} + x^{74} + x^{56} + x^{50} + x^{36} + x^{32}\\
&+ x^{30} + x^{26} + x^{22} + x^{18} + x^{12},\\
p_9(x) &= x^{145} + x^{142} + x^{139} + x^{138} + x^{137} + x^{136} + x^{135} + x^{134} + x^{132} + x^{131}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{130} + x^{129} + x^{127} + x^{126} + x^{124} + x^{121} + x^{120} + x^{118} + x^{97} + x^{94}\\
&+ x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79}\\
&+ x^{78} + x^{76} + x^{73} + x^{72} + x^{70} + x^{65} + x^{62} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{50} + x^{47} + x^{44} + x^{43} + x^{42} + x^{39} + x^{36}\\
&+ x^{35} + x^{34} + x^{31} + x^{28} + x^{27} + x^{26} + x^{23} + x^{20} + x^{19} + x^{18} + x^{17}\\
&+ x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = {}& x^{148} + x^{140} + x^{136} + x^{124} + x^{116} + x^{112} + x^{100} + x^{92} + x^{88} + x^{76}\\
&+ x^{64} + x^{60} + x^{56} + x^{52} + x^{40} + x^{32} + x^{24} + x^{20} + x^{16} + x^{12} + x^{4} + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0].

For $\phi(M^o, 1, 0)$:

$$
\begin{aligned}
p_0(x) = {}& x^{160} + x^{157} + x^{153} + x^{150} + x^{149} + x^{148} + x^{147} + x^{144} + x^{140} + x^{139}\\
&+ x^{136} + x^{135} + x^{134} + x^{132} + x^{129} + x^{124} + x^{123} + x^{122} + x^{121}\\
&+ x^{119} + x^{117} + x^{116} + x^{115} + x^{113} + x^{111} + x^{110} + x^{108} + x^{106}\\
&+ x^{105} + x^{103} + x^{102} + x^{98} + x^{97} + x^{91} + x^{90} + x^{89} + x^{88} + x^{85} + x^{83}\\
&+ x^{82} + x^{76} + x^{74} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{63} + x^{62}\\
&+ x^{61} + x^{58} + x^{55} + x^{52} + x^{49} + x^{44} + x^{39} + x^{37} + x^{34} + x^{33},\\
p_3(x) = {}& x^{151} + x^{148} + x^{147} + x^{141} + x^{140} + x^{139} + x^{136} + x^{135} + x^{133} + x^{132}\\
&+ x^{131} + x^{130} + x^{129} + x^{127} + x^{123} + x^{120} + x^{118} + x^{116} + x^{115}\\
&+ x^{111} + x^{110} + x^{109} + x^{107} + x^{105} + x^{104} + x^{103} + x^{102} + x^{100}\\
&+ x^{99} + x^{98} + x^{95} + x^{92} + x^{90} + x^{88} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80}\\
&+ x^{79} + x^{76} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{65} + x^{63} + x^{58} + x^{54}\\
&+ x^{53} + x^{52} + x^{51} + x^{50} + x^{49} + x^{47} + x^{46} + x^{41} + x^{40} + x^{39} + x^{36}\\
&+ x^{35} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{21} + x^{20} + x^{18},\\
p_6(x) = {}& x^{154} + x^{150} + x^{148} + x^{144} + x^{142} + x^{140} + x^{138} + x^{134} + x^{132} + x^{130}\\
&+ x^{128} + x^{124} + x^{120} + x^{118} + x^{116} + x^{112} + x^{108} + x^{106} + x^{102}\\
&+ x^{100} + x^{98} + x^{88} + x^{80} + x^{76} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{54}\\
&+ x^{50} + x^{42} + x^{40} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{24} + x^{18} + x^{16}\\
&+ x^{12},\\
p_9(x) = {}& x^{157} + x^{154} + x^{153} + x^{151} + x^{148} + x^{146} + x^{145} + x^{143} + x^{142} + x^{139}\\
&+ x^{138} + x^{134} + x^{130} + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122}\\
&+ x^{121} + x^{120} + x^{118} + x^{109} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{97}\\
&+ x^{95} + x^{94} + x^{91} + x^{90} + x^{86} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{72}\\
&+ x^{71} + x^{70} + x^{68} + x^{66} + x^{65} + x^{63} + x^{62} + x^{61} + x^{59} + x^{57} + x^{55}\\
&+ x^{54} + x^{52} + x^{48} + x^{43} + x^{42} + x^{40} + x^{39} + x^{36} + x^{32} + x^{29} + x^{27}\\
&+ x^{25} + x^{24} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8} + x^{6},
\end{aligned}
$$

$$
\begin{aligned}
p_{12}(x) = {} & x^{160} + x^{156} + x^{136} + x^{132} + x^{128} + x^{120} + x^{108} + x^{88} + x^{84} + x^{76} \\
& + x^{72} + x^{60} + x^{56} + x^{52} + x^{44} + x^{36} + x^{20} + x^{8} + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1].

For $\phi(M^o, 1, 1)$:

$$
\begin{aligned}
p_0(x) = {} & x^{147} + x^{146} + x^{144} + x^{143} + x^{139} + x^{134} + x^{132} + x^{131} + x^{130} + x^{129} \\
& + x^{126} + x^{123} + x^{120} + x^{118} + x^{115} + x^{114} + x^{111} + x^{106} + x^{104} \\
& + x^{103} + x^{102} + x^{100} + x^{94} + x^{88} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{76} \\
& + x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{65} + x^{64} + x^{58} + x^{54} + x^{52} + x^{50} \\
& + x^{49} + x^{48} + x^{46} + x^{42}, \\
p_3(x) = {} & x^{143} + x^{142} + x^{140} + x^{138} + x^{136} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} \\
& + x^{122} + x^{121} + x^{118} + x^{117} + x^{110} + x^{109} + x^{108} + x^{107} + x^{104} \\
& + x^{102} + x^{100} + x^{99} + x^{98} + x^{94} + x^{93} + x^{89} + x^{87} + x^{86} + x^{84} + x^{78} \\
& + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} + x^{67} + x^{61} + x^{60} + x^{57} + x^{54} + x^{53} \\
& + x^{52} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39} + x^{38} + x^{37} \\
& + x^{36} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22}, \\
p_6(x) = {} & x^{145} + x^{144} + x^{143} + x^{142} + x^{140} + x^{135} + x^{134} + x^{132} + x^{128} + x^{126} \\
& + x^{123} + x^{116} + x^{114} + x^{113} + x^{111} + x^{105} + x^{104} + x^{102} + x^{100} \\
& + x^{97} + x^{92} + x^{90} + x^{87} + x^{85} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{74} \\
& + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58} \\
& + x^{57} + x^{55} + x^{53} + x^{51} + x^{49} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{36} \\
& + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{20} + x^{19} + x^{18} + x^{17} \\
& + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} + x^{3} + x + 1, \\
p_9(x) = {} & x^{143} + x^{142} + x^{141} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{126} \\
& + x^{124} + x^{123} + x^{121} + x^{120} + x^{95} + x^{94} + x^{93} + x^{90} + x^{88} + x^{86} \\
& + x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{63} + x^{62} + x^{61} \\
& + x^{58} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{43} + x^{42} \\
& + x^{41} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} \\
& + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{11} + x^{9} + x^{8}, \\
p_{12}(x) = {} & x^{147} + x^{146} + x^{145} + x^{143} + x^{141} + x^{140} + x^{135} + x^{134} + x^{133} + x^{131} \\
& + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116} \\
& + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{95} + x^{93} + x^{92} + x^{87} + x^{86} \\
& + x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{70} + x^{68} \\
& + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{55} + x^{54} + x^{53} + x^{50} + x^{48} + x^{46} \\
& + x^{44} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30} + x^{28} \\
& + x^{26} + x^{24} + x^{23} + x^{21} + x^{20} + x^{15} + x^{14} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4}
\end{aligned}
$$

$$+ x^{3} + x + 1,$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0].

For $\phi(W^o, 0, 0)$:

$$\begin{aligned}
p_0(x) = {} & x^{147} + x^{146} + x^{144} + x^{142} + x^{140} + x^{138} + x^{135} + x^{134} + x^{133} + x^{132} \\
& + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{120} \\
& + x^{119} + x^{118} + x^{116} + x^{115} + x^{112} + x^{106} + x^{105} + x^{104} + x^{103} \\
& + x^{102} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84} \\
& + x^{83} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{74} + x^{71} + x^{70} + x^{68} + x^{67} \\
& + x^{65} + x^{63} + x^{62} + x^{60} + x^{58} + x^{57} + x^{54} + x^{53} + x^{51} + x^{49} + x^{47} \\
& + x^{46} + x^{45} + x^{44} + x^{41} + x^{35} + x^{34} + x^{32} + x^{31} + x^{29} + x^{27} + x^{25} \\
& + x^{24}, \\
p_3(x) = {} & x^{143} + x^{142} + x^{140} + x^{139} + x^{135} + x^{134} + x^{131} + x^{129} + x^{128} + x^{124} \\
& + x^{122} + x^{119} + x^{118} + x^{116} + x^{113} + x^{112} + x^{111} + x^{110} + x^{109} \\
& + x^{107} + x^{106} + x^{103} + x^{102} + x^{100} + x^{99} + x^{97} + x^{96} + x^{95} + x^{90} \\
& + x^{84} + x^{83} + x^{82} + x^{80} + x^{78} + x^{77} + x^{75} + x^{71} + x^{69} + x^{66} + x^{58} \\
& + x^{57} + x^{50} + x^{49} + x^{48} + x^{47} + x^{45} + x^{44} + x^{42} + x^{41} + x^{35} + x^{33} \\
& + x^{31} + x^{28} + x^{26} + x^{25} + x^{23} + x^{21} + x^{19} + x^{17} + x^{16}, \\
p_6(x) = {} & x^{145} + x^{144} + x^{136} + x^{132} + x^{128} + x^{127} + x^{125} + x^{123} + x^{122} + x^{120} \\
& + x^{119} + x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110} + x^{108} \\
& + x^{106} + x^{105} + x^{103} + x^{102} + x^{101} + x^{96} + x^{94} + x^{93} + x^{91} + x^{89} \\
& + x^{87} + x^{86} + x^{81} + x^{79} + x^{77} + x^{76} + x^{75} + x^{73} + x^{70} + x^{68} + x^{67} \\
& + x^{66} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{58} + x^{55} + x^{53} + x^{52} + x^{51} \\
& + x^{46} + x^{44} + x^{43} + x^{42} + x^{39} + x^{38} + x^{36} + x^{33} + x^{29} + x^{23} + x^{22} \\
& + x^{17} + x^{16} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4} + x^{3} + x + 1, \\
p_9(x) = {} & x^{143} + x^{142} + x^{141} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{126} \\
& + x^{124} + x^{123} + x^{121} + x^{120} + x^{95} + x^{94} + x^{93} + x^{90} + x^{88} + x^{86} \\
& + x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{63} + x^{62} + x^{61} \\
& + x^{58} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{43} + x^{42} \\
& + x^{41} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} \\
& + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{11} + x^{9} + x^{8}, \\
p_{12}(x) = {} & x^{147} + x^{146} + x^{145} + x^{143} + x^{141} + x^{140} + x^{135} + x^{134} + x^{133} + x^{131} \\
& + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116} \\
& + x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{95} + x^{93} + x^{92} + x^{87} + x^{86} \\
& + x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{70} + x^{68} \\
& + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{55} + x^{54} + x^{53} + x^{50} + x^{48} + x^{46}
\end{aligned}$$

$$+ x^{44} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30} + x^{28} + x^{26} + x^{24} + x^{23} + x^{21} + x^{20} + x^{15} + x^{14} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4} + x^{3} + x + 1,$$

and the initial terms are [1, 0, 0, 0, 1, 0, 0, 1, 0, 1, 1, 0, 0, 0, 0, 0].

For $\phi(W^o, 0, 1)$:

$$\begin{aligned}
p_0(x) &= x^{160} + x^{157} + x^{153} + x^{150} + x^{149} + x^{148} + x^{147} + x^{144} + x^{140} + x^{139} \\
&\quad + x^{136} + x^{135} + x^{134} + x^{132} + x^{129} + x^{124} + x^{123} + x^{122} + x^{121} \\
&\quad + x^{119} + x^{117} + x^{116} + x^{115} + x^{113} + x^{111} + x^{110} + x^{108} + x^{106} \\
&\quad + x^{105} + x^{103} + x^{102} + x^{98} + x^{97} + x^{91} + x^{90} + x^{89} + x^{88} + x^{85} + x^{83} \\
&\quad + x^{82} + x^{76} + x^{74} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{63} + x^{62} \\
&\quad + x^{61} + x^{58} + x^{55} + x^{52} + x^{49} + x^{44} + x^{39} + x^{37} + x^{34} + x^{33}, \\
p_3(x) &= x^{151} + x^{148} + x^{147} + x^{141} + x^{140} + x^{139} + x^{136} + x^{135} + x^{133} + x^{132} \\
&\quad + x^{131} + x^{130} + x^{129} + x^{127} + x^{123} + x^{120} + x^{118} + x^{116} + x^{115} \\
&\quad + x^{111} + x^{110} + x^{109} + x^{107} + x^{105} + x^{104} + x^{103} + x^{102} + x^{100} \\
&\quad + x^{99} + x^{98} + x^{95} + x^{92} + x^{90} + x^{88} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} \\
&\quad + x^{79} + x^{76} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{65} + x^{63} + x^{58} + x^{54} \\
&\quad + x^{53} + x^{52} + x^{51} + x^{50} + x^{49} + x^{47} + x^{46} + x^{41} + x^{40} + x^{39} + x^{36} \\
&\quad + x^{35} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{21} + x^{20} + x^{18}, \\
p_6(x) &= x^{154} + x^{150} + x^{148} + x^{144} + x^{142} + x^{140} + x^{138} + x^{134} + x^{132} + x^{130} \\
&\quad + x^{128} + x^{124} + x^{120} + x^{118} + x^{116} + x^{112} + x^{108} + x^{106} + x^{102} \\
&\quad + x^{100} + x^{98} + x^{88} + x^{80} + x^{76} + x^{68} + x^{66} + x^{64} + x^{62} + x^{60} + x^{54} \\
&\quad + x^{50} + x^{42} + x^{40} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{24} + x^{18} + x^{16} \\
&\quad + x^{12}, \\
p_9(x) &= x^{157} + x^{154} + x^{153} + x^{151} + x^{148} + x^{146} + x^{145} + x^{143} + x^{142} + x^{139} \\
&\quad + x^{138} + x^{134} + x^{130} + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122} \\
&\quad + x^{121} + x^{120} + x^{118} + x^{109} + x^{106} + x^{105} + x^{103} + x^{100} + x^{98} + x^{97} \\
&\quad + x^{95} + x^{94} + x^{91} + x^{90} + x^{86} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{72} \\
&\quad + x^{71} + x^{70} + x^{68} + x^{66} + x^{65} + x^{63} + x^{62} + x^{61} + x^{59} + x^{57} + x^{55} \\
&\quad + x^{54} + x^{52} + x^{48} + x^{43} + x^{42} + x^{40} + x^{39} + x^{36} + x^{32} + x^{29} + x^{27} \\
&\quad + x^{25} + x^{24} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8} + x^{6}, \\
p_{12}(x) &= x^{160} + x^{156} + x^{136} + x^{132} + x^{128} + x^{120} + x^{108} + x^{88} + x^{84} + x^{76} \\
&\quad + x^{72} + x^{60} + x^{56} + x^{52} + x^{44} + x^{36} + x^{20} + x^{8} + 1,
\end{aligned}$$

and the initial terms are [0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1].

For $\phi(W^o, 1, 0)$:

$$p_0(x) = x^{148} + x^{145} + x^{144} + x^{142} + x^{140} + x^{135} + x^{134} + x^{133} + x^{132} + x^{131}$$

$$
\begin{aligned}
&+ x^{129} + x^{128} + x^{126} + x^{125} + x^{123} + x^{120} + x^{119} + x^{116} + x^{113}\\
&+ x^{111} + x^{110} + x^{108} + x^{106} + x^{104} + x^{103} + x^{102} + x^{99} + x^{98} + x^{95}\\
&+ x^{94} + x^{92} + x^{90} + x^{89} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{76} + x^{73}\\
&+ x^{72} + x^{71} + x^{70} + x^{68} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59} + x^{55} + x^{53}\\
&+ x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{37}\\
&+ x^{36} + x^{35} + x^{33},\\
p_3(x) = {}& x^{139} + x^{136} + x^{132} + x^{131} + x^{129} + x^{128} + x^{125} + x^{124} + x^{121} + x^{120}\\
&+ x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{112} + x^{108} + x^{107} + x^{105}\\
&+ x^{104} + x^{101} + x^{100} + x^{97} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{88}\\
&+ x^{84} + x^{81} + x^{77} + x^{72} + x^{70} + x^{68} + x^{67} + x^{66} + x^{62} + x^{59} + x^{58}\\
&+ x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{45} + x^{40} + x^{38} + x^{36} + x^{35} + x^{34}\\
&+ x^{30} + x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) = {}& x^{142} + x^{136} + x^{134} + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{100} + x^{98}\\
&+ x^{96} + x^{94} + x^{92} + x^{86} + x^{78} + x^{76} + x^{74} + x^{56} + x^{50} + x^{36} + x^{32}\\
&+ x^{30} + x^{26} + x^{22} + x^{18} + x^{12},\\
p_9(x) = {}& x^{145} + x^{142} + x^{139} + x^{138} + x^{137} + x^{136} + x^{135} + x^{134} + x^{132} + x^{131}\\
&+ x^{130} + x^{129} + x^{127} + x^{126} + x^{124} + x^{121} + x^{120} + x^{118} + x^{97} + x^{94}\\
&+ x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} + x^{81} + x^{79}\\
&+ x^{78} + x^{76} + x^{73} + x^{72} + x^{70} + x^{65} + x^{62} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{50} + x^{47} + x^{44} + x^{43} + x^{42} + x^{39} + x^{36}\\
&+ x^{35} + x^{34} + x^{31} + x^{28} + x^{27} + x^{26} + x^{23} + x^{20} + x^{19} + x^{18} + x^{17}\\
&+ x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = {}& x^{148} + x^{140} + x^{136} + x^{124} + x^{116} + x^{112} + x^{100} + x^{92} + x^{88} + x^{76}\\
&+ x^{64} + x^{60} + x^{56} + x^{52} + x^{40} + x^{32} + x^{24} + x^{20} + x^{16} + x^{12} + x^{4} + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0].

