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

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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 $(a,b) = (z^3+z, z^4+z^3+z^2+z+1)$.

1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

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

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

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

$$\begin{aligned}
p_0(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{14}+z^{13}+z^{10}+z^7+z^6+z^4+z^3+z+1,\\
p_1(z)&=z^{25}+z^{24}+z^{20}+z^{19}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{11}+z^{10}+z^9\\
&\quad+z^8+z^6+z^2+z,\\
p_2(z)&=z^{28}+z^{24}+z^{22}+z^{20}+z^{18}+z^{16}+z^{14}+z^{10}+z^6+z^2,\\
p_3(z)&=z^{25}+z^{24}+z^{20}+z^{19}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{11}+z^{10}+z^9\\
&\quad+z^8+z^6+z^2+z,\\
p_4(z)&=z^{22}+z^{21}+z^{19}+z^{13}+z^7+z^3+z^2+z,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{16}+z^{14}+z^{13}+z^{10}+z^8+z^7+z^6+z^4+z^3\\
&\quad+z,\\
p_1(z)&=z^{25}+z^{24}+z^{20}+z^{19}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{11}+z^{10}+z^9\\
&\quad+z^8+z^6+z^2+z,\\
p_2(z)&=z^{28}+z^{24}+z^{22}+z^{20}+z^{18}+z^{16}+z^{14}+z^{10}+z^6+z^2,\\
p_3(z)&=z^{25}+z^{24}+z^{20}+z^{19}+z^{17}+z^{16}+z^{15}+z^{14}+z^{13}+z^{11}+z^{10}+z^9\\
&\quad+z^8+z^6+z^2+z,\\
p_4(z)&=z^{22}+z^{21}+z^{19}+z^{16}+z^{13}+z^8+z^7+z^3+z^2+z+1.
\end{aligned}$$

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 $n \ge 0$

$$\begin{aligned} M_{n+1}(x) &= W_n(x) \cdot M_n(x), \\ W_{n+1}(x) &= M_n(x) \cdot W_n(x). \end{aligned}$$

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

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

for some positive integer d_n. Hence,

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

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

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

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

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

of the vector

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

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

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

Lemma 2.1. *We have*

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

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

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

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

Proof. We give the proof of the identity

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

the proofs of the others being similar.

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

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

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

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

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

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

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

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.*

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

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

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

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

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 $u = 2^{2k}$,

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

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

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

which can be rewritten as

$$0 = T[[w]_2] + T[[10w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.7}$$

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

$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.9}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1010w]_2],\end{aligned} \tag{2.10}$$

$$0 = T[[1w]_2] + T[[11w]_2] + T[[101w]_2] + T[[1011w]_2], \tag{2.11}$$

$$0 = T[[w]_2] + T[[10w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1100w]_2], \tag{2.12}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1101w]_2],\end{aligned} \tag{2.13}$$

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

$$0 = T[[w]_2] + T[[10w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.14}$$

$$0 = T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[110w]_2] + T[[1000w]_2], \tag{2.15}$$

$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.16}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1010w]_2],\end{aligned} \tag{2.17}$$

$$0 = T[[1w]_2] + T[[11w]_2] + T[[101w]_2] + T[[1011w]_2], \tag{2.18}$$

$$0 = T[[w]_2] + T[[10w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1100w]_2], \tag{2.19}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2]\\ &\quad + T[[110w]_2] + T[[1101w]_2],\end{aligned} \tag{2.20}$$

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 3566 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

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 10)) + \tau(A(s, 110)) + \tau(A(s, 111)), \tag{2.21}$$

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

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 110)) + \tau(A(s, 1001)), \tag{2.23}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 10)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 1010)), \tag{2.24}$$

$$0 = \tau(A(s, 1)) + \tau(A(s, 11)) + \tau(A(s, 101)) + \tau(A(s, 1011)), \tag{2.25}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 10)) + \tau(A(s, 100)) + \tau(A(s, 110)) + \tau(A(s, 1100)), \tag{2.26}$$

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

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

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 10)) + \tau(A(s, 110)) + \tau(A(s, 111)), \tag{2.28}$$

$$0 = \tau(A(s, 1)) + \tau(A(s, 10)) + \tau(A(s, 11)) + \tau(A(s, 110)) + \tau(A(s, 1000)), \tag{2.29}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 110)) + \tau(A(s, 1001)), \tag{2.30}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 10)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 1010)), \tag{2.31}$$

$$0 = \tau(A(s, 1)) + \tau(A(s, 11)) + \tau(A(s, 101)) + \tau(A(s, 1011)), \tag{2.32}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 10)) + \tau(A(s, 100)) + \tau(A(s, 110)) + \tau(A(s, 1100)), \tag{2.33}$$

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

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{40}), E_{40}) = (A(i, 0^{28}), E_{28})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \leq k \leq 20$, 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 $k \geq 2$, and $u = 2^{2k-1}$,*

$$M_{2k} = M^e[:7u] + x^u M^e[:6u] + x^{5u} M^e[:2u] + x^{7u} R^e,$$

$$W_{2k} = W^e[:7u] + x^u W^e[:6u] + x^{5u} W^e[:2u] + x^{7u} R^e.$$

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

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

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

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

We give the proof of

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

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

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

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

$$W^e[:14v]M^e[:14v] + x^{2v} W^e[:12v]M^e[:12v] + x^{10v} W^e[:4v]M^e[:4v].$$

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

$$\begin{aligned}
q_0(x) &= x^{28} + x^{27} + x^{25} + x^{24} + x^{22} + x^{21} + x^{18} + x^{15} + x^{14} + x^{10} + x^9 + x^8 \\
&\quad + x^7, \\
q_1(x) &= x^{27} + x^{26} + x^{22} + x^{20} + x^{19} + x^{18} + x^{17} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} \\
&\quad + x^9 + x^8 + x^4 + x^3, \\
q_2(x) &= x^{26} + x^{22} + x^{18} + x^{14} + x^{12} + x^{10} + x^8 + x^6 + x^4 + 1, \\
q_3(x) &= x^{27} + x^{26} + x^{22} + x^{20} + x^{19} + x^{18} + x^{17} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} \\
&\quad + x^9 + x^8 + x^4 + x^3, \\
q_4(x) &= x^{27} + x^{26} + x^{25} + x^{21} + x^{15} + x^9 + x^7 + x^6.
\end{aligned}$$

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

$$\begin{aligned}
p_0(x) &= x^{150} + x^{148} + x^{146} + x^{136} + x^{132} + x^{130} + x^{126} + x^{124} + x^{118} + x^{116} \\
&\quad + x^{110} + x^{86} + x^{84} + x^{82} + x^{80} + x^{76} + x^{74} + x^{72} + x^{70} + x^{64} + x^{60} \\
&\quad + x^{48} + x^{46} + x^{44} + x^{42} + x^{38} + x^{36}, \\
p_3(x) &= x^{146} + x^{144} + x^{142} + x^{140} + x^{138} + x^{136} + x^{134} + x^{130} + x^{114} + x^{110} \\
&\quad + x^{104} + x^{98} + x^{96} + x^{92} + x^{90} + x^{88} + x^{84} + x^{82} + x^{80} + x^{76} + x^{74} \\
&\quad + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} + x^{52} + x^{50} + x^{46} + x^{42} + x^{38} + x^{34}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{28} + x^{20},\\
p_6(x) &= x^{138} + x^{136} + x^{128} + x^{124} + x^{118} + x^{114} + x^{110} + x^{108} + x^{104} + x^{100}\\
&+ x^{98} + x^{94} + x^{92} + x^{88} + x^{82} + x^{80} + x^{78} + x^{72} + x^{62} + x^{60} + x^{58}\\
&+ x^{54} + x^{48} + x^{44} + x^{42} + x^{40} + x^{38} + x^{36} + x^{32} + x^{26} + x^{22} + x^{20}\\
&+ x^{14} + x^{12} + x^{10} + x^{6} + x^{4} + 1,\\
p_9(x) &= x^{148} + x^{146} + x^{144} + x^{142} + x^{140} + x^{136} + x^{132} + x^{130} + x^{128} + x^{114}\\
&+ x^{112} + x^{110} + x^{106} + x^{100} + x^{94} + x^{92} + x^{90} + x^{88} + x^{86} + x^{84}\\
&+ x^{82} + x^{78} + x^{76} + x^{72} + x^{68} + x^{62} + x^{58} + x^{56} + x^{54} + x^{52} + x^{50}\\
&+ x^{42} + x^{40} + x^{38} + x^{34} + x^{32} + x^{30} + x^{28} + x^{20} + x^{18} + x^{16} + x^{10}\\
&+ x^{8} + x^{6},\\
p_{12}(x) &= x^{148} + x^{144} + x^{140} + x^{136} + x^{108} + x^{104} + x^{100} + x^{96} + x^{84} + x^{80}\\
&+ x^{76} + x^{72} + x^{68} + x^{64} + x^{60} + x^{56} + x^{44} + x^{40} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{143} + x^{135} + x^{129} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121}\\
&+ x^{119} + x^{117} + x^{115} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106}\\
&+ x^{105} + x^{103} + x^{100} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90}\\
&+ x^{89} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75}\\
&+ x^{74} + x^{73} + x^{69} + x^{68} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{55} + x^{53}\\
&+ x^{51} + x^{49} + x^{48} + x^{44} + x^{42} + x^{40} + x^{39},\\
p_3(x) &= x^{145} + x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{125} + x^{119} + x^{115} + x^{113}\\
&+ x^{99} + x^{95} + x^{93} + x^{91} + x^{85} + x^{79} + x^{77} + x^{75} + x^{69} + x^{65} + x^{61}\\
&+ x^{55} + x^{53} + x^{49} + x^{41} + x^{39} + x^{29} + x^{27},\\
p_6(x) &= x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133}\\
&+ x^{130} + x^{127} + x^{126} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116}\\
&+ x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{103} + x^{101}\\
&+ x^{100} + x^{99} + x^{97} + x^{93} + x^{91} + x^{90} + x^{89} + x^{87} + x^{84} + x^{82} + x^{79}\\
&+ x^{77} + x^{74} + x^{71} + x^{70} + x^{66} + x^{65} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{45} + x^{44} + x^{38} + x^{37} + x^{33} + x^{31}\\
&+ x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18},\\
p_9(x) &= x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{121} + x^{117} + x^{115} + x^{109} + x^{107}\\
&+ x^{105} + x^{99} + x^{97} + x^{93} + x^{89} + x^{85} + x^{77} + x^{75} + x^{71} + x^{61} + x^{59}\\
&+ x^{57} + x^{53} + x^{45} + x^{41} + x^{37} + x^{33} + x^{29} + x^{25} + x^{23} + x^{21} + x^{19}\\
&+ x^{13} + x^{9},\\
p_{12}(x) &= x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{126} + x^{125} + x^{121} + x^{120}
\end{aligned}
$$

