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

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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 $(a,b)=(z^5+z^4+z^2,z^2+1)$.

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

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

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Theorem 1.1. *When* $(a,b)=(z^5+z^4+z^2,z^2+1)$*, 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 $\mathrm{CF}(a,b)$*,*

$$\begin{aligned}
p_0(z) &= z^{21}+z^{20}+z^{18}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{12}+z^{11}+z^{10}+z^9\\
&\qquad +z^8+z^7+z^5+z^4+z^2+1,\\
p_1(z) &= z^{26}+z^{24}+z^{23}+z^{21}+z^{20}+z^{19}+z^{14}+z^{12}+z^{10}+z^6+z^5+z^2,\\
p_2(z) &= z^{28}+z^{20}+z^{18}+z^{10}+z^8+z^4,\\
p_3(z) &= z^{26}+z^{24}+z^{23}+z^{21}+z^{20}+z^{19}+z^{14}+z^{12}+z^{10}+z^6+z^5+z^2,\\
p_4(z) &= z^{24}+z^{21}+z^{17}+z^{15}+z^{14}+z^{13}+z^{12}+z^{11}+z^9+z^8+z^7+z^5+z^2,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z) &= z^{21}+z^{18}+z^{17}+z^{15}+z^{14}+z^{13}+z^{12}+z^{11}+z^{10}+z^9+z^8+z^7+z^5\\
&\qquad +z^4+z^2,\\
p_1(z) &= z^{26}+z^{24}+z^{23}+z^{21}+z^{20}+z^{19}+z^{14}+z^{12}+z^{10}+z^6+z^5+z^2,\\
p_2(z) &= z^{28}+z^{20}+z^{18}+z^{10}+z^8+z^4,\\
p_3(z) &= z^{26}+z^{24}+z^{23}+z^{21}+z^{20}+z^{19}+z^{14}+z^{12}+z^{10}+z^6+z^5+z^2,\\
p_4(z) &= z^{24}+z^{21}+z^{20}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{12}+z^{11}+z^9+z^8+z^7\\
&\qquad +z^5+z^2+1.
\end{aligned}$$

2. Proof

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

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

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

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 $a_0, a_1, \dots, a_{n-1} \in \mathbb{F}_2$ $P(x, \sum_{j=0}^{n-1} a_j x^j) = O(x^n)$ 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

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

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

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

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

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

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

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 $u = 2^{2k}$,

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

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

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

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

which can be rewritten as

$$0 = T[[1w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.7}$$

$$\begin{aligned}0 &= T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[1000w]_2],\end{aligned} \tag{2.8}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1001w]_2],\end{aligned} \tag{2.9}$$

$$0 = T[[100w]_2] + T[[1010w]_2], \tag{2.10}$$

$$0 = T[[101w]_2] + T[[1011w]_2], \tag{2.11}$$

$$0 = T[[110w]_2] + T[[1100w]_2], \tag{2.12}$$

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

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

$$0 = T[[1w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.14}$$

$$\begin{aligned}0 &= T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[1000w]_2],\end{aligned} \tag{2.15}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1001w]_2],\end{aligned} \tag{2.16}$$

$$0 = T[[100w]_2] + T[[1010w]_2], \tag{2.17}$$

$$0 = T[[101w]_2] + T[[1011w]_2], \tag{2.18}$$

$$0 = T[[110w]_2] + T[[1100w]_2], \tag{2.19}$$

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

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 3282 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

$$0 = \tau(A(s, 1)) + \tau(A(s, 11)) + \tau(A(s, 101)) + \tau(A(s, 110))$$

$$+\tau(A(s,111)), \tag{2.21}$$

$$\begin{aligned} 0 &= \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) \\ &\quad + \tau(A(s,101)) + \tau(A(s,1000)), \end{aligned} \tag{2.22}$$

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) \\ &\quad + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1001)), \end{aligned} \tag{2.23}$$

$$0 = \tau(A(s,100)) + \tau(A(s,1010)), \tag{2.24}$$

$$0 = \tau(A(s,101)) + \tau(A(s,1011)), \tag{2.25}$$

$$0 = \tau(A(s,110)) + \tau(A(s,1100)), \tag{2.26}$$

$$\begin{aligned} 0 &= \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,1101)), \end{aligned} \tag{2.27}$$

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

$$\begin{aligned} 0 &= \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,111)), \end{aligned} \tag{2.28}$$

$$\begin{aligned} 0 &= \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) \\ &\quad + \tau(A(s,101)) + \tau(A(s,1000)), \end{aligned} \tag{2.29}$$

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) \\ &\quad + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,1001)), \end{aligned} \tag{2.30}$$

$$0 = \tau(A(s,100)) + \tau(A(s,1010)), \tag{2.31}$$

$$0 = \tau(A(s,101)) + \tau(A(s,1011)), \tag{2.32}$$

$$0 = \tau(A(s,110)) + \tau(A(s,1100)), \tag{2.33}$$

$$\begin{aligned} 0 &= \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,1101)), \end{aligned} \tag{2.34}$$

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{28}), E_{28}) = (A(i, 0^{24}), E_{24})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 14$, 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 $u = 2^{2k-1}$,*

$$\begin{aligned} M_{2k} &= M^e[:7u] + x^u M^e[:6u] + x^{2u} M^e[:5u] + x^{4u} M^e[:3u] + x^{6u} M^e[:u] \\ &\quad + x^{7u} R^e, \\ W_{2k} &= W^e[:7u] + x^u W^e[:6u] + x^{2u} W^e[:5u] + x^{4u} W^e[:3u] + x^{6u} W^e[:u] \\ &\quad + x^{7u} R^e. \end{aligned}$$

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

$$\begin{aligned} M_{2k+1} &= M^o[:7u] + x^u M^o[:6u] + x^{2u} M^o[:5u] + x^{4u} M^o[:3u] + x^{6u} M^o[:u] \\ &\quad + x^{7u} R^o, \\ W_{2k+1} &= W^o[:7u] + x^u W^o[:6u] + x^{2u} W^o[:5u] + x^{4u} W^o[:3u] + x^{6u} W^o[:u] \\ &\quad + x^{7u} R^o. \end{aligned}$$

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

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

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

$$\begin{aligned} W_{2k}M_{2k} = \big(&W^e[:7v] + x^v W^e[:6v] + x^{2v} W^e[:5v] + x^{4v} W^e[:3v] + x^{6v} W^e[:v] \\ &+ x^{7u} R^e\big) \times \big(M^e[:7v] + x^v M^e[:6v] + x^{2v} M^e[:5v] + x^{4v} M^e[:3v] \\ &+ x^{6v} M^e[:v] + x^{7u} R^e\big); \end{aligned} \tag{2.35}$$

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

$$\begin{aligned} W^e[:14v]M^e[:14v] + x^{2v} W^e[:12v]M^e[:12v] + x^{4v} W^e[:10v]M^e[:10v] \\ + x^{8v} W^e[:6v]M^e[:6v] + x^{12v} W^e[:2v]M^e[:2v]. \end{aligned}$$

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 $0 \leq j, k \leq 1$,

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

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

$$\begin{aligned}
q_0(x) &= x^{28} + x^{26} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} \\
&\quad + x^{13} + x^{12} + x^{11} + x^{10} + x^8 + x^7, \\
q_1(x) &= x^{26} + x^{23} + x^{22} + x^{18} + x^{16} + x^{14} + x^9 + x^8 + x^7 + x^5 + x^4 + x^2, \\
q_2(x) &= x^{24} + x^{20} + x^{18} + x^{10} + x^8 + 1, \\
q_3(x) &= x^{26} + x^{23} + x^{22} + x^{18} + x^{16} + x^{14} + x^9 + x^8 + x^7 + x^5 + x^4 + x^2, \\
q_4(x) &= x^{26} + x^{23} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{11} + x^7 \\
&\quad + x^4.
\end{aligned}$$