For $\phi(W^o, 1, 1)$:

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{146} + x^{144} + x^{143} + x^{139} + x^{134} + x^{132} + x^{131} + x^{130} + x^{129}\\
&+ x^{126} + x^{123} + x^{120} + x^{118} + x^{115} + x^{114} + x^{111} + x^{106} + x^{104}\\
&+ x^{103} + x^{102} + x^{100} + x^{94} + x^{88} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{76}\\
&+ x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{65} + x^{64} + x^{58} + x^{54} + x^{52} + x^{50}\\
&+ x^{49} + x^{48} + x^{46} + x^{42},\\
p_3(x) = {}& x^{143} + x^{142} + x^{140} + x^{138} + x^{136} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126}\\
&+ x^{122} + x^{121} + x^{118} + x^{117} + x^{110} + x^{109} + x^{108} + x^{107} + x^{104}\\
&+ x^{102} + x^{100} + x^{99} + x^{98} + x^{94} + x^{93} + x^{89} + x^{87} + x^{86} + x^{84} + x^{78}\\
&+ x^{77} + x^{76} + x^{74} + x^{73} + x^{72} + x^{67} + x^{61} + x^{60} + x^{57} + x^{54} + x^{53}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{52} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39} + x^{38} + x^{37}\\
&+ x^{36} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22},\\
p_6(x) = {}& x^{145} + x^{144} + x^{143} + x^{142} + x^{140} + x^{135} + x^{134} + x^{132} + x^{128} + x^{126}\\
&+ x^{123} + x^{116} + x^{114} + x^{113} + x^{111} + x^{105} + x^{104} + x^{102} + x^{100}\\
&+ x^{97} + x^{92} + x^{90} + x^{87} + x^{85} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{74}\\
&+ x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{55} + x^{53} + x^{51} + x^{49} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{36}\\
&+ x^{33} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{20} + x^{19} + x^{18} + x^{17}\\
&+ x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} + x^{3} + x + 1,\\
p_9(x) = {}& x^{143} + x^{142} + x^{141} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{126}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{95} + x^{94} + x^{93} + x^{90} + x^{88} + x^{86}\\
&+ x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{63} + x^{62} + x^{61}\\
&+ x^{58} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{43} + x^{42}\\
&+ x^{41} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25}\\
&+ x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{11} + x^{9} + x^{8},\\
p_{12}(x) = {}& x^{147} + x^{146} + x^{145} + x^{143} + x^{141} + x^{140} + x^{135} + x^{134} + x^{133} + x^{131}\\
&+ x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116}\\
&+ x^{115} + x^{113} + x^{112} + x^{99} + x^{98} + x^{97} + x^{95} + x^{93} + x^{92} + x^{87} + x^{86}\\
&+ x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{70} + x^{68}\\
&+ x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{55} + x^{54} + x^{53} + x^{50} + x^{48} + x^{46}\\
&+ x^{44} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30} + x^{28}\\
&+ x^{26} + x^{24} + x^{23} + x^{21} + x^{20} + x^{15} + x^{14} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4}\\
&+ x^{3} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0].

Below is the transition function and output function of an 2-automaton that generates $T = M^o_{0,0}$:

Transition function $(n, j) \mapsto \delta(n, j)$ $(\Lambda(n) := [\delta(n, 0), \delta(n, 1)])$:

n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$
0	[1, 2]	866	[1406, 1407]	1732	[2463, 2359]	2598	[840, 1524]
1	[3, 4]	867	[1408, 1409]	1733	[1180, 2464]	2599	[3007, 3122]
2	[5, 6]	868	[1410, 1411]	1734	[1212, 2465]	2600	[3123, 3124]
3	[7, 8]	869	[1412, 1413]	1735	[2466, 1210]	2601	[1875, 3125]
4	[9, 10]	870	[1414, 1415]	1736	[1027, 1273]	2602	[2914, 3077]
5	[11, 12]	871	[1416, 1417]	1737	[1215, 2254]	2603	[3126, 3127]
6	[13, 14]	872	[1418, 1419]	1738	[1361, 1294]	2604	[3128, 3129]
7	[15, 16]	873	[1420, 1421]	1739	[279, 2467]	2605	[1902, 3130]
8	[17, 18]	874	[1422, 1423]	1740	[1001, 1270]	2606	[2856, 3131]
9	[19, 20]	875	[1424, 1406]	1741	[407, 2468]	2607	[3132, 3133]

10	[21, 22]	876	[655, 1425]	1742	[2410, 23]	2608	[3134, 2699]
11	[23, 24]	877	[1426, 1427]	1743	[2465, 2469]	2609	[3072, 3135]
12	[25, 26]	878	[1428, 219]	1744	[1175, 2470]	2610	[3136, 2002]
13	[27, 28]	879	[507, 1429]	1745	[1263, 2471]	2611	[2145, 1813]
14	[29, 30]	880	[1430, 1431]	1746	[1063, 2468]	2612	[3016, 3137]
15	[31, 32]	881	[1432, 1433]	1747	[1191, 1282]	2613	[3138, 2107]
16	[33, 34]	882	[1434, 809]	1748	[1339, 105]	2614	[3139, 673]
17	[35, 36]	883	[1435, 1436]	1749	[2472, 2473]	2615	[1453, 3140]
18	[37, 38]	884	[1437, 688]	1750	[262, 290]	2616	[2811, 2974]
19	[39, 40]	885	[1438, 1439]	1751	[2381, 2474]	2617	[1779, 3141]
20	[41, 42]	886	[1440, 1441]	1752	[2475, 2476]	2618	[698, 1758]
21	[43, 44]	887	[1442, 1443]	1753	[2477, 2478]	2619	[182, 2100]
22	[45, 46]	888	[1444, 1445]	1754	[939, 2479]	2620	[3040, 2851]
23	[47, 48]	889	[1446, 1447]	1755	[1384, 2480]	2621	[2994, 760]
24	[49, 50]	890	[1448, 47]	1756	[2481, 2329]	2622	[3021, 1866]
25	[51, 52]	891	[164, 1449]	1757	[1218, 1390]	2623	[1401, 2738]
26	[53, 54]	892	[1450, 1451]	1758	[1197, 2234]	2624	[1764, 3142]
27	[55, 56]	893	[1452, 1453]	1759	[2355, 899]	2625	[753, 3143]
28	[57, 58]	894	[1454, 1455]	1760	[2292, 294]	2626	[2970, 3144]
29	[59, 60]	895	[1456, 1457]	1761	[1267, 2481]	2627	[3145, 137]
30	[61, 62]	896	[1458, 1459]	1762	[2188, 2181]	2628	[1541, 140]
31	[63, 64]	897	[1460, 1461]	1763	[2407, 2482]	2629	[2810, 1478]
32	[65, 66]	898	[1462, 1463]	1764	[2483, 1346]	2630	[1465, 516]
33	[67, 68]	899	[1464, 1465]	1765	[354, 1274]	2631	[3146, 3147]
34	[69, 70]	900	[1466, 1467]	1766	[2484, 1116]	2632	[2702, 3148]
35	[71, 72]	901	[1468, 1469]	1767	[2485, 2486]	2633	[782, 1749]
36	[73, 74]	902	[1470, 1471]	1768	[928, 2487]	2634	[596, 211]
37	[75, 21]	903	[1472, 1473]	1769	[1108, 1292]	2635	[2057, 2883]
38	[76, 77]	904	[1474, 1475]	1770	[1279, 2488]	2636	[3149, 631]
39	[78, 79]	905	[598, 740]	1771	[85, 2244]	2637	[3150, 533]
40	[80, 19]	906	[1476, 1477]	1772	[2489, 2351]	2638	[1945, 568]
41	[81, 82]	907	[1478, 1479]	1773	[2294, 2432]	2639	[1936, 2679]
42	[83, 84]	908	[1480, 1481]	1774	[2490, 2489]	2640	[1900, 3091]
43	[85, 86]	909	[1482, 1483]	1775	[2330, 64]	2641	[3151, 3152]
44	[87, 88]	910	[1484, 669]	1776	[2369, 80]	2642	[1953, 3070]
45	[89, 90]	911	[1485, 1486]	1777	[2491, 2492]	2643	[3153, 1829]
46	[91, 92]	912	[1487, 1488]	1778	[302, 908]	2644	[1809, 3154]
47	[93, 94]	913	[553, 1489]	1779	[2493, 2384]	2645	[3155, 3156]
48	[95, 96]	914	[1490, 1491]	1780	[257, 2305]	2646	[3157, 1607]
49	[97, 98]	915	[1492, 1493]	1781	[1169, 1143]	2647	[1449, 3158]
50	[99, 100]	916	[1494, 1495]	1782	[2366, 2494]	2648	[3130, 2875]
51	[101, 102]	917	[1496, 1497]	1783	[2174, 323]	2649	[1588, 723]
52	[103, 104]	918	[1498, 1499]	1784	[110, 2450]	2650	[3159, 650]
53	[105, 106]	919	[190, 1500]	1785	[2495, 2316]	2651	[2129, 592]

54	[107, 108]	920	[1501, 1502]	1786	[2496, 989]	2652	[3058, 3160]
55	[109, 110]	921	[620, 1503]	1787	[1269, 1059]	2653	[168, 2155]
56	[111, 112]	922	[805, 1504]	1788	[316, 112]	2654	[3035, 2989]
57	[113, 114]	923	[1505, 1498]	1789	[361, 1177]	2655	[662, 2111]
58	[115, 116]	924	[1506, 1507]	1790	[1147, 2497]	2656	[1713, 686]
59	[117, 118]	925	[1508, 1509]	1791	[2429, 1267]	2657	[1939, 2900]
60	[119, 120]	926	[744, 1510]	1792	[2498, 1136]	2658	[3161, 704]
61	[121, 122]	927	[1394, 1511]	1793	[308, 2499]	2659	[3162, 825]
62	[123, 124]	928	[1512, 1513]	1794	[1028, 1340]	2660	[3163, 3120]
63	[125, 126]	929	[835, 1508]	1795	[2500, 2159]	2661	[3028, 1808]
64	[127, 128]	930	[1514, 1515]	1796	[1292, 2339]	2662	[3164, 1654]
65	[129, 130]	931	[1516, 1517]	1797	[1378, 2501]	2663	[3017, 2689]
66	[131, 132]	932	[1518, 1519]	1798	[2502, 312]	2664	[1767, 1927]
67	[133, 134]	933	[1520, 544]	1799	[74, 1049]	2665	[3165, 2032]
68	[135, 136]	934	[713, 1521]	1800	[2503, 2237]	2666	[1844, 3166]
69	[137, 138]	935	[1522, 1523]	1801	[2504, 2382]	2667	[3167, 3168]
70	[139, 135]	936	[1524, 1525]	1802	[1376, 1227]	2668	[800, 2917]
71	[140, 141]	937	[1526, 1527]	1803	[2505, 1215]	2669	[1786, 3005]
72	[142, 143]	938	[637, 1528]	1804	[2506, 407]	2670	[1814, 821]
73	[144, 145]	939	[1529, 1530]	1805	[414, 2304]	2671	[3169, 2876]
74	[146, 147]	940	[1531, 1532]	1806	[2338, 1149]	2672	[1707, 3170]
75	[148, 149]	941	[200, 1533]	1807	[2200, 2507]	2673	[3171, 2708]
76	[150, 151]	942	[487, 1534]	1808	[1392, 2406]	2674	[1419, 3172]
77	[152, 153]	943	[1469, 1535]	1809	[24, 1343]	2675	[1636, 161]
78	[154, 155]	944	[1536, 506]	1810	[2267, 1074]	2676	[2485, 3173]
79	[156, 157]	945	[1537, 1538]	1811	[2508, 304]	2677	[3174, 2656]
80	[158, 41]	946	[852, 1539]	1812	[2509, 1252]	2678	[1215, 2373]
81	[159, 160]	947	[1540, 1541]	1813	[2510, 2436]	2679	[2343, 2670]
82	[161, 162]	948	[1542, 575]	1814	[335, 2309]	2680	[3175, 2178]
83	[163, 164]	949	[1543, 1544]	1815	[2511, 2512]	2681	[2595, 1120]
84	[165, 166]	950	[1545, 476]	1816	[945, 2513]	2682	[3176, 369]
85	[167, 168]	951	[1546, 1547]	1817	[2514, 2515]	2683	[2627, 3177]
86	[169, 170]	952	[526, 1490]	1818	[957, 2389]	2684	[3178, 1208]
87	[171, 172]	953	[1548, 1549]	1819	[1332, 2170]	2685	[3179, 2501]
88	[173, 174]	954	[1550, 1551]	1820	[2516, 2293]	2686	[1158, 431]
89	[175, 176]	955	[807, 1552]	1821	[2320, 2517]	2687	[2465, 3180]
90	[177, 178]	956	[1445, 1553]	1822	[19, 2518]	2688	[2400, 3181]
91	[179, 180]	957	[1447, 1554]	1823	[2519, 2520]	2689	[3182, 3183]
92	[181, 182]	958	[535, 1555]	1824	[2271, 2521]	2690	[1170, 3184]
93	[183, 184]	959	[1552, 1556]	1825	[2290, 66]	2691	[2162, 1015]
94	[185, 186]	960	[1557, 1558]	1826	[2522, 1360]	2692	[1314, 2419]
95	[187, 188]	961	[1499, 1559]	1827	[1156, 1277]	2693	[3185, 460]
96	[189, 190]	962	[1560, 1514]	1828	[2376, 2428]	2694	[3186, 2636]
97	[191, 192]	963	[1561, 1562]	1829	[2213, 1253]	2695	[1073, 3187]

98	[193, 194]	964	[1563, 1564]	1830	[1380, 1362]	2696	[3188, 2415]
99	[195, 196]	965	[1565, 1566]	1831	[348, 1050]	2697	[2181, 72]
100	[197, 198]	966	[1567, 146]	1832	[337, 2341]	2698	[2584, 975]
101	[199, 200]	967	[1443, 1568]	1833	[337, 276]	2699	[3189, 3190]
102	[201, 202]	968	[756, 1569]	1834	[2523, 1142]	2700	[3175, 3191]
103	[203, 204]	969	[1570, 1571]	1835	[1388, 2459]	2701	[1316, 953]
104	[205, 206]	970	[1572, 817]	1836	[943, 2524]	2702	[1042, 3192]
105	[207, 208]	971	[1573, 1574]	1837	[1204, 1389]	2703	[2511, 1120]
106	[209, 210]	972	[1575, 1576]	1838	[2525, 350]	2704	[25, 3193]
107	[211, 212]	973	[1577, 1578]	1839	[407, 2526]	2705	[1288, 281]
108	[213, 214]	974	[1579, 1580]	1840	[2527, 372]	2706	[2481, 401]
109	[215, 216]	975	[600, 1581]	1841	[2203, 2528]	2707	[2238, 3194]
110	[217, 218]	976	[1582, 1583]	1842	[2195, 312]	2708	[1319, 884]
111	[219, 220]	977	[1584, 1585]	1843	[895, 2350]	2709	[2226, 3195]
112	[221, 222]	978	[1586, 225]	1844	[1328, 1106]	2710	[2630, 366]
113	[223, 224]	979	[1587, 1588]	1845	[2529, 2299]	2711	[2165, 3196]
114	[225, 226]	980	[1589, 1590]	1846	[103, 2530]	2712	[3197, 263]
115	[227, 228]	981	[1591, 1592]	1847	[109, 1373]	2713	[404, 967]
116	[229, 230]	982	[1593, 1594]	1848	[2531, 2367]	2714	[2668, 3198]
117	[231, 232]	983	[1595, 1596]	1849	[2494, 2328]	2715	[3199, 2252]
118	[233, 177]	984	[1597, 1598]	1850	[73, 122]	2716	[17, 2315]
119	[234, 235]	985	[1599, 1600]	1851	[2532, 2511]	2717	[2244, 1231]
120	[236, 237]	986	[1601, 1602]	1852	[949, 2300]	2718	[2447, 2664]
121	[238, 239]	987	[1603, 1604]	1853	[381, 1383]	2719	[1083, 3200]
122	[240, 241]	988	[1605, 1606]	1854	[1133, 2533]	2720	[278, 2218]
123	[36, 242]	989	[1607, 1608]	1855	[1118, 2534]	2721	[3201, 3202]
124	[243, 244]	990	[1609, 1610]	1856	[1270, 2535]	2722	[3203, 1262]
125	[245, 246]	991	[1611, 1612]	1857	[2248, 1327]	2723	[2166, 3204]
126	[247, 248]	992	[1613, 1614]	1858	[365, 1071]	2724	[2178, 3205]
127	[249, 250]	993	[1615, 1616]	1859	[86, 2245]	2725	[3195, 2190]
128	[251, 252]	994	[1617, 710]	1860	[2384, 1280]	2726	[3206, 266]
129	[253, 254]	995	[683, 1618]	1861	[2295, 2536]	2727	[2490, 1208]
130	[255, 256]	996	[1619, 1620]	1862	[2537, 1246]	2728	[3207, 64]
131	[257, 258]	997	[1621, 1622]	1863	[2236, 2538]	2729	[356, 2375]
132	[259, 260]	998	[1623, 1624]	1864	[2539, 2540]	2730	[2301, 2568]
133	[261, 262]	999	[1625, 1626]	1865	[369, 2541]	2731	[1306, 451]
134	[263, 264]	1000	[1627, 1565]	1866	[2347, 2187]	2732	[2566, 3208]
135	[265, 266]	1001	[1628, 1629]	1867	[984, 1177]	2733	[335, 314]
136	[267, 268]	1002	[1533, 1630]	1868	[2542, 1370]	2734	[871, 3209]
137	[269, 270]	1003	[1631, 828]	1869	[2239, 2543]	2735	[3210, 877]
138	[271, 272]	1004	[1632, 1501]	1870	[305, 2292]	2736	[1370, 1319]
139	[273, 274]	1005	[1633, 1634]	1871	[1289, 955]	2737	[3211, 2267]
140	[275, 276]	1006	[1635, 1636]	1872	[2544, 1188]	2738	[2335, 2257]
141	[277, 278]	1007	[1637, 1638]	1873	[2545, 2546]	2739	[971, 1321]