$$+ x^{118} + x^{117} + x^{113} + x^{112} + x^{106} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} + x^{78} + x^{77} + x^{74} + x^{72} + x^{69} + x^{68} + x^{58} + x^{57} + x^{54} + x^{52} + x^{49} + x^{48} + x^{46} + x^{45} + x^{42} + x^{40} + x^{37} + x^{36} + x^{30} + x^{29} + x^{25} + x^{24} + x^{22} + x^{21} + x^{17} + x^{16} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{143} + x^{135} + x^{129} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121} \\
&\quad + x^{119} + x^{117} + x^{115} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106} \\
&\quad + x^{105} + x^{103} + x^{100} + x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} \\
&\quad + x^{89} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} \\
&\quad + x^{74} + x^{73} + x^{69} + x^{68} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{55} + x^{53} \\
&\quad + x^{51} + x^{49} + x^{48} + x^{44} + x^{42} + x^{40} + x^{39}, \\
p_3(x) &= x^{145} + x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{125} + x^{119} + x^{115} + x^{113} \\
&\quad + x^{99} + x^{95} + x^{93} + x^{91} + x^{85} + x^{79} + x^{77} + x^{75} + x^{69} + x^{65} + x^{61} \\
&\quad + x^{55} + x^{53} + x^{49} + x^{41} + x^{39} + x^{29} + x^{27}, \\
p_6(x) &= x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133} \\
&\quad + x^{130} + x^{127} + x^{126} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116} \\
&\quad + x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{103} + x^{101} \\
&\quad + x^{100} + x^{99} + x^{97} + x^{93} + x^{91} + x^{90} + x^{89} + x^{87} + x^{84} + x^{82} + x^{79} \\
&\quad + x^{77} + x^{74} + x^{71} + x^{70} + x^{66} + x^{65} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} \\
&\quad + x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{45} + x^{44} + x^{38} + x^{37} + x^{33} + x^{31} \\
&\quad + x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18}, \\
p_9(x) &= x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{121} + x^{117} + x^{115} + x^{109} + x^{107} \\
&\quad + x^{105} + x^{99} + x^{97} + x^{93} + x^{89} + x^{85} + x^{77} + x^{75} + x^{71} + x^{61} + x^{59} \\
&\quad + x^{57} + x^{53} + x^{45} + x^{41} + x^{37} + x^{33} + x^{29} + x^{25} + x^{23} + x^{21} + x^{19} \\
&\quad + x^{13} + x^{9}, \\
p_{12}(x) &= x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{126} + x^{125} + x^{121} + x^{120} \\
&\quad + x^{118} + x^{117} + x^{113} + x^{112} + x^{106} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} \\
&\quad + x^{78} + x^{77} + x^{74} + x^{72} + x^{69} + x^{68} + x^{58} + x^{57} + x^{54} + x^{52} + x^{49} \\
&\quad + x^{48} + x^{46} + x^{45} + x^{42} + x^{40} + x^{37} + x^{36} + x^{30} + x^{29} + x^{25} + x^{24} \\
&\quad + x^{22} + x^{21} + x^{17} + x^{16} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{144} + x^{140} + x^{138} + x^{136} + x^{132} + x^{128} + x^{126} + x^{122} + x^{120} + x^{116} \\
&\quad + x^{114} + x^{112} + x^{110} + x^{96} + x^{94} + x^{90} + x^{88} + x^{72} + x^{70} + x^{68} + x^{66}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{64} + x^{58} + x^{56} + x^{52} + x^{50} + x^{42},\\
p_3(x) &= x^{138} + x^{130} + x^{124} + x^{120} + x^{118} + x^{116} + x^{104} + x^{96} + x^{94} + x^{92}\\
&+ x^{88} + x^{82} + x^{72} + x^{64} + x^{58} + x^{54} + x^{48} + x^{46} + x^{44} + x^{38} + x^{32}\\
&+ x^{30} + x^{28} + x^{26} + x^{20} + x^{18},\\
p_6(x) &= x^{138} + x^{136} + x^{130} + x^{124} + x^{122} + x^{118} + x^{116} + x^{112} + x^{108} + x^{100}\\
&+ x^{94} + x^{82} + x^{80} + x^{76} + x^{66} + x^{64} + x^{58} + x^{54} + x^{52} + x^{48} + x^{46}\\
&+ x^{44} + x^{38} + x^{36} + x^{32} + x^{30} + x^{20} + x^{18} + x^{8} + x^{4} + x^{2} + 1,\\
p_9(x) &= x^{136} + x^{124} + x^{122} + x^{116} + x^{112} + x^{110} + x^{108} + x^{106} + x^{102} + x^{100}\\
&+ x^{96} + x^{86} + x^{82} + x^{80} + x^{72} + x^{70} + x^{68} + x^{62} + x^{60} + x^{54} + x^{50}\\
&+ x^{42} + x^{36} + x^{32} + x^{26} + x^{22} + x^{12} + x^{6},\\
p_{12}(x) &= x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{104} + x^{102} + x^{100} + x^{98} + x^{96}\\
&+ x^{72} + x^{70} + x^{68} + x^{66} + x^{64} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{40}\\
&+ x^{38} + x^{36} + x^{34} + x^{32} + x^{8} + x^{6} + x^{4} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{144} + x^{136} + x^{134} + x^{130} + x^{128} + x^{116} + x^{114} + x^{112} + x^{110} + x^{108}\\
&+ x^{106} + x^{104} + x^{96} + x^{78} + x^{76} + x^{74} + x^{72} + x^{70} + x^{66} + x^{64} + x^{62}\\
&+ x^{60} + x^{58} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} + x^{36},\\
p_3(x) &= x^{138} + x^{134} + x^{126} + x^{124} + x^{120} + x^{116} + x^{110} + x^{104} + x^{96} + x^{94}\\
&+ x^{92} + x^{88} + x^{78} + x^{72} + x^{70} + x^{66} + x^{64} + x^{54} + x^{50} + x^{48} + x^{44}\\
&+ x^{38} + x^{34} + x^{32} + x^{30} + x^{28} + x^{22} + x^{20},\\
p_6(x) &= x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124} + x^{120} + x^{114} + x^{104}\\
&+ x^{102} + x^{100} + x^{90} + x^{82} + x^{78} + x^{76} + x^{72} + x^{68} + x^{66} + x^{64} + x^{62}\\
&+ x^{60} + x^{58} + x^{56} + x^{54} + x^{46} + x^{44} + x^{42} + x^{40} + x^{36} + x^{28} + x^{26}\\
&+ x^{24} + x^{20} + x^{14} + x^{12} + x^{8} + x^{4} + x^{2} + 1,\\
p_9(x) &= x^{136} + x^{124} + x^{122} + x^{116} + x^{112} + x^{110} + x^{108} + x^{106} + x^{102} + x^{100}\\
&+ x^{96} + x^{86} + x^{82} + x^{80} + x^{72} + x^{70} + x^{68} + x^{62} + x^{60} + x^{54} + x^{50}\\
&+ x^{42} + x^{36} + x^{32} + x^{26} + x^{22} + x^{12} + x^{6},\\
p_{12}(x) &= x^{136} + x^{134} + x^{132} + x^{130} + x^{128} + x^{104} + x^{102} + x^{100} + x^{98} + x^{96}\\
&+ x^{72} + x^{70} + x^{68} + x^{66} + x^{64} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{40}\\
&+ x^{38} + x^{36} + x^{34} + x^{32} + x^{8} + x^{6} + x^{4} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{143} + x^{142} + x^{140} + x^{139} + x^{138} + x^{132} + x^{131} + x^{129}\\
&+ x^{126} + x^{125} + x^{124} + x^{122} + x^{120} + x^{115} + x^{114} + x^{112} + x^{111}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{110} + x^{109} + x^{105} + x^{103} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95} + x^{91}\\
&+ x^{90} + x^{87} + x^{86} + x^{85} + x^{83} + x^{82} + x^{80} + x^{76} + x^{72} + x^{70} + x^{68}\\
&+ x^{67} + x^{66} + x^{65} + x^{64} + x^{62} + x^{61} + x^{58} + x^{57} + x^{54} + x^{53} + x^{52}\\
&+ x^{51} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} + x^{42} + x^{40} + x^{39},\\
p_3(x) &= x^{145} + x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{125} + x^{119} + x^{115} + x^{113}\\
&+ x^{99} + x^{95} + x^{93} + x^{91} + x^{85} + x^{79} + x^{77} + x^{75} + x^{69} + x^{65} + x^{61}\\
&+ x^{55} + x^{53} + x^{49} + x^{41} + x^{39} + x^{29} + x^{27},\\
p_6(x) &= x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133}\\
&+ x^{130} + x^{127} + x^{126} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116}\\
&+ x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{103} + x^{101}\\
&+ x^{100} + x^{99} + x^{97} + x^{93} + x^{91} + x^{90} + x^{89} + x^{87} + x^{84} + x^{82} + x^{79}\\
&+ x^{77} + x^{74} + x^{71} + x^{70} + x^{66} + x^{65} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{45} + x^{44} + x^{38} + x^{37} + x^{33} + x^{31}\\
&+ x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18},\\
p_9(x) &= x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{121} + x^{117} + x^{115} + x^{109} + x^{107}\\
&+ x^{105} + x^{99} + x^{97} + x^{93} + x^{89} + x^{85} + x^{77} + x^{75} + x^{71} + x^{61} + x^{59}\\
&+ x^{57} + x^{53} + x^{45} + x^{41} + x^{37} + x^{33} + x^{29} + x^{25} + x^{23} + x^{21} + x^{19}\\
&+ x^{13} + x^{9},\\
p_{12}(x) &= x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{126} + x^{125} + x^{121} + x^{120}\\
&+ x^{118} + x^{117} + x^{113} + x^{112} + x^{106} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96}\\
&+ x^{78} + x^{77} + x^{74} + x^{72} + x^{69} + x^{68} + x^{58} + x^{57} + x^{54} + x^{52} + x^{49}\\
&+ x^{48} + x^{46} + x^{45} + x^{42} + x^{40} + x^{37} + x^{36} + x^{30} + x^{29} + x^{25} + x^{24}\\
&+ x^{22} + x^{21} + x^{17} + x^{16} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{143} + x^{142} + x^{140} + x^{139} + x^{138} + x^{132} + x^{131} + x^{129}\\
&+ x^{126} + x^{125} + x^{124} + x^{122} + x^{120} + x^{115} + x^{114} + x^{112} + x^{111}\\
&+ x^{110} + x^{109} + x^{105} + x^{103} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95} + x^{91}\\
&+ x^{90} + x^{87} + x^{86} + x^{85} + x^{83} + x^{82} + x^{80} + x^{76} + x^{72} + x^{70} + x^{68}\\
&+ x^{67} + x^{66} + x^{65} + x^{64} + x^{62} + x^{61} + x^{58} + x^{57} + x^{54} + x^{53} + x^{52}\\
&+ x^{51} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} + x^{42} + x^{40} + x^{39},\\
p_3(x) &= x^{145} + x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{125} + x^{119} + x^{115} + x^{113}\\
&+ x^{99} + x^{95} + x^{93} + x^{91} + x^{85} + x^{79} + x^{77} + x^{75} + x^{69} + x^{65} + x^{61}\\
&+ x^{55} + x^{53} + x^{49} + x^{41} + x^{39} + x^{29} + x^{27},\\
p_6(x) &= x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{130} + x^{127} + x^{126} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116}\\
&+ x^{115} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{107} + x^{103} + x^{101}\\
&+ x^{100} + x^{99} + x^{97} + x^{93} + x^{91} + x^{90} + x^{89} + x^{87} + x^{84} + x^{82} + x^{79}\\
&+ x^{77} + x^{74} + x^{71} + x^{70} + x^{66} + x^{65} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{45} + x^{44} + x^{38} + x^{37} + x^{33} + x^{31}\\
&+ x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18},\\
p_9(x) &= x^{143} + x^{139} + x^{137} + x^{131} + x^{127} + x^{121} + x^{117} + x^{115} + x^{109} + x^{107}\\
&+ x^{105} + x^{99} + x^{97} + x^{93} + x^{89} + x^{85} + x^{77} + x^{75} + x^{71} + x^{61} + x^{59}\\
&+ x^{57} + x^{53} + x^{45} + x^{41} + x^{37} + x^{33} + x^{29} + x^{25} + x^{23} + x^{21} + x^{19}\\
&+ x^{13} + x^{9},\\
p_{12}(x) &= x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{126} + x^{125} + x^{121} + x^{120}\\
&+ x^{118} + x^{117} + x^{113} + x^{112} + x^{106} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96}\\
&+ x^{78} + x^{77} + x^{74} + x^{72} + x^{69} + x^{68} + x^{58} + x^{57} + x^{54} + x^{52} + x^{49}\\
&+ x^{48} + x^{46} + x^{45} + x^{42} + x^{40} + x^{37} + x^{36} + x^{30} + x^{29} + x^{25} + x^{24}\\
&+ x^{22} + x^{21} + x^{17} + x^{16} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{150} + x^{144} + x^{136} + x^{134} + x^{132} + x^{130} + x^{120} + x^{112} + x^{110} + x^{108}\\
&+ x^{106} + x^{104} + x^{102} + x^{100} + x^{98} + x^{94} + x^{92} + x^{88} + x^{84} + x^{82}\\
&+ x^{74} + x^{70} + x^{68} + x^{62} + x^{58} + x^{56} + x^{52} + x^{48} + x^{46} + x^{44} + x^{42},\\
p_3(x) &= x^{142} + x^{140} + x^{136} + x^{134} + x^{132} + x^{122} + x^{120} + x^{114} + x^{112} + x^{110}\\
&+ x^{108} + x^{104} + x^{100} + x^{96} + x^{92} + x^{90} + x^{88} + x^{84} + x^{76} + x^{68} + x^{62}\\
&+ x^{60} + x^{56} + x^{46} + x^{42} + x^{38} + x^{32} + x^{28} + x^{26} + x^{18},\\
p_6(x) &= x^{146} + x^{136} + x^{132} + x^{130} + x^{128} + x^{122} + x^{118} + x^{114} + x^{110} + x^{104}\\
&+ x^{100} + x^{94} + x^{88} + x^{80} + x^{78} + x^{74} + x^{72} + x^{68} + x^{62} + x^{54} + x^{52}\\
&+ x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{22} + x^{18} + x^{14}\\
&+ x^{10} + x^{6} + x^{4} + 1,\\
p_9(x) &= x^{148} + x^{146} + x^{144} + x^{142} + x^{140} + x^{136} + x^{132} + x^{130} + x^{128} + x^{114}\\
&+ x^{112} + x^{110} + x^{106} + x^{100} + x^{94} + x^{92} + x^{90} + x^{88} + x^{86} + x^{84}\\
&+ x^{82} + x^{78} + x^{76} + x^{72} + x^{68} + x^{62} + x^{58} + x^{56} + x^{54} + x^{52} + x^{50}\\
&+ x^{42} + x^{40} + x^{38} + x^{34} + x^{32} + x^{30} + x^{28} + x^{20} + x^{18} + x^{16} + x^{10}\\
&+ x^{8} + x^{6},\\
p_{12}(x) &= x^{148} + x^{144} + x^{140} + x^{136} + x^{108} + x^{104} + x^{100} + x^{96} + x^{84} + x^{80}\\
&+ x^{76} + x^{72} + x^{68} + x^{64} + x^{60} + x^{56} + x^{44} + x^{40} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{145} + x^{143} + x^{140} + x^{138} + x^{136} + x^{129} + x^{127} + x^{125} \\
&\quad + x^{124} + x^{123} + x^{121} + x^{119} + x^{116} + x^{115} + x^{113} + x^{112} + x^{110} \\
&\quad + x^{108} + x^{107} + x^{105} + x^{103} + x^{99} + x^{91} + x^{89} + x^{87} + x^{86} + x^{83} \\
&\quad + x^{82} + x^{79} + x^{78} + x^{76} + x^{74} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} + x^{63} \\
&\quad + x^{61} + x^{59} + x^{56} + x^{55} + x^{52} + x^{51} + x^{50} + x^{49} + x^{48} + x^{46} + x^{45} \\
&\quad + x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36}, \\
p_3(x) &= x^{146} + x^{144} + x^{143} + x^{140} + x^{139} + x^{137} + x^{136} + x^{135} + x^{134} + x^{132} \\
&\quad + x^{129} + x^{128} + x^{127} + x^{124} + x^{122} + x^{118} + x^{117} + x^{115} + x^{113} \\
&\quad + x^{110} + x^{107} + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{98} + x^{97} + x^{95} \\
&\quad + x^{93} + x^{92} + x^{90} + x^{89} + x^{86} + x^{85} + x^{81} + x^{80} + x^{79} + x^{76} + x^{75} \\
&\quad + x^{71} + x^{70} + x^{69} + x^{68} + x^{65} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58} + x^{55} \\
&\quad + x^{52} + x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{42} + x^{34} + x^{33} + x^{30} + x^{29} \\
&\quad + x^{27} + x^{26} + x^{25} + x^{24}, \\
p_6(x) &= x^{146} + x^{144} + x^{143} + x^{141} + x^{137} + x^{135} + x^{132} + x^{131} + x^{128} + x^{125} \\
&\quad + x^{124} + x^{123} + x^{122} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111} \\
&\quad + x^{106} + x^{105} + x^{104} + x^{103} + x^{102} + x^{100} + x^{96} + x^{95} + x^{93} + x^{92} \\
&\quad + x^{91} + x^{88} + x^{86} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{72} + x^{70} \\
&\quad + x^{68} + x^{63} + x^{61} + x^{59} + x^{55} + x^{52} + x^{50} + x^{49} + x^{45} + x^{42} + x^{39} \\
&\quad + x^{38} + x^{37} + x^{36} + x^{34} + x^{30} + x^{25} + x^{24} + x^{23} + x^{20} + x^{19} + x^{17} \\
&\quad + x^{15} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1, \\
p_9(x) &= x^{146} + x^{145} + x^{141} + x^{140} + x^{138} + x^{137} + x^{133} + x^{132} + x^{122} + x^{121} \\
&\quad + x^{117} + x^{116} + x^{114} + x^{113} + x^{109} + x^{108} + x^{82} + x^{81} + x^{77} + x^{76} \\
&\quad + x^{74} + x^{73} + x^{69} + x^{68} + x^{66} + x^{65} + x^{61} + x^{60} + x^{50} + x^{49} + x^{45} \\
&\quad + x^{44} + x^{42} + x^{41} + x^{37} + x^{36} + x^{26} + x^{25} + x^{21} + x^{20} + x^{18} + x^{17} \\
&\quad + x^{13} + x^{12}, \\
p_{12}(x) &= x^{146} + x^{145} + x^{142} + x^{140} + x^{137} + x^{136} + x^{126} + x^{125} + x^{122} + x^{120} \\
&\quad + x^{118} + x^{116} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{102} \\
&\quad + x^{100} + x^{97} + x^{96} + x^{82} + x^{81} + x^{78} + x^{76} + x^{73} + x^{72} + x^{66} + x^{65} \\
&\quad + x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{44} + x^{41} \\
&\quad + x^{40} + x^{30} + x^{29} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{13} + x^{12} \\
&\quad + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}
$$