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

$$\begin{aligned}
p_0(x) &= x^{138} + x^{134} + x^{126} + x^{120} + x^{112} + x^{100} + x^{96} + x^{92} + x^{90} + x^{88} \\
&\quad + x^{82} + x^{80} + x^{78} + x^{72} + x^{70} + x^{68} + x^{64} + x^{60} + x^{50} + x^{40} + x^{34} \\
&\quad + x^{26} + x^{24}, \\
p_3(x) &= x^{130} + x^{126} + x^{124} + x^{122} + x^{118} + x^{112} + x^{110} + x^{106} + x^{104} + x^{102} \\
&\quad + x^{100} + x^{84} + x^{80} + x^{76} + x^{74} + x^{72} + x^{70} + x^{64} + x^{54} + x^{48} + x^{46} \\
&\quad + x^{42} + x^{40} + x^{34} + x^{30} + x^{28} + x^{20} + x^{16}, \\
p_6(x) &= x^{124} + x^{118} + x^{114} + x^{110} + x^{108} + x^{104} + x^{102} + x^{100} + x^{94} + x^{84}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{82} + x^{74} + x^{64} + x^{62} + x^{58} + x^{56} + x^{52} + x^{50} + x^{46} + x^{44} + x^{42}\\
&+ x^{38} + x^{36} + x^{28} + x^{26} + x^{24} + x^{22} + x^{16} + x^{12} + x^{4} + x^{2} + 1,\\
p_9(x) &= x^{134} + x^{128} + x^{116} + x^{110} + x^{104} + x^{100} + x^{94} + x^{92} + x^{90} + x^{86}\\
&+ x^{84} + x^{76} + x^{72} + x^{70} + x^{64} + x^{62} + x^{60} + x^{56} + x^{54} + x^{52} + x^{48}\\
&+ x^{46} + x^{40} + x^{34} + x^{32} + x^{28} + x^{26} + x^{22} + x^{20} + x^{18} + x^{6} + x^{4},\\
p_{12}(x) &= x^{134} + x^{130} + x^{128} + x^{118} + x^{114} + x^{112} + x^{102} + x^{98} + x^{96} + x^{86}\\
&+ x^{82} + x^{80} + x^{70} + x^{66} + x^{64} + x^{54} + x^{50} + x^{48} + x^{38} + x^{34} + x^{32}\\
&+ x^{6} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{145} + x^{143} + x^{142} + x^{141} + x^{140} + x^{135} + x^{133} + x^{132} + x^{131}\\
&+ x^{128} + x^{127} + x^{126} + x^{123} + x^{121} + x^{119} + x^{118} + x^{115} + x^{114}\\
&+ x^{110} + x^{109} + x^{105} + x^{103} + x^{102} + x^{100} + x^{98} + x^{97} + x^{95} + x^{94}\\
&+ x^{92} + x^{90} + x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{75} + x^{74} + x^{73} + x^{72}\\
&+ x^{71} + x^{69} + x^{68} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{53} + x^{52} + x^{51}\\
&+ x^{49} + x^{47} + x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33},\\
p_3(x) &= x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111}\\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92}\\
&+ x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68}\\
&+ x^{66} + x^{63} + x^{62} + x^{59} + x^{55} + x^{54} + x^{49} + x^{47} + x^{45} + x^{44} + x^{42}\\
&+ x^{41} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{29} + x^{28} + x^{27}\\
&+ x^{26} + x^{23} + x^{19} + x^{18},\\
p_6(x) &= x^{141} + x^{138} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{115} + x^{114} + x^{111} + x^{109}\\
&+ x^{108} + x^{107} + x^{105} + x^{104} + x^{99} + x^{96} + x^{94} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{81} + x^{80} + x^{77} + x^{74} + x^{72} + x^{70}\\
&+ x^{68} + x^{66} + x^{65} + x^{64} + x^{59} + x^{56} + x^{54} + x^{52} + x^{51} + x^{50} + x^{45}\\
&+ x^{42} + x^{41} + x^{40} + x^{35} + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24}\\
&+ x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13} + x^{12},\\
p_9(x) &= x^{139} + x^{134} + x^{130} + x^{129} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{119}\\
&+ x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105}\\
&+ x^{104} + x^{103} + x^{102} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87}\\
&+ x^{85} + x^{84} + x^{82} + x^{78} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66}\\
&+ x^{65} + x^{63} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} + x^{51} + x^{50}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{47} + x^{43} + x^{42} + x^{41} + x^{39} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{27}\\
&+ x^{26} + x^{23} + x^{19} + x^{18} + x^{17} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6},\\
p_{12}(x) = {}& x^{137} + x^{134} + x^{133} + x^{132} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116} + x^{114}\\
&+ x^{113} + x^{112} + x^{105} + x^{102} + x^{101} + x^{100} + x^{93} + x^{90} + x^{88} + x^{86}\\
&+ x^{84} + x^{82} + x^{81} + x^{80} + x^{73} + x^{70} + x^{69} + x^{68} + x^{61} + x^{58} + x^{56}\\
&+ x^{54} + x^{52} + x^{50} + x^{49} + x^{48} + x^{41} + x^{38} + x^{37} + x^{36} + x^{29} + x^{26}\\
&+ x^{25} + x^{24} + x^{21} + x^{18} + x^{17} + x^{16} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4} + x^{2}\\
&+ x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_{0}(x) = {}& x^{147} + x^{145} + x^{143} + x^{142} + x^{141} + x^{140} + x^{135} + x^{133} + x^{132} + x^{131}\\
&+ x^{128} + x^{127} + x^{126} + x^{123} + x^{121} + x^{119} + x^{118} + x^{115} + x^{114}\\
&+ x^{110} + x^{109} + x^{105} + x^{103} + x^{102} + x^{100} + x^{98} + x^{97} + x^{95} + x^{94}\\
&+ x^{92} + x^{90} + x^{85} + x^{83} + x^{81} + x^{80} + x^{79} + x^{75} + x^{74} + x^{73} + x^{72}\\
&+ x^{71} + x^{69} + x^{68} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{53} + x^{52} + x^{51}\\
&+ x^{49} + x^{47} + x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33},\\
p_{3}(x) = {}& x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111}\\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92}\\
&+ x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68}\\
&+ x^{66} + x^{63} + x^{62} + x^{59} + x^{55} + x^{54} + x^{49} + x^{47} + x^{45} + x^{44} + x^{42}\\
&+ x^{41} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{29} + x^{28} + x^{27}\\
&+ x^{26} + x^{23} + x^{19} + x^{18},\\
p_{6}(x) = {}& x^{141} + x^{138} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{115} + x^{114} + x^{111} + x^{109}\\
&+ x^{108} + x^{107} + x^{105} + x^{104} + x^{99} + x^{96} + x^{94} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{81} + x^{80} + x^{77} + x^{74} + x^{72} + x^{70}\\
&+ x^{68} + x^{66} + x^{65} + x^{64} + x^{59} + x^{56} + x^{54} + x^{52} + x^{51} + x^{50} + x^{45}\\
&+ x^{42} + x^{41} + x^{40} + x^{35} + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24}\\
&+ x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13} + x^{12},\\
p_{9}(x) = {}& x^{139} + x^{134} + x^{130} + x^{129} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{119}\\
&+ x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105}\\
&+ x^{104} + x^{103} + x^{102} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87}\\
&+ x^{85} + x^{84} + x^{82} + x^{78} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66}\\
&+ x^{65} + x^{63} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} + x^{51} + x^{50}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{47}+x^{43}+x^{42}+x^{41}+x^{39}+x^{36}+x^{34}+x^{33}+x^{32}+x^{30}+x^{27}\\
&+x^{26}+x^{23}+x^{19}+x^{18}+x^{17}+x^{15}+x^{13}+x^{12}+x^{10}+x^{7}+x^{6},\\
p_{12}(x)=&\,x^{137}+x^{134}+x^{133}+x^{132}+x^{125}+x^{122}+x^{120}+x^{118}+x^{116}+x^{114}\\
&+x^{113}+x^{112}+x^{105}+x^{102}+x^{101}+x^{100}+x^{93}+x^{90}+x^{88}+x^{86}\\
&+x^{84}+x^{82}+x^{81}+x^{80}+x^{73}+x^{70}+x^{69}+x^{68}+x^{61}+x^{58}+x^{56}\\
&+x^{54}+x^{52}+x^{50}+x^{49}+x^{48}+x^{41}+x^{38}+x^{37}+x^{36}+x^{29}+x^{26}\\
&+x^{25}+x^{24}+x^{21}+x^{18}+x^{17}+x^{16}+x^{13}+x^{10}+x^{8}+x^{6}+x^{4}+x^{2}\\
&+x+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=&\,x^{156}+x^{148}+x^{146}+x^{144}+x^{140}+x^{138}+x^{128}+x^{126}+x^{122}+x^{112}\\
&+x^{108}+x^{106}+x^{102}+x^{100}+x^{98}+x^{96}+x^{94}+x^{92}+x^{88}+x^{84}\\
&+x^{82}+x^{78}+x^{76}+x^{72}+x^{70}+x^{68}+x^{66}+x^{62}+x^{58}+x^{56}+x^{48}\\
&+x^{44}+x^{42},\\
p_3(x)=&\,x^{144}+x^{140}+x^{138}+x^{134}+x^{132}+x^{128}+x^{126}+x^{120}+x^{118}+x^{116}\\
&+x^{110}+x^{108}+x^{104}+x^{102}+x^{100}+x^{98}+x^{94}+x^{92}+x^{90}+x^{88}\\
&+x^{82}+x^{80}+x^{76}+x^{72}+x^{66}+x^{60}+x^{58}+x^{56}+x^{54}+x^{38}+x^{36}\\
&+x^{32}+x^{30}+x^{26}+x^{24}+x^{20}+x^{16}+x^{12},\\
p_6(x)=&\,x^{144}+x^{138}+x^{134}+x^{132}+x^{130}+x^{128}+x^{126}+x^{124}+x^{122}+x^{116}\\
&+x^{114}+x^{110}+x^{106}+x^{104}+x^{102}+x^{94}+x^{92}+x^{80}+x^{78}+x^{74}\\
&+x^{70}+x^{66}+x^{64}+x^{54}+x^{50}+x^{48}+x^{42}+x^{36}+x^{34}+x^{16}+x^{14}\\
&+x^{10}+x^{8}+1,\\
p_9(x)=&\,x^{140}+x^{130}+x^{126}+x^{124}+x^{106}+x^{100}+x^{92}+x^{88}+x^{86}+x^{78}\\
&+x^{76}+x^{64}+x^{52}+x^{48}+x^{46}+x^{38}+x^{26}+x^{24}+x^{22}+x^{10}+x^{8}\\
&+x^{4},\\
p_{12}(x)=&\,x^{140}+x^{136}+x^{124}+x^{120}+x^{116}+x^{112}+x^{108}+x^{104}+x^{92}+x^{88}\\
&+x^{84}+x^{80}+x^{76}+x^{72}+x^{60}+x^{56}+x^{52}+x^{48}+x^{44}+x^{40}+x^{20}\\
&+x^{16}+x^{12}+x^{8}+x^{4}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=&\,x^{156}+x^{146}+x^{140}+x^{138}+x^{130}+x^{128}+x^{126}+x^{124}+x^{122}+x^{116}\\
&+x^{114}+x^{112}+x^{104}+x^{100}+x^{98}+x^{96}+x^{90}+x^{88}+x^{86}+x^{84}\\
&+x^{82}+x^{78}+x^{74}+x^{72}+x^{70}+x^{66}+x^{62}+x^{60}+x^{50}+x^{48}+x^{46}\\
&+x^{44}+x^{42}+x^{38}+x^{34}+x^{32}+x^{30}+x^{28}+x^{24},\\
p_3(x)=&\,x^{144}+x^{140}+x^{138}+x^{136}+x^{134}+x^{130}+x^{128}+x^{122}+x^{114}+x^{112}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{110} + x^{106} + x^{104} + x^{98} + x^{90} + x^{88} + x^{86} + x^{78} + x^{76} + x^{62} + x^{58} \\
&+ x^{56} + x^{52} + x^{46} + x^{42} + x^{40} + x^{36} + x^{32} + x^{30} + x^{28} + x^{26} + x^{24} \\
&+ x^{18} + x^{16}, \\
p_6(x) &= x^{144} + x^{138} + x^{136} + x^{134} + x^{132} + x^{124} + x^{118} + x^{116} + x^{112} + x^{110} \\
&+ x^{104} + x^{96} + x^{92} + x^{86} + x^{82} + x^{74} + x^{72} + x^{70} + x^{62} + x^{56} + x^{50} \\
&+ x^{48} + x^{46} + x^{40} + x^{38} + x^{36} + x^{34} + x^{18} + x^{16} + x^{14} + x^{10} + 1, \\
p_9(x) &= x^{140} + x^{130} + x^{126} + x^{124} + x^{106} + x^{100} + x^{92} + x^{88} + x^{86} + x^{78} \\
&+ x^{76} + x^{64} + x^{52} + x^{48} + x^{46} + x^{38} + x^{26} + x^{24} + x^{22} + x^{10} + x^{8} \\
&+ x^{4}, \\
p_{12}(x) &= x^{140} + x^{136} + x^{124} + x^{120} + x^{116} + x^{112} + x^{108} + x^{104} + x^{92} + x^{88} \\
&+ x^{84} + x^{80} + x^{76} + x^{72} + x^{60} + x^{56} + x^{52} + x^{48} + x^{44} + x^{40} + x^{20} \\
&+ x^{16} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{141} + x^{138} + x^{136} + x^{132} + x^{131} + x^{130} + x^{129} + x^{126} + x^{125} \\
&+ x^{124} + x^{123} + x^{118} + x^{117} + x^{116} + x^{112} + x^{109} + x^{108} + x^{107} \\
&+ x^{101} + x^{100} + x^{98} + x^{94} + x^{93} + x^{91} + x^{88} + x^{87} + x^{85} + x^{83} + x^{82} \\
&+ x^{81} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{71} + x^{70} + x^{68} + x^{67} + x^{66} \\
&+ x^{64} + x^{61} + x^{60} + x^{59} + x^{57} + x^{56} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} \\
&+ x^{47} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{39} + x^{37} + x^{35} + x^{34} + x^{33}, \\
p_3(x) &= x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129} + x^{125} + x^{124} \\
&+ x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} \\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} \\
&+ x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68} \\
&+ x^{66} + x^{63} + x^{62} + x^{59} + x^{55} + x^{54} + x^{49} + x^{47} + x^{45} + x^{44} + x^{42} \\
&+ x^{41} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{29} + x^{28} + x^{27} \\
&+ x^{26} + x^{23} + x^{19} + x^{18}, \\
p_6(x) &= x^{141} + x^{138} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128} \\
&+ x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{115} + x^{114} + x^{111} + x^{109} \\
&+ x^{108} + x^{107} + x^{105} + x^{104} + x^{99} + x^{96} + x^{94} + x^{92} + x^{90} + x^{89} \\
&+ x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{81} + x^{80} + x^{77} + x^{74} + x^{72} + x^{70} \\
&+ x^{68} + x^{66} + x^{65} + x^{64} + x^{59} + x^{56} + x^{54} + x^{52} + x^{51} + x^{50} + x^{45} \\
&+ x^{42} + x^{41} + x^{40} + x^{35} + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} \\
&+ x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13} + x^{12}, \\
p_9(x) &= x^{139} + x^{134} + x^{130} + x^{129} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{119}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} \\
&+ x^{104} + x^{103} + x^{102} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87} \\
&+ x^{85} + x^{84} + x^{82} + x^{78} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66} \\
&+ x^{65} + x^{63} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} + x^{51} + x^{50} \\
&+ x^{47} + x^{43} + x^{42} + x^{41} + x^{39} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{27} \\
&+ x^{26} + x^{23} + x^{19} + x^{18} + x^{17} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6}, \\
p_{12}(x) &= x^{137} + x^{134} + x^{133} + x^{132} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116} + x^{114} \\
&+ x^{113} + x^{112} + x^{105} + x^{102} + x^{101} + x^{100} + x^{93} + x^{90} + x^{88} + x^{86} \\
&+ x^{84} + x^{82} + x^{81} + x^{80} + x^{73} + x^{70} + x^{69} + x^{68} + x^{61} + x^{58} + x^{56} \\
&+ x^{54} + x^{52} + x^{50} + x^{49} + x^{48} + x^{41} + x^{38} + x^{37} + x^{36} + x^{29} + x^{26} \\
&+ x^{25} + x^{24} + x^{21} + x^{18} + x^{17} + x^{16} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4} + x^{2} \\
&+ x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{141} + x^{138} + x^{136} + x^{132} + x^{131} + x^{130} + x^{129} + x^{126} + x^{125} \\
&+ x^{124} + x^{123} + x^{118} + x^{117} + x^{116} + x^{112} + x^{109} + x^{108} + x^{107} \\
&+ x^{101} + x^{100} + x^{98} + x^{94} + x^{93} + x^{91} + x^{88} + x^{87} + x^{85} + x^{83} + x^{82} \\
&+ x^{81} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{71} + x^{70} + x^{68} + x^{67} + x^{66} \\
&+ x^{64} + x^{61} + x^{60} + x^{59} + x^{57} + x^{56} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} \\
&+ x^{47} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{39} + x^{37} + x^{35} + x^{34} + x^{33}, \\
p_3(x) &= x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129} + x^{125} + x^{124} \\
&+ x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} \\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} \\
&+ x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{82} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68} \\
&+ x^{66} + x^{63} + x^{62} + x^{59} + x^{55} + x^{54} + x^{49} + x^{47} + x^{45} + x^{44} + x^{42} \\
&+ x^{41} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} + x^{29} + x^{28} + x^{27} \\
&+ x^{26} + x^{23} + x^{19} + x^{18}, \\
p_6(x) &= x^{141} + x^{138} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128} \\
&+ x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{115} + x^{114} + x^{111} + x^{109} \\
&+ x^{108} + x^{107} + x^{105} + x^{104} + x^{99} + x^{96} + x^{94} + x^{92} + x^{90} + x^{89} \\
&+ x^{88} + x^{87} + x^{85} + x^{84} + x^{83} + x^{81} + x^{80} + x^{77} + x^{74} + x^{72} + x^{70} \\
&+ x^{68} + x^{66} + x^{65} + x^{64} + x^{59} + x^{56} + x^{54} + x^{52} + x^{51} + x^{50} + x^{45} \\
&+ x^{42} + x^{41} + x^{40} + x^{35} + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} \\
&+ x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13} + x^{12}, \\
p_9(x) &= x^{139} + x^{134} + x^{130} + x^{129} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{119}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105}\\
&+ x^{104} + x^{103} + x^{102} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87}\\
&+ x^{85} + x^{84} + x^{82} + x^{78} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66}\\
&+ x^{65} + x^{63} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} + x^{51} + x^{50}\\
&+ x^{47} + x^{43} + x^{42} + x^{41} + x^{39} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{27}\\
&+ x^{26} + x^{23} + x^{19} + x^{18} + x^{17} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6},\\
p_{12}(x) = {}& x^{137} + x^{134} + x^{133} + x^{132} + x^{125} + x^{122} + x^{120} + x^{118} + x^{116} + x^{114}\\
&+ x^{113} + x^{112} + x^{105} + x^{102} + x^{101} + x^{100} + x^{93} + x^{90} + x^{88} + x^{86}\\
&+ x^{84} + x^{82} + x^{81} + x^{80} + x^{73} + x^{70} + x^{69} + x^{68} + x^{61} + x^{58} + x^{56}\\
&+ x^{54} + x^{52} + x^{50} + x^{49} + x^{48} + x^{41} + x^{38} + x^{37} + x^{36} + x^{29} + x^{26}\\
&+ x^{25} + x^{24} + x^{21} + x^{18} + x^{17} + x^{16} + x^{13} + x^{10} + x^{8} + x^{6} + x^{4} + x^{2}\\
&+ x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{138} + x^{128} + x^{126} + x^{122} + x^{118} + x^{112} + x^{110} + x^{106} + x^{104} + x^{98}\\
&+ x^{96} + x^{92} + x^{86} + x^{84} + x^{82} + x^{78} + x^{72} + x^{68} + x^{66} + x^{54} + x^{50}\\
&+ x^{44} + x^{42},\\
p_3(x) = {}& x^{124} + x^{122} + x^{120} + x^{116} + x^{114} + x^{110} + x^{106} + x^{104} + x^{100} + x^{98}\\
&+ x^{92} + x^{90} + x^{88} + x^{86} + x^{80} + x^{76} + x^{72} + x^{66} + x^{60} + x^{54} + x^{52}\\
&+ x^{50} + x^{48} + x^{46} + x^{44} + x^{42} + x^{38} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28}\\
&+ x^{24} + x^{22} + x^{20} + x^{18} + x^{14} + x^{12},\\
p_6(x) = {}& x^{130} + x^{124} + x^{122} + x^{116} + x^{114} + x^{112} + x^{104} + x^{100} + x^{90} + x^{88}\\
&+ x^{80} + x^{64} + x^{60} + x^{58} + x^{52} + x^{48} + x^{44} + x^{42} + x^{40} + x^{34} + x^{32}\\
&+ x^{26} + x^{24} + x^{20} + x^{16} + x^{10} + x^{8} + x^{4} + x^{2} + 1,\\
p_9(x) = {}& x^{134} + x^{128} + x^{116} + x^{110} + x^{104} + x^{100} + x^{94} + x^{92} + x^{90} + x^{86}\\
&+ x^{84} + x^{76} + x^{72} + x^{70} + x^{64} + x^{62} + x^{60} + x^{56} + x^{54} + x^{52} + x^{48}\\
&+ x^{46} + x^{40} + x^{34} + x^{32} + x^{28} + x^{26} + x^{22} + x^{20} + x^{18} + x^{6} + x^{4},\\
p_{12}(x) = {}& x^{134} + x^{130} + x^{128} + x^{118} + x^{114} + x^{112} + x^{102} + x^{98} + x^{96} + x^{86}\\
&+ x^{82} + x^{80} + x^{70} + x^{66} + x^{64} + x^{54} + x^{50} + x^{48} + x^{38} + x^{34} + x^{32}\\
&+ x^{6} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{145} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{132} + x^{130}\\
&+ x^{129} + x^{128} + x^{125} + x^{121} + x^{120} + x^{119} + x^{117} + x^{116} + x^{115}\\
&+ x^{114} + x^{112} + x^{111} + x^{110} + x^{109} + x^{105} + x^{100} + x^{98} + x^{95} + x^{92}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{91}+x^{89}+x^{85}+x^{83}+x^{81}+x^{79}+x^{78}+x^{77}+x^{73}+x^{69}+x^{68}\\
&+x^{67}+x^{66}+x^{65}+x^{62}+x^{55}+x^{53}+x^{50}+x^{49}+x^{48}+x^{46}+x^{45}\\
&+x^{44}+x^{43}+x^{42}+x^{41}+x^{39}+x^{35}+x^{32}+x^{30}+x^{29}+x^{26}+x^{25}\\
&+x^{24},\\
p_3(x)=\;&x^{145}+x^{143}+x^{142}+x^{140}+x^{139}+x^{138}+x^{137}+x^{136}+x^{135}+x^{134}\\
&+x^{131}+x^{128}+x^{121}+x^{120}+x^{119}+x^{118}+x^{116}+x^{114}+x^{113}\\
&+x^{112}+x^{111}+x^{110}+x^{109}+x^{108}+x^{103}+x^{100}+x^{99}+x^{98}+x^{97}\\
&+x^{96}+x^{94}+x^{93}+x^{92}+x^{91}+x^{88}+x^{85}+x^{84}+x^{83}+x^{81}+x^{80}\\
&+x^{75}+x^{71}+x^{70}+x^{69}+x^{68}+x^{65}+x^{64}+x^{56}+x^{55}+x^{54}+x^{49}\\
&+x^{47}+x^{45}+x^{42}+x^{39}+x^{38}+x^{37}+x^{36}+x^{33}+x^{28}+x^{27}+x^{26}\\
&+x^{25}+x^{22}+x^{21}+x^{18}+x^{17}+x^{16},\\
p_6(x)=\;&x^{145}+x^{143}+x^{142}+x^{140}+x^{139}+x^{138}+x^{137}+x^{136}+x^{134}+x^{133}\\
&+x^{130}+x^{129}+x^{127}+x^{126}+x^{121}+x^{118}+x^{117}+x^{116}+x^{115}\\
&+x^{114}+x^{113}+x^{112}+x^{111}+x^{108}+x^{107}+x^{105}+x^{96}+x^{95}+x^{94}\\
&+x^{91}+x^{87}+x^{86}+x^{85}+x^{84}+x^{81}+x^{80}+x^{77}+x^{75}+x^{74}+x^{72}\\
&+x^{70}+x^{60}+x^{59}+x^{57}+x^{52}+x^{51}+x^{50}+x^{45}+x^{42}+x^{40}+x^{38}\\
&+x^{37}+x^{35}+x^{33}+x^{29}+x^{26}+x^{22}+x^{19}+x^{16}+x^{14}+x^{9}+x^{6}+x^{4}\\
&+x^{2}+x+1,\\
p_9(x)=\;&x^{145}+x^{142}+x^{141}+x^{140}+x^{129}+x^{126}+x^{124}+x^{122}+x^{121}+x^{120}\\
&+x^{113}+x^{110}+x^{109}+x^{108}+x^{97}+x^{94}+x^{92}+x^{90}+x^{89}+x^{88}\\
&+x^{81}+x^{78}+x^{77}+x^{76}+x^{65}+x^{62}+x^{60}+x^{58}+x^{57}+x^{56}+x^{49}\\
&+x^{46}+x^{45}+x^{44}+x^{29}+x^{26}+x^{25}+x^{24}+x^{17}+x^{14}+x^{12}+x^{10}\\
&+x^{9}+x^{8},\\
p_{12}(x)=\;&x^{145}+x^{142}+x^{141}+x^{140}+x^{137}+x^{134}+x^{133}+x^{132}+x^{129}+x^{126}\\
&+x^{125}+x^{124}+x^{121}+x^{118}+x^{116}+x^{114}+x^{112}+x^{110}+x^{109}\\
&+x^{108}+x^{105}+x^{102}+x^{101}+x^{100}+x^{97}+x^{94}+x^{93}+x^{92}+x^{89}\\
&+x^{86}+x^{84}+x^{82}+x^{80}+x^{78}+x^{77}+x^{76}+x^{73}+x^{70}+x^{69}+x^{68}\\
&+x^{65}+x^{62}+x^{61}+x^{60}+x^{57}+x^{54}+x^{52}+x^{50}+x^{48}+x^{46}+x^{45}\\
&+x^{44}+x^{41}+x^{38}+x^{37}+x^{36}+x^{21}+x^{18}+x^{16}+x^{14}+x^{13}+x^{12}\\
&+x^{9}+x^{6}+x^{4}+x^{2}+x+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=\;&x^{160}+x^{154}+x^{152}+x^{151}+x^{149}+x^{148}+x^{147}+x^{144}+x^{143}+x^{141}\\
&+x^{140}+x^{138}+x^{137}+x^{135}+x^{132}+x^{131}+x^{128}+x^{124}+x^{123}\\
&+x^{116}+x^{114}+x^{113}+x^{109}+x^{108}+x^{107}+x^{106}+x^{102}+x^{101}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{90} + x^{89} + x^{88} + x^{87} + x^{84} + x^{82}\\
&+ x^{80} + x^{78} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{64} + x^{58} + x^{57}\\
&+ x^{54} + x^{52} + x^{51} + x^{44} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34}\\
&+ x^{33},\\
p_3(x) &= x^{146} + x^{143} + x^{140} + x^{139} + x^{137} + x^{134} + x^{132} + x^{131} + x^{130} + x^{127}\\
&+ x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{119} + x^{118} + x^{117} + x^{115}\\
&+ x^{114} + x^{109} + x^{105} + x^{104} + x^{101} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92}\\
&+ x^{91} + x^{85} + x^{81} + x^{80} + x^{77} + x^{75} + x^{73} + x^{71} + x^{70} + x^{66} + x^{65}\\
&+ x^{63} + x^{62} + x^{61} + x^{58} + x^{56} + x^{55} + x^{54} + x^{51} + x^{50} + x^{49} + x^{48}\\
&+ x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{25} + x^{24}\\
&+ x^{23} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{148} + x^{142} + x^{136} + x^{134} + x^{130} + x^{128} + x^{122} + x^{116} + x^{112} + x^{106}\\
&+ x^{100} + x^{98} + x^{94} + x^{92} + x^{88} + x^{86} + x^{82} + x^{66} + x^{64} + x^{62} + x^{58}\\
&+ x^{52} + x^{50} + x^{44} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{30} + x^{28} + x^{26}\\
&+ x^{22} + x^{18} + x^{16} + x^{12},\\
p_9(x) &= x^{150} + x^{147} + x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129}\\
&+ x^{124} + x^{123} + x^{122} + x^{121} + x^{120} + x^{115} + x^{111} + x^{106} + x^{105}\\
&+ x^{103} + x^{102} + x^{101} + x^{100} + x^{97} + x^{92} + x^{91} + x^{90} + x^{89} + x^{88}\\
&+ x^{83} + x^{79} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65} + x^{60} + x^{59}\\
&+ x^{58} + x^{57} + x^{56} + x^{51} + x^{47} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{35}\\
&+ x^{33} + x^{31} + x^{28} + x^{27} + x^{24} + x^{23} + x^{21} + x^{20} + x^{17} + x^{12} + x^{11}\\
&+ x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) &= x^{152} + x^{140} + x^{132} + x^{112} + x^{108} + x^{100} + x^{80} + x^{76} + x^{68} + x^{48}\\
&+ x^{44} + x^{40} + x^{36} + x^{28} + x^{24} + x^{20} + x^{16} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{144} + x^{142} + x^{140} + x^{139} + x^{137} + x^{136} + x^{133} + x^{130} + x^{128} + x^{127}\\
&+ x^{126} + x^{125} + x^{123} + x^{121} + x^{116} + x^{115} + x^{109} + x^{106} + x^{105}\\
&+ x^{102} + x^{100} + x^{99} + x^{98} + x^{96} + x^{94} + x^{91} + x^{89} + x^{85} + x^{81} + x^{76}\\
&+ x^{74} + x^{73} + x^{72} + x^{69} + x^{65} + x^{64} + x^{63} + x^{57} + x^{56} + x^{55} + x^{46}\\
&+ x^{44} + x^{42} + x^{40} + x^{33},\\
p_3(x) &= x^{142} + x^{139} + x^{136} + x^{135} + x^{133} + x^{128} + x^{126} + x^{124} + x^{122} + x^{120}\\
&+ x^{118} + x^{116} + x^{114} + x^{112} + x^{108} + x^{107} + x^{106} + x^{103} + x^{101}\\
&+ x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{93} + x^{88} + x^{84} + x^{83} + x^{82} + x^{79}\\
&+ x^{77} + x^{76} + x^{75} + x^{74} + x^{72} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{62}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{61}+x^{60}+x^{58}+x^{54}+x^{51}+x^{48}+x^{47}+x^{45}+x^{40}+x^{38}+x^{36}\\
&+x^{34}+x^{32}+x^{28}+x^{27}+x^{26}+x^{23}+x^{22}+x^{21}+x^{20}+x^{18},\\
p_6(x)&=x^{144}+x^{138}+x^{130}+x^{118}+x^{116}+x^{112}+x^{106}+x^{104}+x^{102}+x^{98}\\
&+x^{92}+x^{90}+x^{82}+x^{76}+x^{68}+x^{64}+x^{62}+x^{58}+x^{54}+x^{50}+x^{48}\\
&+x^{40}+x^{38}+x^{34}+x^{32}+x^{30}+x^{24}+x^{20}+x^{18}+x^{12},\\
p_9(x)&=x^{146}+x^{143}+x^{139}+x^{133}+x^{130}+x^{129}+x^{128}+x^{127}+x^{126}+x^{125}\\
&+x^{123}+x^{121}+x^{120}+x^{118}+x^{114}+x^{111}+x^{107}+x^{101}+x^{98}+x^{97}\\
&+x^{96}+x^{95}+x^{94}+x^{93}+x^{91}+x^{89}+x^{88}+x^{86}+x^{82}+x^{79}+x^{75}\\
&+x^{69}+x^{66}+x^{65}+x^{64}+x^{63}+x^{62}+x^{61}+x^{59}+x^{57}+x^{56}+x^{54}\\
&+x^{50}+x^{47}+x^{43}+x^{37}+x^{33}+x^{32}+x^{30}+x^{29}+x^{25}+x^{24}+x^{22}\\
&+x^{21}+x^{18}+x^{17}+x^{16}+x^{15}+x^{14}+x^{13}+x^{11}+x^{9}+x^{8}+x^{6},\\
p_{12}(x)&=x^{148}+x^{120}+x^{112}+x^{88}+x^{80}+x^{56}+x^{48}+x^{36}+x^{24}+x^{20}+x^{16}\\
&+x^{8}+x^{4}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)&=x^{147}+x^{143}+x^{137}+x^{134}+x^{132}+x^{131}+x^{129}+x^{127}+x^{126}+x^{125}\\
&+x^{124}+x^{122}+x^{120}+x^{119}+x^{117}+x^{115}+x^{114}+x^{113}+x^{112}\\
&+x^{108}+x^{106}+x^{104}+x^{101}+x^{100}+x^{98}+x^{95}+x^{94}+x^{93}+x^{91}\\
&+x^{90}+x^{88}+x^{86}+x^{84}+x^{82}+x^{79}+x^{74}+x^{71}+x^{69}+x^{68}+x^{66}\\
&+x^{62}+x^{61}+x^{58}+x^{56}+x^{55}+x^{54}+x^{52}+x^{49}+x^{48}+x^{47}+x^{45}\\
&+x^{44}+x^{42},\\
p_3(x)&=x^{145}+x^{143}+x^{142}+x^{141}+x^{140}+x^{139}+x^{137}+x^{133}+x^{130}+x^{128}\\
&+x^{127}+x^{124}+x^{123}+x^{122}+x^{120}+x^{116}+x^{115}+x^{114}+x^{110}\\
&+x^{107}+x^{105}+x^{104}+x^{103}+x^{100}+x^{99}+x^{98}+x^{96}+x^{95}+x^{92}\\
&+x^{90}+x^{88}+x^{87}+x^{75}+x^{73}+x^{69}+x^{68}+x^{67}+x^{65}+x^{62}+x^{61}\\
&+x^{60}+x^{57}+x^{56}+x^{55}+x^{53}+x^{52}+x^{49}+x^{44}+x^{43}+x^{42}+x^{40}\\
&+x^{37}+x^{36}+x^{35}+x^{32}+x^{31}+x^{29}+x^{26}+x^{24}+x^{22},\\
p_6(x)&=x^{145}+x^{143}+x^{142}+x^{141}+x^{140}+x^{139}+x^{137}+x^{135}+x^{133}+x^{131}\\
&+x^{130}+x^{129}+x^{128}+x^{127}+x^{125}+x^{124}+x^{121}+x^{118}+x^{117}\\
&+x^{116}+x^{114}+x^{109}+x^{104}+x^{101}+x^{99}+x^{98}+x^{97}+x^{96}+x^{95}\\
&+x^{93}+x^{92}+x^{91}+x^{89}+x^{85}+x^{84}+x^{83}+x^{81}+x^{78}+x^{76}+x^{75}\\
&+x^{74}+x^{73}+x^{72}+x^{68}+x^{66}+x^{65}+x^{64}+x^{61}+x^{60}+x^{58}+x^{57}\\
&+x^{52}+x^{50}+x^{49}+x^{48}+x^{45}+x^{42}+x^{40}+x^{38}+x^{34}+x^{33}+x^{27}\\
&+x^{25}+x^{23}+x^{17}+x^{14}+x^{13}+x^{10}+x^{8}+x^{6}+x^{4}+x^{2}+x+1,\\
p_9(x)&=x^{145}+x^{142}+x^{141}+x^{140}+x^{129}+x^{126}+x^{124}+x^{122}+x^{121}+x^{120}
\end{aligned}
$$

$$+ x^{113} + x^{110} + x^{109} + x^{108} + x^{97} + x^{94} + x^{92} + x^{90} + x^{89} + x^{88}$$
$$+ x^{81} + x^{78} + x^{77} + x^{76} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{49}$$
$$+ x^{46} + x^{45} + x^{44} + x^{29} + x^{26} + x^{25} + x^{24} + x^{17} + x^{14} + x^{12} + x^{10}$$
$$+ x^{9} + x^{8},$$
$$\begin{aligned} p_{12}(x) = {} & x^{145} + x^{142} + x^{141} + x^{140} + x^{137} + x^{134} + x^{133} + x^{132} + x^{129} + x^{126} \\ & + x^{125} + x^{124} + x^{121} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{109} \\ & + x^{108} + x^{105} + x^{102} + x^{101} + x^{100} + x^{97} + x^{94} + x^{93} + x^{92} + x^{89} \\ & + x^{86} + x^{84} + x^{82} + x^{80} + x^{78} + x^{77} + x^{76} + x^{73} + x^{70} + x^{69} + x^{68} \\ & + x^{65} + x^{62} + x^{61} + x^{60} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{45} \\ & + x^{44} + x^{41} + x^{38} + x^{37} + x^{36} + x^{21} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} \\ & + x^{9} + x^{6} + x^{4} + x^{2} + x + 1, \end{aligned}$$