142	[279, 280]	1008	[1639, 1640]	1874	[2510, 2547]	2740	[1047, 2655]
143	[281, 282]	1009	[1641, 139]	1875	[1219, 2548]	2741	[3212, 1052]
144	[283, 284]	1010	[1642, 1643]	1876	[971, 439]	2742	[3213, 2370]
145	[285, 286]	1011	[1644, 1645]	1877	[904, 2334]	2743	[1144, 1216]
146	[287, 288]	1012	[1646, 1647]	1878	[2549, 2550]	2744	[2389, 2409]
147	[289, 290]	1013	[707, 1648]	1879	[2411, 1380]	2745	[282, 958]
148	[291, 292]	1014	[1649, 1650]	1880	[2536, 981]	2746	[2314, 18]
149	[293, 294]	1015	[1651, 231]	1881	[961, 2435]	2747	[1323, 2517]
150	[295, 296]	1016	[1652, 1548]	1882	[2551, 1123]	2748	[3214, 3215]
151	[297, 298]	1017	[838, 53]	1883	[2406, 1292]	2749	[246, 1353]
152	[299, 300]	1018	[162, 171]	1884	[2552, 2298]	2750	[2409, 2210]
153	[76, 301]	1019	[796, 512]	1885	[2553, 2250]	2751	[411, 2269]
154	[302, 303]	1020	[1653, 1446]	1886	[2379, 2405]	2752	[2633, 460]
155	[304, 305]	1021	[1654, 1655]	1887	[2459, 1056]	2753	[3216, 2382]
156	[306, 307]	1022	[1656, 1657]	1888	[2554, 2511]	2754	[105, 3189]
157	[93, 308]	1023	[1658, 1659]	1889	[868, 1336]	2755	[301, 2368]
158	[309, 83]	1024	[1660, 1661]	1890	[2225, 2555]	2756	[1386, 1258]
159	[310, 311]	1025	[1662, 1663]	1891	[2556, 1101]	2757	[991, 264]
160	[312, 313]	1026	[1664, 1665]	1892	[1286, 1347]	2758	[2609, 2169]
161	[314, 315]	1027	[1666, 1667]	1893	[2557, 2558]	2759	[1346, 2658]
162	[316, 317]	1028	[1668, 1669]	1894	[2559, 973]	2760	[1083, 2258]
163	[318, 319]	1029	[1670, 522]	1895	[121, 74]	2761	[948, 3217]
164	[320, 321]	1030	[1671, 1672]	1896	[2164, 115]	2762	[2353, 2477]
165	[322, 323]	1031	[1673, 1674]	1897	[2165, 116]	2763	[1045, 865]
166	[324, 325]	1032	[569, 1675]	1898	[1262, 91]	2764	[2402, 256]
167	[326, 327]	1033	[1676, 1677]	1899	[2560, 425]	2765	[2469, 2647]
168	[328, 329]	1034	[1678, 1679]	1900	[422, 2354]	2766	[3218, 99]
169	[24, 330]	1035	[32, 1680]	1901	[2219, 2432]	2767	[2293, 2219]
170	[331, 252]	1036	[1681, 1682]	1902	[2561, 2558]	2768	[2517, 2231]
171	[332, 333]	1037	[1683, 1684]	1903	[2562, 410]	2769	[3219, 367]
172	[334, 335]	1038	[1685, 1686]	1904	[2563, 1336]	2770	[2397, 2621]
173	[336, 337]	1039	[1687, 1688]	1905	[2564, 2565]	2771	[287, 1164]
174	[338, 339]	1040	[1689, 743]	1906	[969, 1317]	2772	[970, 438]
175	[95, 340]	1041	[1690, 1691]	1907	[30, 1368]	2773	[2354, 2589]
176	[341, 342]	1042	[1692, 1666]	1908	[1103, 2513]	2774	[1209, 2386]
177	[343, 344]	1043	[1693, 1694]	1909	[2566, 2322]	2775	[947, 260]
178	[345, 325]	1044	[1695, 1696]	1910	[1029, 2567]	2776	[1211, 3220]
179	[346, 347]	1045	[1697, 1698]	1911	[2201, 94]	2777	[2519, 3221]
180	[122, 348]	1046	[1699, 1700]	1912	[2568, 1134]	2778	[1104, 3222]
181	[349, 350]	1047	[1701, 1702]	1913	[2569, 2404]	2779	[2642, 2648]
182	[351, 352]	1048	[1703, 1704]	1914	[2570, 1385]	2780	[2393, 2424]
183	[353, 354]	1049	[1700, 605]	1915	[2333, 398]	2781	[71, 3223]
184	[355, 356]	1050	[147, 1705]	1916	[1131, 2482]	2782	[1160, 1332]
185	[299, 357]	1051	[1706, 1707]	1917	[955, 958]	2783	[3224, 907]

186	[358, 320]	1052	[157, 1456]	1918	[2571, 98]	2784	[3225, 463]
187	[68, 359]	1053	[1708, 1709]	1919	[882, 96]	2785	[932, 1319]
188	[360, 361]	1054	[222, 1710]	1920	[923, 2171]	2786	[3226, 1358]
189	[362, 363]	1055	[1455, 1711]	1921	[2478, 2412]	2787	[2331, 2425]
190	[364, 86]	1056	[1712, 1713]	1922	[2572, 2573]	2788	[458, 3227]
191	[365, 366]	1057	[1705, 1714]	1923	[2484, 2453]	2789	[935, 3228]
192	[367, 368]	1058	[1495, 1715]	1924	[346, 2574]	2790	[2362, 3177]
193	[369, 370]	1059	[1716, 1717]	1925	[249, 895]	2791	[2671, 2494]
194	[371, 372]	1060	[1718, 797]	1926	[2438, 362]	2792	[1264, 3204]
195	[373, 374]	1061	[816, 1719]	1927	[2575, 874]	2793	[3229, 104]
196	[375, 376]	1062	[1720, 1721]	1928	[2352, 1182]	2794	[3206, 2265]
197	[377, 378]	1063	[1722, 1723]	1929	[2555, 2189]	2795	[3230, 1338]
198	[379, 380]	1064	[1724, 1725]	1930	[1389, 1056]	2796	[1324, 3231]
199	[381, 382]	1065	[1726, 1727]	1931	[2562, 2576]	2797	[2563, 1279]
200	[383, 384]	1066	[511, 1728]	1932	[2232, 68]	2798	[28, 1103]
201	[385, 386]	1067	[1729, 1466]	1933	[1153, 1065]	2799	[2259, 2224]
202	[387, 388]	1068	[1610, 1730]	1934	[2553, 1186]	2800	[2586, 1342]
203	[389, 390]	1069	[1731, 1732]	1935	[2577, 2276]	2801	[3232, 70]
204	[391, 392]	1070	[836, 1733]	1936	[2338, 2389]	2802	[1387, 2223]
205	[393, 394]	1071	[1734, 1735]	1937	[1167, 1260]	2803	[3214, 1069]
206	[395, 396]	1072	[1736, 603]	1938	[2483, 1090]	2804	[2365, 2550]
207	[397, 16]	1073	[1737, 1738]	1939	[2575, 891]	2805	[2206, 2184]
208	[398, 306]	1074	[1739, 1740]	1940	[2398, 963]	2806	[22, 1124]
209	[399, 400]	1075	[214, 1741]	1941	[98, 2578]	2807	[3178, 2489]
210	[292, 401]	1076	[1742, 1470]	1942	[462, 2242]	2808	[3233, 2528]
211	[402, 403]	1077	[42, 1722]	1943	[2418, 2502]	2809	[3183, 2246]
212	[404, 405]	1078	[1743, 1744]	1944	[1262, 1004]	2810	[3234, 976]
213	[406, 407]	1079	[172, 1745]	1945	[83, 339]	2811	[2263, 1118]
214	[408, 409]	1080	[1746, 1747]	1946	[1282, 1047]	2812	[2466, 2257]
215	[410, 411]	1081	[1748, 144]	1947	[1244, 2158]	2813	[3235, 3236]
216	[412, 413]	1082	[1749, 1750]	1948	[1176, 2310]	2814	[3216, 2625]
217	[414, 415]	1083	[1751, 642]	1949	[1114, 383]	2815	[119, 2426]
218	[416, 405]	1084	[1752, 1753]	1950	[1177, 338]	2816	[2477, 3237]
219	[417, 418]	1085	[1754, 1755]	1951	[2505, 2253]	2817	[1062, 77]
220	[419, 420]	1086	[1756, 1757]	1952	[2579, 379]	2818	[1229, 2597]
221	[77, 421]	1087	[1758, 1557]	1953	[2529, 327]	2819	[1072, 272]
222	[422, 423]	1088	[1759, 1760]	1954	[326, 2299]	2820	[3195, 3238]
223	[424, 425]	1089	[1761, 1762]	1955	[2422, 1312]	2821	[454, 2623]
224	[426, 427]	1090	[1763, 1764]	1956	[2221, 2286]	2822	[3239, 3240]
225	[428, 429]	1091	[184, 1765]	1957	[416, 967]	2823	[951, 2449]
226	[430, 431]	1092	[1766, 1767]	1958	[2283, 2392]	2824	[3241, 2510]
227	[432, 433]	1093	[1768, 1432]	1959	[2179, 925]	2825	[2555, 3195]
228	[434, 435]	1094	[1769, 1770]	1960	[2374, 2580]	2826	[2187, 67]
229	[436, 437]	1095	[1771, 1772]	1961	[914, 879]	2827	[1277, 2659]

230	[438, 439]	1096	[1773, 1761]	1962	[2470, 2581]	2828	[3218, 893]
231	[440, 441]	1097	[1774, 1771]	1963	[2582, 2583]	2829	[1168, 3242]
232	[442, 443]	1098	[1775, 1550]	1964	[2584, 2585]	2830	[2441, 3179]
233	[444, 345]	1099	[1776, 1777]	1965	[2462, 361]	2831	[1294, 120]
234	[445, 446]	1100	[1778, 1779]	1966	[2460, 1147]	2832	[2527, 3243]
235	[447, 448]	1101	[1780, 1781]	1967	[1052, 988]	2833	[2385, 1027]
236	[449, 450]	1102	[1782, 1783]	1968	[2586, 1160]	2834	[3244, 2212]
237	[451, 452]	1103	[56, 1784]	1969	[2587, 2588]	2835	[2245, 1232]
238	[453, 341]	1104	[1785, 1397]	1970	[2589, 2486]	2836	[330, 3245]
239	[454, 455]	1105	[734, 1786]	1971	[1036, 2590]	2837	[3246, 2293]
240	[261, 289]	1106	[1787, 1788]	1972	[2591, 931]	2838	[3247, 249]
241	[456, 457]	1107	[1789, 1790]	1973	[81, 2592]	2839	[1118, 2629]
242	[458, 459]	1108	[730, 1791]	1974	[2593, 867]	2840	[3207, 2331]
243	[460, 461]	1109	[1511, 1792]	1975	[1033, 2387]	2841	[1367, 3248]
244	[462, 463]	1110	[1793, 1794]	1976	[2594, 2555]	2842	[2496, 286]
245	[464, 465]	1111	[850, 527]	1977	[1071, 271]	2843	[2472, 2175]
246	[466, 467]	1112	[1795, 1796]	1978	[2595, 2512]	2844	[345, 1163]
247	[468, 469]	1113	[1797, 1798]	1979	[2596, 1367]	2845	[926, 3249]
248	[470, 471]	1114	[1799, 720]	1980	[2552, 2446]	2846	[1063, 2526]
249	[472, 473]	1115	[1521, 1800]	1981	[1381, 2597]	2847	[3250, 3251]
250	[474, 475]	1116	[1801, 1802]	1982	[2598, 396]	2848	[3252, 3253]
251	[476, 477]	1117	[1803, 1804]	1983	[65, 2291]	2849	[2439, 3254]
252	[478, 479]	1118	[1805, 1633]	1984	[1210, 2599]	2850	[1138, 2246]
253	[480, 481]	1119	[1806, 1484]	1985	[1276, 2497]	2851	[2163, 3255]
254	[482, 483]	1120	[1807, 466]	1986	[2600, 2601]	2852	[2551, 1266]
255	[484, 485]	1121	[1808, 1809]	1987	[2602, 979]	2853	[1097, 1094]
256	[486, 487]	1122	[210, 1810]	1988	[2287, 336]	2854	[3256, 1272]
257	[488, 489]	1123	[1811, 1812]	1989	[2282, 2603]	2855	[2665, 3192]
258	[490, 491]	1124	[1813, 1814]	1990	[2547, 2437]	2856	[3257, 3258]
259	[492, 493]	1125	[1815, 1816]	1991	[2604, 2605]	2857	[423, 2485]
260	[494, 495]	1126	[1817, 1818]	1992	[1287, 1348]	2858	[3259, 114]
261	[496, 497]	1127	[1819, 1615]	1993	[354, 2336]	2859	[3257, 102]
262	[498, 499]	1128	[1820, 1821]	1994	[2606, 2401]	2860	[3191, 3205]
263	[500, 501]	1129	[739, 1822]	1995	[1252, 2607]	2861	[2445, 2541]
264	[502, 503]	1130	[1823, 1824]	1996	[997, 2325]	2862	[439, 2441]
265	[504, 505]	1131	[1825, 1826]	1997	[122, 1049]	2863	[1014, 2163]
266	[506, 507]	1132	[1827, 1828]	1998	[2261, 1258]	2864	[3260, 3261]
267	[508, 509]	1133	[1829, 1830]	1999	[2608, 2473]	2865	[2561, 3262]
268	[510, 511]	1134	[1831, 1832]	2000	[2609, 1309]	2866	[1270, 1189]
269	[512, 513]	1135	[539, 1833]	2001	[2610, 2272]	2867	[2318, 1327]
270	[514, 515]	1136	[132, 1834]	2002	[75, 2611]	2868	[2317, 956]
271	[516, 517]	1137	[1835, 1836]	2003	[2307, 428]	2869	[2454, 2397]
272	[518, 519]	1138	[1837, 1838]	2004	[1077, 2612]	2870	[2508, 420]
273	[520, 521]	1139	[1839, 1840]	2005	[2489, 1209]	2871	[3263, 1335]

274	[522, 523]	1140	[1841, 1842]	2006	[2327, 2613]	2872	[1136, 24]
275	[524, 525]	1141	[1843, 1844]	2007	[1297, 2614]	2873	[3203, 1146]
276	[244, 526]	1142	[1538, 1845]	2008	[450, 906]	2874	[3264, 3265]
277	[527, 528]	1143	[1846, 1847]	2009	[1213, 2469]	2875	[894, 3266]
278	[529, 530]	1144	[1848, 1849]	2010	[1281, 351]	2876	[2533, 3267]
279	[531, 532]	1145	[1850, 179]	2011	[253, 2413]	2877	[1040, 1339]
280	[533, 534]	1146	[1638, 1851]	2012	[2567, 274]	2878	[2606, 3181]
281	[483, 535]	1147	[1852, 1853]	2013	[2427, 2615]	2879	[1300, 429]
282	[536, 537]	1148	[1854, 1855]	2014	[1084, 388]	2880	[117, 862]
283	[538, 539]	1149	[1481, 1856]	2015	[1203, 1388]	2881	[3230, 1040]
284	[540, 541]	1150	[1857, 1444]	2016	[2616, 2219]	2882	[2617, 2505]
285	[542, 543]	1151	[1517, 1858]	2017	[2617, 6]	2883	[935, 3268]
286	[544, 545]	1152	[1859, 508]	2018	[2618, 976]	2884	[3244, 2421]
287	[546, 547]	1153	[1622, 1393]	2019	[2535, 2318]	2885	[2208, 2208]
288	[548, 549]	1154	[1624, 1860]	2020	[1021, 2317]	2886	[2408, 1370]
289	[550, 551]	1155	[1527, 1861]	2021	[2619, 1338]	2887	[1330, 3236]
290	[552, 553]	1156	[1717, 1862]	2022	[1252, 2620]	2888	[1283, 2355]
291	[554, 555]	1157	[1863, 1864]	2023	[1144, 417]	2889	[2396, 912]
292	[556, 557]	1158	[812, 1865]	2024	[2241, 110]	2890	[3229, 2530]
293	[558, 559]	1159	[1866, 1801]	2025	[879, 2365]	2891	[3198, 2668]
294	[560, 561]	1160	[1867, 1868]	2026	[341, 2621]	2892	[957, 1149]
295	[562, 563]	1161	[1869, 1870]	2027	[2622, 2623]	2893	[3182, 1138]
296	[564, 565]	1162	[1871, 1872]	2028	[362, 268]	2894	[3269, 2174]
297	[566, 567]	1163	[1873, 1874]	2029	[1033, 1135]	2895	[1304, 99]
298	[568, 569]	1164	[1741, 1875]	2030	[2531, 343]	2896	[1236, 2638]
299	[570, 571]	1165	[547, 1876]	2031	[1387, 1259]	2897	[101, 3258]
300	[481, 572]	1166	[1877, 1878]	2032	[2624, 28]	2898	[291, 2481]
301	[573, 574]	1167	[1879, 1880]	2033	[2625, 2383]	2899	[1347, 2356]
302	[575, 576]	1168	[1881, 1882]	2034	[391, 2626]	2900	[2560, 3175]
303	[577, 578]	1169	[1883, 1795]	2035	[2627, 2363]	2901	[2193, 3270]
304	[38, 579]	1170	[1884, 529]	2036	[903, 2628]	2902	[3271, 298]
305	[580, 581]	1171	[1885, 1886]	2037	[1024, 2259]	2903	[2360, 2476]
306	[582, 542]	1172	[1836, 1887]	2038	[2473, 2176]	2904	[3268, 3272]
307	[583, 584]	1173	[1888, 1889]	2039	[2264, 2629]	2905	[3239, 3273]
308	[585, 586]	1174	[1890, 1891]	2040	[2535, 2248]	2906	[2157, 1245]
309	[587, 165]	1175	[1892, 1893]	2041	[2345, 957]	2907	[3188, 3274]
310	[588, 589]	1176	[1894, 1895]	2042	[2630, 1071]	2908	[2643, 2301]
311	[590, 591]	1177	[1896, 1897]	2043	[2391, 451]	2909	[1199, 1195]
312	[592, 593]	1178	[751, 1898]	2044	[1359, 2631]	2910	[3275, 2635]
313	[545, 594]	1179	[1899, 1900]	2045	[402, 2540]	2911	[976, 1087]
314	[595, 596]	1180	[1901, 1902]	2046	[914, 2364]	2912	[3276, 2614]
315	[597, 598]	1181	[1903, 1904]	2047	[1365, 1059]	2913	[412, 2559]
316	[599, 600]	1182	[1905, 1906]	2048	[2632, 2442]	2914	[91, 1322]
317	[601, 602]	1183	[1907, 1908]	2049	[2633, 2358]	2915	[67, 933]

318	[603, 604]	1184	[1909, 1910]	2050	[1196, 2349]	2916	[3277, 3270]
319	[605, 606]	1185	[1911, 1912]	2051	[1149, 2409]	2917	[959, 2535]
320	[607, 608]	1186	[1913, 540]	2052	[1018, 2634]	2918	[3278, 1277]
321	[609, 610]	1187	[1914, 1915]	2053	[899, 2346]	2919	[2512, 1121]
322	[611, 612]	1188	[1910, 1916]	2054	[2463, 458]	2920	[3263, 943]
323	[613, 614]	1189	[1555, 1917]	2055	[894, 1369]	2921	[2319, 3279]
324	[615, 616]	1190	[1918, 661]	2056	[1246, 2635]	2922	[2184, 1031]
325	[617, 618]	1191	[1677, 1919]	2057	[2636, 1125]	2923	[938, 2632]
326	[619, 620]	1192	[1920, 1921]	2058	[2533, 2637]	2924	[3280, 3194]
327	[621, 622]	1193	[1922, 1923]	2059	[2565, 2547]	2925	[366, 1072]
328	[623, 13]	1194	[1924, 789]	2060	[2638, 437]	2926	[1253, 2470]
329	[624, 625]	1195	[858, 1925]	2061	[1351, 982]	2927	[2569, 2440]
330	[48, 626]	1196	[1926, 656]	2062	[2325, 1064]	2928	[2437, 3233]
331	[627, 628]	1197	[1927, 1928]	2063	[2639, 2159]	2929	[2264, 2534]
332	[557, 183]	1198	[1929, 573]	2064	[901, 1352]	2930	[3281, 991]
333	[629, 630]	1199	[856, 1930]	2065	[1056, 400]	2931	[1025, 2260]
334	[631, 632]	1200	[1931, 1932]	2066	[2594, 2226]	2932	[2323, 999]
335	[633, 634]	1201	[1933, 1934]	2067	[2640, 1340]	2933	[2636, 1094]
336	[635, 636]	1202	[1935, 1936]	2068	[2641, 1008]	2934	[2500, 373]
337	[242, 637]	1203	[1937, 679]	2069	[298, 1067]	2935	[2576, 411]
338	[638, 639]	1204	[1938, 1939]	2070	[2616, 2294]	2936	[1216, 942]
339	[640, 641]	1205	[1551, 1940]	2071	[2436, 2202]	2937	[2207, 2581]
340	[642, 643]	1206	[1941, 560]	2072	[2273, 2573]	2938	[2353, 1183]
341	[644, 645]	1207	[1942, 1474]	2073	[2469, 2642]	2939	[328, 79]
342	[646, 647]	1208	[1943, 1775]	2074	[107, 1060]	2940	[2495, 1130]
343	[648, 649]	1209	[1944, 1945]	2075	[2579, 2643]	2941	[383, 3282]
344	[650, 651]	1210	[1946, 1947]	2076	[934, 2644]	2942	[2570, 2480]
345	[652, 653]	1211	[1948, 1949]	2077	[936, 2471]	2943	[2539, 403]
346	[654, 655]	1212	[1950, 1951]	2078	[2645, 2448]	2944	[3283, 2284]
347	[656, 189]	1213	[1952, 1953]	2079	[2367, 2443]	2945	[3284, 3285]
348	[145, 657]	1214	[1954, 1955]	2080	[2250, 2646]	2946	[2610, 2521]
349	[658, 564]	1215	[12, 169]	2081	[2278, 1287]	2947	[277, 1284]
350	[659, 660]	1216	[1956, 1658]	2082	[1082, 946]	2948	[27, 1102]
351	[661, 662]	1217	[138, 1957]	2083	[2576, 2268]	2949	[1191, 351]
352	[663, 664]	1218	[218, 1958]	2084	[1049, 1318]	2950	[1193, 1391]
353	[665, 666]	1219	[1959, 1960]	2085	[2229, 293]	2951	[3259, 871]
354	[667, 668]	1220	[1657, 717]	2086	[2647, 2648]	2952	[3286, 115]
355	[669, 670]	1221	[1503, 1961]	2087	[2572, 2274]	2953	[1336, 2488]
356	[671, 672]	1222	[1962, 1956]	2088	[2587, 2649]	2954	[1064, 1154]
357	[673, 674]	1223	[1634, 1422]	2089	[1233, 2289]	2955	[1290, 3287]
358	[675, 676]	1224	[1600, 1963]	2090	[2650, 343]	2956	[2181, 3223]
359	[677, 678]	1225	[1964, 1726]	2091	[2523, 2306]	2957	[3288, 995]
360	[679, 680]	1226	[1832, 648]	2092	[2651, 2195]	2958	[885, 1284]
361	[681, 638]	1227	[1965, 1966]	2093	[327, 2652]	2959	[1029, 273]