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

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

$$
p_0(x) = x^{152} + x^{149} + x^{145} + x^{137} + x^{136} + x^{134} + x^{133} + x^{130} + x^{128} + x^{123}
$$

$$
\begin{aligned}
&+ x^{122} + x^{120} + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113}\\
&+ x^{112} + x^{110} + x^{109} + x^{107} + x^{106} + x^{102} + x^{101} + x^{99} + x^{98} + x^{95}\\
&+ x^{90} + x^{89} + x^{88} + x^{86} + x^{85} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{75}\\
&+ x^{71} + x^{67} + x^{66} + x^{65} + x^{63} + x^{62} + x^{58} + x^{57} + x^{56} + x^{55} + x^{51}\\
&+ x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39},\\
p_3(x) = &\, x^{145} + x^{144} + x^{140} + x^{138} + x^{135} + x^{133} + x^{130} + x^{128} + x^{124} + x^{123}\\
&+ x^{113} + x^{112} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} + x^{101} + x^{100}\\
&+ x^{97} + x^{95} + x^{93} + x^{91} + x^{89} + x^{87} + x^{85} + x^{83} + x^{81} + x^{79} + x^{77}\\
&+ x^{75} + x^{73} + x^{71} + x^{69} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58}\\
&+ x^{56} + x^{52} + x^{51} + x^{49} + x^{48} + x^{44} + x^{42} + x^{39} + x^{37} + x^{34} + x^{32}\\
&+ x^{28} + x^{27},\\
p_6(x) = &\, x^{146} + x^{144} + x^{138} + x^{132} + x^{130} + x^{126} + x^{124} + x^{122} + x^{120} + x^{116}\\
&+ x^{108} + x^{104} + x^{98} + x^{94} + x^{88} + x^{86} + x^{82} + x^{80} + x^{78} + x^{76} + x^{74}\\
&+ x^{70} + x^{68} + x^{62} + x^{58} + x^{54} + x^{50} + x^{44} + x^{40} + x^{34} + x^{30} + x^{26}\\
&+ x^{20} + x^{18},\\
p_9(x) = &\, x^{147} + x^{146} + x^{145} + x^{144} + x^{142} + x^{138} + x^{136} + x^{132} + x^{131} + x^{129}\\
&+ x^{128} + x^{124} + x^{123} + x^{121} + x^{120} + x^{116} + x^{114} + x^{110} + x^{108}\\
&+ x^{107} + x^{106} + x^{105} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{74} + x^{72} + x^{68}\\
&+ x^{66} + x^{62} + x^{60} + x^{59} + x^{58} + x^{57} + x^{51} + x^{50} + x^{49} + x^{48} + x^{46}\\
&+ x^{42} + x^{40} + x^{36} + x^{35} + x^{33} + x^{32} + x^{28} + x^{27} + x^{25} + x^{24} + x^{20}\\
&+ x^{18} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9},\\
p_{12}(x) = &\, x^{148} + x^{144} + x^{140} + x^{136} + x^{128} + x^{124} + x^{112} + x^{104} + x^{100} + x^{96}\\
&+ x^{84} + x^{80} + x^{76} + x^{72} + x^{68} + x^{56} + x^{44} + x^{40} + x^{32} + x^{28} + x^{16}\\
&+ x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = &\, x^{154} + x^{153} + x^{152} + x^{151} + x^{148} + x^{147} + x^{146} + x^{145} + x^{144} + x^{142}\\
&+ x^{139} + x^{137} + x^{136} + x^{131} + x^{130} + x^{129} + x^{123} + x^{120} + x^{117}\\
&+ x^{116} + x^{115} + x^{111} + x^{109} + x^{106} + x^{104} + x^{103} + x^{101} + x^{100}\\
&+ x^{99} + x^{97} + x^{95} + x^{93} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{72} + x^{70} + x^{69} + x^{68} + x^{65} + x^{63} + x^{60}\\
&+ x^{56} + x^{55} + x^{53} + x^{48} + x^{46} + x^{45} + x^{42} + x^{39},\\
p_3(x) = &\, x^{153} + x^{152} + x^{149} + x^{146} + x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138}\\
&+ x^{134} + x^{132} + x^{131} + x^{130} + x^{129} + x^{125} + x^{124} + x^{120} + x^{119}\\
&+ x^{115} + x^{114} + x^{110} + x^{109} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{91}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{90} + x^{87} + x^{85} + x^{82} + x^{81} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{63} \\
&+ x^{62} + x^{58} + x^{56} + x^{52} + x^{50} + x^{49} + x^{48} + x^{46} + x^{42} + x^{41} + x^{39} \\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{31} + x^{28} + x^{27}, \\
p_6(x) &= x^{154} + x^{152} + x^{150} + x^{148} + x^{146} + x^{142} + x^{140} + x^{132} + x^{128} + x^{126} \\
&+ x^{124} + x^{122} + x^{118} + x^{116} + x^{110} + x^{106} + x^{102} + x^{98} + x^{92} + x^{90} \\
&+ x^{82} + x^{80} + x^{78} + x^{76} + x^{74} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{58} \\
&+ x^{56} + x^{54} + x^{52} + x^{48} + x^{46} + x^{44} + x^{40} + x^{38} + x^{36} + x^{34} + x^{26} \\
&+ x^{24} + x^{22} + x^{20} + x^{18}, \\
p_9(x) &= x^{155} + x^{154} + x^{153} + x^{152} + x^{151} + x^{149} + x^{148} + x^{144} + x^{142} + x^{138} \\
&+ x^{136} + x^{135} + x^{134} + x^{133} + x^{127} + x^{126} + x^{125} + x^{124} + x^{122} \\
&+ x^{118} + x^{116} + x^{112} + x^{111} + x^{109} + x^{108} + x^{107} + x^{106} + x^{105} \\
&+ x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{80} + x^{78} + x^{75} + x^{73} \\
&+ x^{70} + x^{68} + x^{64} + x^{63} + x^{61} + x^{60} + x^{56} + x^{55} + x^{53} + x^{52} + x^{48} \\
&+ x^{46} + x^{42} + x^{40} + x^{39} + x^{38} + x^{37} + x^{31} + x^{30} + x^{29} + x^{28} + x^{26} \\
&+ x^{22} + x^{20} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9}, \\
p_{12}(x) &= x^{156} + x^{128} + x^{108} + x^{96} + x^{92} + x^{76} + x^{64} + x^{48} + x^{32} + x^{12} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{145} + x^{143} + x^{142} + x^{137} + x^{136} + x^{135} + x^{134} + x^{132} + x^{130} \\
&+ x^{129} + x^{122} + x^{120} + x^{119} + x^{118} + x^{116} + x^{107} + x^{102} + x^{99} + x^{98} \\
&+ x^{95} + x^{94} + x^{93} + x^{90} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{80} + x^{76} \\
&+ x^{75} + x^{74} + x^{72} + x^{68} + x^{65} + x^{63} + x^{59} + x^{57} + x^{56} + x^{54} + x^{53} \\
&+ x^{51} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42}, \\
p_3(x) &= x^{146} + x^{139} + x^{138} + x^{137} + x^{136} + x^{132} + x^{130} + x^{126} + x^{124} + x^{121} \\
&+ x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{107} + x^{105} + x^{104} \\
&+ x^{103} + x^{101} + x^{100} + x^{96} + x^{94} + x^{93} + x^{92} + x^{90} + x^{89} + x^{88} + x^{87} \\
&+ x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{72} + x^{70} \\
&+ x^{69} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{59} + x^{54} + x^{52} + x^{50} \\
&+ x^{49} + x^{45} + x^{44} + x^{42} + x^{40} + x^{39} + x^{36} + x^{34} + x^{31} + x^{30} + x^{29} \\
&+ x^{28} + x^{27} + x^{26}, \\
p_6(x) &= x^{146} + x^{141} + x^{139} + x^{138} + x^{137} + x^{135} + x^{132} + x^{131} + x^{130} + x^{129} \\
&+ x^{127} + x^{124} + x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{113} + x^{109} \\
&+ x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} \\
&+ x^{90} + x^{87} + x^{84} + x^{78} + x^{77} + x^{71} + x^{70} + x^{65} + x^{64} + x^{63} + x^{61} \\
&+ x^{60} + x^{58} + x^{57} + x^{56} + x^{55} + x^{51} + x^{48} + x^{46} + x^{40} + x^{39} + x^{38}
\end{aligned}
$$