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

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

$$\begin{aligned} p_{0}(x) = {} & x^{147} + x^{145} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{133} + x^{132} + x^{130} \\ & + x^{129} + x^{128} + x^{125} + x^{121} + x^{120} + x^{119} + x^{117} + x^{116} + x^{115} \\ & + x^{114} + x^{112} + x^{111} + x^{110} + x^{109} + x^{105} + x^{100} + x^{98} + x^{95} + x^{92} \\ & + x^{91} + x^{89} + x^{85} + x^{83} + x^{81} + x^{79} + x^{78} + x^{77} + x^{73} + x^{69} + x^{68} \\ & + x^{67} + x^{66} + x^{65} + x^{62} + x^{55} + x^{53} + x^{50} + x^{49} + x^{48} + x^{46} + x^{45} \\ & + x^{44} + x^{43} + x^{42} + x^{41} + x^{39} + x^{35} + x^{32} + x^{30} + x^{29} + x^{26} + x^{25} \\ & + x^{24}, \end{aligned}$$
$$\begin{aligned} p_{3}(x) = {} & x^{145} + x^{143} + x^{142} + x^{140} + x^{139} + x^{138} + x^{137} + x^{136} + x^{135} + x^{134} \\ & + x^{131} + x^{128} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116} + x^{114} + x^{113} \\ & + x^{112} + x^{111} + x^{110} + x^{109} + x^{108} + x^{103} + x^{100} + x^{99} + x^{98} + x^{97} \\ & + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{88} + x^{85} + x^{84} + x^{83} + x^{81} + x^{80} \\ & + x^{75} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65} + x^{64} + x^{56} + x^{55} + x^{54} + x^{49} \\ & + x^{47} + x^{45} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{33} + x^{28} + x^{27} + x^{26} \\ & + x^{25} + x^{22} + x^{21} + x^{18} + x^{17} + x^{16}, \end{aligned}$$
$$\begin{aligned} p_{6}(x) = {} & x^{145} + x^{143} + x^{142} + x^{140} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133} \\ & + x^{130} + x^{129} + x^{127} + x^{126} + x^{121} + x^{118} + x^{117} + x^{116} + x^{115} \\ & + x^{114} + x^{113} + x^{112} + x^{111} + x^{108} + x^{107} + x^{105} + x^{96} + x^{95} + x^{94} \\ & + x^{91} + x^{87} + x^{86} + x^{85} + x^{84} + x^{81} + x^{80} + x^{77} + x^{75} + x^{74} + x^{72} \\ & + x^{70} + x^{60} + x^{59} + x^{57} + x^{52} + x^{51} + x^{50} + x^{45} + x^{42} + x^{40} + x^{38} \\ & + x^{37} + x^{35} + x^{33} + x^{29} + x^{26} + x^{22} + x^{19} + x^{16} + x^{14} + x^{9} + x^{6} + x^{4} \\ & + x^{2} + x + 1, \end{aligned}$$
$$p_{9}(x) = x^{145} + x^{142} + x^{141} + x^{140} + x^{129} + x^{126} + x^{124} + x^{122} + x^{121} + x^{120}$$

$$
\begin{aligned}
&+ x^{113} + x^{110} + x^{109} + x^{108} + x^{97} + x^{94} + x^{92} + x^{90} + x^{89} + x^{88} \\
&+ x^{81} + x^{78} + x^{77} + x^{76} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{49} \\
&+ x^{46} + x^{45} + x^{44} + x^{29} + x^{26} + x^{25} + x^{24} + x^{17} + x^{14} + x^{12} + x^{10} \\
&+ x^{9} + x^{8}, \\
p_{12}(x) = &\, x^{145} + x^{142} + x^{141} + x^{140} + x^{137} + x^{134} + x^{133} + x^{132} + x^{129} + x^{126} \\
&+ x^{125} + x^{124} + x^{121} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{109} \\
&+ x^{108} + x^{105} + x^{102} + x^{101} + x^{100} + x^{97} + x^{94} + x^{93} + x^{92} + x^{89} \\
&+ x^{86} + x^{84} + x^{82} + x^{80} + x^{78} + x^{77} + x^{76} + x^{73} + x^{70} + x^{69} + x^{68} \\
&+ x^{65} + x^{62} + x^{61} + x^{60} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{45} \\
&+ x^{44} + x^{41} + x^{38} + x^{37} + x^{36} + x^{21} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} \\
&+ x^{9} + x^{6} + x^{4} + x^{2} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = &\, x^{144} + x^{142} + x^{140} + x^{139} + x^{137} + x^{136} + x^{133} + x^{130} + x^{128} + x^{127} \\
&+ x^{126} + x^{125} + x^{123} + x^{121} + x^{116} + x^{115} + x^{109} + x^{106} + x^{105} \\
&+ x^{102} + x^{100} + x^{99} + x^{98} + x^{96} + x^{94} + x^{91} + x^{89} + x^{85} + x^{81} + x^{76} \\
&+ x^{74} + x^{73} + x^{72} + x^{69} + x^{65} + x^{64} + x^{63} + x^{57} + x^{56} + x^{55} + x^{46} \\
&+ x^{44} + x^{42} + x^{40} + x^{33}, \\
p_3(x) = &\, x^{142} + x^{139} + x^{136} + x^{135} + x^{133} + x^{128} + x^{126} + x^{124} + x^{122} + x^{120} \\
&+ x^{118} + x^{116} + x^{114} + x^{112} + x^{108} + x^{107} + x^{106} + x^{103} + x^{101} \\
&+ x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{93} + x^{88} + x^{84} + x^{83} + x^{82} + x^{79} \\
&+ x^{77} + x^{76} + x^{75} + x^{74} + x^{72} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{62} \\
&+ x^{61} + x^{60} + x^{58} + x^{54} + x^{51} + x^{48} + x^{47} + x^{45} + x^{40} + x^{38} + x^{36} \\
&+ x^{34} + x^{32} + x^{28} + x^{27} + x^{26} + x^{23} + x^{22} + x^{21} + x^{20} + x^{18}, \\
p_6(x) = &\, x^{144} + x^{138} + x^{130} + x^{118} + x^{116} + x^{112} + x^{106} + x^{104} + x^{102} + x^{98} \\
&+ x^{92} + x^{90} + x^{82} + x^{76} + x^{68} + x^{64} + x^{62} + x^{58} + x^{54} + x^{50} + x^{48} \\
&+ x^{40} + x^{38} + x^{34} + x^{32} + x^{30} + x^{24} + x^{20} + x^{18} + x^{12}, \\
p_9(x) = &\, x^{146} + x^{143} + x^{139} + x^{133} + x^{130} + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} \\
&+ x^{123} + x^{121} + x^{120} + x^{118} + x^{114} + x^{111} + x^{107} + x^{101} + x^{98} + x^{97} \\
&+ x^{96} + x^{95} + x^{94} + x^{93} + x^{91} + x^{89} + x^{88} + x^{86} + x^{82} + x^{79} + x^{75} \\
&+ x^{69} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{59} + x^{57} + x^{56} + x^{54} \\
&+ x^{50} + x^{47} + x^{43} + x^{37} + x^{33} + x^{32} + x^{30} + x^{29} + x^{25} + x^{24} + x^{22} \\
&+ x^{21} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{11} + x^{9} + x^{8} + x^{6}, \\
p_{12}(x) = &\, x^{148} + x^{120} + x^{112} + x^{88} + x^{80} + x^{56} + x^{48} + x^{36} + x^{24} + x^{20} + x^{16} \\
&+ x^{8} + 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 $\phi(W^o, 1, 0)$:

$$\begin{aligned}
p_0(x) = {} & x^{160} + x^{154} + x^{152} + x^{151} + x^{149} + x^{148} + x^{147} + x^{144} + x^{143} + x^{141} \\
& + x^{140} + x^{138} + x^{137} + x^{135} + x^{132} + x^{131} + x^{128} + x^{124} + x^{123} \\
& + x^{116} + x^{114} + x^{113} + x^{109} + x^{108} + x^{107} + x^{106} + x^{102} + x^{101} \\
& + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{90} + x^{89} + x^{88} + x^{87} + x^{84} + x^{82} \\
& + x^{80} + x^{78} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{64} + x^{58} + x^{57} \\
& + x^{54} + x^{52} + x^{51} + x^{44} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{35} + x^{34} \\
& + x^{33}, \\
p_3(x) = {} & x^{146} + x^{143} + x^{140} + x^{139} + x^{137} + x^{134} + x^{132} + x^{131} + x^{130} + x^{127} \\
& + x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{119} + x^{118} + x^{117} + x^{115} \\
& + x^{114} + x^{109} + x^{105} + x^{104} + x^{101} + x^{99} + x^{98} + x^{97} + x^{94} + x^{92} \\
& + x^{91} + x^{85} + x^{81} + x^{80} + x^{77} + x^{75} + x^{73} + x^{71} + x^{70} + x^{66} + x^{65} \\
& + x^{63} + x^{62} + x^{61} + x^{58} + x^{56} + x^{55} + x^{54} + x^{51} + x^{50} + x^{49} + x^{48} \\
& + x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{25} + x^{24} \\
& + x^{23} + x^{21} + x^{20} + x^{18}, \\
p_6(x) = {} & x^{148} + x^{142} + x^{136} + x^{134} + x^{130} + x^{128} + x^{122} + x^{116} + x^{112} + x^{106} \\
& + x^{100} + x^{98} + x^{94} + x^{92} + x^{88} + x^{86} + x^{82} + x^{66} + x^{64} + x^{62} + x^{58} \\
& + x^{52} + x^{50} + x^{44} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{30} + x^{28} + x^{26} \\
& + x^{22} + x^{18} + x^{16} + x^{12}, \\
p_9(x) = {} & x^{150} + x^{147} + x^{143} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133} + x^{132} + x^{129} \\
& + x^{124} + x^{123} + x^{122} + x^{121} + x^{120} + x^{115} + x^{111} + x^{106} + x^{105} \\
& + x^{103} + x^{102} + x^{101} + x^{100} + x^{97} + x^{92} + x^{91} + x^{90} + x^{89} + x^{88} \\
& + x^{83} + x^{79} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65} + x^{60} + x^{59} \\
& + x^{58} + x^{57} + x^{56} + x^{51} + x^{47} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{35} \\
& + x^{33} + x^{31} + x^{28} + x^{27} + x^{24} + x^{23} + x^{21} + x^{20} + x^{17} + x^{12} + x^{11} \\
& + x^{10} + x^{9} + x^{8} + x^{6}, \\
p_{12}(x) = {} & x^{152} + x^{140} + x^{132} + x^{112} + x^{108} + x^{100} + x^{80} + x^{76} + x^{68} + x^{48} \\
& + x^{44} + x^{40} + x^{36} + x^{28} + x^{24} + x^{20} + x^{16} + x^{8} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{147} + x^{143} + x^{137} + x^{134} + x^{132} + x^{131} + x^{129} + x^{127} + x^{126} + x^{125} \\
& + x^{124} + x^{122} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{113} + x^{112} \\
& + x^{108} + x^{106} + x^{104} + x^{101} + x^{100} + x^{98} + x^{95} + x^{94} + x^{93} + x^{91} \\
& + x^{90} + x^{88} + x^{86} + x^{84} + x^{82} + x^{79} + x^{74} + x^{71} + x^{69} + x^{68} + x^{66}
\end{aligned}$$

$$
\begin{aligned}
&+x^{62}+x^{61}+x^{58}+x^{56}+x^{55}+x^{54}+x^{52}+x^{49}+x^{48}+x^{47}+x^{45}\\
&+x^{44}+x^{42},\\
p_3(x) &= x^{145}+x^{143}+x^{142}+x^{141}+x^{140}+x^{139}+x^{137}+x^{133}+x^{130}+x^{128}\\
&+x^{127}+x^{124}+x^{123}+x^{122}+x^{120}+x^{116}+x^{115}+x^{114}+x^{110}\\
&+x^{107}+x^{105}+x^{104}+x^{103}+x^{100}+x^{99}+x^{98}+x^{96}+x^{95}+x^{92}\\
&+x^{90}+x^{88}+x^{87}+x^{75}+x^{73}+x^{69}+x^{68}+x^{67}+x^{65}+x^{62}+x^{61}\\
&+x^{60}+x^{57}+x^{56}+x^{55}+x^{53}+x^{52}+x^{49}+x^{44}+x^{43}+x^{42}+x^{40}\\
&+x^{37}+x^{36}+x^{35}+x^{32}+x^{31}+x^{29}+x^{26}+x^{24}+x^{22},\\
p_6(x) &= x^{145}+x^{143}+x^{142}+x^{141}+x^{140}+x^{139}+x^{137}+x^{135}+x^{133}+x^{131}\\
&+x^{130}+x^{129}+x^{128}+x^{127}+x^{125}+x^{124}+x^{121}+x^{118}+x^{117}\\
&+x^{116}+x^{114}+x^{109}+x^{104}+x^{101}+x^{99}+x^{98}+x^{97}+x^{96}+x^{95}\\
&+x^{93}+x^{92}+x^{91}+x^{89}+x^{85}+x^{84}+x^{83}+x^{81}+x^{78}+x^{76}+x^{75}\\
&+x^{74}+x^{73}+x^{72}+x^{68}+x^{66}+x^{65}+x^{64}+x^{61}+x^{60}+x^{58}+x^{57}\\
&+x^{52}+x^{50}+x^{49}+x^{48}+x^{45}+x^{42}+x^{40}+x^{38}+x^{34}+x^{33}+x^{27}\\
&+x^{25}+x^{23}+x^{17}+x^{14}+x^{13}+x^{10}+x^{8}+x^{6}+x^{4}+x^{2}+x+1,\\
p_9(x) &= x^{145}+x^{142}+x^{141}+x^{140}+x^{129}+x^{126}+x^{124}+x^{122}+x^{121}+x^{120}\\
&+x^{113}+x^{110}+x^{109}+x^{108}+x^{97}+x^{94}+x^{92}+x^{90}+x^{89}+x^{88}\\
&+x^{81}+x^{78}+x^{77}+x^{76}+x^{65}+x^{62}+x^{60}+x^{58}+x^{57}+x^{56}+x^{49}\\
&+x^{46}+x^{45}+x^{44}+x^{29}+x^{26}+x^{25}+x^{24}+x^{17}+x^{14}+x^{12}+x^{10}\\
&+x^{9}+x^{8},\\
p_{12}(x) &= x^{145}+x^{142}+x^{141}+x^{140}+x^{137}+x^{134}+x^{133}+x^{132}+x^{129}+x^{126}\\
&+x^{125}+x^{124}+x^{121}+x^{118}+x^{116}+x^{114}+x^{112}+x^{110}+x^{109}\\
&+x^{108}+x^{105}+x^{102}+x^{101}+x^{100}+x^{97}+x^{94}+x^{93}+x^{92}+x^{89}\\
&+x^{86}+x^{84}+x^{82}+x^{80}+x^{78}+x^{77}+x^{76}+x^{73}+x^{70}+x^{69}+x^{68}\\
&+x^{65}+x^{62}+x^{61}+x^{60}+x^{57}+x^{54}+x^{52}+x^{50}+x^{48}+x^{46}+x^{45}\\
&+x^{44}+x^{41}+x^{38}+x^{37}+x^{36}+x^{21}+x^{18}+x^{16}+x^{14}+x^{13}+x^{12}\\
&+x^{9}+x^{6}+x^{4}+x^{2}+x+1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 0, 0, 1, 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]	821	[1317, 204]	1642	[2173, 1424]	2463	[2291, 2160]
1	[3, 4]	822	[173, 128]	1643	[551, 2174]	2464	[1472, 1547]
2	[5, 6]	823	[591, 1262]	1644	[600, 2175]	2465	[633, 486]
3	[7, 8]	824	[49, 1318]	1645	[2176, 184]	2466	[2822, 1530]

4	[9, 10]	825	[1319, 1320]	1646	[2177, 1397]	2467	[2823, 706]
5	[11, 12]	826	[1321, 582]	1647	[1354, 505]	2468	[526, 2392]
6	[13, 14]	827	[1322, 709]	1648	[2178, 2179]	2469	[546, 205]
7	[15, 16]	828	[1323, 1324]	1649	[2180, 1236]	2470	[2824, 498]
8	[17, 18]	829	[743, 499]	1650	[2181, 2182]	2471	[1260, 483]
9	[19, 20]	830	[1325, 13]	1651	[2183, 2184]	2472	[592, 229]
10	[21, 22]	831	[1326, 1327]	1652	[2185, 2186]	2473	[2825, 2826]
11	[23, 24]	832	[155, 673]	1653	[489, 650]	2474	[2827, 2184]
12	[25, 26]	833	[234, 1237]	1654	[1455, 494]	2475	[2828, 1351]
13	[27, 28]	834	[456, 527]	1655	[2187, 222]	2476	[1294, 1456]
14	[29, 30]	835	[1328, 1329]	1656	[451, 2188]	2477	[2829, 2199]
15	[31, 32]	836	[615, 1330]	1657	[2189, 46]	2478	[2830, 2274]
16	[33, 34]	837	[1331, 1332]	1658	[1428, 2190]	2479	[2831, 1283]
17	[35, 36]	838	[149, 663]	1659	[2191, 2192]	2480	[2334, 2832]
18	[37, 38]	839	[498, 1333]	1660	[2193, 1244]	2481	[2203, 2833]
19	[39, 40]	840	[1334, 226]	1661	[1606, 2194]	2482	[1251, 716]
20	[41, 42]	841	[1335, 1336]	1662	[2195, 736]	2483	[1299, 2340]
21	[43, 44]	842	[623, 1337]	1663	[2196, 1437]	2484	[222, 1436]
22	[45, 46]	843	[688, 637]	1664	[2197, 1483]	2485	[1407, 592]
23	[47, 48]	844	[1285, 1338]	1665	[2198, 2199]	2486	[1478, 2834]
24	[49, 50]	845	[53, 167]	1666	[609, 184]	2487	[2835, 2234]
25	[51, 52]	846	[1339, 1239]	1667	[563, 199]	2488	[2836, 503]
26	[53, 54]	847	[1340, 1341]	1668	[595, 1237]	2489	[2837, 667]
27	[55, 56]	848	[1342, 1343]	1669	[234, 2200]	2490	[2838, 2189]
28	[57, 58]	849	[1344, 200]	1670	[623, 1300]	2491	[2839, 696]
29	[59, 60]	850	[1345, 43]	1671	[133, 2201]	2492	[2840, 2401]
30	[61, 62]	851	[452, 1346]	1672	[223, 1429]	2493	[544, 1417]
31	[63, 64]	852	[1347, 1348]	1673	[184, 460]	2494	[2841, 534]
32	[65, 66]	853	[670, 1349]	1674	[2202, 153]	2495	[2176, 610]
33	[67, 68]	854	[1350, 1351]	1675	[1580, 1497]	2496	[1600, 2842]
34	[69, 70]	855	[720, 611]	1676	[1338, 488]	2497	[1416, 1526]
35	[71, 72]	856	[1352, 1353]	1677	[1463, 2203]	2498	[1510, 738]
36	[73, 74]	857	[1354, 1355]	1678	[1439, 573]	2499	[1515, 14]
37	[75, 76]	858	[1356, 1357]	1679	[2204, 33]	2500	[737, 2843]
38	[77, 78]	859	[8, 205]	1680	[2205, 1506]	2501	[537, 484]
39	[79, 80]	860	[1358, 1359]	1681	[704, 2206]	2502	[2844, 497]
40	[81, 25]	861	[1360, 453]	1682	[479, 150]	2503	[1596, 2845]
41	[82, 83]	862	[1245, 1361]	1683	[2207, 207]	2504	[591, 1408]
42	[84, 85]	863	[223, 146]	1684	[2161, 582]	2505	[2846, 472]
43	[86, 87]	864	[1362, 177]	1685	[660, 655]	2506	[2814, 2382]
44	[88, 89]	865	[491, 1363]	1686	[2208, 664]	2507	[684, 2283]
45	[90, 91]	866	[1364, 1365]	1687	[726, 1318]	2508	[2187, 1394]
46	[92, 93]	867	[1366, 618]	1688	[2209, 487]	2509	[2345, 614]
47	[94, 95]	868	[454, 130]	1689	[2210, 2211]	2510	[1325, 1355]

48	[96, 97]	869	[33, 648]	1690	[721, 478]	2511	[161, 1276]
49	[98, 99]	870	[1367, 453]	1691	[179, 2212]	2512	[693, 1307]
50	[100, 101]	871	[600, 635]	1692	[577, 1475]	2513	[1341, 636]
51	[102, 103]	872	[574, 692]	1693	[182, 2213]	2514	[2847, 234]
52	[104, 105]	873	[1368, 1369]	1694	[718, 51]	2515	[1381, 2848]
53	[106, 107]	874	[173, 38]	1695	[1434, 523]	2516	[531, 2849]
54	[108, 109]	875	[451, 205]	1696	[193, 1300]	2517	[2850, 740]
55	[110, 111]	876	[607, 1302]	1697	[2214, 674]	2518	[1410, 36]
56	[112, 113]	877	[622, 1370]	1698	[189, 725]	2519	[724, 1400]
57	[114, 115]	878	[236, 62]	1699	[1464, 1302]	2520	[2416, 1537]
58	[116, 117]	879	[45, 1371]	1700	[1292, 469]	2521	[1270, 156]
59	[118, 119]	880	[221, 644]	1701	[1414, 556]	2522	[1542, 2230]
60	[120, 121]	881	[147, 1372]	1702	[1248, 2201]	2523	[583, 699]
61	[122, 123]	882	[1373, 1318]	1703	[742, 34]	2524	[1322, 585]
62	[124, 125]	883	[1374, 152]	1704	[2215, 171]	2525	[2851, 2852]
63	[126, 127]	884	[1375, 139]	1705	[1390, 632]	2526	[2853, 227]
64	[37, 128]	885	[546, 224]	1706	[2216, 1234]	2527	[2377, 2854]
65	[129, 130]	886	[1322, 672]	1707	[1340, 512]	2528	[1513, 2302]
66	[131, 132]	887	[1335, 1376]	1708	[517, 2217]	2529	[2349, 1399]
67	[133, 134]	888	[1377, 1378]	1709	[2218, 506]	2530	[2158, 594]
68	[135, 136]	889	[35, 1379]	1710	[2219, 2220]	2531	[2851, 2855]
69	[137, 138]	890	[158, 233]	1711	[2221, 1265]	2532	[2856, 2857]
70	[42, 139]	891	[610, 189]	1712	[1380, 168]	2533	[7, 546]
71	[140, 141]	892	[1380, 633]	1713	[1559, 1366]	2534	[2858, 2859]
72	[142, 143]	893	[706, 683]	1714	[1308, 1442]	2535	[1578, 681]
73	[144, 145]	894	[1381, 1382]	1715	[212, 1491]	2536	[1470, 222]
74	[139, 146]	895	[692, 656]	1716	[1364, 1449]	2537	[1519, 1576]
75	[147, 148]	896	[1383, 1384]	1717	[2222, 1479]	2538	[705, 721]
76	[149, 150]	897	[627, 533]	1718	[2206, 721]	2539	[2860, 1404]
77	[151, 152]	898	[213, 656]	1719	[2223, 1530]	2540	[1387, 32]
78	[153, 154]	899	[1314, 1299]	1720	[1405, 2224]	2541	[1567, 1321]
79	[155, 156]	900	[1385, 1386]	1721	[679, 1267]	2542	[2322, 608]
80	[157, 132]	901	[1387, 475]	1722	[694, 1499]	2543	[1249, 1357]
81	[158, 159]	902	[1298, 235]	1723	[686, 1439]	2544	[2265, 1241]
82	[160, 161]	903	[1388, 1389]	1724	[2225, 153]	2545	[2301, 1514]
83	[162, 163]	904	[1390, 1254]	1725	[1547, 188]	2546	[2284, 1607]
84	[164, 165]	905	[505, 206]	1726	[139, 1429]	2547	[2210, 228]
85	[166, 167]	906	[573, 1391]	1727	[1331, 2226]	2548	[2292, 234]
86	[168, 169]	907	[1392, 616]	1728	[1373, 50]	2549	[1603, 2816]
87	[170, 171]	908	[711, 1393]	1729	[1317, 451]	2550	[457, 1566]
88	[172, 173]	909	[728, 601]	1730	[1501, 1278]	2551	[1504, 1536]
89	[174, 175]	910	[585, 149]	1731	[1443, 621]	2552	[2861, 1494]
90	[176, 174]	911	[1388, 208]	1732	[1476, 614]	2553	[2370, 1479]
91	[177, 178]	912	[1338, 589]	1733	[1548, 587]	2554	[666, 2862]