362	[682, 683]	1228	[1967, 1968]	2094	[2653, 2588]	2960	[304, 2229]
363	[684, 685]	1229	[1969, 1970]	2095	[2382, 2654]	2961	[1051, 3247]
364	[686, 687]	1230	[1971, 1972]	2096	[2277, 1267]	2962	[3289, 2359]
365	[688, 150]	1231	[687, 1442]	2097	[1009, 2603]	2963	[2414, 3274]
366	[689, 690]	1232	[1973, 708]	2098	[405, 968]	2964	[2267, 3187]
367	[691, 692]	1233	[523, 1974]	2099	[2174, 1302]	2965	[3252, 3290]
368	[693, 694]	1234	[1975, 1460]	2100	[350, 296]	2966	[864, 1046]
369	[695, 696]	1235	[186, 1914]	2101	[352, 2655]	2967	[246, 383]
370	[697, 698]	1236	[1976, 1977]	2102	[2384, 1314]	2968	[3219, 972]
371	[692, 195]	1237	[1978, 1979]	2103	[2591, 2296]	2969	[1335, 944]
372	[699, 700]	1238	[1980, 1981]	2104	[1228, 1368]	2970	[2191, 2281]
373	[701, 702]	1239	[1479, 1982]	2105	[442, 2656]	2971	[3291, 27]
374	[703, 566]	1240	[1983, 1984]	2106	[1307, 875]	2972	[2624, 1102]
375	[704, 705]	1241	[128, 1589]	2107	[2317, 2345]	2973	[3292, 3293]
376	[706, 707]	1242	[1985, 1986]	2108	[2657, 1152]	2974	[2622, 455]
377	[708, 709]	1243	[1987, 1988]	2109	[2288, 1234]	2975	[3294, 2578]
378	[710, 711]	1244	[1989, 1990]	2110	[1090, 2658]	2976	[3289, 458]
379	[712, 713]	1245	[1991, 1701]	2111	[1139, 2303]	2977	[2318, 1288]
380	[714, 715]	1246	[1992, 1993]	2112	[2494, 994]	2978	[6, 2253]
381	[716, 234]	1247	[1682, 1994]	2113	[1268, 2378]	2979	[2177, 938]
382	[717, 718]	1248	[1995, 621]	2114	[2348, 346]	2980	[3183, 1172]
383	[465, 719]	1249	[1996, 1997]	2115	[2226, 2189]	2981	[1183, 2478]
384	[720, 599]	1250	[1998, 1999]	2116	[1157, 2659]	2982	[2557, 3262]
385	[721, 722]	1251	[212, 2000]	2117	[2660, 2661]	2983	[2334, 306]
386	[723, 724]	1252	[833, 1805]	2118	[2434, 2662]	2984	[2365, 3295]
387	[725, 726]	1253	[1930, 2001]	2119	[1184, 2518]	2985	[3296, 1182]
388	[727, 728]	1254	[2002, 1408]	2120	[2600, 2663]	2986	[106, 3190]
389	[729, 730]	1255	[764, 1673]	2121	[2645, 2664]	2987	[271, 449]
390	[731, 732]	1256	[664, 1954]	2122	[258, 377]	2988	[2604, 3297]
391	[733, 734]	1257	[2003, 480]	2123	[2665, 1043]	2989	[1090, 3298]
392	[735, 736]	1258	[1580, 1987]	2124	[2602, 2666]	2990	[334, 1055]
393	[645, 737]	1259	[2004, 2005]	2125	[295, 408]	2991	[436, 3299]
394	[738, 739]	1260	[2006, 2007]	2126	[2345, 2338]	2992	[2390, 2465]
395	[740, 550]	1261	[2008, 2009]	2127	[2512, 1181]	2993	[353, 1273]
396	[741, 742]	1262	[2010, 181]	2128	[2509, 394]	2994	[924, 907]
397	[743, 744]	1263	[2011, 659]	2129	[118, 863]	2995	[356, 2580]
398	[745, 583]	1264	[1916, 2012]	2130	[988, 895]	2996	[3300, 280]
399	[746, 747]	1265	[2013, 2014]	2131	[1106, 862]	2997	[3237, 2412]
400	[748, 749]	1266	[2015, 1885]	2132	[2667, 1160]	2998	[1015, 3255]
401	[750, 751]	1267	[2016, 2017]	2133	[2668, 2668]	2999	[97, 3294]
402	[752, 753]	1268	[1554, 482]	2134	[2669, 2670]	3000	[3294, 1140]
403	[742, 754]	1269	[1475, 2018]	2135	[2671, 993]	3001	[2167, 912]
404	[755, 756]	1270	[2019, 2020]	2136	[2653, 2649]	3002	[3286, 2165]
405	[52, 757]	1271	[239, 2021]	2137	[297, 1066]	3003	[2611, 948]

406	[758, 759]	1272	[1592, 733]	2138	[1289, 282]	3004	[86, 1231]
407	[760, 761]	1273	[2022, 1522]	2139	[1058, 73]	3005	[1096, 2636]
408	[762, 763]	1274	[666, 2023]	2140	[1005, 2200]	3006	[2640, 1029]
409	[563, 764]	1275	[2024, 2025]	2141	[1161, 1333]	3007	[3226, 2235]
410	[765, 766]	1276	[204, 1448]	2142	[1315, 914]	3008	[16, 1035]
411	[767, 768]	1277	[571, 607]	2143	[423, 2589]	3009	[306, 2283]
412	[769, 770]	1278	[1862, 2026]	2144	[2564, 2510]	3010	[3241, 2565]
413	[771, 772]	1279	[2027, 2028]	2145	[1054, 335]	3011	[3301, 2214]
414	[773, 774]	1280	[1618, 2029]	2146	[2504, 2625]	3012	[2240, 2548]
415	[761, 775]	1281	[1781, 663]	2147	[974, 2585]	3013	[3302, 3303]
416	[776, 777]	1282	[2030, 2031]	2148	[1103, 2255]	3014	[69, 3304]
417	[485, 778]	1283	[2032, 2033]	2149	[2672, 1106]	3015	[998, 1064]
418	[779, 780]	1284	[2034, 2035]	2150	[1143, 2673]	3016	[982, 88]
419	[781, 782]	1285	[528, 2036]	2151	[2545, 2674]	3017	[911, 2324]
420	[783, 784]	1286	[2037, 2038]	2152	[961, 2662]	3018	[1146, 1004]
421	[151, 695]	1287	[1497, 2039]	2153	[2598, 909]	3019	[3305, 961]
422	[785, 786]	1288	[1917, 536]	2154	[2388, 1260]	3020	[2455, 248]
423	[787, 788]	1289	[2040, 2041]	2155	[2675, 311]	3021	[1279, 1337]
424	[789, 790]	1290	[479, 2042]	2156	[2171, 918]	3022	[1226, 1377]
425	[791, 792]	1291	[719, 588]	2157	[1800, 1780]	3023	[2542, 932]
426	[793, 794]	1292	[1790, 1950]	2158	[2676, 2677]	3024	[115, 3196]
427	[795, 796]	1293	[2043, 236]	2159	[2678, 1827]	3025	[917, 2278]
428	[797, 798]	1294	[2044, 2045]	2160	[2679, 1628]	3026	[1117, 2264]
429	[799, 800]	1295	[2046, 2047]	2161	[1794, 2680]	3027	[1201, 3248]
430	[685, 801]	1296	[530, 2048]	2162	[2681, 2682]	3028	[3306, 1128]
431	[802, 803]	1297	[647, 500]	2163	[2683, 1926]	3029	[2394, 1013]
432	[804, 805]	1298	[2049, 2050]	2164	[2684, 2685]	3030	[1346, 3298]
433	[806, 807]	1299	[2051, 2052]	2165	[1960, 2686]	3031	[3234, 1086]
434	[808, 615]	1300	[2053, 2054]	2166	[1602, 727]	3032	[3307, 1291]
435	[809, 810]	1301	[820, 2055]	2167	[643, 2687]	3033	[1044, 2632]
436	[811, 812]	1302	[2056, 2057]	2168	[2688, 504]	3034	[3308, 438]
437	[813, 814]	1303	[2058, 2059]	2169	[2028, 1570]	3035	[313, 2536]
438	[815, 816]	1304	[1858, 2060]	2170	[2689, 1695]	3036	[1235, 2232]
439	[817, 818]	1305	[2061, 552]	2171	[2690, 2691]	3037	[3309, 2634]
440	[819, 820]	1306	[2062, 2063]	2172	[2692, 2693]	3038	[2537, 3275]
441	[821, 822]	1307	[2064, 681]	2173	[2694, 2056]	3039	[94, 2499]
442	[823, 824]	1308	[2065, 1820]	2174	[2695, 2696]	3040	[2441, 1378]
443	[825, 826]	1309	[2036, 2066]	2175	[2697, 2698]	3041	[1310, 2644]
444	[827, 617]	1310	[2067, 2068]	2176	[2699, 2700]	3042	[1251, 2563]
445	[828, 829]	1311	[2069, 2070]	2177	[2701, 2702]	3043	[2250, 3310]
446	[830, 831]	1312	[2071, 1438]	2178	[2703, 691]	3044	[2294, 2220]
447	[832, 833]	1313	[2072, 2073]	2179	[2704, 127]	3045	[114, 3209]
448	[834, 835]	1314	[1755, 2074]	2180	[2705, 142]	3046	[3197, 991]
449	[690, 836]	1315	[2075, 2076]	2181	[2706, 2707]	3047	[2675, 2430]

450	[517, 804]	1316	[792, 2077]	2182	[2708, 1692]	3048	[1107, 2406]
451	[837, 838]	1317	[768, 2078]	2183	[1842, 2709]	3049	[2652, 3311]
452	[839, 840]	1318	[1714, 2079]	2184	[2710, 490]	3050	[2308, 3184]
453	[841, 842]	1319	[2080, 2081]	2185	[166, 2711]	3051	[2464, 2605]
454	[174, 843]	1320	[1519, 2082]	2186	[2712, 133]	3052	[3312, 995]
455	[844, 619]	1321	[2083, 2084]	2187	[2713, 1520]	3053	[2642, 2545]
456	[845, 846]	1322	[1988, 2085]	2188	[2714, 2715]	3054	[1111, 2673]
457	[847, 848]	1323	[586, 2086]	2189	[2716, 2717]	3055	[2493, 996]
458	[849, 850]	1324	[2087, 2088]	2190	[2718, 2719]	3056	[394, 2620]
459	[851, 601]	1325	[2089, 827]	2191	[2720, 2721]	3057	[2577, 3313]
460	[153, 852]	1326	[1744, 2064]	2192	[228, 2722]	3058	[78, 329]
461	[853, 854]	1327	[1578, 1871]	2193	[2723, 2724]	3059	[978, 2666]
462	[855, 856]	1328	[2090, 233]	2194	[2725, 2726]	3060	[3314, 2643]
463	[857, 858]	1329	[2047, 1603]	2195	[2727, 2728]	3061	[2648, 2674]
464	[15, 859]	1330	[2091, 2092]	2196	[2729, 1967]	3062	[355, 2374]
465	[860, 861]	1331	[2093, 2094]	2197	[2730, 2731]	3063	[1338, 1041]
466	[862, 863]	1332	[2095, 1946]	2198	[2732, 2733]	3064	[3260, 3315]
467	[864, 865]	1333	[2096, 1773]	2199	[2734, 1703]	3065	[3276, 1298]
468	[866, 433]	1334	[509, 1536]	2200	[2735, 2136]	3066	[2514, 3316]
469	[867, 868]	1335	[2097, 152]	2201	[2736, 2737]	3067	[2305, 3301]
470	[439, 869]	1336	[2000, 2098]	2202	[2738, 2739]	3068	[2204, 2474]
471	[870, 284]	1337	[1411, 2099]	2203	[2740, 1485]	3069	[399, 1057]
472	[113, 871]	1338	[1915, 207]	2204	[1433, 2741]	3070	[379, 2301]
473	[288, 872]	1339	[2100, 2101]	2205	[1604, 2742]	3071	[1138, 1172]
474	[873, 874]	1340	[2102, 2103]	2206	[2743, 1540]	3072	[2220, 2433]
475	[451, 875]	1341	[1727, 2104]	2207	[1891, 1929]	3073	[1349, 2395]
476	[876, 877]	1342	[2070, 2096]	2208	[143, 2744]	3074	[2342, 2323]
477	[878, 879]	1343	[2105, 2106]	2209	[2744, 2745]	3075	[1343, 3245]
478	[880, 881]	1344	[2107, 2108]	2210	[1856, 769]	3076	[920, 2464]
479	[882, 340]	1345	[1738, 1683]	2211	[2746, 1913]	3077	[2559, 1375]
480	[883, 884]	1346	[2035, 1911]	2212	[2747, 2748]	3078	[2386, 2638]
481	[885, 278]	1347	[2109, 2110]	2213	[1608, 1980]	3079	[2358, 1082]
482	[886, 887]	1348	[2111, 2112]	2214	[491, 2749]	3080	[2349, 347]
483	[888, 889]	1349	[1999, 2037]	2215	[2052, 2750]	3081	[1038, 1222]
484	[440, 890]	1350	[2113, 1819]	2216	[2751, 845]	3082	[3317, 1247]
485	[873, 891]	1351	[2081, 1595]	2217	[2752, 2753]	3083	[2599, 3220]
486	[892, 456]	1352	[2114, 1964]	2218	[2754, 2755]	3084	[1031, 2305]
487	[893, 100]	1353	[1461, 2115]	2219	[2756, 2757]	3085	[917, 1286]
488	[30, 894]	1354	[2116, 2117]	2220	[2758, 2759]	3086	[3281, 263]
489	[895, 896]	1355	[649, 1437]	2221	[2760, 2015]	3087	[1260, 3242]
490	[897, 246]	1356	[513, 1537]	2222	[2029, 1668]	3088	[1255, 2184]
491	[366, 271]	1357	[2118, 1623]	2223	[2151, 813]	3089	[2445, 370]
492	[898, 899]	1358	[2073, 55]	2224	[2761, 2762]	3090	[1204, 2459]
493	[900, 253]	1359	[235, 2119]	2225	[1672, 2716]	3091	[2196, 2492]

494	[901, 902]	1360	[2120, 2121]	2226	[1436, 2763]	3092	[2354, 2485]
495	[259, 903]	1361	[608, 2122]	2227	[1810, 2764]	3093	[1315, 878]
496	[904, 398]	1362	[1898, 45]	2228	[2765, 1787]	3094	[2425, 1241]
497	[905, 906]	1363	[2123, 1402]	2229	[2766, 1492]	3095	[3302, 3318]
498	[907, 908]	1364	[1581, 2124]	2230	[2767, 2768]	3096	[3277, 2194]
499	[395, 909]	1365	[2125, 213]	2231	[2769, 2770]	3097	[2167, 3319]
500	[432, 910]	1366	[2126, 1935]	2232	[2771, 677]	3098	[405, 1053]
501	[911, 376]	1367	[2127, 2128]	2233	[1598, 2772]	3099	[2395, 1286]
502	[912, 913]	1368	[60, 2129]	2234	[2773, 1969]	3100	[3320, 410]
503	[333, 914]	1369	[1968, 2130]	2235	[2774, 2775]	3101	[912, 3321]
504	[293, 915]	1370	[2131, 2132]	2236	[2088, 2776]	3102	[2643, 380]
505	[916, 917]	1371	[2133, 2134]	2237	[2777, 2778]	3103	[933, 2199]
506	[320, 918]	1372	[680, 2135]	2238	[574, 2779]	3104	[2625, 2654]
507	[919, 920]	1373	[2136, 238]	2239	[2780, 1543]	3105	[3322, 3261]
508	[921, 922]	1374	[2137, 1933]	2240	[46, 2781]	3106	[2525, 295]
509	[923, 320]	1375	[770, 2138]	2241	[2782, 2783]	3107	[1368, 3266]
510	[924, 302]	1376	[1569, 129]	2242	[1895, 2784]	3108	[2516, 2616]
511	[899, 925]	1377	[2139, 2140]	2243	[2785, 793]	3109	[2457, 2200]
512	[447, 922]	1378	[818, 2141]	2244	[2085, 2688]	3110	[2321, 3208]
513	[926, 927]	1379	[2142, 2143]	2245	[2786, 2787]	3111	[3317, 446]
514	[928, 929]	1380	[2144, 2145]	2246	[2788, 2102]	3112	[371, 3243]
515	[930, 931]	1381	[1535, 1962]	2247	[2789, 2790]	3113	[2641, 1217]
516	[932, 883]	1382	[1955, 159]	2248	[1585, 2040]	3114	[1055, 314]
517	[933, 359]	1383	[2146, 2147]	2249	[2791, 1848]	3115	[2503, 2538]
518	[934, 935]	1384	[2148, 2149]	2250	[2792, 2793]	3116	[2599, 3323]
519	[333, 878]	1385	[2150, 785]	2251	[2794, 2795]	3117	[2608, 2175]
520	[936, 937]	1386	[2021, 2151]	2252	[1984, 1846]	3118	[3324, 898]
521	[938, 939]	1387	[2152, 2153]	2253	[2796, 2797]	3119	[3325, 2247]
522	[940, 941]	1388	[1847, 1712]	2254	[14, 2798]	3120	[3292, 3326]
523	[417, 942]	1389	[2154, 748]	2255	[561, 2799]	3121	[940, 3254]
524	[943, 944]	1390	[2155, 682]	2256	[2800, 1572]	3122	[2257, 2599]
525	[28, 945]	1391	[1921, 2156]	2257	[1889, 2801]	3123	[1186, 3310]
526	[461, 946]	1392	[1525, 2116]	2258	[854, 2802]	3124	[1242, 3202]
527	[947, 903]	1393	[309, 338]	2259	[705, 2803]	3125	[2230, 2325]
528	[21, 948]	1394	[2157, 2158]	2260	[2804, 1743]	3126	[3327, 3328]
529	[949, 270]	1395	[2159, 2160]	2261	[2805, 2806]	3127	[331, 1356]
530	[950, 902]	1396	[1251, 868]	2262	[2807, 2808]	3128	[2227, 390]
531	[951, 319]	1397	[1339, 2161]	2263	[2809, 2810]	3129	[920, 2604]
532	[952, 333]	1398	[2162, 2163]	2264	[2094, 2811]	3130	[2432, 2311]
533	[953, 880]	1399	[2164, 2165]	2265	[2106, 2812]	3131	[983, 2167]
534	[954, 415]	1400	[1164, 872]	2266	[1553, 2813]	3132	[2478, 1077]
535	[281, 955]	1401	[441, 1301]	2267	[1709, 2814]	3133	[110, 1374]
536	[956, 957]	1402	[2166, 1265]	2268	[2815, 2743]	3134	[424, 3175]
537	[958, 959]	1403	[88, 2167]	2269	[766, 787]	3135	[3329, 1388]