$$\begin{aligned}
&+ x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{24} + x^{20} + x^{15} + x^{14} + x^{10} + x^{9}\\
&+ x^{6} + x^{4} + x + 1,\\
p_9(x) = {}& x^{146} + x^{145} + x^{141} + x^{140} + x^{138} + x^{137} + x^{133} + x^{132} + x^{122} + x^{121}\\
&+ x^{117} + x^{116} + x^{114} + x^{113} + x^{109} + x^{108} + x^{82} + x^{81} + x^{77} + x^{76}\\
&+ x^{74} + x^{73} + x^{69} + x^{68} + x^{66} + x^{65} + x^{61} + x^{60} + x^{50} + x^{49} + x^{45}\\
&+ x^{44} + x^{42} + x^{41} + x^{37} + x^{36} + x^{26} + x^{25} + x^{21} + x^{20} + x^{18} + x^{17}\\
&+ x^{13} + x^{12},\\
p_{12}(x) = {}& x^{146} + x^{145} + x^{142} + x^{140} + x^{137} + x^{136} + x^{126} + x^{125} + x^{122} + x^{120}\\
&+ x^{118} + x^{116} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{102}\\
&+ x^{100} + x^{97} + x^{96} + x^{82} + x^{81} + x^{78} + x^{76} + x^{73} + x^{72} + x^{66} + x^{65}\\
&+ x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{44} + x^{41}\\
&+ x^{40} + x^{30} + x^{29} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{13} + x^{12}\\
&+ x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {}& x^{147} + x^{146} + x^{145} + x^{143} + x^{140} + x^{138} + x^{136} + x^{129} + x^{127} + x^{125}\\
&+ x^{124} + x^{123} + x^{121} + x^{119} + x^{116} + x^{115} + x^{113} + x^{112} + x^{110}\\
&+ x^{108} + x^{107} + x^{105} + x^{103} + x^{99} + x^{91} + x^{89} + x^{87} + x^{86} + x^{83}\\
&+ x^{82} + x^{79} + x^{78} + x^{76} + x^{74} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} + x^{63}\\
&+ x^{61} + x^{59} + x^{56} + x^{55} + x^{52} + x^{51} + x^{50} + x^{49} + x^{48} + x^{46} + x^{45}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36},\\
p_3(x) = {}& x^{146} + x^{144} + x^{143} + x^{140} + x^{139} + x^{137} + x^{136} + x^{135} + x^{134} + x^{132}\\
&+ x^{129} + x^{128} + x^{127} + x^{124} + x^{122} + x^{118} + x^{117} + x^{115} + x^{113}\\
&+ x^{110} + x^{107} + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{98} + x^{97} + x^{95}\\
&+ x^{93} + x^{92} + x^{90} + x^{89} + x^{86} + x^{85} + x^{81} + x^{80} + x^{79} + x^{76} + x^{75}\\
&+ x^{71} + x^{70} + x^{69} + x^{68} + x^{65} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58} + x^{55}\\
&+ x^{52} + x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{42} + x^{34} + x^{33} + x^{30} + x^{29}\\
&+ x^{27} + x^{26} + x^{25} + x^{24},\\
p_6(x) = {}& x^{146} + x^{144} + x^{143} + x^{141} + x^{137} + x^{135} + x^{132} + x^{131} + x^{128} + x^{125}\\
&+ x^{124} + x^{123} + x^{122} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111}\\
&+ x^{106} + x^{105} + x^{104} + x^{103} + x^{102} + x^{100} + x^{96} + x^{95} + x^{93} + x^{92}\\
&+ x^{91} + x^{88} + x^{86} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{72} + x^{70}\\
&+ x^{68} + x^{63} + x^{61} + x^{59} + x^{55} + x^{52} + x^{50} + x^{49} + x^{45} + x^{42} + x^{39}\\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{30} + x^{25} + x^{24} + x^{23} + x^{20} + x^{19} + x^{17}\\
&+ x^{15} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}$$

$$\begin{aligned}
p_9(x) = {} & x^{146} + x^{145} + x^{141} + x^{140} + x^{138} + x^{137} + x^{133} + x^{132} + x^{122} + x^{121} \\
& + x^{117} + x^{116} + x^{114} + x^{113} + x^{109} + x^{108} + x^{82} + x^{81} + x^{77} + x^{76} \\
& + x^{74} + x^{73} + x^{69} + x^{68} + x^{66} + x^{65} + x^{61} + x^{60} + x^{50} + x^{49} + x^{45} \\
& + x^{44} + x^{42} + x^{41} + x^{37} + x^{36} + x^{26} + x^{25} + x^{21} + x^{20} + x^{18} + x^{17} \\
& + x^{13} + x^{12}, \\
p_{12}(x) = {} & x^{146} + x^{145} + x^{142} + x^{140} + x^{137} + x^{136} + x^{126} + x^{125} + x^{122} + x^{120} \\
& + x^{118} + x^{116} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{102} \\
& + x^{100} + x^{97} + x^{96} + x^{82} + x^{81} + x^{78} + x^{76} + x^{73} + x^{72} + x^{66} + x^{65} \\
& + x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{44} + x^{41} \\
& + x^{40} + x^{30} + x^{29} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{13} + x^{12} \\
& + x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{154} + x^{153} + x^{152} + x^{151} + x^{148} + x^{147} + x^{146} + x^{145} + x^{144} + x^{142} \\
& + x^{139} + x^{137} + x^{136} + x^{131} + x^{130} + x^{129} + x^{123} + x^{120} + x^{117} \\
& + x^{116} + x^{115} + x^{111} + x^{109} + x^{106} + x^{104} + x^{103} + x^{101} + x^{100} \\
& + x^{99} + x^{97} + x^{95} + x^{93} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{80} + x^{79} \\
& + x^{78} + x^{77} + x^{76} + x^{75} + x^{72} + x^{70} + x^{69} + x^{68} + x^{65} + x^{63} + x^{60} \\
& + x^{56} + x^{55} + x^{53} + x^{48} + x^{46} + x^{45} + x^{42} + x^{39}, \\
p_3(x) = {} & x^{153} + x^{152} + x^{149} + x^{146} + x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} \\
& + x^{134} + x^{132} + x^{131} + x^{130} + x^{129} + x^{125} + x^{124} + x^{120} + x^{119} \\
& + x^{115} + x^{114} + x^{110} + x^{109} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{91} \\
& + x^{90} + x^{87} + x^{85} + x^{82} + x^{81} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{63} \\
& + x^{62} + x^{58} + x^{56} + x^{52} + x^{50} + x^{49} + x^{48} + x^{46} + x^{42} + x^{41} + x^{39} \\
& + x^{38} + x^{37} + x^{36} + x^{34} + x^{31} + x^{28} + x^{27}, \\
p_6(x) = {} & x^{154} + x^{152} + x^{150} + x^{148} + x^{146} + x^{142} + x^{140} + x^{132} + x^{128} + x^{126} \\
& + x^{124} + x^{122} + x^{118} + x^{116} + x^{110} + x^{106} + x^{102} + x^{98} + x^{92} + x^{90} \\
& + x^{82} + x^{80} + x^{78} + x^{76} + x^{74} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{58} \\
& + x^{56} + x^{54} + x^{52} + x^{48} + x^{46} + x^{44} + x^{40} + x^{38} + x^{36} + x^{34} + x^{26} \\
& + x^{24} + x^{22} + x^{20} + x^{18}, \\
p_9(x) = {} & x^{155} + x^{154} + x^{153} + x^{152} + x^{151} + x^{149} + x^{148} + x^{144} + x^{142} + x^{138} \\
& + x^{136} + x^{135} + x^{134} + x^{133} + x^{127} + x^{126} + x^{125} + x^{124} + x^{122} \\
& + x^{118} + x^{116} + x^{112} + x^{111} + x^{109} + x^{108} + x^{107} + x^{106} + x^{105} \\
& + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{80} + x^{78} + x^{75} + x^{73} \\
& + x^{70} + x^{68} + x^{64} + x^{63} + x^{61} + x^{60} + x^{56} + x^{55} + x^{53} + x^{52} + x^{48}
\end{aligned}$$