92	[179, 180]	913	[1394, 223]	1734	[2227, 1573]	2555	[1582, 634]
93	[181, 182]	914	[61, 40]	1735	[1394, 139]	2556	[1548, 181]
94	[183, 184]	915	[1395, 1321]	1736	[1459, 1249]	2557	[1538, 611]
95	[185, 186]	916	[1396, 1397]	1737	[1479, 518]	2558	[1496, 1241]
96	[187, 188]	917	[1398, 1316]	1738	[2228, 1393]	2559	[2863, 2864]
97	[189, 190]	918	[1399, 1400]	1739	[2229, 1306]	2560	[2216, 718]
98	[191, 192]	919	[32, 476]	1740	[2230, 521]	2561	[1464, 705]
99	[193, 194]	920	[500, 1401]	1741	[2231, 10]	2562	[2865, 492]
100	[169, 195]	921	[626, 1402]	1742	[2232, 571]	2563	[572, 1253]
101	[196, 197]	922	[495, 1286]	1743	[2233, 742]	2564	[1260, 2866]
102	[198, 199]	923	[1403, 1404]	1744	[582, 50]	2565	[2867, 2259]
103	[200, 201]	924	[1405, 1406]	1745	[2205, 2234]	2566	[2868, 2869]
104	[202, 203]	925	[1407, 1408]	1746	[9, 2235]	2567	[2870, 450]
105	[204, 205]	926	[1409, 1269]	1747	[2236, 2163]	2568	[2384, 1375]
106	[13, 206]	927	[1410, 1401]	1748	[2237, 1558]	2569	[710, 2871]
107	[207, 208]	928	[1411, 1412]	1749	[2238, 2239]	2570	[2309, 492]
108	[209, 210]	929	[451, 547]	1750	[2240, 612]	2571	[2391, 2872]
109	[211, 49]	930	[475, 1413]	1751	[452, 2241]	2572	[59, 2375]
110	[212, 213]	931	[1414, 1415]	1752	[2242, 1419]	2573	[2837, 2873]
111	[214, 215]	932	[200, 527]	1753	[2243, 1297]	2574	[672, 470]
112	[216, 217]	933	[1416, 1417]	1754	[625, 522]	2575	[2412, 1254]
113	[218, 197]	934	[475, 1418]	1755	[2244, 1367]	2576	[211, 582]
114	[176, 154]	935	[56, 535]	1756	[726, 50]	2577	[518, 2175]
115	[219, 220]	936	[1419, 1413]	1757	[1399, 717]	2578	[2322, 473]
116	[221, 180]	937	[642, 230]	1758	[2228, 712]	2579	[569, 2874]
117	[222, 223]	938	[534, 1281]	1759	[714, 1280]	2580	[2875, 2388]
118	[204, 224]	939	[1420, 1251]	1760	[636, 605]	2581	[1263, 2876]
119	[225, 226]	940	[621, 1421]	1761	[2170, 1284]	2582	[463, 1382]
120	[227, 228]	941	[164, 713]	1762	[614, 650]	2583	[1389, 1377]
121	[229, 230]	942	[1358, 621]	1763	[2245, 2246]	2584	[2867, 2220]
122	[231, 232]	943	[703, 127]	1764	[2247, 2248]	2585	[2308, 1489]
123	[48, 233]	944	[724, 203]	1765	[2249, 2250]	2586	[2357, 1552]
124	[234, 235]	945	[187, 1422]	1766	[487, 589]	2587	[1438, 693]
125	[236, 237]	946	[467, 669]	1767	[1395, 2161]	2588	[2877, 1382]
126	[238, 239]	947	[140, 1423]	1768	[2251, 671]	2589	[2824, 170]
127	[240, 241]	948	[1305, 1424]	1769	[2252, 456]	2590	[2257, 60]
128	[242, 243]	949	[1425, 1332]	1770	[2253, 1514]	2591	[2269, 552]
129	[244, 245]	950	[206, 1426]	1771	[2254, 2255]	2592	[1590, 1247]
130	[246, 247]	951	[1238, 1427]	1772	[1282, 1451]	2593	[484, 2878]
131	[248, 249]	952	[1428, 1429]	1773	[2256, 168]	2594	[2879, 13]
132	[250, 251]	953	[1385, 1430]	1774	[1371, 538]	2595	[1598, 514]
133	[252, 253]	954	[1277, 233]	1775	[2257, 2258]	2596	[2243, 229]
134	[254, 255]	955	[742, 1431]	1776	[2219, 2259]	2597	[1452, 2880]
135	[256, 257]	956	[1432, 716]	1777	[1457, 2260]	2598	[2419, 562]

136	[258, 259]	957	[1433, 497]	1778	[1491, 1438]	2599	[1604, 600]
137	[260, 261]	958	[1434, 45]	1779	[1550, 728]	2600	[2879, 1515]
138	[262, 263]	959	[1435, 565]	1780	[1591, 494]	2601	[2881, 2882]
139	[264, 265]	960	[1375, 1436]	1781	[1251, 61]	2602	[1473, 2266]
140	[266, 267]	961	[1437, 495]	1782	[2261, 165]	2603	[2883, 2852]
141	[268, 269]	962	[587, 182]	1783	[2189, 1256]	2604	[2342, 1315]
142	[270, 271]	963	[689, 1438]	1784	[653, 217]	2605	[1273, 1564]
143	[272, 273]	964	[694, 1439]	1785	[2262, 655]	2606	[1374, 2407]
144	[274, 275]	965	[1308, 1440]	1786	[1320, 1341]	2607	[2884, 2885]
145	[276, 277]	966	[1441, 1442]	1787	[532, 1357]	2608	[1502, 1569]
146	[85, 278]	967	[495, 1443]	1788	[581, 49]	2609	[2397, 1261]
147	[279, 280]	968	[1444, 1445]	1789	[468, 1293]	2610	[646, 2163]
148	[281, 282]	969	[1446, 1406]	1790	[582, 1318]	2611	[2886, 1537]
149	[283, 284]	970	[1437, 1447]	1791	[2263, 653]	2612	[2887, 1488]
150	[285, 286]	971	[1448, 1449]	1792	[675, 485]	2613	[2881, 2239]
151	[287, 288]	972	[1450, 1451]	1793	[2264, 1291]	2614	[1398, 1601]
152	[289, 290]	973	[1388, 1267]	1794	[2265, 709]	2615	[41, 1394]
153	[291, 292]	974	[216, 654]	1795	[31, 475]	2616	[2888, 2889]
154	[293, 294]	975	[720, 580]	1796	[2167, 2266]	2617	[2233, 33]
155	[295, 296]	976	[1452, 685]	1797	[2267, 2235]	2618	[2890, 2891]
156	[297, 298]	977	[1453, 657]	1798	[1397, 1268]	2619	[2886, 452]
157	[299, 300]	978	[1454, 603]	1799	[657, 1492]	2620	[679, 208]
158	[301, 302]	979	[477, 543]	1800	[553, 2268]	2621	[127, 2892]
159	[303, 304]	980	[8, 547]	1801	[2195, 665]	2622	[1354, 13]
160	[305, 306]	981	[1455, 539]	1802	[2153, 141]	2623	[2176, 459]
161	[307, 308]	982	[1456, 474]	1803	[1584, 1330]	2624	[2817, 152]
162	[309, 310]	983	[1311, 1457]	1804	[2269, 2174]	2625	[2331, 2881]
163	[311, 312]	984	[1458, 1391]	1805	[1436, 146]	2626	[1538, 2871]
164	[313, 314]	985	[1459, 532]	1806	[2270, 2271]	2627	[2197, 2274]
165	[315, 316]	986	[1460, 623]	1807	[1286, 1359]	2628	[2893, 2894]
166	[317, 318]	987	[1255, 1249]	1808	[713, 2272]	2629	[2251, 1349]
167	[319, 320]	988	[1461, 195]	1809	[1339, 638]	2630	[2895, 2304]
168	[321, 322]	989	[1462, 613]	1810	[1428, 146]	2631	[2896, 1358]
169	[323, 324]	990	[588, 488]	1811	[482, 529]	2632	[2829, 2897]
170	[325, 326]	991	[1463, 576]	1812	[127, 1257]	2633	[1577, 2344]
171	[327, 328]	992	[618, 618]	1813	[614, 490]	2634	[603, 2898]
172	[329, 242]	993	[502, 192]	1814	[2273, 2274]	2635	[2899, 537]
173	[330, 331]	994	[521, 1257]	1815	[2209, 1338]	2636	[543, 631]
174	[332, 333]	995	[606, 1464]	1816	[45, 1256]	2637	[2267, 2900]
175	[292, 334]	996	[1339, 135]	1817	[2275, 1495]	2638	[2287, 2901]
176	[335, 336]	997	[1465, 729]	1818	[730, 736]	2639	[2848, 2902]
177	[337, 338]	998	[1466, 659]	1819	[608, 524]	2640	[2903, 1304]
178	[339, 340]	999	[1381, 464]	1820	[511, 1341]	2641	[2202, 587]
179	[341, 342]	1000	[1467, 1468]	1821	[2276, 1361]	2642	[570, 2873]

180	[343, 344]	1001	[470, 663]	1822	[1504, 725]	2643	[1456, 730]
181	[345, 346]	1002	[667, 1427]	1823	[2227, 1320]	2644	[2394, 1528]
182	[347, 348]	1003	[652, 190]	1824	[2218, 166]	2645	[2904, 1404]
183	[349, 350]	1004	[1299, 38]	1825	[2277, 1595]	2646	[2905, 1291]
184	[351, 352]	1005	[48, 1278]	1826	[2278, 2279]	2647	[2376, 526]
185	[353, 354]	1006	[193, 1469]	1827	[1494, 699]	2648	[2906, 2842]
186	[355, 356]	1007	[1470, 42]	1828	[2280, 2281]	2649	[162, 1402]
187	[357, 358]	1008	[1471, 1472]	1829	[2282, 561]	2650	[151, 2907]
188	[359, 16]	1009	[542, 478]	1830	[548, 731]	2651	[2908, 1287]
189	[360, 361]	1010	[1473, 1430]	1831	[1452, 2283]	2652	[2359, 1456]
190	[362, 363]	1011	[1360, 1346]	1832	[2284, 2194]	2653	[2247, 740]
191	[99, 94]	1012	[1391, 692]	1833	[492, 743]	2654	[1328, 2172]
192	[364, 365]	1013	[693, 686]	1834	[1236, 235]	2655	[1463, 1244]
193	[366, 367]	1014	[142, 1457]	1835	[708, 1464]	2656	[2847, 1298]
194	[368, 369]	1015	[1474, 1475]	1836	[1574, 585]	2657	[2299, 1348]
195	[370, 371]	1016	[1353, 592]	1837	[1280, 210]	2658	[2850, 2248]
196	[372, 373]	1017	[1355, 14]	1838	[2285, 1304]	2659	[8, 2188]
197	[374, 375]	1018	[1476, 218]	1839	[1442, 1490]	2660	[166, 54]
198	[376, 377]	1019	[1334, 1288]	1840	[2286, 1443]	2661	[513, 1599]
199	[378, 379]	1020	[1477, 1353]	1841	[2287, 2288]	2662	[593, 2159]
200	[380, 381]	1021	[55, 1280]	1842	[2289, 1552]	2663	[2909, 2825]
201	[382, 383]	1022	[1478, 543]	1843	[1585, 1408]	2664	[2831, 2910]
202	[384, 385]	1023	[1479, 161]	1844	[719, 1538]	2665	[2274, 193]
203	[386, 387]	1024	[1416, 545]	1845	[2290, 58]	2666	[2267, 10]
204	[388, 389]	1025	[602, 179]	1846	[537, 51]	2667	[2411, 2874]
205	[390, 391]	1026	[1480, 215]	1847	[2291, 677]	2668	[2911, 2912]
206	[392, 393]	1027	[1308, 573]	1848	[2232, 169]	2669	[666, 1566]
207	[394, 395]	1028	[1481, 701]	1849	[566, 476]	2670	[1470, 1375]
208	[396, 397]	1029	[691, 686]	1850	[2292, 1298]	2671	[1565, 458]
209	[398, 278]	1030	[1482, 1483]	1851	[154, 175]	2672	[2416, 1360]
210	[399, 400]	1031	[1301, 705]	1852	[1242, 2293]	2673	[2913, 1478]
211	[401, 402]	1032	[1484, 1485]	1853	[1392, 1330]	2674	[1521, 1234]
212	[403, 404]	1033	[1267, 57]	1854	[738, 2268]	2675	[2274, 623]
213	[405, 406]	1034	[1486, 696]	1855	[2294, 740]	2676	[2348, 545]
214	[407, 408]	1035	[1487, 1488]	1856	[734, 662]	2677	[661, 735]
215	[409, 410]	1036	[1489, 1447]	1857	[14, 1426]	2678	[2342, 173]
216	[411, 412]	1037	[690, 1313]	1858	[1509, 1327]	2679	[703, 1275]
217	[413, 414]	1038	[573, 1490]	1859	[1478, 478]	2680	[2914, 2889]
218	[415, 416]	1039	[574, 1491]	1860	[2295, 2296]	2681	[2915, 1236]
219	[417, 418]	1040	[1492, 1439]	1861	[1500, 158]	2682	[1441, 1458]
220	[419, 420]	1041	[1440, 574]	1862	[2297, 2298]	2683	[2821, 616]
221	[421, 422]	1042	[1493, 1306]	1863	[2299, 2300]	2684	[2401, 2854]
222	[423, 424]	1043	[1288, 1239]	1864	[2301, 2302]	2685	[2916, 2917]
223	[425, 426]	1044	[1494, 220]	1865	[2303, 2304]	2686	[2888, 2918]

224	[427, 428]	1045	[709, 470]	1866	[1517, 584]	2687	[2244, 452]
225	[429, 256]	1046	[1465, 473]	1867	[2305, 219]	2688	[2903, 1323]
226	[430, 431]	1047	[1235, 741]	1868	[568, 610]	2689	[225, 1288]
227	[432, 279]	1048	[1495, 132]	1869	[1554, 180]	2690	[2919, 2256]
228	[433, 434]	1049	[1483, 641]	1870	[658, 2306]	2691	[1420, 561]
229	[435, 436]	1050	[1473, 1386]	1871	[2307, 2283]	2692	[471, 2920]
230	[437, 438]	1051	[481, 1400]	1872	[2308, 1437]	2693	[1465, 608]
231	[439, 440]	1052	[743, 1333]	1873	[2309, 1363]	2694	[2402, 671]
232	[441, 442]	1053	[1496, 672]	1874	[2310, 2]	2695	[1593, 1547]
233	[443, 114]	1054	[1309, 1497]	1875	[157, 2311]	2696	[1234, 596]
234	[444, 445]	1055	[489, 197]	1876	[626, 1370]	2697	[2193, 576]
235	[446, 106]	1056	[615, 1498]	1877	[596, 485]	2698	[2883, 2855]
236	[447, 448]	1057	[1499, 573]	1878	[486, 1252]	2699	[2847, 1236]
237	[282, 449]	1058	[1500, 1501]	1879	[1505, 13]	2700	[2366, 1546]
238	[450, 451]	1059	[1502, 130]	1880	[1562, 2312]	2701	[596, 2878]
239	[452, 453]	1060	[541, 1503]	1881	[506, 54]	2702	[586, 153]
240	[454, 455]	1061	[459, 652]	1882	[1532, 1506]	2703	[2921, 226]
241	[456, 201]	1062	[177, 722]	1883	[2313, 1299]	2704	[2922, 152]
242	[457, 458]	1063	[1504, 190]	1884	[2314, 199]	2705	[2381, 2815]
243	[459, 460]	1064	[1352, 591]	1885	[2315, 738]	2706	[2877, 464]
244	[461, 462]	1065	[1505, 1355]	1886	[1321, 49]	2707	[2403, 2857]
245	[463, 464]	1066	[1304, 1324]	1887	[2316, 2279]	2708	[2923, 1251]
246	[465, 466]	1067	[1368, 1506]	1888	[2317, 2318]	2709	[621, 2372]
247	[467, 175]	1068	[1501, 233]	1889	[454, 1569]	2710	[2231, 2900]
248	[468, 469]	1069	[158, 1278]	1890	[229, 643]	2711	[1444, 2924]
249	[470, 150]	1070	[1275, 522]	1891	[502, 2156]	2712	[2925, 2926]
250	[471, 472]	1071	[505, 555]	1892	[2319, 2320]	2713	[2927, 2179]
251	[473, 474]	1072	[1489, 495]	1893	[524, 736]	2714	[2908, 33]
252	[475, 476]	1073	[713, 1324]	1894	[2294, 2321]	2715	[1344, 526]
253	[477, 478]	1074	[608, 730]	1895	[181, 154]	2716	[1600, 1316]
254	[479, 480]	1075	[1507, 497]	1896	[1604, 634]	2717	[2828, 2928]
255	[481, 203]	1076	[1419, 1418]	1897	[1315, 128]	2718	[1451, 8]
256	[482, 483]	1077	[57, 1508]	1898	[2187, 42]	2719	[2836, 192]
257	[484, 485]	1078	[1356, 533]	1899	[2322, 729]	2720	[1482, 2274]
258	[486, 195]	1079	[1509, 1510]	1900	[534, 210]	2721	[2350, 2929]
259	[487, 488]	1080	[57, 1378]	1901	[2183, 138]	2722	[2844, 1570]
260	[489, 490]	1081	[1398, 232]	1902	[1279, 2323]	2723	[2930, 133]
261	[491, 492]	1082	[1367, 1346]	1903	[32, 1418]	2724	[153, 182]
262	[58, 493]	1083	[610, 460]	1904	[1477, 591]	2725	[2838, 1535]
263	[494, 495]	1084	[56, 210]	1905	[729, 474]	2726	[2931, 508]
264	[496, 497]	1085	[686, 1308]	1906	[1313, 694]	2727	[509, 2932]
265	[498, 499]	1086	[722, 45]	1907	[1439, 1442]	2728	[607, 705]
266	[500, 501]	1087	[47, 1277]	1908	[1442, 212]	2729	[32, 567]
267	[502, 503]	1088	[1511, 1243]	1909	[1391, 1491]	2730	[2238, 2882]

268	[44, 504]	1089	[1493, 1424]	1910	[1313, 1492]	2731	[2933, 577]
269	[505, 14]	1090	[1512, 186]	1911	[618, 1559]	2732	[142, 1312]
270	[220, 506]	1091	[1513, 1514]	1912	[1366, 1559]	2733	[1325, 1515]
271	[507, 508]	1092	[1515, 206]	1913	[459, 189]	2734	[2916, 472]
272	[509, 510]	1093	[1516, 1382]	1914	[1266, 208]	2735	[2425, 1501]
273	[511, 512]	1094	[1441, 573]	1915	[2324, 2296]	2736	[221, 2212]
274	[513, 514]	1095	[540, 1517]	1916	[2325, 481]	2737	[494, 2896]
275	[198, 515]	1096	[1518, 58]	1917	[2326, 2327]	2738	[1560, 2934]
276	[516, 517]	1097	[161, 519]	1918	[1273, 2328]	2739	[47, 158]
277	[518, 519]	1098	[1519, 1520]	1919	[137, 2184]	2740	[2418, 2281]
278	[165, 520]	1099	[1521, 718]	1920	[2329, 1288]	2741	[2270, 44]
279	[521, 522]	1100	[1284, 1434]	1921	[1291, 589]	2742	[2198, 2897]
280	[523, 46]	1101	[1522, 1523]	1922	[1568, 2330]	2743	[1581, 1479]
281	[524, 525]	1102	[177, 1434]	1923	[598, 2160]	2744	[695, 2935]
282	[526, 527]	1103	[690, 691]	1924	[2331, 2332]	2745	[1330, 2936]
283	[528, 529]	1104	[1499, 1442]	1925	[42, 223]	2746	[2835, 1533]
284	[530, 194]	1105	[1490, 1491]	1926	[1571, 1399]	2747	[2937, 1402]
285	[531, 167]	1106	[1524, 1401]	1927	[2333, 641]	2748	[11, 1268]
286	[532, 533]	1107	[1525, 1526]	1928	[2286, 1286]	2749	[2938, 1461]
287	[534, 535]	1108	[1527, 557]	1929	[2334, 1530]	2750	[2939, 1445]
288	[536, 537]	1109	[512, 1528]	1930	[1490, 689]	2751	[1363, 498]
289	[46, 538]	1110	[1529, 1530]	1931	[1391, 213]	2752	[2859, 2894]
290	[539, 495]	1111	[1409, 1531]	1932	[2307, 685]	2753	[2294, 2248]
291	[540, 541]	1112	[1532, 1533]	1933	[2335, 579]	2754	[2379, 2940]
292	[542, 543]	1113	[1534, 1383]	1934	[1294, 729]	2755	[560, 1590]
293	[544, 545]	1114	[1535, 1256]	1935	[2261, 713]	2756	[2325, 202]
294	[546, 547]	1115	[460, 1536]	1936	[571, 195]	2757	[699, 53]
295	[548, 462]	1116	[1537, 453]	1937	[2336, 1597]	2758	[2905, 588]
296	[549, 550]	1117	[1280, 535]	1938	[1307, 1499]	2759	[720, 2941]
297	[551, 552]	1118	[1538, 580]	1939	[1458, 1490]	2760	[2942, 2362]
298	[182, 175]	1119	[1539, 624]	1940	[212, 692]	2761	[1516, 464]
299	[553, 554]	1120	[521, 1540]	1941	[2168, 39]	2762	[2253, 2943]
300	[555, 556]	1121	[1461, 572]	1942	[1575, 1520]	2763	[588, 2944]
301	[557, 148]	1122	[726, 1541]	1943	[1389, 57]	2764	[568, 651]
302	[206, 556]	1123	[1399, 203]	1944	[2337, 1595]	2765	[1362, 727]
303	[558, 559]	1124	[1542, 624]	1945	[2338, 1284]	2766	[2157, 1552]
304	[560, 135]	1125	[230, 1543]	1946	[651, 460]	2767	[33, 1431]
305	[561, 39]	1126	[1544, 178]	1947	[2242, 566]	2768	[518, 635]
306	[562, 34]	1127	[1454, 179]	1948	[2158, 1259]	2769	[2329, 226]
307	[563, 564]	1128	[1377, 58]	1949	[496, 1570]	2770	[2408, 2255]
308	[565, 132]	1129	[1545, 1546]	1950	[1268, 1531]	2771	[1517, 2945]
309	[566, 567]	1130	[1239, 1247]	1951	[2339, 711]	2772	[2289, 31]
310	[568, 184]	1131	[1547, 1422]	1952	[37, 2340]	2773	[2277, 2946]
311	[569, 570]	1132	[638, 136]	1953	[484, 52]	2774	[685, 2947]