538	[124, 337]	1404	[1231, 2168]	2270	[2816, 2817]	3136	[2475, 2361]
539	[960, 961]	1405	[1308, 2169]	2271	[2818, 2819]	3137	[2331, 1240]
540	[962, 963]	1406	[1161, 2170]	2272	[2820, 2821]	3138	[2251, 3330]
541	[964, 441]	1407	[1192, 1390]	2273	[1853, 1699]	3139	[3291, 2624]
542	[330, 965]	1408	[358, 2171]	2274	[2822, 1973]	3140	[5, 2505]
543	[966, 121]	1409	[2172, 1023]	2275	[2823, 2824]	3141	[3194, 2543]
544	[967, 968]	1410	[2173, 2174]	2276	[2825, 2690]	3142	[3174, 443]
545	[969, 953]	1411	[2175, 2176]	2277	[2826, 2827]	3143	[1238, 1364]
546	[970, 971]	1412	[2177, 1044]	2278	[2828, 2829]	3144	[3232, 3304]
547	[972, 368]	1413	[425, 2178]	2279	[2830, 2150]	3145	[2491, 2197]
548	[413, 973]	1414	[898, 2179]	2280	[2831, 1642]	3146	[3284, 2661]
549	[974, 975]	1415	[2180, 2181]	2281	[2832, 2833]	3147	[2313, 3222]
550	[976, 977]	1416	[373, 2160]	2282	[2834, 2835]	3148	[953, 3283]
551	[978, 979]	1417	[2182, 435]	2283	[826, 795]	3149	[3308, 971]
552	[980, 981]	1418	[426, 2183]	2284	[1549, 209]	3150	[425, 3191]
553	[982, 983]	1419	[2184, 257]	2285	[2836, 2837]	3151	[1300, 2215]
554	[984, 309]	1420	[1314, 2185]	2286	[1855, 43]	3152	[3247, 988]
555	[985, 30]	1421	[2186, 2187]	2287	[2838, 2831]	3153	[1178, 1380]
556	[986, 987]	1422	[1307, 452]	2288	[2084, 1965]	3154	[3331, 3251]
557	[988, 250]	1423	[1214, 859]	2289	[2839, 2840]	3155	[876, 3332]
558	[285, 989]	1424	[2188, 71]	2290	[2841, 2826]	3156	[3180, 2642]
559	[260, 990]	1425	[2189, 2190]	2291	[1961, 2024]	3157	[2364, 2549]
560	[991, 992]	1426	[2191, 2192]	2292	[579, 221]	3158	[2502, 1088]
561	[993, 994]	1427	[2193, 2194]	2293	[1398, 2842]	3159	[3186, 1097]
562	[995, 996]	1428	[350, 408]	2294	[2843, 2844]	3160	[2644, 3228]
563	[997, 998]	1429	[2195, 1088]	2295	[2728, 1591]	3161	[1366, 1201]
564	[986, 999]	1430	[2196, 2197]	2296	[2845, 746]	3162	[307, 426]
565	[1000, 330]	1431	[327, 2198]	2297	[2846, 1835]	3163	[3194, 2458]
566	[282, 1001]	1432	[1221, 1039]	2298	[1403, 1496]	3164	[1151, 3333]
567	[1002, 1003]	1433	[68, 2199]	2299	[1925, 2847]	3165	[2372, 2613]
568	[1004, 92]	1434	[352, 1048]	2300	[2848, 2849]	3166	[3278, 1157]
569	[1005, 1006]	1435	[2200, 1223]	2301	[2850, 2760]	3167	[2402, 1144]
570	[1007, 1008]	1436	[256, 1216]	2302	[2851, 518]	3168	[1205, 26]
571	[1009, 1010]	1437	[349, 295]	2303	[1451, 2142]	3169	[2619, 1040]
572	[434, 1011]	1438	[2201, 308]	2304	[810, 2852]	3170	[2571, 3294]
573	[1012, 1013]	1439	[2202, 2203]	2305	[606, 2853]	3171	[960, 2434]
574	[1014, 1015]	1440	[2204, 2205]	2306	[2770, 2067]	3172	[1317, 880]
575	[296, 1016]	1441	[2206, 1030]	2307	[2138, 2854]	3173	[831, 1487]
576	[1017, 25]	1442	[1175, 2207]	2308	[2855, 2856]	3174	[1908, 3334]
577	[1018, 1019]	1443	[1382, 382]	2309	[1710, 2857]	3175	[1928, 3335]
578	[1020, 1021]	1444	[2208, 2209]	2310	[1753, 1920]	3176	[537, 697]
579	[1022, 1023]	1445	[1327, 1289]	2311	[2757, 1458]	3177	[2140, 3336]
580	[1024, 1025]	1446	[1150, 1020]	2312	[2858, 2858]	3178	[1887, 1978]
581	[114, 1026]	1447	[2210, 888]	2313	[2859, 2860]	3179	[3337, 3107]

582	[1027, 354]	1448	[2211, 2212]	2314	[2861, 765]	3180	[3338, 3069]
583	[1028, 1029]	1449	[2213, 1175]	2315	[2862, 2863]	3181	[3339, 2109]
584	[1030, 1031]	1450	[952, 1315]	2316	[2864, 2865]	3182	[3340, 3341]
585	[1012, 1032]	1451	[377, 2214]	2317	[2866, 2867]	3183	[1396, 1888]
586	[870, 1033]	1452	[428, 2215]	2318	[1556, 2868]	3184	[798, 3342]
587	[444, 324]	1453	[2216, 2217]	2319	[2842, 745]	3185	[3343, 2894]
588	[1034, 357]	1454	[1284, 2218]	2320	[2869, 2769]	3186	[525, 1815]
589	[1035, 927]	1455	[2219, 2220]	2321	[2781, 1599]	3187	[3344, 1506]
590	[1036, 1037]	1456	[2221, 2222]	2322	[1532, 2713]	3188	[1765, 2995]
591	[1038, 1039]	1457	[308, 1091]	2323	[1981, 494]	3189	[1691, 701]
592	[336, 275]	1458	[1258, 2223]	2324	[2870, 2871]	3190	[1614, 2825]
593	[863, 90]	1459	[1025, 2224]	2325	[2872, 2873]	3191	[790, 2692]
594	[1040, 1041]	1460	[2225, 2226]	2326	[2750, 2874]	3192	[3345, 484]
595	[1042, 1043]	1461	[2227, 2228]	2327	[2875, 2114]	3193	[10, 1975]
596	[1044, 939]	1462	[420, 2229]	2328	[2876, 2877]	3194	[3346, 1716]
597	[1045, 1046]	1463	[2230, 998]	2329	[2017, 1901]	3195	[3347, 3348]
598	[1047, 1048]	1464	[1324, 2231]	2330	[1659, 570]	3196	[3349, 3350]
599	[1049, 1050]	1465	[2232, 933]	2331	[2082, 2878]	3197	[532, 502]
600	[1051, 1052]	1466	[2209, 2208]	2332	[2879, 2880]	3198	[3198, 3198]
601	[967, 1053]	1467	[2233, 2234]	2333	[565, 582]	3199	[728, 1660]
602	[1054, 1055]	1468	[1357, 2235]	2334	[2881, 167]	3200	[1566, 1941]
603	[1056, 1057]	1469	[2236, 2237]	2335	[630, 1560]	3201	[3351, 3352]
604	[1058, 121]	1470	[2238, 2239]	2336	[2882, 1892]	3202	[2748, 3353]
605	[1059, 1060]	1471	[2240, 1220]	2337	[2883, 2884]	3203	[3152, 3354]
606	[1061, 423]	1472	[1363, 1239]	2338	[2885, 1857]	3204	[3355, 3356]
607	[921, 448]	1473	[2241, 1373]	2339	[2886, 633]	3205	[3335, 693]
608	[1062, 301]	1474	[305, 293]	2340	[2887, 2019]	3206	[489, 3139]
609	[406, 1063]	1475	[2242, 1199]	2341	[2888, 158]	3207	[1735, 1983]
610	[1064, 1065]	1476	[398, 2243]	2342	[541, 2889]	3208	[3357, 2869]
611	[1066, 1067]	1477	[2244, 2245]	2343	[1409, 496]	3209	[224, 3150]
612	[1068, 1069]	1478	[2246, 1173]	2344	[1680, 2890]	3210	[2790, 3339]
613	[450, 1070]	1479	[1334, 943]	2345	[2891, 2892]	3211	[578, 3344]
614	[1071, 1072]	1480	[1325, 2247]	2346	[2893, 1670]	3212	[3358, 1605]
615	[1073, 1074]	1481	[2248, 1288]	2347	[2894, 2895]	3213	[3006, 1909]
616	[1075, 1076]	1482	[2249, 255]	2348	[732, 2896]	3214	[2909, 611]
617	[1077, 1078]	1483	[1185, 2250]	2349	[2897, 837]	3215	[604, 2747]
618	[87, 983]	1484	[2251, 2252]	2350	[473, 2734]	3216	[1473, 3359]
619	[1079, 920]	1485	[2253, 2254]	2351	[2898, 2899]	3217	[3360, 3361]
620	[1080, 1081]	1486	[1086, 977]	2352	[2798, 1907]	3218	[3362, 1797]
621	[1082, 1083]	1487	[945, 2255]	2353	[2900, 1776]	3219	[2066, 3363]
622	[1084, 1085]	1488	[2246, 2256]	2354	[763, 2901]	3220	[3356, 2148]
623	[1086, 1087]	1489	[2257, 1211]	2355	[130, 2893]	3221	[2124, 1942]
624	[1088, 313]	1490	[463, 1199]	2356	[2829, 640]	3222	[3364, 2027]
625	[1089, 1090]	1491	[946, 2258]	2357	[1951, 2902]	3223	[3365, 2126]

626	[94, 1091]	1492	[2259, 2260]	2358	[2731, 2089]	3224	[1629, 1480]
627	[1092, 1093]	1493	[99, 1113]	2359	[2903, 2834]	3225	[469, 3366]
628	[1094, 1095]	1494	[2261, 1387]	2360	[2884, 2904]	3226	[1730, 1621]
629	[1096, 1097]	1495	[2262, 288]	2361	[2905, 2906]	3227	[3367, 3368]
630	[1098, 938]	1496	[2263, 2264]	2362	[1745, 2897]	3228	[2068, 3369]
631	[1099, 246]	1497	[265, 2265]	2363	[672, 2907]	3229	[1571, 1785]
632	[1100, 1101]	1498	[2266, 2267]	2364	[2076, 2908]	3230	[2797, 841]
633	[1102, 1103]	1499	[2268, 2269]	2365	[1491, 2909]	3231	[3370, 3371]
634	[1104, 1105]	1500	[860, 2270]	2366	[1441, 2910]	3232	[3372, 3373]
635	[1106, 118]	1501	[1102, 945]	2367	[2911, 2912]	3233	[3103, 1582]
636	[1107, 1108]	1502	[2271, 2272]	2368	[2913, 2914]	3234	[1655, 3374]
637	[74, 348]	1503	[2273, 2274]	2369	[1423, 1468]	3235	[1788, 2144]
638	[1109, 1110]	1504	[2182, 1011]	2370	[2915, 2916]	3236	[3348, 3029]
639	[1111, 1112]	1505	[410, 2268]	2371	[2917, 2887]	3237	[1906, 3375]
640	[893, 1113]	1506	[1021, 889]	2372	[1796, 2918]	3238	[2763, 2936]
641	[263, 992]	1507	[2275, 2276]	2373	[2833, 1799]	3239	[3168, 3376]
642	[903, 990]	1508	[2277, 291]	2374	[2919, 2920]	3240	[2007, 3377]
643	[897, 1114]	1509	[2278, 1347]	2375	[2921, 2705]	3241	[1904, 215]
644	[1115, 1116]	1510	[1253, 2207]	2376	[1993, 2879]	3242	[3378, 3360]
645	[1117, 1118]	1511	[338, 84]	2377	[2922, 2923]	3243	[3379, 1561]
646	[1119, 432]	1512	[1193, 2279]	2378	[2141, 2924]	3244	[632, 1752]
647	[1120, 1121]	1513	[2280, 2281]	2379	[1590, 1637]	3245	[3024, 3380]
648	[907, 303]	1514	[2282, 1010]	2380	[2925, 2926]	3246	[3381, 3046]
649	[1122, 1123]	1515	[2243, 2283]	2381	[2101, 2870]	3247	[495, 3382]
650	[948, 1124]	1516	[880, 2284]	2382	[2927, 1651]	3248	[3383, 2885]
651	[1097, 1125]	1517	[2285, 2286]	2383	[2928, 2929]	3249	[202, 1992]
652	[1066, 1126]	1518	[460, 1082]	2384	[2930, 2931]	3250	[3111, 3009]
653	[1127, 1128]	1519	[2287, 124]	2385	[2764, 2932]	3251	[2119, 2091]
654	[1129, 1130]	1520	[2288, 2289]	2386	[2742, 2933]	3252	[2768, 3146]
655	[1131, 1132]	1521	[2290, 2291]	2387	[2934, 2678]	3253	[2696, 1931]
656	[1133, 1134]	1522	[2229, 2292]	2388	[1630, 2008]	3254	[3384, 2758]
657	[284, 1135]	1523	[387, 1085]	2389	[2892, 2714]	3255	[1650, 1579]
658	[23, 1000]	1524	[1367, 1202]	2390	[1932, 2935]	3256	[1405, 689]
659	[1136, 1000]	1525	[2293, 2294]	2391	[2104, 839]	3257	[2793, 3385]
660	[1137, 1138]	1526	[1088, 2295]	2392	[2936, 771]	3258	[3386, 3387]
661	[892, 1139]	1527	[964, 890]	2393	[1864, 2937]	3259	[2824, 3388]
662	[98, 1140]	1528	[930, 2296]	2394	[1669, 2903]	3260	[3389, 3390]
663	[1141, 1142]	1529	[2297, 2298]	2395	[2691, 1440]	3261	[572, 3391]
664	[1143, 1112]	1530	[2299, 2198]	2396	[1594, 2938]	3262	[3392, 531]
665	[255, 1144]	1531	[269, 2300]	2397	[2045, 783]	3263	[1957, 3393]
666	[1145, 1146]	1532	[2301, 1133]	2398	[2939, 2780]	3264	[2821, 3060]
667	[1147, 1148]	1533	[2172, 2302]	2399	[226, 2882]	3265	[3394, 1676]
668	[351, 1047]	1534	[456, 2303]	2400	[2940, 2862]	3266	[3395, 33]
669	[1149, 1150]	1535	[954, 2304]	2401	[2941, 2942]	3267	[3093, 3396]

670	[1151, 1152]	1536	[2305, 377]	2402	[757, 2823]	3268	[3397, 3398]
671	[1153, 1154]	1537	[1141, 2306]	2403	[2943, 2944]	3269	[3399, 3400]
672	[1155, 25]	1538	[2163, 1257]	2404	[2945, 2946]	3270	[3401, 1751]
673	[1156, 1157]	1539	[301, 421]	2405	[824, 2947]	3271	[2041, 1817]
674	[1158, 1159]	1540	[124, 275]	2406	[2948, 2886]	3272	[1523, 1575]
675	[1160, 1161]	1541	[2307, 1300]	2407	[1719, 2087]	3273	[3342, 2800]
676	[1162, 356]	1542	[1280, 2185]	2408	[2949, 2950]	3274	[3402, 3403]
677	[324, 1163]	1543	[2308, 1171]	2409	[1818, 1806]	3275	[1816, 2127]
678	[1164, 1165]	1544	[2309, 315]	2410	[2951, 2952]	3276	[2954, 2861]
679	[1166, 345]	1545	[1080, 2310]	2411	[180, 1649]	3277	[1647, 3404]
680	[1167, 1168]	1546	[2220, 2311]	2412	[2953, 2954]	3278	[471, 3405]
681	[1169, 1111]	1547	[2312, 255]	2413	[2955, 758]	3279	[3398, 2683]
682	[1170, 1171]	1548	[1389, 399]	2414	[709, 2956]	3280	[3026, 3406]
683	[283, 1033]	1549	[2313, 1105]	2415	[2957, 2958]	3281	[3407, 3408]
684	[1119, 866]	1550	[2314, 2315]	2416	[1874, 2959]	3282	[3147, 3075]
685	[1172, 1173]	1551	[1129, 2316]	2417	[2960, 2022]	3283	[2077, 3409]
686	[1174, 1175]	1552	[888, 2317]	2418	[1997, 1563]	3284	[2033, 3410]
687	[1176, 1081]	1553	[2209, 2209]	2419	[1620, 779]	3285	[775, 3411]
688	[1177, 83]	1554	[1020, 888]	2420	[2961, 2962]	3286	[2772, 229]
689	[1178, 1179]	1555	[889, 956]	2421	[1934, 2963]	3287	[3033, 217]
690	[919, 1180]	1556	[1001, 959]	2422	[2964, 658]	3288	[2895, 1998]
691	[250, 896]	1557	[1189, 2318]	2423	[628, 1938]	3289	[1694, 3367]
692	[1120, 1181]	1558	[2319, 1003]	2424	[2965, 2966]	3290	[206, 3412]
693	[1182, 1183]	1559	[2320, 1324]	2425	[126, 2967]	3291	[3413, 3358]
694	[80, 1184]	1560	[2321, 2322]	2426	[2968, 1793]	3292	[3056, 3414]
695	[296, 409]	1561	[1329, 2323]	2427	[2969, 2970]	3293	[616, 3415]
696	[1185, 1186]	1562	[375, 2324]	2428	[2971, 834]	3294	[2956, 3022]
697	[1187, 1188]	1563	[2325, 1153]	2429	[2972, 1985]	3295	[230, 1859]
698	[959, 1189]	1564	[2326, 2327]	2430	[2973, 597]	3296	[3044, 1414]
699	[1190, 1191]	1565	[993, 2328]	2431	[1770, 2752]	3297	[3121, 1434]
700	[1192, 1193]	1566	[1168, 1261]	2432	[2974, 2839]	3298	[1762, 1756]
701	[1194, 1195]	1567	[1305, 289]	2433	[2799, 2975]	3299	[2933, 3394]
702	[1196, 346]	1568	[1237, 1111]	2434	[1576, 2976]	3300	[3382, 1774]
703	[1197, 1198]	1569	[292, 2329]	2435	[1558, 2977]	3301	[1674, 671]
704	[1199, 1200]	1570	[2330, 2331]	2436	[2978, 2740]	3302	[3416, 3355]
705	[1201, 1202]	1571	[2332, 2270]	2437	[2979, 2922]	3303	[501, 750]
706	[1203, 1204]	1572	[1000, 1343]	2438	[2980, 684]	3304	[3417, 3068]
707	[1155, 1205]	1573	[2333, 2334]	2439	[774, 2981]	3305	[2020, 3418]
708	[89, 1206]	1574	[2335, 1210]	2440	[1986, 2982]	3306	[794, 154]
709	[411, 1207]	1575	[2292, 915]	2441	[1574, 2983]	3307	[3142, 3134]
710	[1208, 1209]	1576	[1273, 2336]	2442	[2946, 2836]	3308	[1870, 2809]
711	[1210, 1211]	1577	[886, 2337]	2443	[2984, 2925]	3309	[1834, 2807]
712	[1212, 1213]	1578	[956, 2338]	2444	[2985, 2986]	3310	[3078, 3419]
713	[1214, 16]	1579	[1248, 2339]	2445	[1488, 205]	3311	[3144, 1542]