$$
\begin{aligned}
&+x^{46}+x^{42}+x^{40}+x^{39}+x^{38}+x^{37}+x^{31}+x^{30}+x^{29}+x^{28}+x^{26}\\
&+x^{22}+x^{20}+x^{16}+x^{15}+x^{13}+x^{12}+x^{11}+x^{10}+x^{9},\\
p_{12}(x)&=x^{156}+x^{128}+x^{108}+x^{96}+x^{92}+x^{76}+x^{64}+x^{48}+x^{32}+x^{12}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=&\,x^{152}+x^{149}+x^{145}+x^{137}+x^{136}+x^{134}+x^{133}+x^{130}+x^{128}+x^{123}\\
&+x^{122}+x^{120}+x^{119}+x^{118}+x^{117}+x^{116}+x^{115}+x^{114}+x^{113}\\
&+x^{112}+x^{110}+x^{109}+x^{107}+x^{106}+x^{102}+x^{101}+x^{99}+x^{98}+x^{95}\\
&+x^{90}+x^{89}+x^{88}+x^{86}+x^{85}+x^{83}+x^{82}+x^{81}+x^{80}+x^{78}+x^{75}\\
&+x^{71}+x^{67}+x^{66}+x^{65}+x^{63}+x^{62}+x^{58}+x^{57}+x^{56}+x^{55}+x^{51}\\
&+x^{48}+x^{47}+x^{46}+x^{45}+x^{44}+x^{43}+x^{42}+x^{39},\\
p_3(x)=&\,x^{145}+x^{144}+x^{140}+x^{138}+x^{135}+x^{133}+x^{130}+x^{128}+x^{124}+x^{123}\\
&+x^{113}+x^{112}+x^{108}+x^{106}+x^{105}+x^{104}+x^{103}+x^{101}+x^{100}\\
&+x^{97}+x^{95}+x^{93}+x^{91}+x^{89}+x^{87}+x^{85}+x^{83}+x^{81}+x^{79}+x^{77}\\
&+x^{75}+x^{73}+x^{71}+x^{69}+x^{67}+x^{64}+x^{63}+x^{61}+x^{60}+x^{59}+x^{58}\\
&+x^{56}+x^{52}+x^{51}+x^{49}+x^{48}+x^{44}+x^{42}+x^{39}+x^{37}+x^{34}+x^{32}\\
&+x^{28}+x^{27},\\
p_6(x)=&\,x^{146}+x^{144}+x^{138}+x^{132}+x^{130}+x^{126}+x^{124}+x^{122}+x^{120}+x^{116}\\
&+x^{108}+x^{104}+x^{98}+x^{94}+x^{88}+x^{86}+x^{82}+x^{80}+x^{78}+x^{76}+x^{74}\\
&+x^{70}+x^{68}+x^{62}+x^{58}+x^{54}+x^{50}+x^{44}+x^{40}+x^{34}+x^{30}+x^{26}\\
&+x^{20}+x^{18},\\
p_9(x)=&\,x^{147}+x^{146}+x^{145}+x^{144}+x^{142}+x^{138}+x^{136}+x^{132}+x^{131}+x^{129}\\
&+x^{128}+x^{124}+x^{123}+x^{121}+x^{120}+x^{116}+x^{114}+x^{110}+x^{108}\\
&+x^{107}+x^{106}+x^{105}+x^{83}+x^{82}+x^{81}+x^{80}+x^{78}+x^{74}+x^{72}+x^{68}\\
&+x^{66}+x^{62}+x^{60}+x^{59}+x^{58}+x^{57}+x^{51}+x^{50}+x^{49}+x^{48}+x^{46}\\
&+x^{42}+x^{40}+x^{36}+x^{35}+x^{33}+x^{32}+x^{28}+x^{27}+x^{25}+x^{24}+x^{20}\\
&+x^{18}+x^{14}+x^{12}+x^{11}+x^{10}+x^{9},\\
p_{12}(x)=&\,x^{148}+x^{144}+x^{140}+x^{136}+x^{128}+x^{124}+x^{112}+x^{104}+x^{100}+x^{96}\\
&+x^{84}+x^{80}+x^{76}+x^{72}+x^{68}+x^{56}+x^{44}+x^{40}+x^{32}+x^{28}+x^{16}\\
&+x^{8}+x^{4}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=&\,x^{147}+x^{145}+x^{143}+x^{142}+x^{137}+x^{136}+x^{135}+x^{134}+x^{132}+x^{130}\\
&+x^{129}+x^{122}+x^{120}+x^{119}+x^{118}+x^{116}+x^{107}+x^{102}+x^{99}+x^{98}\\
&+x^{95}+x^{94}+x^{93}+x^{90}+x^{88}+x^{87}+x^{86}+x^{84}+x^{83}+x^{80}+x^{76}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{75} + x^{74} + x^{72} + x^{68} + x^{65} + x^{63} + x^{59} + x^{57} + x^{56} + x^{54} + x^{53} \\
&+ x^{51} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42}, \\
p_3(x) = {}& x^{146} + x^{139} + x^{138} + x^{137} + x^{136} + x^{132} + x^{130} + x^{126} + x^{124} + x^{121} \\
&+ x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{107} + x^{105} + x^{104} \\
&+ x^{103} + x^{101} + x^{100} + x^{96} + x^{94} + x^{93} + x^{92} + x^{90} + x^{89} + x^{88} + x^{87} \\
&+ x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{72} + x^{70} \\
&+ x^{69} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{59} + x^{54} + x^{52} + x^{50} \\
&+ x^{49} + x^{45} + x^{44} + x^{42} + x^{40} + x^{39} + x^{36} + x^{34} + x^{31} + x^{30} + x^{29} \\
&+ x^{28} + x^{27} + x^{26}, \\
p_6(x) = {}& x^{146} + x^{141} + x^{139} + x^{138} + x^{137} + x^{135} + x^{132} + x^{131} + x^{130} + x^{129} \\
&+ x^{127} + x^{124} + x^{123} + x^{121} + x^{118} + x^{117} + x^{116} + x^{113} + x^{109} \\
&+ x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} \\
&+ x^{90} + x^{87} + x^{84} + x^{78} + x^{77} + x^{71} + x^{70} + x^{65} + x^{64} + x^{63} + x^{61} \\
&+ x^{60} + x^{58} + x^{57} + x^{56} + x^{55} + x^{51} + x^{48} + x^{46} + x^{40} + x^{39} + x^{38} \\
&+ x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{24} + x^{20} + x^{15} + x^{14} + x^{10} + x^{9} \\
&+ x^{6} + x^{4} + x + 1, \\
p_9(x) = {}& x^{146} + x^{145} + x^{141} + x^{140} + x^{138} + x^{137} + x^{133} + x^{132} + x^{122} + x^{121} \\
&+ x^{117} + x^{116} + x^{114} + x^{113} + x^{109} + x^{108} + x^{82} + x^{81} + x^{77} + x^{76} \\
&+ x^{74} + x^{73} + x^{69} + x^{68} + x^{66} + x^{65} + x^{61} + x^{60} + x^{50} + x^{49} + x^{45} \\
&+ x^{44} + x^{42} + x^{41} + x^{37} + x^{36} + x^{26} + x^{25} + x^{21} + x^{20} + x^{18} + x^{17} \\
&+ x^{13} + x^{12}, \\
p_{12}(x) = {}& x^{146} + x^{145} + x^{142} + x^{140} + x^{137} + x^{136} + x^{126} + x^{125} + x^{122} + x^{120} \\
&+ x^{118} + x^{116} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{102} \\
&+ x^{100} + x^{97} + x^{96} + x^{82} + x^{81} + x^{78} + x^{76} + x^{73} + x^{72} + x^{66} + x^{65} \\
&+ x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{44} + x^{41} \\
&+ x^{40} + x^{30} + x^{29} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{13} + x^{12} \\
&+ x^{10} + x^{9} + x^{6} + x^{4} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 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]	892	[1198, 1326]	1784	[2239, 2240]	2676	[2942, 2818]
1	[3, 4]	893	[1327, 618]	1785	[1177, 706]	2677	[2943, 674]
2	[5, 6]	894	[1328, 1199]	1786	[593, 706]	2678	[2944, 2434]
3	[7, 8]	895	[1329, 1330]	1787	[2241, 137]	2679	[2282, 2405]

4	[9, 10]	896	[1331, 1213]	1788	[2242, 1440]	2680	[130, 698]
5	[11, 12]	897	[1332, 1333]	1789	[2243, 1550]	2681	[2945, 1459]
6	[13, 14]	898	[1334, 1335]	1790	[2244, 2206]	2682	[2862, 2337]
7	[15, 16]	899	[1336, 1190]	1791	[1527, 2245]	2683	[2946, 2119]
8	[17, 18]	900	[1337, 1172]	1792	[2246, 1526]	2684	[2947, 2332]
9	[19, 20]	901	[1289, 1338]	1793	[1329, 60]	2685	[1512, 1460]
10	[21, 22]	902	[1339, 1315]	1794	[2247, 1178]	2686	[2948, 1537]
11	[23, 24]	903	[497, 172]	1795	[2248, 1570]	2687	[188, 1469]
12	[25, 26]	904	[1340, 443]	1796	[2249, 1291]	2688	[2949, 1442]
13	[27, 28]	905	[1341, 1342]	1797	[2250, 1326]	2689	[2867, 2196]
14	[29, 30]	906	[1343, 50]	1798	[1530, 682]	2690	[2950, 1207]
15	[31, 32]	907	[1344, 483]	1799	[2251, 1152]	2691	[2951, 123]
16	[33, 34]	908	[1345, 558]	1800	[2252, 441]	2692	[680, 1551]
17	[35, 36]	909	[1346, 1228]	1801	[2253, 1339]	2693	[696, 591]
18	[37, 38]	910	[1347, 1348]	1802	[1398, 1238]	2694	[2952, 475]
19	[39, 40]	911	[1349, 702]	1803	[2254, 1375]	2695	[2953, 177]
20	[41, 42]	912	[1350, 1351]	1804	[2167, 1325]	2696	[2954, 2157]
21	[43, 44]	913	[1352, 1326]	1805	[1291, 2255]	2697	[2291, 2109]
22	[45, 46]	914	[1353, 1354]	1806	[170, 2256]	2698	[2261, 499]
23	[47, 48]	915	[1355, 574]	1807	[2257, 2194]	2699	[2955, 1332]
24	[49, 50]	916	[1356, 1357]	1808	[2095, 2258]	2700	[2132, 2412]
25	[51, 52]	917	[1358, 473]	1809	[2192, 50]	2701	[2956, 2170]
26	[53, 54]	918	[1359, 1310]	1810	[2259, 544]	2702	[2957, 2104]
27	[55, 56]	919	[459, 1360]	1811	[2260, 554]	2703	[2958, 593]
28	[57, 58]	920	[1361, 1362]	1812	[2261, 1153]	2704	[2315, 554]
29	[59, 60]	921	[11, 1363]	1813	[528, 2262]	2705	[690, 2937]
30	[50, 61]	922	[1364, 1365]	1814	[580, 1162]	2706	[2959, 465]
31	[62, 63]	923	[1366, 1294]	1815	[2263, 2264]	2707	[1438, 2960]
32	[64, 21]	924	[1367, 440]	1816	[2265, 2266]	2708	[1408, 720]
33	[65, 66]	925	[1368, 633]	1817	[2267, 1419]	2709	[2961, 448]
34	[67, 68]	926	[1211, 186]	1818	[2265, 2268]	2710	[2962, 1342]
35	[69, 70]	927	[1369, 1370]	1819	[1391, 1188]	2711	[2912, 1450]
36	[71, 72]	928	[1371, 169]	1820	[1412, 2269]	2712	[2094, 1473]
37	[73, 74]	929	[504, 1338]	1821	[2270, 477]	2713	[2963, 567]
38	[75, 76]	930	[1372, 1373]	1822	[1495, 584]	2714	[2964, 2326]
39	[77, 78]	931	[1374, 1375]	1823	[2271, 640]	2715	[2859, 547]
40	[79, 80]	932	[1376, 1245]	1824	[1551, 1242]	2716	[2965, 601]
41	[81, 82]	933	[1377, 693]	1825	[2272, 2273]	2717	[2310, 663]
42	[83, 84]	934	[1378, 1379]	1826	[2239, 1351]	2718	[2966, 2967]
43	[85, 86]	935	[1380, 602]	1827	[2274, 2275]	2719	[1359, 578]
44	[87, 88]	936	[1381, 712]	1828	[2227, 1434]	2720	[2968, 2375]
45	[89, 90]	937	[1382, 477]	1829	[2276, 188]	2721	[2969, 609]
46	[91, 92]	938	[1383, 697]	1830	[1214, 2277]	2722	[2846, 2296]
47	[93, 94]	939	[1384, 1385]	1831	[2278, 2279]	2723	[2970, 137]