312	[571, 572]	1133	[1532, 1369]	1954	[2230, 625]	2775	[2948, 2949]
313	[573, 574]	1134	[202, 1400]	1955	[1525, 545]	2776	[689, 656]
314	[575, 576]	1135	[1548, 153]	1956	[2341, 636]	2777	[2393, 1543]
315	[577, 578]	1136	[1549, 1336]	1957	[2342, 37]	2778	[2906, 1601]
316	[579, 580]	1137	[604, 637]	1958	[1511, 2293]	2779	[2365, 503]
317	[581, 582]	1138	[1550, 681]	1959	[1587, 143]	2780	[2211, 557]
318	[583, 220]	1139	[1551, 219]	1960	[2280, 2343]	2781	[2314, 515]
319	[541, 584]	1140	[1552, 566]	1961	[1438, 657]	2782	[1274, 2375]
320	[585, 470]	1141	[1553, 60]	1962	[2309, 2344]	2783	[2341, 604]
321	[586, 587]	1142	[1474, 578]	1963	[632, 168]	2784	[2335, 710]
322	[588, 589]	1143	[1554, 644]	1964	[686, 1441]	2785	[1395, 211]
323	[585, 590]	1144	[1481, 1555]	1965	[2345, 218]	2786	[1, 1321]
324	[591, 592]	1145	[1282, 1317]	1966	[1496, 709]	2787	[2942, 2950]
325	[593, 594]	1146	[539, 1447]	1967	[1573, 1341]	2788	[1480, 733]
326	[526, 201]	1147	[1267, 1377]	1968	[1582, 600]	2789	[170, 2951]
327	[595, 235]	1148	[1556, 508]	1969	[2206, 542]	2790	[1535, 46]
328	[596, 52]	1149	[1557, 1558]	1970	[2346, 2288]	2791	[2921, 1339]
329	[183, 459]	1150	[727, 1434]	1971	[2167, 2347]	2792	[2827, 138]
330	[12, 597]	1151	[657, 694]	1972	[2348, 1526]	2793	[178, 1535]
331	[14, 556]	1152	[213, 1453]	1973	[2349, 481]	2794	[2952, 2220]
332	[598, 599]	1153	[732, 215]	1974	[2350, 199]	2795	[2414, 2347]
333	[600, 519]	1154	[1288, 135]	1975	[2344, 2215]	2796	[622, 1402]
334	[541, 601]	1155	[1499, 1440]	1976	[1448, 1365]	2797	[225, 1339]
335	[602, 603]	1156	[692, 1438]	1977	[1490, 692]	2798	[2953, 2954]
336	[604, 605]	1157	[617, 1366]	1978	[2273, 1460]	2799	[2955, 2424]
337	[606, 607]	1158	[213, 1438]	1979	[219, 699]	2800	[723, 481]
338	[608, 474]	1159	[1440, 1490]	1980	[2324, 2351]	2801	[1412, 2406]
339	[609, 610]	1160	[1438, 691]	1981	[2252, 200]	2802	[2956, 1566]
340	[579, 611]	1161	[1458, 212]	1982	[1563, 2328]	2803	[1350, 2928]
341	[612, 613]	1162	[617, 1559]	1983	[2352, 2353]	2804	[2225, 176]
342	[614, 197]	1163	[691, 694]	1984	[2354, 2355]	2805	[1394, 1428]
343	[615, 616]	1164	[1560, 1343]	1985	[2338, 1544]	2806	[2419, 1287]
344	[617, 618]	1165	[1435, 157]	1986	[1307, 1439]	2807	[1403, 2957]
345	[619, 196]	1166	[1561, 1562]	1987	[574, 689]	2808	[1367, 2241]
346	[620, 621]	1167	[1537, 1346]	1988	[1453, 691]	2809	[2211, 2399]
347	[622, 163]	1168	[1563, 1564]	1989	[1262, 642]	2810	[2958, 209]
348	[623, 194]	1169	[1565, 1566]	1990	[2356, 508]	2811	[2430, 1494]
349	[624, 625]	1170	[1551, 583]	1991	[678, 207]	2812	[2959, 2033]
350	[626, 163]	1171	[1567, 211]	1992	[2332, 2155]	2813	[2756, 2592]
351	[619, 489]	1172	[1568, 1569]	1993	[460, 190]	2814	[2960, 2961]
352	[506, 167]	1173	[1507, 1570]	1994	[624, 521]	2815	[2962, 2015]
353	[627, 628]	1174	[570, 667]	1995	[2357, 1387]	2816	[2963, 2964]
354	[629, 450]	1175	[560, 638]	1996	[1254, 168]	2817	[1207, 2965]
355	[630, 631]	1176	[1571, 481]	1997	[1264, 2358]	2818	[2966, 1899]

356	[632, 633]	1177	[1572, 675]	1998	[1353, 1408]	2819	[2967, 2968]
357	[634, 635]	1178	[1287, 34]	1999	[656, 1313]	2820	[2969, 1788]
358	[636, 637]	1179	[1319, 1573]	2000	[2359, 473]	2821	[2970, 2971]
359	[638, 639]	1180	[587, 154]	2001	[2360, 1514]	2822	[2972, 2973]
360	[59, 640]	1181	[1574, 709]	2002	[2208, 597]	2823	[2974, 2975]
361	[641, 194]	1182	[627, 1357]	2003	[2361, 2362]	2824	[2976, 255]
362	[642, 643]	1183	[1575, 1576]	2004	[2363, 550]	2825	[2977, 1678]
363	[179, 644]	1184	[1559, 618]	2005	[549, 2364]	2826	[2978, 1998]
364	[645, 646]	1185	[1577, 1363]	2006	[694, 1308]	2827	[2979, 2980]
365	[169, 572]	1186	[1578, 728]	2007	[676, 599]	2828	[1107, 2981]
366	[647, 156]	1187	[183, 610]	2008	[160, 518]	2829	[772, 2982]
367	[562, 648]	1188	[1579, 489]	2009	[2365, 192]	2830	[2983, 2984]
368	[157, 649]	1189	[1580, 1310]	2010	[2366, 2367]	2831	[2985, 2499]
369	[39, 237]	1190	[700, 1555]	2011	[652, 725]	2832	[2986, 1233]
370	[196, 650]	1191	[1581, 1582]	2012	[641, 1469]	2833	[2987, 100]
371	[651, 652]	1192	[494, 1447]	2013	[680, 1321]	2834	[2988, 2724]
372	[653, 654]	1193	[1462, 1583]	2014	[532, 2368]	2835	[2989, 2990]
373	[603, 644]	1194	[1584, 616]	2015	[176, 182]	2836	[1812, 2991]
374	[549, 655]	1195	[13, 555]	2016	[592, 1297]	2837	[2992, 1822]
375	[656, 657]	1196	[1585, 592]	2017	[2369, 48]	2838	[2993, 1866]
376	[658, 659]	1197	[1410, 1379]	2018	[1524, 501]	2839	[2994, 1679]
377	[660, 550]	1198	[1512, 1586]	2019	[2231, 2235]	2840	[2995, 2743]
378	[661, 662]	1199	[1483, 530]	2020	[2357, 31]	2841	[2996, 2997]
379	[479, 663]	1200	[1440, 1391]	2021	[2370, 1604]	2842	[2998, 89]
380	[12, 664]	1201	[1587, 1457]	2022	[2371, 2372]	2843	[2999, 1196]
381	[474, 665]	1202	[682, 707]	2023	[1592, 1538]	2844	[3000, 1724]
382	[666, 458]	1203	[681, 601]	2024	[705, 542]	2845	[3001, 322]
383	[226, 135]	1204	[586, 181]	2025	[2373, 1445]	2846	[799, 3002]
384	[667, 668]	1205	[1588, 1589]	2026	[2374, 2217]	2847	[2594, 446]
385	[154, 669]	1206	[1590, 136]	2027	[672, 149]	2848	[3003, 2095]
386	[670, 671]	1207	[1517, 601]	2028	[2256, 633]	2849	[3004, 1217]
387	[672, 590]	1208	[1507, 1289]	2029	[1502, 2330]	2850	[3005, 3006]
388	[647, 673]	1209	[634, 519]	2030	[1553, 2375]	2851	[3007, 3008]
389	[674, 201]	1210	[1591, 539]	2031	[44, 133]	2852	[3009, 340]
390	[565, 649]	1211	[612, 1583]	2032	[1375, 223]	2853	[3010, 2514]
391	[675, 52]	1212	[1592, 720]	2033	[2376, 200]	2854	[3011, 3012]
392	[676, 677]	1213	[1528, 605]	2034	[2377, 2378]	2855	[3013, 92]
393	[170, 499]	1214	[598, 677]	2035	[739, 2248]	2856	[3014, 3015]
394	[678, 679]	1215	[566, 1418]	2036	[2379, 2380]	2857	[3016, 406]
395	[222, 139]	1216	[1593, 513]	2037	[165, 1324]	2858	[3017, 3018]
396	[680, 211]	1217	[473, 730]	2038	[2381, 2382]	2859	[3019, 872]
397	[681, 584]	1218	[1408, 715]	2039	[2383, 733]	2860	[3020, 1176]
398	[682, 683]	1219	[1594, 1595]	2040	[2384, 42]	2861	[3021, 3022]
399	[684, 685]	1220	[1596, 1597]	2041	[1471, 1296]	2862	[3023, 1914]

400	[657, 686]	1221	[1598, 1599]	2042	[1518, 1378]	2863	[3024, 3025]
401	[687, 541]	1222	[1600, 1601]	2043	[2369, 1277]	2864	[3026, 3027]
402	[688, 605]	1223	[1602, 1603]	2044	[1321, 726]	2865	[3028, 3029]
403	[689, 690]	1224	[1581, 1604]	2045	[704, 1302]	2866	[3030, 2790]
404	[656, 691]	1225	[531, 54]	2046	[2385, 2386]	2867	[3031, 819]
405	[692, 690]	1226	[1249, 533]	2047	[2275, 157]	2868	[3032, 1146]
406	[693, 694]	1227	[1521, 537]	2048	[2387, 2388]	2869	[3033, 1936]
407	[220, 166]	1228	[1290, 1605]	2049	[1466, 2306]	2870	[1649, 745]
408	[695, 696]	1229	[1606, 1607]	2050	[214, 733]	2871	[3034, 1029]
409	[697, 510]	1230	[555, 1426]	2051	[2319, 1468]	2872	[3035, 1744]
410	[698, 699]	1231	[557, 1372]	2052	[1414, 1426]	2873	[1704, 2444]
411	[700, 701]	1232	[730, 665]	2053	[2389, 2256]	2874	[3036, 1857]
412	[690, 657]	1233	[1315, 38]	2054	[1443, 2390]	2875	[1017, 3037]
413	[702, 703]	1234	[1608, 104]	2055	[2332, 1589]	2876	[3038, 123]
414	[704, 705]	1235	[1609, 1610]	2056	[182, 669]	2877	[3039, 3040]
415	[706, 707]	1236	[1611, 1612]	2057	[1383, 1485]	2878	[3041, 279]
416	[209, 535]	1237	[1613, 982]	2058	[2391, 156]	2879	[3042, 392]
417	[708, 607]	1238	[1614, 1137]	2059	[456, 2392]	2880	[3043, 2561]
418	[709, 590]	1239	[1615, 1616]	2060	[161, 635]	2881	[3044, 3045]
419	[41, 222]	1240	[1055, 1617]	2061	[642, 2393]	2882	[1756, 870]
420	[710, 611]	1241	[1618, 1619]	2062	[2204, 562]	2883	[3046, 3047]
421	[711, 712]	1242	[1620, 1621]	2063	[1524, 1379]	2884	[3048, 3049]
422	[713, 520]	1243	[1622, 1623]	2064	[1320, 2394]	2885	[3050, 963]
423	[714, 56]	1244	[1624, 1031]	2065	[2305, 583]	2886	[2786, 1770]
424	[715, 643]	1245	[1625, 1106]	2066	[1355, 206]	2887	[3051, 3052]
425	[528, 483]	1246	[1626, 426]	2067	[2317, 2164]	2888	[3053, 3054]
426	[716, 62]	1247	[942, 422]	2068	[647, 1271]	2889	[3055, 1066]
427	[202, 717]	1248	[1627, 1628]	2069	[2395, 2299]	2890	[3056, 3057]
428	[498, 171]	1249	[1629, 1630]	2070	[675, 2396]	2891	[3058, 1953]
429	[718, 484]	1250	[849, 1631]	2071	[486, 572]	2892	[3059, 1754]
430	[719, 720]	1251	[1632, 124]	2072	[1552, 1419]	2893	[3060, 2113]
431	[721, 543]	1252	[1633, 1634]	2073	[2397, 483]	2894	[3061, 2728]
432	[722, 523]	1253	[1635, 1003]	2074	[168, 571]	2895	[2609, 3062]
433	[723, 724]	1254	[1636, 251]	2075	[1439, 1458]	2896	[3063, 1787]
434	[460, 725]	1255	[1637, 1638]	2076	[2398, 710]	2897	[3064, 109]
435	[581, 726]	1256	[340, 1639]	2077	[561, 236]	2898	[3065, 1200]
436	[727, 178]	1257	[780, 1640]	2078	[674, 527]	2899	[3066, 3067]
437	[728, 584]	1258	[1641, 1642]	2079	[2265, 672]	2900	[3068, 778]
438	[729, 730]	1259	[1643, 434]	2080	[2374, 1303]	2901	[3069, 1004]
439	[461, 731]	1260	[1644, 1645]	2081	[1527, 2399]	2902	[3070, 1816]
440	[732, 733]	1261	[1646, 1225]	2082	[184, 652]	2903	[3071, 3072]
441	[734, 735]	1262	[1647, 1084]	2083	[2295, 2351]	2904	[3073, 3074]
442	[474, 736]	1263	[1648, 1649]	2084	[2400, 157]	2905	[867, 991]
443	[737, 138]	1264	[1650, 1651]	2085	[2401, 2378]	2906	[3075, 3076]

444	[738, 554]	1265	[1652, 1653]	2086	[2402, 1349]	2907	[3077, 2485]
445	[590, 150]	1266	[1654, 304]	2087	[2403, 2404]	2908	[2040, 69]
446	[739, 740]	1267	[1655, 116]	2088	[2405, 2406]	2909	[3078, 3079]
447	[593, 741]	1268	[1656, 1657]	2089	[151, 2407]	2910	[107, 302]
448	[742, 648]	1269	[1658, 368]	2090	[2400, 1495]	2911	[3080, 400]
449	[743, 171]	1270	[1659, 1660]	2091	[1341, 604]	2912	[2586, 1036]
450	[744, 390]	1271	[1661, 1662]	2092	[2408, 2409]	2913	[3081, 2037]
451	[745, 746]	1272	[1663, 1664]	2093	[1491, 656]	2914	[3082, 3083]
452	[747, 748]	1273	[1665, 375]	2094	[702, 2230]	2915	[1674, 3084]
453	[749, 750]	1274	[1616, 1666]	2095	[1320, 512]	2916	[3085, 3086]
454	[751, 752]	1275	[1667, 1668]	2096	[1450, 450]	2917	[3087, 1016]
455	[753, 754]	1276	[1669, 1670]	2097	[637, 1605]	2918	[3088, 2543]
456	[755, 756]	1277	[1671, 1672]	2098	[1460, 193]	2919	[3089, 3090]
457	[757, 758]	1278	[95, 1673]	2099	[2410, 2192]	2920	[3091, 2045]
458	[759, 760]	1279	[774, 1674]	2100	[2229, 1424]	2921	[3092, 3093]
459	[761, 762]	1280	[1675, 1676]	2101	[1425, 2226]	2922	[3094, 3095]
460	[350, 763]	1281	[1677, 1678]	2102	[2411, 570]	2923	[2084, 79]
461	[764, 765]	1282	[1679, 1680]	2103	[1, 2161]	2924	[3096, 890]
462	[766, 320]	1283	[1681, 1682]	2104	[1572, 596]	2925	[3097, 2523]
463	[767, 768]	1284	[1683, 1684]	2105	[2412, 632]	2926	[3098, 762]
464	[769, 770]	1285	[1012, 1685]	2106	[1432, 61]	2927	[3099, 3100]
465	[771, 772]	1286	[905, 760]	2107	[2413, 677]	2928	[3101, 966]
466	[773, 774]	1287	[1686, 1687]	2108	[2414, 2266]	2929	[3102, 1698]
467	[775, 776]	1288	[1688, 258]	2109	[191, 503]	2930	[3103, 1728]
468	[777, 778]	1289	[1689, 1690]	2110	[2315, 2415]	2931	[3104, 3105]
469	[779, 780]	1290	[1691, 1623]	2111	[2416, 452]	2932	[3106, 116]
470	[781, 277]	1291	[1692, 101]	2112	[1568, 130]	2933	[3107, 3108]
471	[782, 783]	1292	[391, 22]	2113	[1492, 1308]	2934	[3109, 1762]
472	[784, 785]	1293	[1693, 239]	2114	[2417, 685]	2935	[3110, 80]
473	[786, 787]	1294	[1694, 788]	2115	[2418, 2343]	2936	[3111, 1890]
474	[788, 789]	1295	[1695, 1696]	2116	[2419, 33]	2937	[763, 2703]
475	[790, 791]	1296	[1697, 1698]	2117	[126, 1275]	2938	[3112, 370]
476	[64, 792]	1297	[996, 1699]	2118	[1250, 1432]	2939	[3113, 2438]
477	[793, 794]	1298	[1700, 1701]	2119	[1544, 1434]	2940	[3114, 1151]
478	[795, 796]	1299	[1702, 1063]	2120	[2394, 688]	2941	[3115, 2776]
479	[797, 774]	1300	[1703, 1704]	2121	[2420, 1445]	2942	[2151, 3116]
480	[798, 799]	1301	[1705, 884]	2122	[2207, 679]	2943	[3117, 1820]
481	[800, 801]	1302	[1019, 795]	2123	[1371, 2421]	2944	[3118, 1940]
482	[30, 802]	1303	[1706, 1707]	2124	[1408, 642]	2945	[3119, 867]
483	[803, 804]	1304	[1708, 1207]	2125	[2422, 2220]	2946	[3120, 1668]
484	[805, 806]	1305	[1709, 1710]	2126	[51, 2396]	2947	[3121, 1619]
485	[807, 808]	1306	[1711, 1712]	2127	[1495, 649]	2948	[1222, 3122]
486	[809, 810]	1307	[1713, 1714]	2128	[9, 2323]	2949	[3123, 438]
487	[811, 812]	1308	[1162, 1715]	2129	[2215, 499]	2950	[3124, 913]

488	[813, 814]	1309	[1716, 1094]	2130	[2285, 1323]	2951	[3125, 3126]
489	[815, 816]	1310	[1717, 770]	2131	[1491, 1453]	2952	[3127, 3128]
490	[817, 818]	1311	[1718, 1719]	2132	[2275, 565]	2953	[3129, 3130]
491	[819, 820]	1312	[1720, 1721]	2133	[2423, 2424]	2954	[3131, 1787]
492	[821, 822]	1313	[1722, 1723]	2134	[2425, 158]	2955	[3132, 3133]
493	[823, 824]	1314	[1724, 77]	2135	[2426, 1335]	2956	[3134, 3135]
494	[825, 826]	1315	[1725, 1726]	2136	[1603, 2182]	2957	[3136, 1068]
495	[827, 828]	1316	[1727, 1728]	2137	[185, 2353]	2958	[977, 399]
496	[829, 830]	1317	[1729, 1730]	2138	[2427, 2250]	2959	[3137, 2386]
497	[831, 358]	1318	[1731, 1226]	2139	[716, 2428]	2960	[2314, 2929]
498	[832, 833]	1319	[1732, 1733]	2140	[174, 2213]	2961	[482, 1261]
499	[834, 252]	1320	[1734, 1735]	2141	[2410, 2429]	2962	[1376, 2332]
500	[835, 836]	1321	[1736, 1731]	2142	[1311, 143]	2963	[1482, 1460]
501	[837, 838]	1322	[1737, 781]	2143	[144, 466]	2964	[1573, 512]
502	[839, 840]	1323	[1738, 287]	2144	[638, 1247]	2965	[1577, 492]
503	[841, 253]	1324	[1739, 906]	2145	[2430, 698]	2966	[2958, 534]
504	[842, 843]	1325	[1740, 1741]	2146	[1250, 561]	2967	[2391, 1271]
505	[844, 845]	1326	[1742, 871]	2147	[2254, 2409]	2968	[528, 1261]
506	[846, 847]	1327	[1743, 1744]	2148	[492, 2215]	2969	[1376, 2881]
507	[848, 849]	1328	[1745, 1746]	2149	[1380, 2232]	2970	[178, 2189]
508	[850, 851]	1329	[1747, 1634]	2150	[2163, 2318]	2971	[3138, 1595]
509	[852, 853]	1330	[1748, 414]	2151	[2205, 1533]	2972	[2955, 3139]
510	[854, 855]	1331	[1749, 1620]	2152	[2431, 1580]	2973	[2214, 200]
511	[856, 243]	1332	[1750, 1215]	2153	[2432, 2433]	2974	[2818, 177]
512	[857, 858]	1333	[1751, 87]	2154	[2434, 2435]	2975	[2273, 1483]
513	[859, 860]	1334	[1752, 1075]	2155	[2436, 306]	2976	[2333, 530]
514	[379, 861]	1335	[1753, 1754]	2156	[2437, 1628]	2977	[2863, 2949]
515	[862, 863]	1336	[1755, 1756]	2157	[2438, 2439]	2978	[2222, 1582]
516	[864, 865]	1337	[1757, 1614]	2158	[2440, 2441]	2979	[1291, 3140]
517	[866, 867]	1338	[1758, 1226]	2159	[2442, 1810]	2980	[2216, 537]
518	[868, 869]	1339	[1759, 1760]	2160	[2443, 2444]	2981	[2860, 2957]
519	[870, 871]	1340	[1761, 1154]	2161	[2445, 100]	2982	[1433, 1570]
520	[314, 872]	1341	[1733, 1762]	2162	[2446, 2447]	2983	[2915, 595]
521	[873, 874]	1342	[1763, 1764]	2163	[2448, 2449]	2984	[2414, 1386]
522	[239, 875]	1343	[1765, 1766]	2164	[2450, 2451]	2985	[1338, 2944]
523	[338, 876]	1344	[1767, 1768]	2165	[2452, 2453]	2986	[3141, 227]
524	[877, 878]	1345	[1175, 1769]	2166	[2454, 2455]	2987	[2952, 3142]
525	[879, 880]	1346	[1770, 826]	2167	[2456, 2457]	2988	[209, 3143]
526	[881, 882]	1347	[1771, 344]	2168	[2458, 282]	2989	[2171, 1329]
527	[883, 884]	1348	[1772, 1773]	2169	[2459, 2460]	2990	[3144, 143]
528	[885, 886]	1349	[1774, 324]	2170	[2461, 339]	2991	[1574, 672]
529	[887, 888]	1350	[1775, 1776]	2171	[2462, 2463]	2992	[172, 37]
530	[889, 890]	1351	[1777, 1778]	2172	[2464, 371]	2993	[1505, 505]
531	[891, 892]	1352	[1779, 997]	2173	[2465, 2466]	2994	[2953, 3145]