714	[6, 1215]	1580	[2327, 2340]	2446	[2987, 2043]	3312	[3420, 2930]
715	[1216, 418]	1581	[1275, 1147]	2447	[1679, 624]	3313	[3092, 1766]
716	[1007, 1217]	1582	[275, 2341]	2448	[2988, 163]	3314	[2130, 675]
717	[1218, 1193]	1583	[2342, 986]	2449	[2989, 2990]	3315	[1840, 1996]
718	[1219, 1220]	1584	[2343, 2344]	2450	[216, 2751]	3316	[1733, 3050]
719	[859, 1035]	1585	[889, 2345]	2451	[2991, 1476]	3317	[3143, 3049]
720	[1221, 1222]	1586	[2179, 2346]	2452	[2992, 2804]	3318	[718, 3421]
721	[1006, 1223]	1587	[2347, 1235]	2453	[1757, 2832]	3319	[1596, 1586]
722	[1224, 1225]	1588	[2348, 2349]	2454	[2993, 2994]	3320	[1747, 3422]
723	[1226, 1227]	1589	[250, 2350]	2455	[2995, 2131]	3321	[2687, 1631]
724	[985, 1228]	1590	[1172, 2256]	2456	[2977, 2996]	3322	[3422, 3013]
725	[1229, 1230]	1591	[1208, 2351]	2457	[2817, 2997]	3323	[2801, 811]
726	[380, 1133]	1592	[64, 1240]	2458	[2779, 2998]	3324	[3423, 1464]
727	[1231, 1232]	1593	[2352, 2353]	2459	[2999, 3000]	3325	[2726, 2075]
728	[1233, 1234]	1594	[1061, 2354]	2460	[822, 3001]	3326	[754, 2888]
729	[298, 1126]	1595	[2355, 2179]	2461	[711, 1472]	3327	[3141, 2848]
730	[1235, 67]	1596	[1287, 2356]	2462	[3002, 1896]	3328	[2907, 3395]
731	[1209, 1236]	1597	[2357, 267]	2463	[1568, 3003]	3329	[3170, 2999]
732	[1237, 1143]	1598	[2285, 2222]	2464	[1500, 3004]	3330	[2959, 1641]
733	[1238, 1239]	1599	[2358, 461]	2465	[3005, 3006]	3331	[3424, 3425]
734	[1240, 1241]	1600	[2359, 459]	2466	[2812, 3007]	3332	[3124, 3426]
735	[1242, 1243]	1601	[2360, 2361]	2467	[3004, 185]	3333	[3148, 2943]
736	[1244, 1245]	1602	[2362, 2363]	2468	[759, 2866]	3334	[3427, 2624]
737	[1095, 1246]	1603	[2364, 2365]	2469	[2935, 187]	3335	[3213, 80]
738	[445, 1247]	1604	[1059, 108]	2470	[8, 3008]	3336	[1068, 3215]
739	[1034, 300]	1605	[2366, 993]	2471	[3009, 1597]	3337	[946, 3200]
740	[1248, 1249]	1606	[2367, 344]	2472	[3010, 3011]	3338	[1342, 1332]
741	[1250, 1251]	1607	[77, 2368]	2473	[1865, 3012]	3339	[3228, 3272]
742	[393, 1252]	1608	[2369, 2370]	2474	[2110, 2701]	3340	[867, 2563]
743	[1174, 1253]	1609	[2371, 2372]	2475	[1940, 2725]	3341	[278, 1285]
744	[247, 1254]	1610	[2253, 2373]	2476	[3013, 3014]	3342	[3306, 2420]
745	[1255, 1030]	1611	[2374, 2375]	2477	[3015, 2953]	3343	[2262, 1164]
746	[1109, 1256]	1612	[2376, 2217]	2478	[2840, 3016]	3344	[3428, 3265]
747	[1015, 1257]	1613	[2203, 2377]	2479	[1528, 1831]	3345	[1094, 2537]
748	[1258, 1259]	1614	[1179, 75]	2480	[1457, 1412]	3346	[3210, 3332]
749	[1260, 1261]	1615	[2378, 254]	2481	[2827, 2915]	3347	[2556, 1295]
750	[1145, 1262]	1616	[2379, 1076]	2482	[2958, 3017]	3348	[1180, 2604]
751	[118, 89]	1617	[980, 2380]	2483	[3018, 3019]	3349	[3189, 3429]
752	[1263, 937]	1618	[2381, 2205]	2484	[3020, 2735]	3350	[1030, 257]
753	[1264, 1265]	1619	[2173, 322]	2485	[786, 2789]	3351	[394, 2607]
754	[1122, 1266]	1620	[871, 1026]	2486	[2901, 3021]	3352	[3430, 3326]
755	[1267, 292]	1621	[361, 309]	2487	[3022, 3023]	3353	[2667, 1342]
756	[1268, 253]	1622	[2382, 2383]	2488	[780, 3024]	3354	[1006, 2507]
757	[1269, 107]	1623	[995, 2384]	2489	[2042, 1976]	3355	[1354, 3431]

758	[958, 1270]	1624	[2385, 353]	2490	[1509, 2898]	3356	[3250, 3432]
759	[1271, 1272]	1625	[2386, 436]	2491	[801, 3025]	3357	[2178, 3219]
760	[1273, 1274]	1626	[284, 2387]	2492	[2724, 3026]	3358	[2650, 2367]
761	[1275, 1276]	1627	[2388, 1168]	2493	[1640, 2794]	3359	[2161, 106]
762	[1277, 1278]	1628	[2389, 1150]	2494	[3027, 3028]	3360	[1182, 2477]
763	[868, 1279]	1629	[1189, 2248]	2495	[3029, 1991]	3361	[2644, 3268]
764	[996, 1280]	1630	[2390, 1213]	2496	[2719, 1482]	3362	[2651, 2502]
765	[1281, 1282]	1631	[1114, 1353]	2497	[3001, 3030]	3363	[1213, 3180]
766	[1283, 898]	1632	[1390, 2279]	2498	[2135, 1627]	3364	[273, 3433]
767	[1284, 1285]	1633	[2391, 1307]	2499	[3031, 2919]	3365	[3428, 3434]
768	[1286, 1287]	1634	[307, 2392]	2500	[2867, 3032]	3366	[1186, 2646]
769	[1288, 1289]	1635	[2393, 1093]	2501	[1413, 3033]	3367	[2437, 2203]
770	[1290, 1291]	1636	[2394, 1032]	2502	[3034, 1890]	3368	[267, 363]
771	[1292, 1249]	1637	[2159, 374]	2503	[534, 1516]	3369	[1340, 2567]
772	[1293, 1294]	1638	[2395, 2278]	2504	[625, 3035]	3370	[449, 905]
773	[1100, 1295]	1639	[88, 2396]	2505	[3036, 2]	3371	[890, 1350]
774	[1296, 392]	1640	[453, 2397]	2506	[2868, 3037]	3372	[1296, 2626]
775	[1297, 1298]	1641	[2398, 1345]	2507	[3038, 3039]	3373	[1362, 2611]
776	[1146, 91]	1642	[385, 2399]	2508	[1715, 2766]	3374	[3435, 887]
777	[1299, 1300]	1643	[2400, 2401]	2509	[2863, 3040]	3375	[2565, 2436]
778	[890, 1301]	1644	[2249, 2402]	2510	[2795, 3041]	3376	[3436, 2487]
779	[322, 1302]	1645	[1017, 1205]	2511	[3042, 1903]	3377	[123, 336]
780	[289, 1303]	1646	[2332, 861]	2512	[3043, 3044]	3378	[1246, 3437]
781	[1304, 893]	1647	[2403, 2404]	2513	[58, 3045]	3379	[3288, 2493]
782	[1305, 262]	1648	[1075, 2405]	2514	[2677, 2985]	3380	[2473, 2451]
783	[1306, 1307]	1649	[2406, 1248]	2515	[1431, 644]	3381	[3269, 322]
784	[1308, 1309]	1650	[2371, 2327]	2516	[3046, 2756]	3382	[2431, 1110]
785	[1310, 935]	1651	[2407, 1132]	2517	[3047, 585]	3383	[1271, 3438]
786	[1311, 1312]	1652	[2408, 932]	2518	[1643, 823]	3384	[3228, 3439]
787	[1282, 352]	1653	[1150, 2210]	2519	[2932, 1768]	3385	[2198, 3311]
788	[1313, 82]	1654	[2210, 1021]	2520	[2803, 3048]	3386	[3327, 2583]
789	[996, 1314]	1655	[2409, 1020]	2521	[3049, 558]	3387	[3331, 3432]
790	[1108, 1248]	1656	[863, 1206]	2522	[3050, 3051]	3388	[3319, 913]
791	[332, 1315]	1657	[2410, 1136]	2523	[149, 3052]	3389	[2359, 3227]
792	[1316, 1317]	1658	[2397, 342]	2524	[3053, 3054]	3390	[3440, 3431]
793	[348, 1318]	1659	[1098, 1044]	2525	[3055, 3056]	3391	[1137, 3183]
794	[1319, 1320]	1660	[2411, 1179]	2526	[3057, 2133]	3392	[314, 3441]
795	[438, 1321]	1661	[2412, 1078]	2527	[610, 1746]	3393	[272, 450]
796	[859, 926]	1662	[2378, 2413]	2528	[198, 2773]	3394	[2370, 1184]
797	[1004, 1322]	1663	[2414, 2415]	2529	[3041, 3058]	3395	[2554, 2595]
798	[1323, 1324]	1664	[972, 2416]	2530	[2962, 3059]	3396	[2299, 2652]
799	[1325, 1326]	1665	[2334, 2243]	2531	[3060, 3061]	3397	[1311, 2423]
800	[1327, 281]	1666	[420, 305]	2532	[2880, 1807]	3398	[2370, 19]
801	[866, 910]	1667	[2417, 353]	2533	[715, 1737]	3399	[3314, 379]

802	[1328, 117]	1668	[1099, 1114]	2534	[3062, 1959]	3400	[1134, 3267]
803	[1293, 119]	1669	[389, 2228]	2535	[1740, 2051]	3401	[2652, 3442]
804	[883, 1320]	1670	[256, 417]	2536	[1760, 2053]	3402	[1190, 1281]
805	[1329, 986]	1671	[2418, 2195]	2537	[602, 3063]	3403	[3280, 2239]
806	[1330, 1331]	1672	[364, 2244]	2538	[3064, 2718]	3404	[1041, 2161]
807	[955, 1001]	1673	[998, 1153]	2539	[1777, 2818]	3405	[869, 1378]
808	[1332, 1333]	1674	[1280, 2419]	2540	[2976, 3065]	3406	[3205, 367]
809	[1250, 867]	1675	[1127, 2420]	2541	[3066, 2891]	3407	[3296, 2353]
810	[1334, 1335]	1676	[2211, 2421]	2542	[3025, 2080]	3408	[2392, 427]
811	[1336, 1337]	1677	[2357, 362]	2543	[3067, 844]	3409	[1317, 3283]
812	[408, 1016]	1678	[2422, 2423]	2544	[3068, 2694]	3410	[3443, 2601]
813	[1338, 1339]	1679	[1092, 2424]	2545	[3069, 808]	3411	[3225, 2242]
814	[1340, 273]	1680	[64, 2425]	2546	[3070, 2093]	3412	[3324, 2355]
815	[1341, 87]	1681	[1294, 2426]	2547	[3071, 3072]	3413	[1166, 324]
816	[1079, 1180]	1682	[2427, 1225]	2548	[3073, 3074]	3414	[3444, 3253]
817	[1342, 1161]	1683	[2216, 2428]	2549	[3075, 2706]	3415	[3320, 2576]
818	[1343, 965]	1684	[2429, 291]	2550	[1429, 3076]	3416	[2349, 2574]
819	[1228, 894]	1685	[310, 2430]	2551	[1833, 1881]	3417	[1240, 3445]
820	[1344, 369]	1686	[1125, 1095]	2552	[3077, 243]	3418	[3446, 2515]
821	[962, 1345]	1687	[1184, 20]	2553	[2775, 3078]	3419	[260, 2628]
822	[1089, 1346]	1688	[2431, 1256]	2554	[3079, 3080]	3420	[2452, 1025]
823	[1347, 1348]	1689	[1341, 982]	2555	[1860, 3081]	3421	[2417, 1027]
824	[1349, 917]	1690	[463, 1194]	2556	[1486, 554]	3422	[1335, 2524]
825	[441, 1350]	1691	[2432, 2433]	2557	[3082, 1693]	3423	[2187, 2232]
826	[397, 859]	1692	[2434, 2435]	2558	[3083, 474]	3424	[2522, 2631]
827	[1351, 87]	1693	[2436, 2437]	2559	[2055, 2146]	3425	[2351, 1236]
828	[950, 1352]	1694	[2438, 267]	2560	[2023, 776]	3426	[1313, 2592]
829	[1353, 384]	1695	[862, 89]	2561	[1826, 3084]	3427	[2952, 57]
830	[1354, 1355]	1696	[2439, 941]	2562	[3085, 767]	3428	[784, 815]
831	[251, 1356]	1697	[2403, 2440]	2563	[3086, 3087]	3429	[208, 3447]
832	[1357, 1358]	1698	[1321, 2441]	2564	[668, 2978]	3430	[3448, 2864]
833	[1359, 1360]	1699	[939, 2442]	2565	[3088, 2979]	3431	[1648, 3449]
834	[1361, 119]	1700	[1022, 2302]	2566	[3089, 3090]	3432	[3450, 175]
835	[430, 1159]	1701	[111, 317]	2567	[3091, 3092]	3433	[2865, 3337]
836	[1179, 1362]	1702	[2171, 321]	2568	[1845, 3093]	3434	[1949, 199]
837	[1363, 1364]	1703	[343, 2443]	2569	[1923, 3083]	3435	[2942, 712]
838	[1365, 107]	1704	[262, 1303]	2570	[2899, 2957]	3436	[3080, 3386]
839	[1366, 1367]	1705	[288, 1165]	2571	[2092, 1841]	3437	[3063, 3451]
840	[1368, 1369]	1706	[2444, 456]	2572	[2890, 3094]	3438	[2733, 1763]
841	[1370, 883]	1707	[2444, 1139]	2573	[3095, 3096]	3439	[2906, 1656]
842	[1371, 413]	1708	[1344, 2445]	2574	[3097, 3098]	3440	[3452, 590]
843	[1372, 1191]	1709	[1194, 1200]	2575	[593, 699]	3441	[1711, 1546]
844	[1373, 1374]	1710	[2297, 2446]	2576	[3099, 3100]	3442	[2847, 1843]
845	[413, 1375]	1711	[2447, 2448]	2577	[1688, 1671]	3443	[3354, 3453]

846	[1376, 1377]	1712	[318, 2449]	2578	[3101, 3102]	3444	[3454, 3455]
847	[1378, 1379]	1713	[1373, 2450]	2579	[1725, 2850]	3445	[1427, 1420]
848	[1380, 75]	1714	[2175, 2451]	2580	[670, 1653]	3446	[1919, 3034]
849	[1381, 1230]	1715	[2452, 2259]	2581	[515, 3103]	3447	[16, 926]
850	[1382, 1383]	1716	[1115, 2453]	2582	[3104, 3105]	3448	[1276, 1148]
851	[313, 980]	1717	[2454, 341]	2583	[499, 3106]	3449	[2532, 2595]
852	[1384, 1385]	1718	[2266, 1073]	2584	[3107, 2069]	3450	[2470, 3456]
853	[1386, 1387]	1719	[2455, 1254]	2585	[3108, 3109]	3451	[1055, 2309]
854	[1139, 457]	1720	[2242, 1194]	2586	[155, 1869]	3452	[2323, 987]
855	[1388, 1389]	1721	[2456, 866]	2587	[3110, 3111]	3453	[3457, 2399]
856	[1390, 1391]	1722	[2268, 1207]	2588	[2707, 3112]	3454	[1205, 3193]
857	[1052, 249]	1723	[2457, 1006]	2589	[3113, 3114]	3455	[3458, 1037]
858	[1392, 1108]	1724	[2239, 2458]	2590	[2698, 1652]	3456	[2001, 2065]
859	[1393, 1394]	1725	[461, 1083]	2591	[3115, 731]	3457	[3366, 2822]
860	[1395, 1396]	1726	[29, 1228]	2592	[3116, 2105]	3458	[3341, 3459]
861	[1397, 1398]	1727	[2459, 399]	2593	[3117, 1410]	3459	[3460, 3240]
862	[1399, 1400]	1728	[2460, 1276]	2594	[2990, 2855]	3460	[3461, 2777]
863	[232, 1401]	1729	[1187, 2461]	2595	[3090, 3118]	3461	[2517, 3231]
864	[1402, 1403]	1730	[2372, 2340]	2596	[2745, 3119]		
865	[1404, 1405]	1731	[2462, 984]	2597	[3120, 3121]		

Output function $n \mapsto \tau(n)$:

n	$\tau(n)$	n	$\tau(n)$	n	$\tau(n)$	n	$\tau(n)$	n	$\tau(n)$	n	$\tau(n)$
0	0	578	0	1156	0	1734	1	2312	1	2890	0
1	0	579	1	1157	0	1735	0	2313	0	2891	0
2	0	580	1	1158	1	1736	1	2314	1	2892	1
3	0	581	1	1159	1	1737	1	2315	0	2893	1
4	0	582	1	1160	1	1738	1	2316	0	2894	1
5	0	583	1	1161	0	1739	0	2317	1	2895	1
6	0	584	1	1162	1	1740	1	2318	1	2896	1
7	0	585	0	1163	0	1741	1	2319	1	2897	1
8	0	586	1	1164	1	1742	1	2320	0	2898	1
9	0	587	0	1165	1	1743	1	2321	0	2899	1
10	1	588	0	1166	1	1744	1	2322	1	2900	1
11	0	589	1	1167	1	1745	1	2323	1	2901	1
12	1	590	1	1168	0	1746	0	2324	0	2902	0
13	0	591	0	1169	0	1747	1	2325	1	2903	0
14	0	592	1	1170	1	1748	1	2326	1	2904	1
15	0	593	1	1171	0	1749	1	2327	1	2905	0
16	1	594	1	1172	0	1750	1	2328	1	2906	1
17	0	595	1	1173	1	1751	1	2329	1	2907	0
18	1	596	1	1174	0	1752	1	2330	1	2908	0
19	0	597	0	1175	1	1753	0	2331	1	2909	1
20	0	598	0	1176	1	1754	0	2332	0	2910	1