48	[95, 96]	940	[1386, 589]	1832	[1158, 1235]	2724	[2971, 2214]
49	[97, 98]	941	[1356, 718]	1833	[2280, 193]	2725	[2972, 2973]
50	[99, 76]	942	[1387, 188]	1834	[2105, 1149]	2726	[2974, 1291]
51	[100, 101]	943	[1388, 1190]	1835	[160, 512]	2727	[2975, 1214]
52	[102, 103]	944	[1389, 1390]	1836	[1264, 2281]	2728	[2976, 2273]
53	[104, 105]	945	[1391, 623]	1837	[1573, 667]	2729	[2977, 639]
54	[106, 107]	946	[1309, 1213]	1838	[1262, 1182]	2730	[1402, 2301]
55	[108, 109]	947	[1310, 1392]	1839	[2282, 616]	2731	[2978, 1563]
56	[110, 111]	948	[1393, 218]	1840	[1461, 1570]	2732	[2323, 1306]
57	[112, 113]	949	[1394, 662]	1841	[2283, 2284]	2733	[2979, 2307]
58	[114, 115]	950	[1395, 1341]	1842	[10, 1433]	2734	[2980, 1419]
59	[116, 117]	951	[1396, 541]	1843	[536, 1365]	2735	[2981, 195]
60	[118, 119]	952	[1397, 1339]	1844	[710, 2285]	2736	[2397, 1450]
61	[120, 121]	953	[1304, 553]	1845	[2286, 1449]	2737	[2982, 497]
62	[122, 123]	954	[1398, 1399]	1846	[2287, 12]	2738	[2983, 1370]
63	[124, 125]	955	[1320, 1400]	1847	[2288, 464]	2739	[2984, 2194]
64	[126, 127]	956	[1401, 1238]	1848	[2289, 1205]	2740	[2985, 1537]
65	[128, 129]	957	[1402, 1185]	1849	[2290, 1499]	2741	[558, 2986]
66	[130, 131]	958	[1403, 1404]	1850	[1505, 1240]	2742	[2853, 2284]
67	[132, 133]	959	[1405, 10]	1851	[2291, 197]	2743	[2987, 1218]
68	[134, 135]	960	[552, 445]	1852	[560, 1254]	2744	[2250, 1199]
69	[136, 137]	961	[640, 1406]	1853	[587, 158]	2745	[2117, 591]
70	[138, 139]	962	[1407, 48]	1854	[2104, 2292]	2746	[1312, 1546]
71	[140, 141]	963	[1408, 1409]	1855	[2293, 1335]	2747	[2988, 2416]
72	[142, 143]	964	[478, 1330]	1856	[2294, 2153]	2748	[2989, 2217]
73	[144, 145]	965	[1299, 1410]	1857	[218, 14]	2749	[2990, 2091]
74	[146, 147]	966	[1411, 182]	1858	[152, 441]	2750	[2431, 1415]
75	[148, 149]	967	[1412, 1413]	1859	[2295, 497]	2751	[2991, 2151]
76	[150, 151]	968	[1414, 1415]	1860	[500, 1503]	2752	[593, 1178]
77	[152, 153]	969	[1416, 693]	1861	[167, 2296]	2753	[2992, 2353]
78	[8, 154]	970	[474, 1417]	1862	[2297, 1226]	2754	[2993, 2389]
79	[155, 156]	971	[1418, 1419]	1863	[2298, 1453]	2755	[2994, 48]
80	[157, 158]	972	[1420, 40]	1864	[2299, 1186]	2756	[2995, 2967]
81	[159, 36]	973	[1421, 1422]	1865	[215, 1375]	2757	[2996, 609]
82	[160, 161]	974	[1423, 566]	1866	[2300, 2301]	2758	[2997, 2858]
83	[162, 163]	975	[1424, 1425]	1867	[2302, 475]	2759	[2998, 720]
84	[164, 165]	976	[1354, 1426]	1868	[2303, 2268]	2760	[2999, 590]
85	[166, 167]	977	[1427, 1428]	1869	[52, 723]	2761	[3000, 137]
86	[168, 169]	978	[485, 491]	1870	[2304, 1372]	2762	[3001, 135]
87	[170, 171]	979	[1429, 1402]	1871	[2305, 1301]	2763	[191, 1535]
88	[157, 172]	980	[1430, 1431]	1872	[2306, 2307]	2764	[3002, 2089]
89	[173, 174]	981	[1432, 1433]	1873	[2308, 1331]	2765	[3003, 2089]
90	[175, 44]	982	[1434, 486]	1874	[2133, 2]	2766	[2235, 2174]
91	[176, 163]	983	[1435, 1436]	1875	[1287, 151]	2767	[2325, 2973]

92	[177, 178]	984	[1417, 1437]	1876	[2309, 684]	2768	[2092, 2115]
93	[179, 180]	985	[1438, 601]	1877	[2310, 1522]	2769	[3004, 1193]
94	[181, 182]	986	[1439, 1440]	1878	[543, 507]	2770	[2127, 12]
95	[183, 184]	987	[1441, 1442]	1879	[2311, 1182]	2771	[3005, 629]
96	[185, 186]	988	[1443, 138]	1880	[2312, 2155]	2772	[3006, 1360]
97	[187, 188]	989	[1444, 1385]	1881	[2313, 2314]	2773	[2816, 1524]
98	[189, 190]	990	[715, 1445]	1882	[2315, 484]	2774	[2841, 584]
99	[191, 135]	991	[1446, 1301]	1883	[2316, 2317]	2775	[3007, 640]
100	[192, 193]	992	[575, 562]	1884	[617, 1483]	2776	[1216, 1424]
101	[194, 195]	993	[1447, 611]	1885	[2318, 1572]	2777	[3008, 2342]
102	[196, 197]	994	[1448, 645]	1886	[1187, 2319]	2778	[615, 2405]
103	[198, 44]	995	[1333, 1449]	1887	[57, 503]	2779	[2872, 1437]
104	[199, 200]	996	[1450, 190]	1888	[2320, 2321]	2780	[3009, 2262]
105	[201, 202]	997	[1451, 461]	1889	[647, 607]	2781	[594, 2123]
106	[203, 204]	998	[1225, 1452]	1890	[2166, 2322]	2782	[3010, 2104]
107	[205, 206]	999	[1453, 1454]	1891	[692, 1310]	2783	[3011, 1252]
108	[207, 208]	1000	[1455, 225]	1892	[2278, 2224]	2784	[1317, 624]
109	[209, 210]	1001	[1456, 1457]	1893	[1385, 2323]	2785	[3012, 2927]
110	[211, 212]	1002	[567, 1458]	1894	[2324, 616]	2786	[2906, 1572]
111	[213, 214]	1003	[1459, 581]	1895	[2325, 2326]	2787	[2170, 3013]
112	[215, 216]	1004	[1196, 1460]	1896	[2327, 527]	2788	[3014, 2332]
113	[217, 218]	1005	[1461, 1272]	1897	[2328, 2314]	2789	[2143, 2]
114	[219, 34]	1006	[522, 1400]	1898	[1152, 499]	2790	[1510, 3015]
115	[193, 220]	1007	[1462, 163]	1899	[2329, 537]	2791	[3016, 568]
116	[221, 222]	1008	[569, 1463]	1900	[2330, 691]	2792	[3017, 3018]
117	[223, 172]	1009	[1151, 1433]	1901	[1344, 154]	2793	[536, 677]
118	[224, 225]	1010	[1464, 1419]	1902	[611, 2269]	2794	[3019, 1146]
119	[226, 227]	1011	[1465, 1156]	1903	[2331, 2332]	2795	[3020, 1440]
120	[228, 229]	1012	[1466, 1467]	1904	[2333, 1522]	2796	[588, 597]
121	[230, 231]	1013	[1468, 1469]	1905	[39, 1257]	2797	[2248, 1272]
122	[232, 233]	1014	[1470, 1471]	1906	[2252, 153]	2798	[140, 2880]
123	[234, 235]	1015	[1472, 549]	1907	[2334, 489]	2799	[3021, 1431]
124	[236, 237]	1016	[1195, 10]	1908	[1332, 2286]	2800	[3022, 1431]
125	[238, 239]	1017	[43, 536]	1909	[2335, 1456]	2801	[3023, 226]
126	[240, 241]	1018	[1401, 1399]	1910	[2336, 1356]	2802	[3024, 2119]
127	[242, 243]	1019	[1376, 1473]	1911	[2316, 2337]	2803	[3025, 537]
128	[244, 245]	1020	[1474, 1475]	1912	[608, 2180]	2804	[2850, 124]
129	[246, 247]	1021	[1476, 1196]	1913	[1493, 2129]	2805	[3026, 1274]
130	[248, 249]	1022	[1477, 441]	1914	[2338, 1354]	2806	[467, 3027]
131	[250, 251]	1023	[1478, 52]	1915	[2339, 643]	2807	[3028, 3029]
132	[252, 253]	1024	[707, 1415]	1916	[2101, 2188]	2808	[3030, 3031]
133	[94, 254]	1025	[1273, 1325]	1917	[2181, 2275]	2809	[3032, 3033]
134	[255, 256]	1026	[713, 1479]	1918	[1298, 133]	2810	[3034, 782]
135	[257, 258]	1027	[1451, 639]	1919	[2340, 1257]	2811	[3035, 868]

136	[259, 260]	1028	[138, 1480]	1920	[2341, 2342]	2812	[3036, 348]
137	[261, 262]	1029	[1421, 1219]	1921	[2091, 1562]	2813	[3037, 2053]
138	[263, 264]	1030	[1183, 461]	1922	[2343, 1310]	2814	[3038, 1903]
139	[265, 266]	1031	[1481, 1482]	1923	[2344, 40]	2815	[3039, 3040]
140	[267, 268]	1032	[1327, 1483]	1924	[1517, 1153]	2816	[3041, 114]
141	[269, 270]	1033	[1484, 480]	1925	[2202, 1172]	2817	[2685, 996]
142	[271, 272]	1034	[1474, 1485]	1926	[493, 1483]	2818	[902, 3042]
143	[273, 274]	1035	[1486, 1487]	1927	[1552, 58]	2819	[3043, 3044]
144	[275, 276]	1036	[1488, 1330]	1928	[2345, 539]	2820	[2511, 1075]
145	[277, 278]	1037	[1489, 611]	1929	[2346, 2214]	2821	[3045, 774]
146	[279, 280]	1038	[1490, 1375]	1930	[2128, 1494]	2822	[3046, 101]
147	[281, 282]	1039	[1491, 1426]	1931	[1508, 718]	2823	[1597, 3047]
148	[283, 284]	1040	[1492, 1166]	1932	[1202, 2347]	2824	[3048, 778]
149	[285, 250]	1041	[1493, 1494]	1933	[1256, 44]	2825	[3049, 2665]
150	[286, 287]	1042	[1495, 1496]	1934	[2348, 1189]	2826	[1686, 2710]
151	[288, 289]	1043	[1497, 1410]	1935	[2298, 52]	2827	[2558, 1060]
152	[290, 291]	1044	[1453, 723]	1936	[2340, 40]	2828	[2639, 966]
153	[292, 293]	1045	[1151, 229]	1937	[666, 1235]	2829	[29, 3050]
154	[294, 295]	1046	[722, 1454]	1938	[2349, 2350]	2830	[1004, 1713]
155	[296, 297]	1047	[1434, 1469]	1939	[2351, 482]	2831	[1691, 281]
156	[298, 299]	1048	[1498, 1499]	1940	[694, 2256]	2832	[955, 3051]
157	[300, 301]	1049	[1500, 59]	1941	[725, 635]	2833	[386, 282]
158	[16, 302]	1050	[1501, 1339]	1942	[2352, 2353]	2834	[3052, 1907]
159	[303, 304]	1051	[53, 489]	1943	[2354, 2355]	2835	[2593, 1605]
160	[305, 306]	1052	[1502, 1503]	1944	[1208, 1224]	2836	[780, 1719]
161	[307, 308]	1053	[616, 1504]	1945	[1217, 1425]	2837	[2607, 63]
162	[309, 310]	1054	[542, 544]	1946	[2356, 2134]	2838	[907, 2784]
163	[311, 312]	1055	[1499, 190]	1947	[2357, 2216]	2839	[3053, 1806]
164	[313, 314]	1056	[1323, 1317]	1948	[2358, 1487]	2840	[2045, 3054]
165	[315, 316]	1057	[1505, 709]	1949	[2153, 2275]	2841	[1811, 3055]
166	[317, 318]	1058	[1506, 626]	1950	[2359, 1356]	2842	[1936, 739]
167	[68, 319]	1059	[1507, 477]	1951	[2360, 1339]	2843	[3056, 1055]
168	[320, 321]	1060	[1508, 1357]	1952	[2361, 45]	2844	[1108, 1600]
169	[322, 323]	1061	[1509, 1410]	1953	[2362, 1356]	2845	[1871, 3057]
170	[324, 325]	1062	[1510, 1232]	1954	[2363, 1557]	2846	[3058, 280]
171	[114, 326]	1063	[527, 1270]	1955	[2364, 2365]	2847	[3059, 769]
172	[294, 327]	1064	[1426, 167]	1956	[2366, 1532]	2848	[3060, 763]
173	[328, 329]	1065	[1511, 618]	1957	[2367, 2279]	2849	[108, 3061]
174	[330, 331]	1066	[1512, 1164]	1958	[498, 1153]	2850	[890, 1958]
175	[332, 333]	1067	[533, 186]	1959	[466, 1400]	2851	[3062, 1905]
176	[334, 335]	1068	[1513, 1188]	1960	[2173, 1524]	2852	[311, 768]
177	[336, 337]	1069	[1514, 497]	1961	[1350, 2240]	2853	[343, 29]
178	[338, 339]	1070	[1515, 56]	1962	[2223, 2279]	2854	[3063, 1867]
179	[340, 341]	1071	[1516, 190]	1963	[1261, 1422]	2855	[341, 3064]