532	[893, 286]	1353	[1780, 1083]	2174	[2467, 1097]	2995	[2389, 1380]
533	[894, 895]	1354	[1781, 29]	2175	[2468, 2469]	2996	[618, 617]
534	[896, 897]	1355	[1782, 1783]	2176	[2470, 2471]	2997	[3144, 1457]
535	[111, 898]	1356	[1784, 799]	2177	[2472, 125]	2998	[2276, 1246]
536	[899, 900]	1357	[1785, 1013]	2178	[2473, 2474]	2999	[572, 3146]
537	[901, 902]	1358	[826, 1786]	2179	[2475, 2460]	3000	[625, 2892]
538	[903, 882]	1359	[1787, 1788]	2180	[2476, 1613]	3001	[3147, 3148]
539	[904, 905]	1360	[1789, 1790]	2181	[2477, 1013]	3002	[2282, 1251]
540	[906, 907]	1361	[1791, 1792]	2182	[2146, 410]	3003	[2237, 3149]
541	[908, 909]	1362	[1793, 1794]	2183	[1203, 2478]	3004	[218, 3150]
542	[910, 911]	1363	[1795, 834]	2184	[2479, 1699]	3005	[1554, 2898]
543	[912, 913]	1364	[1796, 1797]	2185	[1797, 2480]	3006	[2222, 1604]
544	[914, 915]	1365	[1798, 93]	2186	[2481, 964]	3007	[2893, 3151]
545	[916, 280]	1366	[1799, 1039]	2187	[2482, 425]	3008	[2846, 2917]
546	[917, 918]	1367	[1800, 1801]	2188	[2483, 2448]	3009	[2427, 3152]
547	[16, 919]	1368	[1802, 1803]	2189	[2484, 2485]	3010	[42, 1428]
548	[920, 921]	1369	[1804, 1805]	2190	[2486, 897]	3011	[2289, 1387]
549	[922, 923]	1370	[1806, 1807]	2191	[2487, 2488]	3012	[207, 1267]
550	[924, 925]	1371	[1808, 1809]	2192	[2489, 1639]	3013	[3147, 2885]
551	[926, 927]	1372	[1810, 124]	2193	[2490, 2491]	3014	[1525, 3153]
552	[928, 929]	1373	[1811, 1812]	2194	[2492, 2129]	3015	[2373, 2924]
553	[930, 888]	1374	[1813, 1814]	2195	[2493, 829]	3016	[1244, 3154]
554	[931, 932]	1375	[1815, 1816]	2196	[2494, 2495]	3017	[2919, 1380]
555	[933, 934]	1376	[1817, 1818]	2197	[2134, 889]	3018	[536, 1234]
556	[28, 935]	1377	[1819, 1820]	2198	[2496, 2497]	3019	[2948, 2864]
557	[936, 937]	1378	[855, 1175]	2199	[2498, 2499]	3020	[1342, 2934]
558	[938, 939]	1379	[1821, 1822]	2200	[2500, 317]	3021	[2264, 588]
559	[940, 810]	1380	[1823, 1092]	2201	[89, 822]	3022	[2879, 1355]
560	[941, 942]	1381	[1824, 1825]	2202	[2501, 2502]	3023	[3155, 3156]
561	[943, 944]	1382	[1826, 1827]	2203	[2503, 2504]	3024	[1270, 2872]
562	[945, 946]	1383	[1828, 1085]	2204	[915, 2505]	3025	[2413, 2160]
563	[947, 948]	1384	[1829, 273]	2205	[2506, 2507]	3026	[1472, 513]
564	[949, 950]	1385	[1830, 1831]	2206	[2508, 912]	3027	[1241, 470]
565	[951, 952]	1386	[1832, 24]	2207	[2509, 2510]	3028	[3157, 131]
566	[953, 954]	1387	[1833, 1834]	2208	[2511, 1080]	3029	[2835, 1506]
567	[955, 859]	1388	[1835, 1673]	2209	[2512, 813]	3030	[645, 2312]
568	[956, 957]	1389	[1836, 1837]	2210	[2513, 105]	3031	[2914, 2918]
569	[958, 369]	1390	[1838, 1065]	2211	[2514, 1810]	3032	[2336, 2845]
570	[959, 838]	1391	[1839, 1778]	2212	[2515, 1977]	3033	[3138, 3158]
571	[960, 961]	1392	[1840, 1841]	2213	[2516, 416]	3034	[2229, 3159]
572	[322, 962]	1393	[1842, 1843]	2214	[2079, 2517]	3035	[1467, 2320]
573	[963, 964]	1394	[1844, 1845]	2215	[2518, 2519]	3036	[3160, 1360]
574	[965, 966]	1395	[1846, 1847]	2216	[2520, 2521]	3037	[2313, 37]
575	[967, 968]	1396	[1848, 1849]	2217	[2522, 2523]	3038	[3141, 3161]

576	[969, 970]	1397	[1850, 1851]	2218	[2524, 319]	3039	[633, 1461]
577	[971, 895]	1398	[1852, 1853]	2219	[2525, 2111]	3040	[3162, 2288]
578	[972, 973]	1399	[1854, 824]	2220	[2526, 918]	3041	[565, 2311]
579	[974, 975]	1400	[1855, 1684]	2221	[2527, 2528]	3042	[1363, 170]
580	[976, 977]	1401	[1856, 1857]	2222	[2529, 2530]	3043	[2316, 3163]
581	[978, 979]	1402	[1858, 1859]	2223	[2531, 2116]	3044	[236, 2428]
582	[4, 980]	1403	[1860, 1861]	2224	[2532, 1900]	3045	[1528, 637]
583	[981, 982]	1404	[1862, 869]	2225	[2533, 293]	3046	[2911, 2826]
584	[983, 984]	1405	[1863, 1864]	2226	[2534, 829]	3047	[1512, 2353]
585	[985, 285]	1406	[1865, 1866]	2227	[2535, 2536]	3048	[1553, 2258]
586	[986, 347]	1407	[1867, 70]	2228	[2537, 1940]	3049	[507, 3164]
587	[987, 988]	1408	[1868, 1869]	2229	[2538, 2539]	3050	[733, 3165]
588	[989, 990]	1409	[125, 121]	2230	[2540, 2451]	3051	[1347, 2300]
589	[991, 992]	1410	[1870, 1871]	2231	[277, 2541]	3052	[1240, 2917]
590	[993, 994]	1411	[1872, 1873]	2232	[2542, 2543]	3053	[2405, 3166]
591	[995, 996]	1412	[1874, 977]	2233	[2544, 2545]	3054	[737, 2184]
592	[997, 437]	1413	[1875, 1696]	2234	[2546, 779]	3055	[2303, 3167]
593	[998, 999]	1414	[1876, 1877]	2235	[2547, 2449]	3056	[226, 1590]
594	[1000, 1001]	1415	[1878, 1143]	2236	[2548, 2011]	3057	[1500, 48]
595	[1002, 1003]	1416	[294, 1879]	2237	[2549, 2550]	3058	[208, 2290]
596	[900, 1004]	1417	[1880, 1881]	2238	[875, 312]	3059	[595, 2200]
597	[24, 1005]	1418	[1123, 357]	2239	[2551, 1069]	3060	[2310, 2820]
598	[1006, 1007]	1419	[1882, 851]	2240	[2552, 2553]	3061	[2282, 1432]
599	[1008, 1009]	1420	[1883, 1884]	2241	[2554, 1905]	3062	[1486, 2935]
600	[1010, 1011]	1421	[1044, 748]	2242	[2555, 1123]	3063	[1567, 581]
601	[907, 1012]	1422	[950, 390]	2243	[2556, 2557]	3064	[2930, 504]
602	[1013, 1014]	1423	[1885, 1886]	2244	[2558, 749]	3065	[2262, 2364]
603	[1015, 259]	1424	[1887, 1707]	2245	[2559, 992]	3066	[3157, 157]
604	[243, 1016]	1425	[1888, 1889]	2246	[2560, 2561]	3067	[500, 1379]
605	[858, 1017]	1426	[1890, 1118]	2247	[812, 2562]	3068	[1326, 1510]
606	[1018, 1019]	1427	[1822, 64]	2248	[2563, 107]	3069	[3168, 1335]
607	[1020, 383]	1428	[1891, 1792]	2249	[2564, 2565]	3070	[3169, 3170]
608	[1021, 1022]	1429	[1816, 1676]	2250	[2566, 1040]	3071	[1492, 1441]
609	[1023, 1024]	1430	[1892, 1893]	2251	[259, 2567]	3072	[2363, 655]
610	[1025, 362]	1431	[1894, 1895]	2252	[2568, 883]	3073	[3171, 2954]
611	[1026, 1027]	1432	[1896, 1897]	2253	[2569, 2570]	3074	[172, 1315]
612	[1028, 1029]	1433	[1215, 1898]	2254	[2571, 2572]	3075	[2361, 2950]
613	[1030, 1031]	1434	[1899, 1900]	2255	[2573, 2574]	3076	[2417, 2283]
614	[1032, 334]	1435	[1645, 1901]	2256	[2575, 2576]	3077	[543, 3172]
615	[1033, 1034]	1436	[1902, 1903]	2257	[2577, 2578]	3078	[2861, 698]
616	[1035, 1036]	1437	[1904, 1905]	2258	[2579, 1657]	3079	[629, 1451]
617	[1037, 1038]	1438	[1906, 1907]	2259	[2580, 746]	3080	[2819, 2]
618	[1039, 1040]	1439	[1105, 1839]	2260	[2581, 1760]	3081	[680, 581]
619	[1041, 1042]	1440	[1908, 1909]	2261	[898, 2582]	3082	[2245, 3173]

620	[1043, 1044]	1441	[1910, 1911]	2262	[2583, 2584]	3083	[2360, 2302]
621	[828, 1045]	1442	[1714, 1912]	2263	[2585, 2586]	3084	[2956, 458]
622	[361, 1046]	1443	[1913, 1914]	2264	[2587, 2588]	3085	[681, 2945]
623	[1047, 1048]	1444	[1915, 1916]	2265	[2589, 2590]	3086	[3174, 624]
624	[1049, 780]	1445	[1917, 367]	2266	[2591, 2592]	3087	[3155, 493]
625	[1050, 1051]	1446	[1918, 1919]	2267	[2593, 2594]	3088	[2856, 2404]
626	[1052, 1053]	1447	[1920, 1921]	2268	[1130, 902]	3089	[2841, 209]
627	[1054, 1055]	1448	[1922, 1923]	2269	[2595, 1796]	3090	[2384, 222]
628	[1056, 1057]	1449	[1924, 1925]	2270	[2596, 328]	3091	[637, 3175]
629	[1058, 1059]	1450	[1926, 917]	2271	[1769, 2144]	3092	[1451, 546]
630	[1060, 1061]	1451	[1927, 861]	2272	[2597, 2113]	3093	[2937, 163]
631	[1062, 1063]	1452	[1928, 1929]	2273	[2598, 366]	3094	[487, 3140]
632	[1064, 323]	1453	[1930, 1151]	2274	[2599, 1005]	3095	[3176, 1604]
633	[1065, 1066]	1454	[1931, 1932]	2275	[2600, 1091]	3096	[3177, 1562]
634	[1067, 1068]	1455	[1933, 1934]	2276	[2601, 2602]	3097	[1557, 3149]
635	[1069, 1070]	1456	[1935, 1936]	2277	[2603, 2604]	3098	[2939, 3178]
636	[1071, 1072]	1457	[1937, 1773]	2278	[2605, 2606]	3099	[2859, 3151]
637	[1073, 1074]	1458	[1938, 1939]	2279	[2607, 2557]	3100	[2253, 2302]
638	[1075, 1076]	1459	[1940, 894]	2280	[2608, 2609]	3101	[464, 3179]
639	[1077, 1078]	1460	[1941, 368]	2281	[2610, 1061]	3102	[465, 145]
640	[1079, 1080]	1461	[251, 1126]	2282	[2611, 1197]	3103	[1435, 1495]
641	[1081, 1082]	1462	[1942, 1027]	2283	[2612, 1843]	3104	[3171, 3145]
642	[1083, 263]	1463	[1943, 1944]	2284	[2613, 2614]	3105	[2292, 1236]
643	[1084, 269]	1464	[1945, 1946]	2285	[1678, 1739]	3106	[3180, 3181]
644	[1014, 1085]	1465	[1947, 1214]	2286	[2615, 1653]	3107	[2196, 1489]
645	[1086, 391]	1466	[1948, 1949]	2287	[2616, 2617]	3108	[1539, 703]
646	[1087, 779]	1467	[1950, 1172]	2288	[2618, 103]	3109	[2884, 3148]
647	[1088, 1089]	1468	[1951, 1812]	2289	[2619, 1882]	3110	[3182, 2327]
648	[1090, 996]	1469	[1952, 1953]	2290	[395, 2620]	3111	[1529, 3183]
649	[1091, 1092]	1470	[1954, 1955]	2291	[2621, 2622]	3112	[609, 651]
650	[1093, 1094]	1471	[1956, 357]	2292	[2623, 2624]	3113	[2178, 3184]
651	[1095, 1096]	1472	[1957, 863]	2293	[2625, 1017]	3114	[655, 3185]
652	[1024, 1097]	1473	[1958, 1959]	2294	[2626, 2627]	3115	[575, 2203]
653	[1098, 898]	1474	[1960, 1961]	2295	[2628, 2629]	3116	[544, 1526]
654	[1099, 1100]	1475	[1962, 1963]	2296	[2630, 1084]	3117	[2393, 3186]
655	[1101, 1102]	1476	[1964, 1093]	2297	[1925, 1957]	3118	[214, 3187]
656	[404, 1103]	1477	[1965, 1966]	2298	[2631, 859]	3119	[1516, 2848]
657	[1104, 1105]	1478	[1180, 1967]	2299	[2632, 1200]	3120	[3188, 2891]
658	[1106, 1107]	1479	[1968, 870]	2300	[2633, 1721]	3121	[2812, 3189]
659	[1108, 1045]	1480	[1969, 1970]	2301	[2634, 2635]	3122	[1279, 2235]
660	[1109, 1110]	1481	[1971, 1972]	2302	[2636, 2620]	3123	[2236, 468]
661	[1111, 1112]	1482	[1973, 1974]	2303	[2637, 2638]	3124	[1510, 2415]
662	[1113, 776]	1483	[1975, 1703]	2304	[2639, 1105]	3125	[1277, 159]
663	[1114, 1055]	1484	[1976, 1977]	2305	[2640, 2641]	3126	[61, 237]

664	[1115, 1116]	1485	[1978, 1979]	2306	[2642, 2643]	3127	[2385, 3190]
665	[1022, 1117]	1486	[1980, 1981]	2307	[2644, 2645]	3128	[2369, 158]
666	[1118, 1119]	1487	[1982, 1983]	2308	[2646, 1920]	3129	[1412, 3166]
667	[1120, 1121]	1488	[1984, 319]	2309	[2647, 325]	3130	[3191, 2353]
668	[1122, 1123]	1489	[1985, 750]	2310	[2648, 2649]	3131	[3192, 2380]
669	[336, 373]	1490	[1986, 1906]	2311	[2650, 2576]	3132	[2166, 2246]
670	[342, 1124]	1491	[1939, 1104]	2312	[2651, 2052]	3133	[558, 1349]
671	[1125, 1126]	1492	[1987, 1988]	2313	[2652, 2653]	3134	[1304, 3193]
672	[1127, 1128]	1493	[1989, 1990]	2314	[2654, 2655]	3135	[3194, 31]
673	[1129, 1130]	1494	[1991, 106]	2315	[2656, 1130]	3136	[3195, 43]
674	[1131, 1132]	1495	[1992, 1993]	2316	[2657, 2658]	3137	[3196, 3197]
675	[1133, 1134]	1496	[1994, 993]	2317	[2659, 2660]	3138	[3198, 1973]
676	[265, 1135]	1497	[1995, 1996]	2318	[2052, 1178]	3139	[3199, 912]
677	[1136, 1137]	1498	[1997, 1998]	2319	[2661, 2662]	3140	[3200, 2455]
678	[1138, 396]	1499	[1999, 1986]	2320	[2663, 99]	3141	[2643, 3201]
679	[1139, 114]	1500	[2000, 2001]	2321	[2664, 847]	3142	[3202, 18]
680	[1140, 1141]	1501	[2002, 1682]	2322	[2665, 2666]	3143	[3203, 412]
681	[1142, 1143]	1502	[2003, 2004]	2323	[2667, 2660]	3144	[3204, 3205]
682	[1144, 906]	1503	[2005, 2006]	2324	[2668, 2669]	3145	[3206, 828]
683	[1145, 1146]	1504	[2007, 929]	2325	[2670, 2671]	3146	[961, 1612]
684	[1147, 1148]	1505	[2008, 2009]	2326	[913, 2672]	3147	[1972, 3207]
685	[1149, 1150]	1506	[2010, 2011]	2327	[2673, 2469]	3148	[3208, 1714]
686	[1151, 963]	1507	[2012, 2013]	2328	[2674, 1827]	3149	[3209, 858]
687	[1152, 1153]	1508	[2014, 2015]	2329	[2675, 2676]	3150	[3210, 2093]
688	[1154, 785]	1509	[2016, 1670]	2330	[2677, 1756]	3151	[2975, 1102]
689	[1155, 1156]	1510	[2017, 1662]	2331	[2678, 754]	3152	[3211, 1038]
690	[1157, 1158]	1511	[2018, 2019]	2332	[2060, 1859]	3153	[3212, 937]
691	[1156, 1159]	1512	[816, 2020]	2333	[2679, 1116]	3154	[968, 1731]
692	[964, 1160]	1513	[897, 2021]	2334	[2680, 2681]	3155	[3213, 2082]
693	[1161, 1162]	1514	[2022, 115]	2335	[2682, 2683]	3156	[1820, 801]
694	[1103, 1163]	1515	[2023, 1890]	2336	[2684, 2685]	3157	[3214, 3215]
695	[1164, 1165]	1516	[2024, 2025]	2337	[2686, 2687]	3158	[3216, 874]
696	[1166, 1167]	1517	[2026, 935]	2338	[2688, 2689]	3159	[3217, 3012]
697	[1168, 1169]	1518	[2027, 2028]	2339	[2690, 2691]	3160	[1007, 3218]
698	[1170, 317]	1519	[2029, 2030]	2340	[2692, 1154]	3161	[3219, 808]
699	[1171, 108]	1520	[2031, 2032]	2341	[2693, 1073]	3162	[3220, 3066]
700	[1172, 1173]	1521	[2033, 102]	2342	[830, 2694]	3163	[3221, 1869]
701	[1174, 1175]	1522	[2034, 2035]	2343	[2695, 796]	3164	[3222, 66]
702	[1176, 1050]	1523	[2036, 2037]	2344	[2696, 327]	3165	[3223, 336]
703	[1177, 1178]	1524	[2038, 2039]	2345	[1094, 2697]	3166	[3224, 2504]
704	[1179, 1180]	1525	[333, 2040]	2346	[2698, 2699]	3167	[3225, 1162]
705	[1181, 1182]	1526	[2041, 2042]	2347	[2700, 1851]	3168	[438, 1817]
706	[1183, 1184]	1527	[2043, 1230]	2348	[2701, 2702]	3169	[3226, 3227]
707	[1185, 925]	1528	[2044, 2045]	2349	[2703, 2704]	3170	[3228, 308]

708	[1186, 1187]	1529	[2046, 2047]	2350	[2705, 2706]	3171	[3229, 3230]
709	[1188, 1114]	1530	[2048, 326]	2351	[2707, 437]	3172	[356, 1726]
710	[1189, 880]	1531	[1893, 1703]	2352	[373, 2708]	3173	[2453, 1150]
711	[1190, 814]	1532	[2049, 2050]	2353	[2709, 1967]	3174	[3231, 1667]
712	[1191, 1192]	1533	[2051, 2052]	2354	[2710, 2711]	3175	[785, 68]
713	[1193, 363]	1534	[2053, 1772]	2355	[2712, 1715]	3176	[2681, 3232]
714	[1029, 1194]	1535	[387, 290]	2356	[2713, 2714]	3177	[3233, 2651]
715	[1195, 1196]	1536	[2054, 287]	2357	[2715, 2716]	3178	[3234, 1048]
716	[1197, 1167]	1537	[2055, 2056]	2358	[2717, 1921]	3179	[1825, 85]
717	[1198, 338]	1538	[2057, 1117]	2359	[2718, 2719]	3180	[3235, 3236]
718	[1199, 807]	1539	[1861, 2058]	2360	[278, 2720]	3181	[3237, 1939]
719	[1200, 1201]	1540	[2059, 2060]	2361	[2721, 2722]	3182	[3238, 2017]
720	[1202, 1203]	1541	[2061, 990]	2362	[2723, 2724]	3183	[3239, 833]
721	[884, 356]	1542	[2062, 2063]	2363	[2725, 2726]	3184	[3240, 420]
722	[1204, 92]	1543	[2064, 249]	2364	[2727, 2728]	3185	[923, 787]
723	[1053, 386]	1544	[2065, 2066]	2365	[2729, 2000]	3186	[1196, 300]
724	[1205, 1206]	1545	[2067, 2068]	2366	[2730, 2462]	3187	[3241, 2964]
725	[1096, 1207]	1546	[2069, 30]	2367	[2731, 1877]	3188	[2499, 3036]
726	[1208, 1209]	1547	[2070, 2071]	2368	[2732, 1961]	3189	[3242, 806]
727	[1210, 387]	1548	[2072, 2073]	2369	[2733, 2734]	3190	[3243, 1837]
728	[1211, 1118]	1549	[2074, 875]	2370	[2735, 1067]	3191	[3244, 3245]
729	[1212, 1213]	1550	[2075, 983]	2371	[2736, 6]	3192	[3246, 3247]
730	[1214, 1215]	1551	[2076, 419]	2372	[2737, 2056]	3193	[3248, 1184]
731	[1216, 1217]	1552	[2077, 2078]	2373	[2738, 2739]	3194	[3249, 65]
732	[1218, 1219]	1553	[257, 2079]	2374	[2740, 984]	3195	[3250, 3251]
733	[1220, 973]	1554	[2080, 1078]	2375	[2741, 26]	3196	[2825, 2912]
734	[1221, 1222]	1555	[2081, 2082]	2376	[119, 382]	3197	[2922, 2407]
735	[1223, 348]	1556	[2083, 2084]	2377	[2742, 2006]	3198	[3137, 3190]
736	[1213, 975]	1557	[2085, 2086]	2378	[2743, 1712]	3199	[3180, 2186]
737	[1117, 1224]	1558	[2087, 1073]	2379	[2030, 2744]	3200	[684, 2880]
738	[1070, 1225]	1559	[1559, 1559]	2380	[2745, 1103]	3201	[2376, 456]
739	[1226, 1227]	1560	[2088, 2089]	2381	[2746, 2747]	3202	[3177, 3252]
740	[1228, 318]	1561	[1634, 2090]	2382	[2748, 117]	3203	[1305, 3159]
741	[1229, 1230]	1562	[2091, 428]	2383	[2749, 2750]	3204	[2938, 486]
742	[1231, 1232]	1563	[2092, 2093]	2384	[2751, 264]	3205	[3169, 1404]
743	[820, 1233]	1564	[2094, 2095]	2385	[2752, 2753]	3206	[2354, 3253]
744	[1234, 675]	1565	[1143, 2096]	2386	[2754, 397]	3207	[2223, 2832]
745	[1235, 594]	1566	[2097, 1786]	2387	[2755, 2756]	3208	[1306, 3254]
746	[1236, 1237]	1567	[2098, 98]	2388	[2757, 25]	3209	[2895, 3167]
747	[1238, 668]	1568	[2099, 2100]	2389	[2758, 321]	3210	[1392, 1498]
748	[1239, 136]	1569	[2101, 1818]	2390	[2759, 2643]	3211	[1498, 3255]
749	[1240, 472]	1570	[2102, 860]	2391	[2760, 2761]	3212	[1549, 1376]
750	[1241, 590]	1571	[2103, 1855]	2392	[2762, 1180]	3213	[1323, 2272]
751	[1242, 1243]	1572	[2104, 932]	2393	[2763, 1886]	3214	[2202, 176]