21	1	599	1	1177	1	1755	0	2333	0	2911	0
22	0	600	1	1178	0	1756	1	2334	1	2912	0
23	0	601	0	1179	1	1757	1	2335	1	2913	0
24	1	602	0	1180	0	1758	1	2336	1	2914	0
25	1	603	1	1181	0	1759	0	2337	0	2915	1
26	0	604	1	1182	0	1760	1	2338	0	2916	0
27	0	605	0	1183	1	1761	0	2339	1	2917	0
28	0	606	1	1184	1	1762	1	2340	0	2918	1
29	0	607	0	1185	1	1763	1	2341	1	2919	0
30	1	608	1	1186	1	1764	1	2342	1	2920	1
31	0	609	0	1187	1	1765	0	2343	0	2921	1
32	1	610	0	1188	0	1766	1	2344	0	2922	0
33	1	611	0	1189	0	1767	1	2345	0	2923	0
34	1	612	0	1190	0	1768	0	2346	1	2924	1
35	0	613	1	1191	1	1769	1	2347	1	2925	0
36	0	614	1	1192	0	1770	1	2348	1	2926	0
37	1	615	1	1193	0	1771	1	2349	1	2927	1
38	0	616	1	1194	0	1772	0	2350	0	2928	0
39	0	617	1	1195	1	1773	1	2351	1	2929	1
40	0	618	1	1196	0	1774	0	2352	0	2930	1
41	0	619	1	1197	1	1775	1	2353	1	2931	0
42	1	620	0	1198	1	1776	1	2354	0	2932	1
43	1	621	1	1199	1	1777	0	2355	0	2933	1
44	1	622	1	1200	0	1778	0	2356	0	2934	1
45	0	623	1	1201	1	1779	1	2357	1	2935	1
46	0	624	0	1202	1	1780	1	2358	1	2936	1
47	0	625	0	1203	1	1781	0	2359	0	2937	1
48	0	626	1	1204	1	1782	1	2360	0	2938	1
49	1	627	1	1205	0	1783	1	2361	0	2939	1
50	0	628	1	1206	0	1784	0	2362	1	2940	1
51	1	629	1	1207	0	1785	1	2363	1	2941	1
52	1	630	1	1208	1	1786	1	2364	1	2942	1
53	0	631	1	1209	0	1787	1	2365	0	2943	0
54	1	632	0	1210	1	1788	1	2366	1	2944	0
55	0	633	1	1211	1	1789	0	2367	0	2945	0
56	0	634	1	1212	1	1790	0	2368	0	2946	1
57	0	635	1	1213	0	1791	1	2369	1	2947	0
58	1	636	0	1214	1	1792	0	2370	1	2948	0
59	0	637	0	1215	1	1793	0	2371	0	2949	1
60	0	638	0	1216	1	1794	1	2372	0	2950	0
61	1	639	0	1217	0	1795	1	2373	1	2951	1
62	0	640	1	1218	1	1796	0	2374	0	2952	0
63	0	641	1	1219	1	1797	1	2375	1	2953	0
64	0	642	0	1220	1	1798	1	2376	0	2954	0

65	1	643	0	1221	1	1799	0	2377	0	2955	1
66	1	644	0	1222	0	1800	1	2378	0	2956	1
67	1	645	1	1223	1	1801	0	2379	0	2957	1
68	0	646	0	1224	0	1802	0	2380	0	2958	1
69	1	647	1	1225	0	1803	1	2381	1	2959	0
70	0	648	1	1226	1	1804	1	2382	1	2960	0
71	0	649	0	1227	0	1805	0	2383	0	2961	1
72	0	650	1	1228	0	1806	0	2384	1	2962	0
73	0	651	0	1229	0	1807	1	2385	1	2963	1
74	0	652	0	1230	1	1808	1	2386	0	2964	0
75	1	653	1	1231	1	1809	1	2387	1	2965	1
76	0	654	0	1232	0	1810	0	2388	0	2966	1
77	1	655	0	1233	0	1811	0	2389	1	2967	1
78	0	656	1	1234	1	1812	0	2390	0	2968	1
79	1	657	0	1235	1	1813	1	2391	0	2969	1
80	0	658	0	1236	1	1814	1	2392	1	2970	0
81	0	659	1	1237	1	1815	0	2393	0	2971	1
82	1	660	0	1238	1	1816	1	2394	1	2972	1
83	1	661	0	1239	0	1817	0	2395	1	2973	0
84	0	662	0	1240	1	1818	1	2396	1	2974	1
85	1	663	1	1241	0	1819	1	2397	1	2975	1
86	1	664	1	1242	1	1820	0	2398	1	2976	0
87	1	665	0	1243	0	1821	0	2399	0	2977	1
88	1	666	0	1244	0	1822	0	2400	1	2978	0
89	0	667	0	1245	0	1823	1	2401	1	2979	0
90	1	668	0	1246	0	1824	0	2402	1	2980	0
91	0	669	0	1247	1	1825	0	2403	0	2981	1
92	0	670	0	1248	1	1826	0	2404	0	2982	1
93	0	671	1	1249	0	1827	0	2405	0	2983	1
94	1	672	1	1250	1	1828	0	2406	0	2984	0
95	0	673	0	1251	0	1829	1	2407	1	2985	1
96	1	674	1	1252	1	1830	0	2408	1	2986	0
97	1	675	1	1253	0	1831	0	2409	1	2987	0
98	0	676	1	1254	1	1832	1	2410	1	2988	0
99	0	677	1	1255	0	1833	1	2411	1	2989	1
100	0	678	1	1256	1	1834	0	2412	0	2990	1
101	1	679	1	1257	1	1835	0	2413	1	2991	0
102	0	680	1	1258	1	1836	0	2414	1	2992	0
103	1	681	0	1259	1	1837	1	2415	1	2993	0
104	1	682	1	1260	1	1838	1	2416	1	2994	1
105	0	683	0	1261	1	1839	1	2417	0	2995	1
106	0	684	0	1262	0	1840	0	2418	1	2996	1
107	1	685	0	1263	1	1841	0	2419	0	2997	1
108	0	686	0	1264	0	1842	0	2420	1	2998	1

109	0	687	1	1265	1	1843	1	2421	0	2999	1
110	0	688	1	1266	1	1844	0	2422	0	3000	1
111	0	689	0	1267	0	1845	0	2423	1	3001	0
112	1	690	0	1268	0	1846	1	2424	1	3002	0
113	0	691	0	1269	1	1847	0	2425	0	3003	0
114	1	692	1	1270	1	1848	1	2426	1	3004	1
115	1	693	0	1271	0	1849	1	2427	1	3005	1
116	0	694	0	1272	0	1850	0	2428	1	3006	0
117	0	695	0	1273	1	1851	0	2429	1	3007	0
118	0	696	1	1274	0	1852	0	2430	0	3008	1
119	0	697	1	1275	1	1853	1	2431	1	3009	1
120	0	698	0	1276	1	1854	1	2432	1	3010	1
121	1	699	0	1277	1	1855	0	2433	1	3011	1
122	1	700	0	1278	0	1856	1	2434	1	3012	0
123	0	701	0	1279	1	1857	0	2435	1	3013	1
124	0	702	0	1280	1	1858	1	2436	0	3014	1
125	0	703	1	1281	0	1859	1	2437	0	3015	0
126	0	704	1	1282	1	1860	1	2438	0	3016	0
127	0	705	1	1283	1	1861	0	2439	0	3017	0
128	0	706	1	1284	1	1862	0	2440	1	3018	1
129	1	707	1	1285	1	1863	0	2441	1	3019	1
130	0	708	0	1286	1	1864	0	2442	1	3020	1
131	1	709	1	1287	0	1865	0	2443	0	3021	1
132	1	710	1	1288	0	1866	1	2444	1	3022	1
133	1	711	1	1289	1	1867	1	2445	1	3023	0
134	1	712	1	1290	1	1868	0	2446	0	3024	1
135	0	713	1	1291	0	1869	0	2447	1	3025	0
136	0	714	0	1292	0	1870	1	2448	0	3026	1
137	1	715	1	1293	0	1871	1	2449	1	3027	1
138	0	716	1	1294	1	1872	0	2450	0	3028	0
139	0	717	1	1295	0	1873	0	2451	0	3029	1
140	0	718	1	1296	0	1874	1	2452	0	3030	0
141	0	719	0	1297	1	1875	1	2453	1	3031	1
142	0	720	1	1298	0	1876	0	2454	0	3032	0
143	0	721	0	1299	0	1877	1	2455	1	3033	1
144	0	722	0	1300	0	1878	1	2456	1	3034	1
145	0	723	1	1301	1	1879	1	2457	1	3035	1
146	0	724	1	1302	0	1880	1	2458	0	3036	1
147	0	725	0	1303	1	1881	0	2459	1	3037	0
148	1	726	0	1304	1	1882	1	2460	0	3038	0
149	0	727	1	1305	0	1883	0	2461	1	3039	1
150	0	728	0	1306	1	1884	1	2462	0	3040	1
151	1	729	1	1307	1	1885	0	2463	1	3041	0
152	1	730	1	1308	1	1886	0	2464	1	3042	0

153	0	731	0	1309	0	1887	1	2465	1	3043	0
154	0	732	1	1310	0	1888	1	2466	0	3044	1
155	0	733	1	1311	1	1889	0	2467	1	3045	1
156	1	734	1	1312	0	1890	0	2468	0	3046	0
157	0	735	1	1313	1	1891	1	2469	1	3047	1
158	0	736	0	1314	0	1892	1	2470	0	3048	0
159	0	737	1	1315	0	1893	1	2471	1	3049	0
160	1	738	0	1316	0	1894	1	2472	1	3050	0
161	1	739	0	1317	1	1895	1	2473	0	3051	1
162	1	740	1	1318	1	1896	1	2474	1	3052	0
163	1	741	1	1319	0	1897	0	2475	1	3053	0
164	0	742	1	1320	1	1898	0	2476	1	3054	0
165	0	743	0	1321	1	1899	1	2477	0	3055	1
166	1	744	0	1322	1	1900	0	2478	0	3056	0
167	1	745	0	1323	1	1901	0	2479	0	3057	1
168	1	746	0	1324	0	1902	0	2480	0	3058	0
169	1	747	1	1325	0	1903	0	2481	1	3059	1
170	1	748	1	1326	1	1904	1	2482	1	3060	1
171	1	749	1	1327	1	1905	0	2483	1	3061	1
172	1	750	0	1328	0	1906	1	2484	1	3062	0
173	1	751	0	1329	0	1907	1	2485	1	3063	0
174	0	752	1	1330	0	1908	0	2486	1	3064	0
175	0	753	0	1331	1	1909	1	2487	1	3065	0
176	0	754	0	1332	1	1910	0	2488	0	3066	0
177	1	755	0	1333	0	1911	1	2489	0	3067	1
178	0	756	0	1334	0	1912	0	2490	0	3068	0
179	0	757	1	1335	1	1913	1	2491	0	3069	0
180	1	758	0	1336	0	1914	1	2492	0	3070	1
181	0	759	0	1337	1	1915	0	2493	1	3071	1
182	0	760	1	1338	0	1916	0	2494	1	3072	0
183	0	761	1	1339	1	1917	0	2495	1	3073	0
184	0	762	1	1340	1	1918	0	2496	1	3074	1
185	1	763	0	1341	1	1919	1	2497	0	3075	1
186	1	764	0	1342	0	1920	0	2498	0	3076	1
187	0	765	0	1343	1	1921	0	2499	1	3077	1
188	1	766	1	1344	1	1922	0	2500	1	3078	0
189	1	767	1	1345	1	1923	1	2501	1	3079	1
190	0	768	1	1346	0	1924	0	2502	1	3080	1
191	1	769	0	1347	1	1925	0	2503	1	3081	0
192	0	770	1	1348	1	1926	0	2504	0	3082	1
193	0	771	0	1349	0	1927	1	2505	1	3083	0
194	1	772	0	1350	0	1928	0	2506	1	3084	0
195	0	773	0	1351	0	1929	1	2507	0	3085	0
196	1	774	0	1352	1	1930	0	2508	0	3086	1

197	0	775	1	1353	0	1931	0	2509	0	3087	1
198	1	776	1	1354	0	1932	0	2510	1	3088	0
199	1	777	0	1355	0	1933	1	2511	0	3089	1
200	1	778	1	1356	0	1934	0	2512	0	3090	1
201	0	779	0	1357	1	1935	1	2513	1	3091	1
202	0	780	0	1358	1	1936	0	2514	0	3092	0
203	1	781	1	1359	1	1937	1	2515	1	3093	0
204	1	782	0	1360	1	1938	1	2516	0	3094	0
205	1	783	1	1361	1	1939	1	2517	1	3095	1
206	1	784	1	1362	0	1940	1	2518	1	3096	0
207	0	785	0	1363	0	1941	0	2519	1	3097	0
208	0	786	1	1364	1	1942	0	2520	1	3098	1
209	0	787	1	1365	0	1943	1	2521	0	3099	1
210	0	788	1	1366	0	1944	0	2522	0	3100	1
211	1	789	0	1367	0	1945	1	2523	0	3101	1
212	0	790	1	1368	0	1946	1	2524	0	3102	0
213	0	791	1	1369	0	1947	0	2525	1	3103	1
214	1	792	0	1370	1	1948	1	2526	1	3104	0
215	0	793	0	1371	1	1949	0	2527	0	3105	1
216	0	794	0	1372	1	1950	1	2528	1	3106	1
217	0	795	1	1373	1	1951	1	2529	0	3107	0
218	1	796	0	1374	1	1952	0	2530	0	3108	0
219	0	797	1	1375	1	1953	0	2531	1	3109	1
220	1	798	1	1376	0	1954	1	2532	0	3110	0
221	1	799	0	1377	1	1955	0	2533	1	3111	1
222	0	800	1	1378	1	1956	1	2534	0	3112	1
223	0	801	0	1379	0	1957	1	2535	1	3113	0
224	0	802	0	1380	0	1958	0	2536	1	3114	0
225	1	803	0	1381	1	1959	1	2537	0	3115	1
226	0	804	1	1382	0	1960	0	2538	0	3116	0
227	1	805	0	1383	0	1961	0	2539	0	3117	0
228	1	806	0	1384	0	1962	0	2540	0	3118	0
229	0	807	0	1385	1	1963	0	2541	0	3119	1
230	1	808	1	1386	0	1964	0	2542	0	3120	0
231	0	809	1	1387	0	1965	0	2543	1	3121	1
232	1	810	0	1388	0	1966	0	2544	0	3122	0
233	0	811	0	1389	0	1967	0	2545	0	3123	1
234	0	812	1	1390	1	1968	0	2546	1	3124	1
235	1	813	0	1391	0	1969	0	2547	1	3125	1
236	0	814	1	1392	1	1970	0	2548	0	3126	1
237	0	815	1	1393	0	1971	1	2549	1	3127	1
238	1	816	1	1394	1	1972	1	2550	0	3128	0
239	0	817	0	1395	1	1973	0	2551	1	3129	1
240	1	818	1	1396	0	1974	0	2552	1	3130	1

241	0	819	0	1397	1	1975	1	2553	0	3131	0
242	1	820	1	1398	1	1976	1	2554	1	3132	0
243	0	821	0	1399	1	1977	1	2555	1	3133	0
244	0	822	0	1400	1	1978	1	2556	1	3134	0
245	0	823	1	1401	0	1979	1	2557	1	3135	0
246	1	824	0	1402	1	1980	1	2558	0	3136	1
247	0	825	0	1403	1	1981	1	2559	1	3137	1
248	0	826	0	1404	1	1982	0	2560	1	3138	1
249	0	827	0	1405	1	1983	1	2561	0	3139	1
250	0	828	0	1406	0	1984	1	2562	0	3140	0
251	0	829	0	1407	0	1985	1	2563	1	3141	1
252	1	830	0	1408	1	1986	1	2564	0	3142	0
253	1	831	0	1409	0	1987	0	2565	0	3143	1
254	0	832	1	1410	0	1988	1	2566	1	3144	0
255	0	833	1	1411	1	1989	0	2567	1	3145	0
256	0	834	1	1412	0	1990	1	2568	0	3146	0
257	1	835	0	1413	1	1991	0	2569	1	3147	0
258	0	836	1	1414	1	1992	0	2570	1	3148	0
259	1	837	0	1415	0	1993	0	2571	0	3149	1
260	1	838	0	1416	0	1994	0	2572	0	3150	1
261	1	839	0	1417	0	1995	1	2573	1	3151	0
262	1	840	0	1418	0	1996	0	2574	0	3152	1
263	1	841	1	1419	0	1997	1	2575	1	3153	0
264	1	842	1	1420	0	1998	1	2576	1	3154	0
265	0	843	1	1421	0	1999	0	2577	1	3155	0
266	0	844	1	1422	1	2000	0	2578	1	3156	0
267	0	845	0	1423	1	2001	1	2579	0	3157	1
268	1	846	0	1424	1	2002	1	2580	0	3158	1
269	1	847	1	1425	0	2003	1	2581	0	3159	0
270	0	848	0	1426	0	2004	1	2582	0	3160	1
271	0	849	1	1427	1	2005	0	2583	1	3161	0
272	1	850	0	1428	1	2006	1	2584	0	3162	1
273	0	851	1	1429	0	2007	1	2585	0	3163	1
274	1	852	0	1430	1	2008	1	2586	0	3164	0
275	0	853	0	1431	1	2009	0	2587	0	3165	0
276	0	854	1	1432	1	2010	0	2588	0	3166	1
277	0	855	0	1433	0	2011	1	2589	0	3167	1
278	0	856	1	1434	1	2012	1	2590	0	3168	0
279	0	857	0	1435	1	2013	1	2591	1	3169	0
280	0	858	1	1436	0	2014	1	2592	0	3170	0
281	0	859	0	1437	0	2015	1	2593	0	3171	0
282	1	860	1	1438	1	2016	0	2594	1	3172	1
283	0	861	1	1439	1	2017	1	2595	1	3173	0
284	0	862	1	1440	0	2018	0	2596	1	3174	0