180	[342, 86]	1072	[44, 1365]	1964	[177, 2368]	2856	[2729, 2012]
181	[343, 344]	1073	[487, 1480]	1965	[2369, 2129]	2857	[424, 916]
182	[345, 346]	1074	[1517, 499]	1966	[2370, 682]	2858	[3065, 3066]
183	[347, 348]	1075	[1393, 156]	1967	[2337, 1456]	2859	[3067, 314]
184	[349, 350]	1076	[1518, 533]	1968	[2371, 1243]	2860	[3068, 1584]
185	[351, 352]	1077	[1519, 56]	1969	[2293, 184]	2861	[3069, 2564]
186	[353, 354]	1078	[129, 1520]	1970	[1313, 635]	2862	[3070, 994]
187	[355, 356]	1079	[147, 145]	1971	[2372, 2269]	2863	[3071, 20]
188	[357, 358]	1080	[1284, 150]	1972	[637, 682]	2864	[1736, 770]
189	[359, 360]	1081	[1521, 558]	1973	[1293, 2151]	2865	[67, 308]
190	[298, 361]	1082	[1522, 662]	1974	[545, 2206]	2866	[3072, 3073]
191	[362, 363]	1083	[1217, 1523]	1975	[2152, 698]	2867	[3074, 113]
192	[364, 365]	1084	[1481, 1524]	1976	[2373, 1221]	2868	[913, 341]
193	[366, 367]	1085	[1200, 1357]	1977	[2374, 2375]	2869	[3075, 2535]
194	[368, 369]	1086	[1337, 583]	1978	[2376, 2177]	2870	[3076, 3077]
195	[370, 371]	1087	[1488, 60]	1979	[2377, 2228]	2871	[1704, 1769]
196	[372, 373]	1088	[502, 58]	1980	[55, 2161]	2872	[3078, 3032]
197	[374, 350]	1089	[1420, 1257]	1981	[529, 2378]	2873	[1052, 245]
198	[375, 376]	1090	[1341, 1319]	1982	[2379, 2321]	2874	[3079, 857]
199	[377, 378]	1091	[1525, 1526]	1983	[1175, 2177]	2875	[3080, 1620]
200	[379, 380]	1092	[1527, 473]	1984	[2274, 1373]	2876	[3081, 1924]
201	[381, 247]	1093	[1528, 197]	1985	[2380, 1403]	2877	[3082, 2685]
202	[382, 383]	1094	[1529, 1482]	1986	[2381, 1252]	2878	[1962, 1584]
203	[384, 385]	1095	[1530, 638]	1987	[1146, 2382]	2879	[434, 1745]
204	[386, 387]	1096	[1531, 1532]	1988	[2383, 548]	2880	[3083, 259]
205	[388, 389]	1097	[1148, 1267]	1989	[2135, 512]	2881	[1664, 2636]
206	[390, 391]	1098	[1533, 230]	1990	[2384, 527]	2882	[3084, 3085]
207	[392, 393]	1099	[1534, 624]	1991	[2385, 554]	2883	[3086, 3087]
208	[394, 395]	1100	[652, 1480]	1992	[2386, 177]	2884	[1636, 859]
209	[396, 397]	1101	[1279, 133]	1993	[2387, 1445]	2885	[3088, 1825]
210	[250, 398]	1102	[134, 1535]	1994	[2388, 2389]	2886	[1803, 1924]
211	[399, 400]	1103	[1536, 1537]	1995	[2390, 2139]	2887	[3089, 1092]
212	[401, 402]	1104	[153, 1538]	1996	[2391, 2147]	2888	[3090, 1000]
213	[403, 404]	1105	[156, 14]	1997	[2349, 1213]	2889	[2541, 383]
214	[405, 406]	1106	[1539, 1436]	1998	[180, 2392]	2890	[3091, 3092]
215	[407, 408]	1107	[1230, 698]	1999	[2393, 2326]	2891	[3093, 763]
216	[409, 410]	1108	[1540, 712]	2000	[2286, 2148]	2892	[764, 3047]
217	[411, 412]	1109	[537, 1541]	2001	[2344, 1257]	2893	[3094, 3095]
218	[413, 22]	1110	[1542, 643]	2002	[1239, 709]	2894	[889, 3096]
219	[414, 415]	1111	[1543, 495]	2003	[1491, 2209]	2895	[1797, 333]
220	[416, 417]	1112	[1544, 141]	2004	[2351, 1193]	2896	[3097, 297]
221	[418, 419]	1113	[1545, 1546]	2005	[1253, 561]	2897	[3098, 26]
222	[420, 421]	1114	[1531, 1489]	2006	[2394, 720]	2898	[3099, 759]
223	[422, 423]	1115	[627, 1547]	2007	[1373, 572]	2899	[3100, 819]

224	[424, 425]	1116	[48, 1547]	2008	[2395, 1554]	2900	[3101, 272]
225	[426, 427]	1117	[1548, 572]	2009	[1206, 2396]	2901	[3102, 3103]
226	[428, 429]	1118	[1549, 1550]	2010	[2093, 1469]	2902	[1613, 297]
227	[430, 431]	1119	[1288, 1551]	2011	[2397, 1499]	2903	[3104, 3105]
228	[244, 432]	1120	[1552, 503]	2012	[663, 2398]	2904	[3106, 411]
229	[20, 433]	1121	[1553, 1554]	2013	[2399, 605]	2905	[1024, 732]
230	[434, 435]	1122	[1555, 36]	2014	[2400, 226]	2906	[1820, 990]
231	[436, 437]	1123	[1556, 1557]	2015	[2401, 569]	2907	[273, 2752]
232	[438, 439]	1124	[1558, 586]	2016	[2402, 566]	2908	[2053, 803]
233	[440, 441]	1125	[1255, 46]	2017	[1275, 2403]	2909	[3107, 1129]
234	[442, 443]	1126	[1559, 574]	2018	[2404, 2107]	2910	[3108, 3109]
235	[444, 445]	1127	[1193, 584]	2019	[1197, 2405]	2911	[3110, 1045]
236	[155, 218]	1128	[1560, 174]	2020	[2103, 1547]	2912	[972, 932]
237	[443, 446]	1129	[1561, 489]	2021	[2406, 1554]	2913	[3111, 1126]
238	[447, 154]	1130	[1562, 1426]	2022	[2407, 2353]	2914	[3112, 1940]
239	[448, 449]	1131	[1378, 1563]	2023	[2408, 1156]	2915	[1915, 858]
240	[450, 451]	1132	[1564, 1565]	2024	[2303, 2266]	2916	[3113, 74]
241	[153, 452]	1133	[1310, 1566]	2025	[2409, 684]	2917	[3114, 1066]
242	[453, 454]	1134	[1567, 451]	2026	[221, 1565]	2918	[3115, 2001]
243	[164, 455]	1135	[1339, 1228]	2027	[2257, 2410]	2919	[416, 1675]
244	[456, 457]	1136	[1568, 593]	2028	[2254, 216]	2920	[3116, 256]
245	[458, 459]	1137	[1569, 1445]	2029	[2411, 1291]	2921	[3117, 308]
246	[460, 461]	1138	[1271, 1570]	2030	[456, 1316]	2922	[3118, 3119]
247	[462, 463]	1139	[708, 1240]	2031	[1286, 2412]	2923	[918, 3120]
248	[464, 465]	1140	[1571, 34]	2032	[2413, 1166]	2924	[3121, 3122]
249	[466, 467]	1141	[534, 1572]	2033	[2414, 1169]	2925	[2461, 1644]
250	[202, 38]	1142	[1573, 1235]	2034	[1328, 1326]	2926	[1868, 260]
251	[468, 469]	1143	[183, 1335]	2035	[2415, 225]	2927	[3123, 2533]
252	[470, 471]	1144	[467, 1574]	2036	[2416, 2210]	2928	[3124, 2567]
253	[472, 473]	1145	[1575, 838]	2037	[2354, 2264]	2929	[3125, 419]
254	[474, 475]	1146	[1576, 1577]	2038	[1562, 2209]	2930	[3126, 329]
255	[476, 477]	1147	[1578, 1579]	2039	[2417, 1404]	2931	[253, 3127]
256	[478, 60]	1148	[1580, 233]	2040	[1389, 451]	2932	[3128, 2602]
257	[479, 480]	1149	[1581, 1582]	2041	[2418, 1221]	2933	[3129, 2784]
258	[481, 482]	1150	[1583, 1584]	2042	[2419, 195]	2934	[3130, 3131]
259	[447, 483]	1151	[249, 299]	2043	[2260, 484]	2935	[3132, 288]
260	[484, 459]	1152	[1585, 765]	2044	[2420, 709]	2936	[3133, 785]
261	[485, 46]	1153	[862, 1586]	2045	[2421, 472]	2937	[3134, 1757]
262	[188, 486]	1154	[1587, 1588]	2046	[2304, 2153]	2938	[2065, 2788]
263	[487, 139]	1155	[1589, 1590]	2047	[2422, 505]	2939	[3135, 3136]
264	[488, 489]	1156	[99, 1083]	2048	[1345, 621]	2940	[3137, 395]
265	[490, 156]	1157	[1591, 421]	2049	[479, 2423]	2941	[3138, 1919]
266	[45, 491]	1158	[1592, 1593]	2050	[2302, 1417]	2942	[3139, 1642]
267	[492, 493]	1159	[1594, 899]	2051	[139, 650]	2943	[3140, 3141]