752	[575, 1244]	1573	[2105, 78]	2394	[2764, 1766]	3215	[3191, 186]
753	[1245, 1246]	1574	[2106, 2107]	2395	[2765, 2766]	3216	[3195, 3256]
754	[135, 1247]	1575	[2108, 2109]	2396	[2767, 2768]	3217	[2887, 3257]
755	[1248, 134]	1576	[2110, 962]	2397	[1877, 2769]	3218	[2352, 186]
756	[174, 669]	1577	[2111, 2112]	2398	[1085, 1026]	3219	[3258, 1518]
757	[1249, 628]	1578	[2113, 2114]	2399	[808, 2042]	3220	[2423, 3139]
758	[1250, 1251]	1579	[2093, 374]	2400	[802, 250]	3221	[2249, 3152]
759	[1252, 1253]	1580	[2115, 818]	2401	[2770, 1012]	3222	[3259, 2298]
760	[1254, 633]	1581	[2116, 868]	2402	[2771, 2772]	3223	[2356, 3260]
761	[1255, 532]	1582	[2117, 1069]	2403	[2433, 2773]	3224	[1450, 1317]
762	[523, 1256]	1583	[2118, 2119]	2404	[2774, 1160]	3225	[3261, 3262]
763	[625, 1257]	1584	[2120, 2121]	2405	[2775, 2776]	3226	[2927, 3184]
764	[1258, 1259]	1585	[2122, 1895]	2406	[1873, 970]	3227	[3160, 452]
765	[1260, 1261]	1586	[2123, 911]	2407	[2777, 876]	3228	[3188, 569]
766	[646, 468]	1587	[2124, 2125]	2408	[2778, 2779]	3229	[2166, 3173]
767	[1262, 715]	1588	[2126, 1807]	2409	[2780, 1074]	3230	[471, 2917]
768	[1263, 696]	1589	[1818, 2127]	2410	[2781, 2782]	3231	[2180, 595]
769	[1264, 1265]	1590	[2128, 2129]	2411	[2783, 1614]	3232	[2906, 1316]
770	[1266, 1267]	1591	[2130, 827]	2412	[2784, 2785]	3233	[1515, 1414]
771	[1268, 1269]	1592	[2131, 976]	2413	[1903, 2786]	3234	[2875, 2177]
772	[1270, 1271]	1593	[2132, 950]	2414	[2787, 2788]	3235	[2397, 2866]
773	[1272, 1273]	1594	[2133, 2134]	2415	[2789, 2790]	3236	[1556, 3164]
774	[204, 547]	1595	[2135, 1051]	2416	[2791, 2792]	3237	[3263, 3264]
775	[1274, 640]	1596	[2136, 2137]	2417	[2793, 2794]	3238	[729, 2195]
776	[1275, 1257]	1597	[2138, 370]	2418	[2795, 2796]	3239	[3182, 1326]
777	[634, 1276]	1598	[2139, 1690]	2419	[2797, 1090]	3240	[2185, 3181]
778	[715, 230]	1599	[2140, 1730]	2420	[2798, 2619]	3241	[2162, 3265]
779	[590, 663]	1600	[2141, 2142]	2421	[876, 381]	3242	[3259, 1471]
780	[1277, 1278]	1601	[2143, 2144]	2422	[2799, 2800]	3243	[3266, 2355]
781	[1279, 10]	1602	[2145, 2146]	2423	[2801, 2802]	3244	[165, 3193]
782	[1280, 1281]	1603	[2147, 1057]	2424	[2803, 795]	3245	[702, 624]
783	[1282, 450]	1604	[2148, 2127]	2425	[2804, 443]	3246	[2348, 3153]
784	[167, 1283]	1605	[2149, 946]	2426	[2805, 2806]	3247	[2346, 2901]
785	[1284, 178]	1606	[2150, 2151]	2427	[2019, 2807]	3248	[1480, 3187]
786	[1285, 487]	1607	[2152, 1076]	2428	[2808, 1849]	3249	[2400, 131]
787	[1286, 621]	1608	[450, 204]	2429	[2809, 1809]	3250	[1355, 1414]
788	[1274, 60]	1609	[2153, 1423]	2430	[2810, 1171]	3251	[2180, 234]
789	[51, 485]	1610	[2154, 1244]	2431	[2811, 2674]	3252	[3267, 919]
790	[198, 564]	1611	[1588, 2155]	2432	[1258, 2159]	3253	[3268, 1911]
791	[1287, 648]	1612	[1436, 1429]	2433	[2257, 2375]	3254	[1710, 352]
792	[127, 522]	1613	[558, 671]	2434	[512, 688]	3255	[1034, 28]
793	[473, 524]	1614	[1419, 476]	2435	[2812, 2288]	3256	[3269, 252]
794	[698, 220]	1615	[191, 2156]	2436	[139, 2190]	3257	[3270, 108]
795	[218, 650]	1616	[39, 62]	2437	[2177, 2813]	3258	[3271, 855]

796	[1288, 638]	1617	[2157, 31]	2438	[2313, 1315]	3259	[3272, 3273]
797	[496, 1289]	1618	[687, 1517]	2439	[1258, 594]	3260	[3274, 954]
798	[604, 1290]	1619	[1297, 643]	2440	[2814, 2815]	3261	[3275, 1979]
799	[1291, 488]	1620	[2158, 2159]	2441	[2262, 550]	3262	[1719, 431]
800	[1292, 1293]	1621	[676, 2160]	2442	[1545, 2367]	3263	[3276, 1192]
801	[524, 665]	1622	[1397, 12]	2443	[1562, 646]	3264	[1148, 1128]
802	[1294, 473]	1623	[2161, 49]	2444	[620, 1359]	3265	[3277, 1182]
803	[1295, 1296]	1624	[2162, 1523]	2445	[1579, 196]	3266	[765, 3278]
804	[1297, 230]	1625	[2163, 2164]	2446	[2181, 2816]	3267	[1447, 620]
805	[129, 455]	1626	[2165, 2166]	2447	[2817, 2407]	3268	[3187, 3279]
806	[1298, 1237]	1627	[1275, 1540]	2448	[716, 237]	3269	[1302, 477]
807	[1299, 128]	1628	[1443, 1359]	2449	[2290, 1378]	3270	[3192, 2940]
808	[530, 1300]	1629	[1484, 1384]	2450	[1239, 639]	3271	[1334, 560]
809	[587, 174]	1630	[1323, 520]	2451	[131, 649]	3272	[1456, 2195]
810	[1301, 1302]	1631	[2167, 1386]	2452	[2818, 727]	3273	[2349, 202]
811	[517, 1303]	1632	[2168, 236]	2453	[1542, 703]	3274	[3168, 3280]
812	[1304, 520]	1633	[728, 1503]	2454	[2819, 2820]	3275	[1522, 3265]
813	[1305, 1306]	1634	[226, 638]	2455	[1442, 1391]	3276	[2221, 2358]
814	[1307, 1308]	1635	[219, 2169]	2456	[2191, 2429]	3277	[3266, 3253]
815	[1309, 1310]	1636	[2170, 1544]	2457	[2821, 1330]	3278	[2337, 2946]
816	[710, 580]	1637	[691, 1307]	2458	[2344, 743]	3279	[1970, 292]
817	[1311, 1312]	1638	[2154, 576]	2459	[2329, 560]	3280	[3281, 1640]
818	[1313, 686]	1639	[610, 652]	2460	[603, 180]	3281	[2169, 531]
819	[1314, 1315]	1640	[641, 1300]	2461	[2398, 579]		
820	[231, 1316]	1641	[2171, 2172]	2462	[2350, 515]		

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	548	1	1096	1	1644	0	2192	0	2740	1
1	0	549	0	1097	1	1645	1	2193	1	2741	1
2	0	550	0	1098	0	1646	0	2194	0	2742	1
3	0	551	1	1099	0	1647	0	2195	0	2743	0
4	1	552	0	1100	1	1648	0	2196	1	2744	1
5	0	553	0	1101	1	1649	0	2197	0	2745	1
6	0	554	0	1102	0	1650	0	2198	1	2746	0
7	0	555	1	1103	1	1651	0	2199	1	2747	0
8	1	556	0	1104	0	1652	0	2200	1	2748	0
9	1	557	1	1105	0	1653	0	2201	0	2749	0
10	0	558	0	1106	0	1654	1	2202	1	2750	0
11	0	559	0	1107	0	1655	0	2203	1	2751	0
12	0	560	0	1108	1	1656	0	2204	1	2752	1
13	0	561	1	1109	0	1657	1	2205	1	2753	0
14	0	562	0	1110	1	1658	1	2206	0	2754	0
15	0	563	1	1111	1	1659	0	2207	1	2755	0

16	0	564	1	1112	1	1660	1	2208	1	2756	1
17	1	565	1	1113	0	1661	0	2209	0	2757	0
18	0	566	1	1114	1	1662	0	2210	1	2758	0
19	1	567	1	1115	0	1663	1	2211	0	2759	0
20	1	568	1	1116	1	1664	0	2212	0	2760	1
21	0	569	1	1117	1	1665	1	2213	0	2761	1
22	0	570	1	1118	0	1666	0	2214	1	2762	1
23	0	571	0	1119	1	1667	1	2215	0	2763	1
24	0	572	1	1120	0	1668	0	2216	1	2764	1
25	0	573	0	1121	1	1669	1	2217	1	2765	1
26	0	574	1	1122	1	1670	0	2218	0	2766	1
27	0	575	0	1123	1	1671	0	2219	0	2767	0
28	0	576	1	1124	1	1672	1	2220	0	2768	1
29	0	577	1	1125	0	1673	1	2221	1	2769	1
30	0	578	0	1126	1	1674	1	2222	1	2770	0
31	0	579	1	1127	1	1675	1	2223	0	2771	1
32	0	580	1	1128	0	1676	0	2224	0	2772	0
33	0	581	1	1129	1	1677	1	2225	0	2773	1
34	0	582	1	1130	0	1678	0	2226	1	2774	0
35	1	583	1	1131	1	1679	1	2227	1	2775	1
36	1	584	0	1132	1	1680	1	2228	0	2776	0
37	0	585	0	1133	1	1681	0	2229	1	2777	1
38	0	586	0	1134	0	1682	0	2230	1	2778	0
39	1	587	1	1135	1	1683	1	2231	1	2779	0
40	1	588	1	1136	0	1684	0	2232	1	2780	0
41	1	589	1	1137	1	1685	0	2233	1	2781	1
42	0	590	1	1138	0	1686	1	2234	1	2782	1
43	0	591	0	1139	0	1687	1	2235	1	2783	0
44	0	592	0	1140	1	1688	0	2236	1	2784	1
45	0	593	1	1141	0	1689	1	2237	1	2785	1
46	0	594	0	1142	0	1690	0	2238	0	2786	0
47	0	595	0	1143	1	1691	0	2239	1	2787	1
48	0	596	1	1144	0	1692	1	2240	1	2788	0
49	0	597	0	1145	1	1693	1	2241	0	2789	1
50	0	598	0	1146	0	1694	0	2242	0	2790	1
51	0	599	0	1147	0	1695	1	2243	1	2791	1
52	0	600	0	1148	0	1696	0	2244	0	2792	1
53	0	601	1	1149	0	1697	1	2245	0	2793	0
54	0	602	0	1150	0	1698	0	2246	1	2794	1
55	0	603	0	1151	0	1699	1	2247	0	2795	1
56	1	604	1	1152	1	1700	1	2248	1	2796	1
57	0	605	0	1153	1	1701	0	2249	0	2797	0
58	1	606	0	1154	0	1702	1	2250	0	2798	0
59	0	607	1	1155	0	1703	1	2251	0	2799	1

60	0	608	0	1156	1	1704	0	2252	0	2800	0
61	0	609	0	1157	1	1705	0	2253	1	2801	0
62	1	610	0	1158	1	1706	1	2254	1	2802	0
63	0	611	0	1159	1	1707	0	2255	0	2803	1
64	0	612	0	1160	1	1708	0	2256	1	2804	0
65	0	613	1	1161	0	1709	0	2257	1	2805	1
66	0	614	1	1162	1	1710	0	2258	1	2806	0
67	0	615	0	1163	1	1711	1	2259	1	2807	0
68	0	616	0	1164	1	1712	1	2260	0	2808	0
69	0	617	1	1165	1	1713	0	2261	1	2809	0
70	0	618	1	1166	1	1714	1	2262	1	2810	0
71	1	619	1	1167	1	1715	0	2263	0	2811	0
72	1	620	0	1168	0	1716	0	2264	1	2812	0
73	1	621	0	1169	1	1717	1	2265	1	2813	1
74	0	622	1	1170	0	1718	0	2266	0	2814	1
75	0	623	0	1171	0	1719	0	2267	0	2815	0
76	1	624	0	1172	1	1720	0	2268	0	2816	1
77	0	625	0	1173	1	1721	0	2269	0	2817	1
78	0	626	0	1174	1	1722	1	2270	1	2818	0
79	1	627	0	1175	0	1723	0	2271	0	2819	1
80	0	628	0	1176	0	1724	0	2272	1	2820	0
81	1	629	1	1177	1	1725	1	2273	0	2821	0
82	1	630	1	1178	1	1726	0	2274	1	2822	1
83	1	631	0	1179	0	1727	0	2275	0	2823	0
84	0	632	0	1180	1	1728	0	2276	1	2824	1
85	1	633	1	1181	1	1729	1	2277	1	2825	0
86	0	634	0	1182	0	1730	1	2278	1	2826	1
87	1	635	1	1183	1	1731	1	2279	0	2827	1
88	0	636	1	1184	0	1732	0	2280	0	2828	0
89	0	637	1	1185	1	1733	1	2281	0	2829	0
90	0	638	1	1186	1	1734	1	2282	0	2830	1
91	0	639	0	1187	0	1735	1	2283	1	2831	0
92	0	640	0	1188	0	1736	0	2284	1	2832	1
93	1	641	1	1189	1	1737	0	2285	0	2833	1
94	0	642	0	1190	1	1738	0	2286	1	2834	0
95	0	643	1	1191	0	1739	1	2287	1	2835	0
96	0	644	1	1192	0	1740	1	2288	1	2836	1
97	0	645	0	1193	1	1741	1	2289	0	2837	0
98	0	646	0	1194	1	1742	1	2290	1	2838	1
99	0	647	0	1195	0	1743	1	2291	1	2839	0
100	0	648	1	1196	1	1744	1	2292	1	2840	0
101	0	649	0	1197	0	1745	1	2293	1	2841	1
102	0	650	1	1198	1	1746	1	2294	0	2842	1
103	0	651	0	1199	0	1747	1	2295	0	2843	1

104	0	652	1	1200	1	1748	1	2296	1	2844	0
105	0	653	0	1201	1	1749	0	2297	0	2845	1
106	0	654	0	1202	0	1750	1	2298	0	2846	1
107	0	655	1	1203	0	1751	1	2299	0	2847	0
108	0	656	0	1204	0	1752	0	2300	1	2848	1
109	1	657	0	1205	0	1753	1	2301	0	2849	1
110	0	658	0	1206	1	1754	0	2302	0	2850	1
111	1	659	1	1207	1	1755	0	2303	0	2851	0
112	1	660	0	1208	1	1756	1	2304	1	2852	1
113	1	661	1	1209	0	1757	1	2305	1	2853	0
114	0	662	0	1210	0	1758	0	2306	1	2854	0
115	1	663	1	1211	0	1759	1	2307	1	2855	1
116	1	664	0	1212	0	1760	1	2308	0	2856	0
117	1	665	1	1213	0	1761	0	2309	0	2857	0
118	0	666	0	1214	0	1762	1	2310	0	2858	1
119	0	667	0	1215	1	1763	0	2311	0	2859	1
120	0	668	1	1216	0	1764	0	2312	0	2860	0
121	1	669	1	1217	1	1765	0	2313	1	2861	1
122	0	670	1	1218	1	1766	0	2314	1	2862	0
123	0	671	0	1219	0	1767	1	2315	0	2863	0
124	1	672	1	1220	1	1768	0	2316	0	2864	1
125	1	673	1	1221	0	1769	0	2317	1	2865	1
126	0	674	1	1222	1	1770	1	2318	0	2866	0
127	1	675	1	1223	0	1771	1	2319	1	2867	0
128	1	676	1	1224	0	1772	1	2320	1	2868	0
129	0	677	0	1225	0	1773	1	2321	0	2869	0
130	0	678	0	1226	1	1774	1	2322	1	2870	0
131	0	679	0	1227	0	1775	1	2323	0	2871	1
132	1	680	1	1228	0	1776	0	2324	1	2872	0
133	0	681	0	1229	0	1777	0	2325	1	2873	0
134	0	682	0	1230	1	1778	0	2326	1	2874	1
135	0	683	1	1231	1	1779	0	2327	1	2875	1
136	1	684	0	1232	0	1780	0	2328	0	2876	1
137	0	685	0	1233	1	1781	0	2329	1	2877	1
138	1	686	0	1234	0	1782	1	2330	1	2878	1
139	0	687	1	1235	0	1783	1	2331	1	2879	0
140	1	688	0	1236	0	1784	0	2332	1	2880	0
141	0	689	0	1237	0	1785	1	2333	1	2881	1
142	1	690	1	1238	1	1786	1	2334	0	2882	1
143	1	691	1	1239	0	1787	1	2335	1	2883	1
144	1	692	1	1240	0	1788	1	2336	0	2884	0
145	1	693	0	1241	1	1789	0	2337	1	2885	1
146	1	694	1	1242	1	1790	1	2338	1	2886	0
147	0	695	1	1243	1	1791	0	2339	1	2887	1

148	1	696	1	1244	0	1792	1	2340	1	2888	1
149	1	697	0	1245	0	1793	1	2341	0	2889	0
150	0	698	0	1246	0	1794	1	2342	1	2890	1
151	0	699	0	1247	0	1795	0	2343	0	2891	1
152	0	700	1	1248	1	1796	0	2344	0	2892	0
153	0	701	1	1249	1	1797	0	2345	1	2893	0
154	0	702	0	1250	1	1798	1	2346	1	2894	0
155	1	703	1	1251	0	1799	0	2347	0	2895	1
156	1	704	0	1252	0	1800	0	2348	1	2896	0
157	0	705	1	1253	1	1801	0	2349	1	2897	1
158	1	706	1	1254	0	1802	0	2350	0	2898	1
159	0	707	1	1255	1	1803	1	2351	1	2899	1
160	1	708	1	1256	1	1804	0	2352	0	2900	1
161	1	709	0	1257	0	1805	0	2353	0	2901	0
162	1	710	1	1258	0	1806	1	2354	1	2902	1
163	1	711	1	1259	1	1807	1	2355	0	2903	1
164	0	712	0	1260	0	1808	1	2356	1	2904	1
165	1	713	1	1261	0	1809	1	2357	1	2905	0
166	1	714	1	1262	0	1810	1	2358	0	2906	0
167	1	715	0	1263	0	1811	0	2359	1	2907	0
168	0	716	0	1264	0	1812	1	2360	1	2908	0
169	0	717	1	1265	0	1813	1	2361	0	2909	1
170	1	718	0	1266	1	1814	0	2362	1	2910	0
171	0	719	1	1267	0	1815	0	2363	1	2911	1
172	0	720	0	1268	0	1816	0	2364	1	2912	1
173	0	721	0	1269	1	1817	0	2365	0	2913	1
174	0	722	0	1270	0	1818	0	2366	0	2914	0
175	0	723	0	1271	0	1819	0	2367	1	2915	1
176	0	724	0	1272	1	1820	0	2368	1	2916	0
177	0	725	1	1273	1	1821	1	2369	1	2917	0
178	0	726	1	1274	1	1822	1	2370	0	2918	0
179	0	727	0	1275	1	1823	1	2371	1	2919	1
180	0	728	0	1276	1	1824	0	2372	0	2920	1
181	1	729	0	1277	0	1825	1	2373	1	2921	1
182	1	730	0	1278	0	1826	1	2374	1	2922	0
183	0	731	0	1279	0	1827	0	2375	1	2923	0
184	1	732	1	1280	1	1828	0	2376	0	2924	0
185	0	733	1	1281	1	1829	0	2377	1	2925	0
186	1	734	0	1282	1	1830	1	2378	0	2926	0
187	0	735	0	1283	0	1831	1	2379	0	2927	1
188	1	736	0	1284	1	1832	1	2380	1	2928	0
189	0	737	1	1285	1	1833	1	2381	0	2929	0
190	0	738	1	1286	1	1834	0	2382	0	2930	1
191	0	739	1	1287	1	1835	1	2383	0	2931	1