285	0	863	1	1441	1	2019	1	2597	0	3175	0
286	0	864	1	1442	1	2020	1	2598	0	3176	0
287	0	865	1	1443	0	2021	0	2599	0	3177	0
288	0	866	0	1444	0	2022	1	2600	1	3178	1
289	0	867	1	1445	1	2023	1	2601	1	3179	0
290	0	868	0	1446	0	2024	1	2602	0	3180	0
291	1	869	0	1447	1	2025	0	2603	1	3181	0
292	0	870	1	1448	1	2026	0	2604	0	3182	1
293	0	871	0	1449	1	2027	1	2605	0	3183	0
294	0	872	0	1450	0	2028	1	2606	0	3184	1
295	0	873	0	1451	0	2029	1	2607	0	3185	1
296	0	874	1	1452	1	2030	1	2608	0	3186	0
297	1	875	1	1453	1	2031	0	2609	0	3187	1
298	1	876	0	1454	1	2032	1	2610	1	3188	0
299	1	877	0	1455	0	2033	0	2611	0	3189	1
300	1	878	1	1456	1	2034	1	2612	0	3190	1
301	0	879	0	1457	0	2035	0	2613	1	3191	1
302	0	880	1	1458	1	2036	0	2614	1	3192	1
303	1	881	1	1459	0	2037	1	2615	1	3193	1
304	0	882	1	1460	0	2038	0	2616	0	3194	1
305	1	883	1	1461	0	2039	1	2617	1	3195	1
306	1	884	0	1462	1	2040	1	2618	0	3196	1
307	1	885	1	1463	1	2041	0	2619	0	3197	0
308	0	886	0	1464	0	2042	0	2620	1	3198	0
309	0	887	1	1465	0	2043	0	2621	1	3199	0
310	0	888	0	1466	1	2044	1	2622	1	3200	0
311	1	889	0	1467	0	2045	1	2623	0	3201	0
312	1	890	1	1468	1	2046	0	2624	1	3202	1
313	1	891	0	1469	0	2047	0	2625	0	3203	1
314	1	892	0	1470	0	2048	1	2626	0	3204	0
315	0	893	1	1471	0	2049	0	2627	0	3205	0
316	1	894	1	1472	0	2050	0	2628	1	3206	1
317	0	895	1	1473	1	2051	0	2629	1	3207	0
318	1	896	1	1474	1	2052	1	2630	0	3208	0
319	0	897	0	1475	1	2053	0	2631	0	3209	0
320	0	898	1	1476	0	2054	1	2632	1	3210	1
321	0	899	0	1477	0	2055	1	2633	0	3211	0
322	0	900	1	1478	1	2056	0	2634	1	3212	0
323	1	901	1	1479	0	2057	1	2635	1	3213	0
324	1	902	0	1480	0	2058	1	2636	1	3214	1
325	1	903	0	1481	0	2059	0	2637	1	3215	1
326	1	904	1	1482	0	2060	1	2638	1	3216	1
327	1	905	0	1483	1	2061	0	2639	0	3217	0
328	1	906	0	1484	1	2062	1	2640	0	3218	0

329	0	907	1	1485	0	2063	0	2641	0	3219	1
330	0	908	0	1486	1	2064	1	2642	0	3220	1
331	1	909	0	1487	1	2065	1	2643	0	3221	0
332	1	910	1	1488	1	2066	1	2644	1	3222	0
333	1	911	0	1489	0	2067	0	2645	0	3223	1
334	1	912	1	1490	0	2068	0	2646	1	3224	0
335	1	913	0	1491	0	2069	1	2647	1	3225	1
336	1	914	0	1492	1	2070	0	2648	1	3226	0
337	1	915	1	1493	0	2071	0	2649	1	3227	0
338	0	916	1	1494	1	2072	1	2650	0	3228	0
339	1	917	0	1495	1	2073	1	2651	0	3229	0
340	0	918	1	1496	0	2074	1	2652	0	3230	1
341	0	919	0	1497	0	2075	0	2653	1	3231	0
342	0	920	1	1498	1	2076	1	2654	1	3232	0
343	1	921	0	1499	0	2077	0	2655	0	3233	1
344	1	922	0	1500	1	2078	0	2656	1	3234	1
345	0	923	0	1501	1	2079	0	2657	1	3235	1
346	0	924	1	1502	0	2080	0	2658	0	3236	0
347	1	925	0	1503	1	2081	0	2659	1	3237	1
348	0	926	0	1504	0	2082	1	2660	1	3238	0
349	0	927	1	1505	0	2083	1	2661	0	3239	0
350	1	928	0	1506	1	2084	1	2662	0	3240	1
351	0	929	0	1507	0	2085	0	2663	0	3241	1
352	1	930	0	1508	0	2086	1	2664	1	3242	0
353	0	931	1	1509	0	2087	0	2665	0	3243	1
354	0	932	0	1510	0	2088	0	2666	0	3244	0
355	0	933	1	1511	0	2089	0	2667	1	3245	1
356	1	934	1	1512	0	2090	0	2668	1	3246	1
357	0	935	0	1513	1	2091	0	2669	1	3247	1
358	1	936	0	1514	0	2092	0	2670	1	3248	0
359	1	937	0	1515	0	2093	1	2671	0	3249	0
360	1	938	0	1516	1	2094	1	2672	1	3250	1
361	0	939	0	1517	0	2095	1	2673	0	3251	1
362	1	940	1	1518	0	2096	0	2674	0	3252	1
363	0	941	1	1519	1	2097	1	2675	1	3253	0
364	0	942	1	1520	1	2098	1	2676	1	3254	0
365	1	943	0	1521	0	2099	1	2677	0	3255	0
366	0	944	1	1522	0	2100	1	2678	1	3256	1
367	0	945	1	1523	0	2101	1	2679	0	3257	0
368	0	946	0	1524	0	2102	1	2680	0	3258	1
369	0	947	0	1525	1	2103	1	2681	1	3259	1
370	1	948	1	1526	0	2104	0	2682	0	3260	0
371	1	949	0	1527	1	2105	1	2683	0	3261	1
372	0	950	0	1528	0	2106	1	2684	1	3262	1

373	0	951	0	1529	0	2107	1	2685	0	3263	1
374	1	952	0	1530	0	2108	1	2686	1	3264	0
375	1	953	0	1531	1	2109	1	2687	1	3265	1
376	1	954	1	1532	1	2110	1	2688	1	3266	1
377	0	955	0	1533	0	2111	1	2689	1	3267	0
378	1	956	1	1534	0	2112	1	2690	1	3268	1
379	1	957	1	1535	1	2113	0	2691	1	3269	1
380	0	958	0	1536	1	2114	1	2692	0	3270	0
381	1	959	0	1537	1	2115	0	2693	1	3271	0
382	1	960	0	1538	0	2116	0	2694	0	3272	0
383	1	961	0	1539	0	2117	1	2695	1	3273	0
384	1	962	0	1540	0	2118	1	2696	0	3274	0
385	0	963	0	1541	1	2119	1	2697	1	3275	1
386	1	964	1	1542	1	2120	1	2698	0	3276	0
387	0	965	0	1543	0	2121	0	2699	1	3277	0
388	1	966	0	1544	0	2122	0	2700	0	3278	1
389	1	967	0	1545	0	2123	0	2701	0	3279	1
390	0	968	0	1546	0	2124	0	2702	1	3280	1
391	1	969	1	1547	1	2125	0	2703	0	3281	1
392	1	970	0	1548	0	2126	0	2704	1	3282	0
393	1	971	0	1549	0	2127	0	2705	0	3283	0
394	0	972	1	1550	1	2128	0	2706	1	3284	0
395	1	973	0	1551	0	2129	0	2707	0	3285	1
396	1	974	1	1552	0	2130	1	2708	0	3286	0
397	0	975	1	1553	1	2131	1	2709	0	3287	1
398	0	976	0	1554	0	2132	1	2710	0	3288	1
399	0	977	0	1555	0	2133	1	2711	0	3289	0
400	1	978	1	1556	1	2134	1	2712	0	3290	1
401	0	979	1	1557	0	2135	0	2713	0	3291	1
402	1	980	0	1558	1	2136	1	2714	1	3292	0
403	1	981	1	1559	0	2137	1	2715	0	3293	1
404	0	982	0	1560	0	2138	1	2716	0	3294	1
405	1	983	0	1561	0	2139	1	2717	0	3295	1
406	0	984	1	1562	1	2140	0	2718	1	3296	1
407	1	985	1	1563	1	2141	0	2719	1	3297	1
408	1	986	0	1564	1	2142	0	2720	0	3298	1
409	0	987	1	1565	0	2143	1	2721	0	3299	1
410	0	988	1	1566	0	2144	0	2722	1	3300	1
411	1	989	1	1567	0	2145	0	2723	1	3301	1
412	0	990	0	1568	1	2146	0	2724	0	3302	1
413	0	991	0	1569	0	2147	1	2725	1	3303	0
414	0	992	0	1570	1	2148	0	2726	1	3304	1
415	1	993	0	1571	0	2149	1	2727	0	3305	1
416	1	994	0	1572	0	2150	1	2728	0	3306	0

417	0	995	0	1573	0	2151	0	2729	1	3307	0
418	0	996	0	1574	1	2152	0	2730	1	3308	1
419	1	997	0	1575	1	2153	0	2731	1	3309	0
420	1	998	0	1576	1	2154	0	2732	1	3310	0
421	1	999	0	1577	0	2155	1	2733	1	3311	0
422	0	1000	0	1578	1	2156	1	2734	0	3312	0
423	1	1001	1	1579	1	2157	1	2735	1	3313	0
424	0	1002	0	1580	1	2158	1	2736	1	3314	1
425	1	1003	0	1581	1	2159	1	2737	0	3315	0
426	0	1004	1	1582	0	2160	0	2738	1	3316	0
427	1	1005	0	1583	1	2161	1	2739	0	3317	1
428	1	1006	0	1584	0	2162	1	2740	0	3318	1
429	0	1007	1	1585	0	2163	0	2741	0	3319	0
430	0	1008	1	1586	1	2164	1	2742	0	3320	1
431	0	1009	1	1587	1	2165	0	2743	1	3321	1
432	1	1010	0	1588	1	2166	1	2744	1	3322	1
433	0	1011	0	1589	0	2167	0	2745	1	3323	0
434	1	1012	0	1590	0	2168	1	2746	1	3324	0
435	1	1013	1	1591	1	2169	1	2747	1	3325	1
436	0	1014	0	1592	0	2170	1	2748	1	3326	0
437	0	1015	1	1593	0	2171	1	2749	1	3327	1
438	1	1016	1	1594	1	2172	0	2750	1	3328	0
439	0	1017	0	1595	0	2173	0	2751	1	3329	0
440	0	1018	1	1596	0	2174	1	2752	0	3330	0
441	0	1019	0	1597	1	2175	1	2753	1	3331	0
442	1	1020	0	1598	0	2176	1	2754	0	3332	1
443	0	1021	1	1599	1	2177	0	2755	0	3333	0
444	0	1022	1	1600	0	2178	0	2756	0	3334	0
445	0	1023	1	1601	0	2179	1	2757	0	3335	0
446	0	1024	1	1602	1	2180	0	2758	0	3336	0
447	1	1025	0	1603	1	2181	1	2759	0	3337	0
448	1	1026	1	1604	0	2182	0	2760	1	3338	0
449	0	1027	1	1605	1	2183	0	2761	1	3339	0
450	1	1028	1	1606	0	2184	0	2762	1	3340	1
451	0	1029	0	1607	1	2185	1	2763	0	3341	0
452	0	1030	1	1608	1	2186	0	2764	1	3342	0
453	1	1031	0	1609	0	2187	0	2765	1	3343	1
454	0	1032	0	1610	0	2188	1	2766	0	3344	1
455	1	1033	1	1611	0	2189	0	2767	1	3345	1
456	0	1034	0	1612	0	2190	1	2768	1	3346	1
457	1	1035	1	1613	0	2191	0	2769	1	3347	1
458	1	1036	1	1614	1	2192	1	2770	1	3348	0
459	1	1037	1	1615	0	2193	1	2771	0	3349	1
460	0	1038	0	1616	0	2194	1	2772	0	3350	1

461	0	1039	1	1617	0	2195	0	2773	0	3351	0
462	0	1040	1	1618	1	2196	1	2774	0	3352	1
463	0	1041	0	1619	0	2197	1	2775	0	3353	1
464	0	1042	1	1620	0	2198	1	2776	1	3354	0
465	1	1043	0	1621	0	2199	0	2777	1	3355	0
466	1	1044	1	1622	1	2200	1	2778	1	3356	1
467	1	1045	0	1623	0	2201	1	2779	0	3357	0
468	0	1046	0	1624	1	2202	1	2780	0	3358	0
469	1	1047	0	1625	0	2203	0	2781	0	3359	1
470	0	1048	1	1626	0	2204	0	2782	1	3360	0
471	1	1049	1	1627	0	2205	0	2783	0	3361	1
472	0	1050	0	1628	1	2206	1	2784	1	3362	0
473	0	1051	1	1629	0	2207	1	2785	0	3363	0
474	0	1052	0	1630	0	2208	0	2786	0	3364	0
475	0	1053	1	1631	0	2209	1	2787	1	3365	1
476	0	1054	0	1632	1	2210	1	2788	1	3366	1
477	1	1055	0	1633	0	2211	1	2789	0	3367	0
478	1	1056	1	1634	1	2212	1	2790	1	3368	0
479	1	1057	0	1635	0	2213	1	2791	0	3369	1
480	1	1058	1	1636	1	2214	0	2792	0	3370	0
481	1	1059	0	1637	1	2215	1	2793	0	3371	1
482	0	1060	1	1638	1	2216	1	2794	1	3372	0
483	0	1061	1	1639	1	2217	0	2795	1	3373	0
484	0	1062	1	1640	1	2218	0	2796	0	3374	1
485	0	1063	0	1641	1	2219	0	2797	1	3375	0
486	0	1064	0	1642	0	2220	0	2798	0	3376	1
487	1	1065	0	1643	1	2221	1	2799	1	3377	0
488	1	1066	0	1644	0	2222	1	2800	0	3378	0
489	1	1067	1	1645	0	2223	0	2801	0	3379	1
490	0	1068	0	1646	0	2224	1	2802	0	3380	0
491	0	1069	0	1647	0	2225	0	2803	1	3381	1
492	1	1070	1	1648	1	2226	0	2804	0	3382	1
493	1	1071	1	1649	0	2227	0	2805	1	3383	0
494	1	1072	1	1650	0	2228	1	2806	0	3384	0
495	1	1073	1	1651	1	2229	0	2807	1	3385	1
496	1	1074	0	1652	1	2230	1	2808	1	3386	1
497	0	1075	1	1653	0	2231	1	2809	0	3387	0
498	1	1076	1	1654	1	2232	0	2810	1	3388	0
499	1	1077	1	1655	1	2233	0	2811	0	3389	0
500	1	1078	1	1656	1	2234	0	2812	0	3390	1
501	0	1079	1	1657	1	2235	0	2813	1	3391	0
502	1	1080	0	1658	1	2236	0	2814	1	3392	1
503	1	1081	1	1659	1	2237	1	2815	0	3393	1
504	0	1082	1	1660	1	2238	0	2816	0	3394	1

505	1	1083	1	1661	0	2239	0	2817	1	3395	1
506	0	1084	1	1662	0	2240	0	2818	0	3396	0
507	0	1085	0	1663	1	2241	1	2819	1	3397	1
508	0	1086	1	1664	1	2242	1	2820	1	3398	1
509	0	1087	1	1665	1	2243	0	2821	0	3399	1
510	1	1088	0	1666	1	2244	0	2822	0	3400	0
511	0	1089	0	1667	0	2245	0	2823	0	3401	0
512	1	1090	1	1668	1	2246	1	2824	1	3402	0
513	0	1091	0	1669	1	2247	0	2825	1	3403	1
514	0	1092	1	1670	0	2248	0	2826	0	3404	0
515	0	1093	0	1671	1	2249	0	2827	1	3405	0
516	0	1094	1	1672	0	2250	0	2828	0	3406	0
517	1	1095	1	1673	0	2251	1	2829	0	3407	1
518	1	1096	1	1674	1	2252	1	2830	1	3408	1
519	1	1097	0	1675	1	2253	0	2831	1	3409	1
520	0	1098	1	1676	1	2254	0	2832	0	3410	0
521	0	1099	1	1677	1	2255	0	2833	1	3411	1
522	1	1100	0	1678	0	2256	0	2834	0	3412	0
523	0	1101	1	1679	1	2257	0	2835	0	3413	1
524	0	1102	1	1680	0	2258	1	2836	0	3414	0
525	0	1103	0	1681	1	2259	1	2837	1	3415	1
526	0	1104	1	1682	1	2260	0	2838	1	3416	1
527	0	1105	1	1683	1	2261	1	2839	0	3417	1
528	1	1106	1	1684	1	2262	1	2840	0	3418	1
529	0	1107	0	1685	0	2263	0	2841	0	3419	1
530	0	1108	1	1686	0	2264	1	2842	1	3420	0
531	0	1109	0	1687	1	2265	1	2843	1	3421	0
532	0	1110	0	1688	1	2266	1	2844	0	3422	1
533	0	1111	0	1689	1	2267	0	2845	0	3423	0
534	1	1112	1	1690	0	2268	0	2846	0	3424	0
535	0	1113	1	1691	1	2269	1	2847	1	3425	1
536	1	1114	0	1692	1	2270	0	2848	1	3426	1
537	0	1115	0	1693	0	2271	0	2849	0	3427	0
538	0	1116	0	1694	0	2272	1	2850	1	3428	1
539	0	1117	1	1695	1	2273	1	2851	0	3429	0
540	0	1118	0	1696	0	2274	0	2852	1	3430	1
541	1	1119	0	1697	0	2275	0	2853	0	3431	1
542	0	1120	1	1698	1	2276	1	2854	1	3432	0
543	0	1121	1	1699	0	2277	0	2855	0	3433	0
544	0	1122	0	1700	1	2278	0	2856	0	3434	0
545	1	1123	0	1701	0	2279	1	2857	1	3435	1
546	0	1124	1	1702	1	2280	1	2858	1	3436	1
547	1	1125	0	1703	1	2281	0	2859	0	3437	0
548	0	1126	0	1704	1	2282	0	2860	1	3438	1

549	1	1127	1	1705	0	2283	0	2861	1	3439	1
550	0	1128	0	1706	1	2284	0	2862	0	3440	1
551	1	1129	0	1707	1	2285	0	2863	0	3441	1
552	0	1130	1	1708	1	2286	0	2864	0	3442	1
553	0	1131	0	1709	0	2287	1	2865	0	3443	0
554	1	1132	0	1710	0	2288	1	2866	1	3444	0
555	1	1133	1	1711	1	2289	0	2867	1	3445	1
556	0	1134	0	1712	1	2290	0	2868	1	3446	1
557	1	1135	0	1713	1	2291	0	2869	0	3447	1
558	0	1136	1	1714	1	2292	1	2870	0	3448	1
559	1	1137	0	1715	0	2293	1	2871	1	3449	0
560	0	1138	1	1716	0	2294	1	2872	1	3450	0
561	0	1139	1	1717	0	2295	0	2873	1	3451	0
562	0	1140	0	1718	1	2296	0	2874	0	3452	1
563	0	1141	1	1719	1	2297	0	2875	1	3453	1
564	0	1142	0	1720	1	2298	1	2876	1	3454	0
565	0	1143	1	1721	1	2299	0	2877	1	3455	0
566	1	1144	1	1722	0	2300	1	2878	0	3456	1
567	0	1145	0	1723	1	2301	1	2879	0	3457	1
568	1	1146	1	1724	0	2302	0	2880	0	3458	0
569	0	1147	0	1725	0	2303	0	2881	1	3459	1
570	1	1148	1	1726	0	2304	0	2882	1	3460	1
571	1	1149	0	1727	1	2305	1	2883	0	3461	1
572	1	1150	0	1728	0	2306	1	2884	0		
573	0	1151	0	1729	1	2307	1	2885	0		
574	0	1152	1	1730	0	2308	0	2886	1		
575	0	1153	1	1731	0	2309	0	2887	0		
576	0	1154	1	1732	1	2310	0	2888	1		
577	1	1155	1	1733	0	2311	0	2889	1		

Université de Strasbourg, CNRS, IRMA UMR 7501, F-67000 Strasbourg, France
Email address: guoniu.han@unistra.fr

School of Mathematics and Statistics, Huazhong University of Science and Technology, Wuhan, PR China
Email address: huyining@hust.edu.cn