192	0	740	0	1288	0	1836	1	2384	0	2932	1
193	0	741	0	1289	1	1837	1	2385	1	2933	1
194	0	742	1	1290	0	1838	0	2386	0	2934	0
195	0	743	0	1291	1	1839	1	2387	0	2935	0
196	0	744	0	1292	1	1840	1	2388	0	2936	1
197	0	745	0	1293	1	1841	1	2389	0	2937	0
198	0	746	0	1294	0	1842	0	2390	0	2938	0
199	1	747	1	1295	1	1843	1	2391	1	2939	0
200	0	748	0	1296	1	1844	1	2392	1	2940	1
201	0	749	0	1297	1	1845	1	2393	1	2941	0
202	0	750	1	1298	1	1846	1	2394	1	2942	1
203	1	751	1	1299	1	1847	1	2395	1	2943	1
204	0	752	0	1300	1	1848	1	2396	0	2944	1
205	1	753	0	1301	0	1849	1	2397	1	2945	1
206	1	754	0	1302	0	1850	1	2398	0	2946	0
207	0	755	1	1303	1	1851	0	2399	1	2947	0
208	1	756	0	1304	0	1852	1	2400	0	2948	1
209	0	757	1	1305	0	1853	1	2401	0	2949	1
210	0	758	1	1306	1	1854	1	2402	1	2950	1
211	1	759	0	1307	0	1855	0	2403	1	2951	0
212	0	760	0	1308	1	1856	0	2404	0	2952	1
213	1	761	1	1309	0	1857	0	2405	1	2953	0
214	1	762	0	1310	1	1858	0	2406	0	2954	1
215	0	763	0	1311	0	1859	1	2407	1	2955	1
216	1	764	0	1312	0	1860	0	2408	0	2956	0
217	0	765	0	1313	1	1861	1	2409	0	2957	1
218	1	766	0	1314	0	1862	0	2410	1	2958	0
219	1	767	0	1315	1	1863	0	2411	0	2959	0
220	1	768	0	1316	0	1864	0	2412	1	2960	1
221	1	769	0	1317	1	1865	0	2413	0	2961	0
222	1	770	1	1318	1	1866	1	2414	1	2962	0
223	1	771	0	1319	0	1867	1	2415	1	2963	1
224	0	772	0	1320	1	1868	1	2416	1	2964	1
225	0	773	1	1321	0	1869	1	2417	0	2965	1
226	1	774	0	1322	0	1870	0	2418	1	2966	0
227	0	775	1	1323	0	1871	1	2419	0	2967	1
228	0	776	1	1324	1	1872	0	2420	0	2968	1
229	1	777	0	1325	1	1873	0	2421	1	2969	0
230	0	778	0	1326	1	1874	0	2422	1	2970	0
231	0	779	1	1327	1	1875	0	2423	0	2971	0
232	0	780	0	1328	1	1876	0	2424	1	2972	1
233	1	781	0	1329	1	1877	1	2425	0	2973	1
234	1	782	1	1330	1	1878	1	2426	1	2974	0
235	1	783	1	1331	0	1879	1	2427	1	2975	0

236	1	784	1	1332	1	1880	1	2428	0	2976	1
237	0	785	1	1333	1	1881	1	2429	0	2977	0
238	0	786	1	1334	0	1882	1	2430	0	2978	1
239	1	787	1	1335	1	1883	1	2431	0	2979	1
240	1	788	1	1336	0	1884	1	2432	0	2980	1
241	1	789	0	1337	1	1885	0	2433	1	2981	0
242	1	790	0	1338	0	1886	0	2434	0	2982	1
243	1	791	1	1339	1	1887	0	2435	0	2983	1
244	0	792	1	1340	0	1888	1	2436	0	2984	1
245	0	793	1	1341	1	1889	1	2437	0	2985	0
246	0	794	0	1342	0	1890	1	2438	1	2986	1
247	1	795	1	1343	0	1891	1	2439	0	2987	1
248	0	796	0	1344	1	1892	1	2440	1	2988	0
249	0	797	0	1345	0	1893	1	2441	1	2989	0
250	1	798	1	1346	1	1894	0	2442	1	2990	0
251	1	799	1	1347	1	1895	1	2443	1	2991	1
252	0	800	1	1348	1	1896	1	2444	0	2992	0
253	1	801	1	1349	1	1897	1	2445	0	2993	1
254	0	802	0	1350	1	1898	0	2446	0	2994	0
255	1	803	1	1351	0	1899	1	2447	1	2995	0
256	0	804	1	1352	0	1900	0	2448	0	2996	1
257	0	805	0	1353	0	1901	0	2449	1	2997	0
258	1	806	1	1354	0	1902	0	2450	0	2998	1
259	0	807	1	1355	1	1903	0	2451	0	2999	1
260	0	808	1	1356	0	1904	1	2452	0	3000	0
261	0	809	1	1357	1	1905	0	2453	1	3001	1
262	1	810	0	1358	0	1906	1	2454	1	3002	0
263	0	811	0	1359	1	1907	0	2455	1	3003	1
264	0	812	0	1360	0	1908	1	2456	0	3004	1
265	1	813	0	1361	0	1909	1	2457	0	3005	1
266	1	814	0	1362	1	1910	1	2458	0	3006	1
267	1	815	0	1363	0	1911	1	2459	1	3007	0
268	0	816	1	1364	0	1912	0	2460	0	3008	1
269	1	817	0	1365	1	1913	1	2461	0	3009	1
270	1	818	1	1366	0	1914	1	2462	0	3010	0
271	0	819	0	1367	0	1915	1	2463	1	3011	0
272	1	820	0	1368	0	1916	1	2464	1	3012	0
273	0	821	1	1369	0	1917	1	2465	1	3013	1
274	1	822	0	1370	1	1918	1	2466	1	3014	0
275	0	823	0	1371	1	1919	0	2467	0	3015	1
276	1	824	0	1372	1	1920	1	2468	0	3016	0
277	1	825	0	1373	0	1921	1	2469	1	3017	1
278	1	826	0	1374	1	1922	1	2470	1	3018	0
279	0	827	0	1375	0	1923	0	2471	0	3019	1

280	0	828	0	1376	0	1924	1	2472	0	3020	0
281	1	829	0	1377	0	1925	0	2473	0	3021	1
282	0	830	1	1378	0	1926	0	2474	1	3022	0
283	1	831	1	1379	1	1927	1	2475	0	3023	0
284	1	832	1	1380	1	1928	1	2476	0	3024	0
285	0	833	1	1381	0	1929	0	2477	0	3025	0
286	1	834	1	1382	1	1930	0	2478	1	3026	1
287	0	835	1	1383	0	1931	1	2479	0	3027	1
288	0	836	0	1384	0	1932	1	2480	0	3028	1
289	0	837	0	1385	1	1933	1	2481	1	3029	0
290	0	838	1	1386	1	1934	0	2482	0	3030	0
291	0	839	1	1387	1	1935	1	2483	1	3031	0
292	0	840	0	1388	1	1936	0	2484	1	3032	0
293	0	841	1	1389	1	1937	0	2485	1	3033	0
294	1	842	0	1390	0	1938	0	2486	1	3034	1
295	1	843	0	1391	1	1939	0	2487	0	3035	0
296	0	844	1	1392	1	1940	0	2488	1	3036	1
297	1	845	0	1393	0	1941	0	2489	0	3037	1
298	1	846	1	1394	1	1942	1	2490	1	3038	1
299	0	847	0	1395	1	1943	1	2491	0	3039	1
300	1	848	0	1396	1	1944	1	2492	0	3040	0
301	1	849	1	1397	1	1945	1	2493	0	3041	1
302	1	850	0	1398	1	1946	0	2494	1	3042	0
303	0	851	1	1399	1	1947	0	2495	1	3043	0
304	0	852	1	1400	0	1948	1	2496	1	3044	1
305	1	853	1	1401	0	1949	0	2497	1	3045	0
306	0	854	1	1402	0	1950	0	2498	1	3046	1
307	1	855	0	1403	0	1951	1	2499	0	3047	1
308	1	856	0	1404	0	1952	0	2500	1	3048	0
309	1	857	0	1405	0	1953	0	2501	1	3049	0
310	1	858	0	1406	0	1954	1	2502	0	3050	1
311	1	859	1	1407	1	1955	0	2503	1	3051	1
312	0	860	0	1408	1	1956	0	2504	0	3052	0
313	0	861	0	1409	1	1957	1	2505	1	3053	1
314	0	862	0	1410	0	1958	0	2506	1	3054	1
315	1	863	1	1411	0	1959	1	2507	0	3055	0
316	1	864	1	1412	0	1960	0	2508	0	3056	1
317	1	865	0	1413	0	1961	1	2509	1	3057	1
318	1	866	0	1414	0	1962	0	2510	1	3058	1
319	1	867	0	1415	1	1963	0	2511	1	3059	0
320	0	868	1	1416	1	1964	0	2512	0	3060	0
321	0	869	0	1417	1	1965	1	2513	1	3061	0
322	1	870	0	1418	1	1966	0	2514	0	3062	1
323	0	871	0	1419	1	1967	1	2515	0	3063	0

324	0	872	1	1420	1	1968	0	2516	0	3064	1
325	1	873	0	1421	0	1969	0	2517	1	3065	1
326	0	874	0	1422	1	1970	1	2518	0	3066	1
327	0	875	0	1423	0	1971	0	2519	0	3067	1
328	1	876	1	1424	0	1972	1	2520	1	3068	1
329	0	877	1	1425	1	1973	1	2521	0	3069	0
330	0	878	1	1426	1	1974	0	2522	1	3070	1
331	0	879	0	1427	1	1975	0	2523	1	3071	1
332	0	880	1	1428	1	1976	1	2524	0	3072	1
333	0	881	0	1429	0	1977	0	2525	0	3073	1
334	1	882	0	1430	1	1978	0	2526	0	3074	0
335	0	883	1	1431	0	1979	1	2527	1	3075	0
336	1	884	0	1432	1	1980	1	2528	0	3076	0
337	0	885	1	1433	1	1981	0	2529	1	3077	0
338	0	886	0	1434	1	1982	0	2530	1	3078	1
339	0	887	1	1435	1	1983	0	2531	0	3079	1
340	1	888	0	1436	0	1984	1	2532	0	3080	1
341	0	889	1	1437	1	1985	1	2533	0	3081	1
342	1	890	1	1438	1	1986	0	2534	1	3082	0
343	0	891	0	1439	0	1987	1	2535	1	3083	1
344	1	892	1	1440	1	1988	0	2536	1	3084	0
345	1	893	1	1441	1	1989	0	2537	0	3085	0
346	0	894	0	1442	1	1990	1	2538	1	3086	0
347	1	895	1	1443	1	1991	0	2539	0	3087	0
348	0	896	0	1444	1	1992	1	2540	1	3088	0
349	0	897	0	1445	1	1993	0	2541	0	3089	1
350	0	898	1	1446	1	1994	0	2542	1	3090	0
351	1	899	0	1447	1	1995	1	2543	1	3091	1
352	1	900	1	1448	1	1996	0	2544	1	3092	1
353	0	901	1	1449	1	1997	0	2545	0	3093	0
354	1	902	1	1450	0	1998	0	2546	1	3094	0
355	1	903	1	1451	1	1999	0	2547	1	3095	1
356	0	904	0	1452	1	2000	1	2548	1	3096	0
357	0	905	1	1453	0	2001	1	2549	1	3097	0
358	1	906	0	1454	1	2002	1	2550	1	3098	0
359	1	907	1	1455	1	2003	0	2551	1	3099	1
360	0	908	1	1456	1	2004	1	2552	1	3100	1
361	1	909	0	1457	0	2005	0	2553	0	3101	0
362	0	910	0	1458	0	2006	1	2554	0	3102	0
363	0	911	1	1459	0	2007	1	2555	0	3103	1
364	0	912	0	1460	0	2008	1	2556	1	3104	1
365	0	913	1	1461	1	2009	0	2557	0	3105	1
366	0	914	0	1462	1	2010	0	2558	0	3106	1
367	0	915	1	1463	1	2011	1	2559	0	3107	1

368	0	916	1	1464	1	2012	1	2560	1	3108	1
369	1	917	1	1465	0	2013	1	2561	1	3109	0
370	0	918	1	1466	1	2014	1	2562	1	3110	0
371	0	919	0	1467	0	2015	0	2563	1	3111	1
372	0	920	1	1468	1	2016	0	2564	0	3112	0
373	0	921	0	1469	0	2017	1	2565	0	3113	0
374	0	922	0	1470	1	2018	0	2566	0	3114	1
375	0	923	0	1471	0	2019	1	2567	0	3115	0
376	0	924	0	1472	1	2020	1	2568	0	3116	0
377	0	925	1	1473	0	2021	0	2569	1	3117	1
378	1	926	1	1474	0	2022	1	2570	0	3118	1
379	0	927	0	1475	0	2023	0	2571	1	3119	1
380	0	928	0	1476	0	2024	1	2572	0	3120	0
381	1	929	0	1477	1	2025	1	2573	0	3121	0
382	0	930	0	1478	1	2026	1	2574	1	3122	0
383	1	931	0	1479	0	2027	1	2575	1	3123	1
384	0	932	0	1480	0	2028	1	2576	1	3124	1
385	0	933	1	1481	0	2029	0	2577	1	3125	0
386	1	934	0	1482	1	2030	0	2578	1	3126	0
387	1	935	1	1483	0	2031	0	2579	1	3127	1
388	0	936	1	1484	1	2032	0	2580	1	3128	1
389	1	937	0	1485	0	2033	0	2581	0	3129	0
390	1	938	0	1486	1	2034	1	2582	0	3130	1
391	1	939	1	1487	0	2035	1	2583	1	3131	1
392	1	940	0	1488	1	2036	0	2584	0	3132	1
393	1	941	0	1489	1	2037	1	2585	0	3133	0
394	0	942	0	1490	0	2038	0	2586	1	3134	0
395	1	943	1	1491	0	2039	0	2587	1	3135	0
396	1	944	0	1492	1	2040	0	2588	1	3136	1
397	0	945	0	1493	0	2041	0	2589	1	3137	0
398	0	946	1	1494	0	2042	1	2590	1	3138	0
399	0	947	1	1495	1	2043	1	2591	0	3139	1
400	0	948	0	1496	0	2044	0	2592	1	3140	0
401	1	949	1	1497	1	2045	0	2593	0	3141	1
402	0	950	1	1498	0	2046	1	2594	0	3142	0
403	0	951	1	1499	0	2047	0	2595	0	3143	0
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405	1	953	1	1501	1	2049	1	2597	1	3145	1
406	0	954	0	1502	0	2050	1	2598	0	3146	1
407	1	955	1	1503	0	2051	1	2599	1	3147	1
408	1	956	1	1504	1	2052	0	2600	0	3148	1
409	0	957	1	1505	1	2053	0	2601	1	3149	1
410	0	958	1	1506	0	2054	1	2602	0	3150	1
411	1	959	1	1507	1	2055	1	2603	1	3151	0

412	1	960	0	1508	1	2056	1	2604	1	3152	0
413	0	961	1	1509	0	2057	0	2605	1	3153	0
414	0	962	1	1510	1	2058	1	2606	1	3154	1
415	1	963	0	1511	0	2059	1	2607	0	3155	0
416	0	964	1	1512	1	2060	1	2608	0	3156	0
417	1	965	1	1513	0	2061	0	2609	1	3157	1
418	0	966	1	1514	1	2062	1	2610	0	3158	1
419	1	967	0	1515	0	2063	0	2611	0	3159	1
420	1	968	1	1516	1	2064	1	2612	1	3160	1
421	1	969	1	1517	1	2065	1	2613	1	3161	0
422	1	970	1	1518	1	2066	1	2614	1	3162	0
423	1	971	1	1519	0	2067	1	2615	1	3163	0
424	0	972	0	1520	0	2068	0	2616	1	3164	1
425	1	973	1	1521	0	2069	1	2617	1	3165	1
426	0	974	1	1522	1	2070	1	2618	1	3166	0
427	0	975	0	1523	0	2071	1	2619	0	3167	1
428	1	976	1	1524	0	2072	1	2620	0	3168	0
429	0	977	0	1525	0	2073	1	2621	1	3169	1
430	1	978	1	1526	0	2074	0	2622	0	3170	0
431	0	979	1	1527	1	2075	0	2623	1	3171	1
432	0	980	1	1528	0	2076	0	2624	1	3172	0
433	0	981	1	1529	1	2077	1	2625	1	3173	1
434	0	982	1	1530	0	2078	1	2626	0	3174	0
435	1	983	0	1531	1	2079	1	2627	0	3175	1
436	0	984	0	1532	1	2080	1	2628	0	3176	1
437	0	985	0	1533	1	2081	1	2629	0	3177	0
438	0	986	0	1534	0	2082	1	2630	1	3178	1
439	0	987	1	1535	1	2083	0	2631	0	3179	1
440	1	988	1	1536	1	2084	0	2632	0	3180	1
441	0	989	1	1537	1	2085	0	2633	1	3181	1
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444	1	992	1	1540	1	2088	1	2636	0	3184	0
445	1	993	1	1541	0	2089	0	2637	0	3185	0
446	1	994	0	1542	1	2090	0	2638	1	3186	1
447	1	995	0	1543	1	2091	1	2639	1	3187	0
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450	0	998	1	1546	1	2094	0	2642	1	3190	0
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452	1	1000	0	1548	1	2096	0	2644	1	3192	1
453	0	1001	0	1549	0	2097	1	2645	1	3193	0
454	1	1002	0	1550	0	2098	0	2646	0	3194	0
455	0	1003	1	1551	0	2099	1	2647	0	3195	1

456	1	1004	1	1552	1	2100	1	2648	0	3196	0
457	1	1005	0	1553	0	2101	1	2649	1	3197	0
458	0	1006	0	1554	1	2102	0	2650	0	3198	0
459	1	1007	1	1555	1	2103	0	2651	0	3199	1
460	0	1008	0	1556	0	2104	1	2652	1	3200	0
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462	0	1010	0	1558	1	2106	1	2654	1	3202	0
463	0	1011	0	1559	0	2107	0	2655	1	3203	0
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466	1	1014	1	1562	1	2110	0	2658	1	3206	1
467	1	1015	0	1563	0	2111	1	2659	1	3207	0
468	0	1016	0	1564	0	2112	1	2660	1	3208	1
469	1	1017	1	1565	1	2113	1	2661	1	3209	1
470	0	1018	0	1566	1	2114	0	2662	1	3210	1
471	1	1019	0	1567	0	2115	1	2663	1	3211	0
472	1	1020	1	1568	1	2116	0	2664	0	3212	0
473	1	1021	0	1569	1	2117	0	2665	1	3213	0
474	1	1022	1	1570	0	2118	1	2666	0	3214	1
475	0	1023	0	1571	0	2119	1	2667	0	3215	1
476	0	1024	1	1572	1	2120	1	2668	1	3216	1
477	1	1025	0	1573	1	2121	0	2669	0	3217	1
478	1	1026	0	1574	1	2122	1	2670	1	3218	0
479	0	1027	1	1575	1	2123	1	2671	1	3219	0
480	1	1028	0	1576	0	2124	1	2672	1	3220	0
481	1	1029	1	1577	1	2125	1	2673	1	3221	0
482	0	1030	1	1578	1	2126	0	2674	0	3222	1
483	1	1031	0	1579	0	2127	1	2675	1	3223	1
484	0	1032	1	1580	1	2128	1	2676	1	3224	0
485	1	1033	0	1581	0	2129	0	2677	1	3225	1
486	1	1034	1	1582	0	2130	0	2678	1	3226	1
487	0	1035	0	1583	1	2131	0	2679	1	3227	1
488	0	1036	1	1584	1	2132	0	2680	0	3228	0
489	0	1037	1	1585	1	2133	0	2681	1	3229	1
490	0	1038	0	1586	1	2134	0	2682	1	3230	1
491	0	1039	1	1587	1	2135	1	2683	0	3231	0
492	1	1040	1	1588	0	2136	1	2684	0	3232	0
493	0	1041	1	1589	0	2137	0	2685	0	3233	0
494	0	1042	0	1590	1	2138	1	2686	1	3234	1
495	0	1043	0	1591	0	2139	0	2687	0	3235	1
496	0	1044	0	1592	0	2140	0	2688	1	3236	0
497	1	1045	0	1593	0	2141	1	2689	0	3237	1
498	1	1046	0	1594	0	2142	0	2690	1	3238	0
499	1	1047	0	1595	1	2143	1	2691	1	3239	0

500	1	1048	1	1596	1	2144	1	2692	1	3240	0
501	0	1049	0	1597	1	2145	0	2693	0	3241	0
502	1	1050	0	1598	0	2146	1	2694	1	3242	1
503	1	1051	1	1599	0	2147	1	2695	0	3243	0
504	0	1052	0	1600	1	2148	1	2696	0	3244	1
505	1	1053	0	1601	1	2149	1	2697	1	3245	0
506	1	1054	0	1602	0	2150	0	2698	1	3246	1
507	0	1055	0	1603	1	2151	1	2699	0	3247	1
508	0	1056	0	1604	1	2152	0	2700	0	3248	0
509	1	1057	0	1605	1	2153	0	2701	1	3249	0
510	1	1058	1	1606	0	2154	0	2702	0	3250	1
511	0	1059	0	1607	0	2155	0	2703	1	3251	0
512	0	1060	1	1608	0	2156	0	2704	0	3252	1
513	1	1061	1	1609	0	2157	1	2705	0	3253	0
514	0	1062	0	1610	0	2158	1	2706	1	3254	0
515	0	1063	1	1611	0	2159	1	2707	1	3255	1
516	1	1064	0	1612	0	2160	1	2708	0	3256	0
517	0	1065	1	1613	0	2161	0	2709	0	3257	1
518	1	1066	0	1614	1	2162	0	2710	1	3258	0
519	0	1067	0	1615	0	2163	0	2711	1	3259	1
520	0	1068	1	1616	1	2164	0	2712	0	3260	0
521	0	1069	1	1617	1	2165	0	2713	1	3261	1
522	1	1070	1	1618	1	2166	1	2714	0	3262	0
523	0	1071	1	1619	1	2167	0	2715	1	3263	1
524	1	1072	1	1620	1	2168	0	2716	1	3264	0
525	0	1073	1	1621	1	2169	1	2717	0	3265	0
526	0	1074	0	1622	1	2170	0	2718	1	3266	0
527	1	1075	1	1623	0	2171	0	2719	1	3267	1
528	1	1076	1	1624	0	2172	1	2720	1	3268	0
529	1	1077	0	1625	0	2173	1	2721	0	3269	0
530	1	1078	0	1626	0	2174	0	2722	0	3270	1
531	0	1079	0	1627	1	2175	0	2723	1	3271	0
532	1	1080	0	1628	1	2176	1	2724	0	3272	1
533	0	1081	1	1629	1	2177	0	2725	1	3273	1
534	0	1082	0	1630	0	2178	0	2726	1	3274	0
535	1	1083	0	1631	0	2179	0	2727	1	3275	1
536	0	1084	1	1632	0	2180	0	2728	1	3276	1
537	1	1085	0	1633	0	2181	0	2729	0	3277	0
538	1	1086	0	1634	1	2182	1	2730	0	3278	1
539	0	1087	0	1635	1	2183	0	2731	1	3279	1
540	0	1088	0	1636	0	2184	0	2732	1	3280	1
541	1	1089	0	1637	1	2185	0	2733	1	3281	1
542	0	1090	1	1638	0	2186	1	2734	0		
543	0	1091	0	1639	0	2187	0	2735	0		

544	0	1092	0	1640	1	2188	1	2736	1		
545	1	1093	1	1641	0	2189	1	2737	0		
546	1	1094	1	1642	1	2190	1	2738	1		
547	0	1095	0	1643	1	2191	0	2739	0		

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