268	[494, 495]	1160	[1102, 842]	2052	[2424, 1221]	2944	[965, 433]
269	[496, 497]	1161	[1595, 1596]	2053	[2425, 1445]	2945	[3142, 911]
270	[498, 499]	1162	[763, 1597]	2054	[2426, 2365]	2946	[3143, 363]
271	[500, 501]	1163	[1598, 798]	2055	[557, 621]	2947	[3144, 1090]
272	[502, 503]	1164	[1599, 1600]	2056	[228, 1433]	2948	[937, 1593]
273	[504, 169]	1165	[1601, 1602]	2057	[2427, 472]	2949	[3145, 3146]
274	[505, 506]	1166	[1603, 321]	2058	[2209, 2174]	2950	[3147, 3148]
275	[507, 508]	1167	[1604, 1605]	2059	[2428, 45]	2951	[3149, 1739]
276	[509, 210]	1168	[1606, 263]	2060	[521, 483]	2952	[3150, 325]
277	[510, 511]	1169	[1607, 1608]	2061	[1456, 2429]	2953	[1867, 1872]
278	[462, 151]	1170	[1609, 1610]	2062	[2430, 1526]	2954	[3151, 2585]
279	[512, 513]	1171	[1066, 1611]	2063	[2431, 613]	2955	[3152, 1929]
280	[209, 514]	1172	[1101, 508]	2064	[2432, 1319]	2956	[2592, 1604]
281	[515, 516]	1173	[260, 1612]	2065	[2416, 2091]	2957	[3153, 859]
282	[517, 516]	1174	[1613, 1614]	2066	[196, 2109]	2958	[3154, 2628]
283	[512, 517]	1175	[1615, 1616]	2067	[2433, 2434]	2959	[2011, 1901]
284	[518, 147]	1176	[1617, 1618]	2068	[1532, 611]	2960	[3155, 2491]
285	[513, 516]	1177	[1619, 1620]	2069	[2435, 2436]	2961	[3067, 2479]
286	[513, 511]	1178	[408, 1621]	2070	[2437, 488]	2962	[3156, 289]
287	[507, 507]	1179	[1622, 767]	2071	[2438, 2279]	2963	[3157, 241]
288	[519, 38]	1180	[1623, 315]	2072	[2439, 643]	2964	[3158, 83]
289	[517, 511]	1181	[1624, 1625]	2073	[2440, 2332]	2965	[3159, 99]
290	[520, 139]	1182	[1626, 1627]	2074	[1302, 2441]	2966	[116, 98]
291	[521, 154]	1183	[1628, 356]	2075	[511, 144]	2967	[3160, 3161]
292	[522, 467]	1184	[1629, 1630]	2076	[2442, 1242]	2968	[3162, 1030]
293	[523, 524]	1185	[1075, 239]	2077	[2443, 2177]	2969	[1902, 3163]
294	[525, 526]	1186	[1631, 307]	2078	[720, 563]	2970	[3164, 1099]
295	[527, 214]	1187	[414, 363]	2079	[2444, 2164]	2971	[3165, 3166]
296	[528, 529]	1188	[1599, 1109]	2080	[2445, 1241]	2972	[2753, 353]
297	[530, 531]	1189	[1632, 1633]	2081	[2446, 1238]	2973	[3167, 1627]
298	[532, 42]	1190	[87, 1055]	2082	[2447, 2188]	2974	[3168, 877]
299	[533, 446]	1191	[1634, 1635]	2083	[2448, 2148]	2975	[3169, 333]
300	[534, 535]	1192	[1636, 1637]	2084	[2330, 647]	2976	[3170, 1716]
301	[198, 536]	1193	[70, 1638]	2085	[2244, 505]	2977	[3171, 803]
302	[537, 538]	1194	[319, 837]	2086	[529, 2449]	2978	[3172, 1835]
303	[190, 539]	1195	[1639, 1640]	2087	[2450, 1905]	2979	[3173, 2575]
304	[540, 541]	1196	[1641, 288]	2088	[2451, 1642]	2980	[3174, 1051]
305	[542, 201]	1197	[757, 1642]	2089	[1719, 295]	2981	[3175, 3176]
306	[518, 144]	1198	[1643, 1644]	2090	[103, 1706]	2982	[3177, 294]
307	[543, 508]	1199	[1645, 72]	2091	[378, 1933]	2983	[102, 1640]
308	[544, 149]	1200	[1646, 740]	2092	[2452, 2453]	2984	[3178, 3179]
309	[545, 505]	1201	[1647, 1648]	2093	[2454, 882]	2985	[794, 1087]
310	[546, 547]	1202	[1649, 1650]	2094	[2455, 398]	2986	[928, 2662]
311	[548, 135]	1203	[290, 1651]	2095	[2456, 1029]	2987	[3180, 1129]

312	[549, 550]	1204	[1652, 20]	2096	[1769, 2457]	2988	[3181, 2677]
313	[551, 127]	1205	[1653, 1654]	2097	[2458, 276]	2989	[3182, 2001]
314	[552, 553]	1206	[1655, 1656]	2098	[2459, 357]	2990	[3183, 282]
315	[554, 459]	1207	[1657, 1658]	2099	[249, 361]	2991	[3184, 2784]
316	[555, 556]	1208	[1659, 1660]	2100	[2460, 236]	2992	[3185, 291]
317	[557, 558]	1209	[1661, 1662]	2101	[2461, 2462]	2993	[3186, 2710]
318	[559, 452]	1210	[1663, 1664]	2102	[2463, 2464]	2994	[3187, 348]
319	[508, 507]	1211	[1665, 1666]	2103	[2465, 2466]	2995	[792, 63]
320	[560, 561]	1212	[1667, 1668]	2104	[2467, 1065]	2996	[2802, 399]
321	[185, 446]	1213	[1669, 863]	2105	[2468, 2469]	2997	[2773, 1092]
322	[562, 480]	1214	[1670, 1036]	2106	[1839, 2470]	2998	[3188, 1137]
323	[563, 564]	1215	[86, 1671]	2107	[120, 2471]	2999	[3189, 841]
324	[565, 566]	1216	[1672, 785]	2108	[2472, 1588]	3000	[3190, 390]
325	[38, 210]	1217	[1673, 929]	2109	[2473, 1827]	3001	[3191, 436]
326	[567, 568]	1218	[1674, 1675]	2110	[2474, 2475]	3002	[3192, 405]
327	[569, 570]	1219	[1623, 1044]	2111	[2476, 2477]	3003	[3193, 996]
328	[571, 572]	1220	[1676, 739]	2112	[2478, 2479]	3004	[3194, 1761]
329	[573, 574]	1221	[1677, 1678]	2113	[413, 241]	3005	[3195, 842]
330	[575, 576]	1222	[1634, 1679]	2114	[2480, 900]	3006	[3196, 318]
331	[577, 578]	1223	[1680, 1681]	2115	[2481, 1958]	3007	[3197, 1783]
332	[579, 505]	1224	[917, 1682]	2116	[1901, 2482]	3008	[2040, 760]
333	[580, 581]	1225	[1683, 785]	2117	[2483, 2484]	3009	[292, 1045]
334	[582, 583]	1226	[1684, 1685]	2118	[2485, 893]	3010	[3198, 774]
335	[482, 584]	1227	[1686, 953]	2119	[901, 2486]	3011	[3199, 417]
336	[585, 586]	1228	[1687, 427]	2120	[2487, 2488]	3012	[1770, 390]
337	[587, 172]	1229	[1688, 1689]	2121	[2489, 1578]	3013	[1604, 3087]
338	[588, 589]	1230	[1690, 21]	2122	[2490, 895]	3014	[3200, 907]
339	[590, 591]	1231	[1691, 386]	2123	[1033, 2491]	3015	[3201, 2619]
340	[592, 593]	1232	[1692, 786]	2124	[2492, 1022]	3016	[3202, 788]
341	[594, 595]	1233	[1693, 1694]	2125	[2493, 282]	3017	[3203, 842]
342	[596, 597]	1234	[1695, 1696]	2126	[2494, 1769]	3018	[3204, 3205]
343	[598, 471]	1235	[78, 266]	2127	[1953, 2495]	3019	[3206, 1713]
344	[599, 131]	1236	[63, 1697]	2128	[2496, 2497]	3020	[3207, 1087]
345	[600, 601]	1237	[1698, 1699]	2129	[2498, 6]	3021	[2714, 86]
346	[602, 603]	1238	[1700, 1701]	2130	[1629, 82]	3022	[1821, 376]
347	[604, 605]	1239	[1702, 1703]	2131	[2499, 1115]	3023	[3208, 29]
348	[606, 607]	1240	[749, 999]	2132	[2500, 290]	3024	[3209, 436]
349	[608, 609]	1241	[1704, 1705]	2133	[2501, 2502]	3025	[3210, 2053]
350	[610, 611]	1242	[1706, 1707]	2134	[2503, 2010]	3026	[3211, 3212]
351	[612, 613]	1243	[1625, 1708]	2135	[2504, 850]	3027	[859, 3213]
352	[490, 218]	1244	[1709, 847]	2136	[1576, 1708]	3028	[2405, 2321]
353	[211, 204]	1245	[1140, 1710]	2137	[2505, 2506]	3029	[3214, 1252]
354	[193, 614]	1246	[1711, 1712]	2138	[2507, 2508]	3030	[3215, 180]
355	[615, 616]	1247	[1713, 1714]	2139	[1101, 1101]	3031	[3216, 2273]

356	[617, 618]	1248	[1715, 120]	2140	[2509, 2510]	3032	[2887, 1400]
357	[532, 619]	1249	[940, 1716]	2141	[2511, 238]	3033	[124, 449]
358	[497, 158]	1250	[1717, 297]	2142	[2512, 285]	3034	[2840, 654]
359	[620, 621]	1251	[1718, 995]	2143	[2513, 1858]	3035	[3217, 1210]
360	[622, 623]	1252	[1719, 327]	2144	[2514, 2515]	3036	[3218, 1474]
361	[465, 624]	1253	[1720, 946]	2145	[2516, 264]	3037	[721, 564]
362	[625, 626]	1254	[1721, 1722]	2146	[2517, 1921]	3038	[3219, 1333]
363	[627, 531]	1255	[1723, 292]	2147	[2518, 2519]	3039	[2185, 2]
364	[628, 629]	1256	[1724, 1725]	2148	[18, 371]	3040	[3001, 1535]
365	[630, 631]	1257	[799, 775]	2149	[2520, 257]	3041	[3220, 2353]
366	[632, 633]	1258	[1726, 1699]	2150	[2521, 838]	3042	[156, 656]
367	[634, 635]	1259	[1727, 1677]	2151	[2522, 1002]	3043	[2961, 124]
368	[49, 636]	1260	[1728, 1729]	2152	[2523, 2524]	3044	[1244, 1473]
369	[637, 638]	1261	[1730, 1731]	2153	[2525, 1931]	3045	[3221, 1370]
370	[460, 639]	1262	[1732, 1733]	2154	[2526, 905]	3046	[3222, 567]
371	[640, 641]	1263	[1734, 1735]	2155	[2464, 2527]	3047	[3223, 2307]
372	[642, 643]	1264	[1736, 799]	2156	[2528, 836]	3048	[3224, 1214]
373	[644, 645]	1265	[1045, 1737]	2157	[1039, 872]	3049	[3225, 177]
374	[646, 647]	1266	[1738, 1739]	2158	[323, 2529]	3050	[1385, 2908]
375	[648, 129]	1267	[1740, 1741]	2159	[2530, 397]	3051	[1480, 650]
376	[649, 473]	1268	[1742, 1743]	2160	[63, 2531]	3052	[3226, 127]
377	[650, 651]	1269	[387, 1744]	2161	[2532, 2533]	3053	[2959, 1317]
378	[652, 139]	1270	[1745, 1746]	2162	[1865, 886]	3054	[3227, 2833]
379	[653, 654]	1271	[1615, 365]	2163	[2534, 82]	3055	[3026, 1325]
380	[655, 656]	1272	[1747, 748]	2164	[2535, 2536]	3056	[3228, 451]
381	[37, 509]	1273	[1748, 1749]	2165	[2537, 2538]	3057	[2301, 2865]
382	[657, 508]	1274	[1640, 1135]	2166	[407, 2517]	3058	[2902, 2854]
383	[150, 463]	1275	[1750, 1653]	2167	[2539, 429]	3059	[3229, 686]
384	[658, 529]	1276	[1751, 1752]	2168	[2540, 1897]	3060	[2833, 2164]
385	[659, 660]	1277	[1753, 1694]	2169	[2541, 1945]	3061	[3230, 684]
386	[661, 662]	1278	[1754, 235]	2170	[2542, 2543]	3062	[3231, 2208]
387	[663, 662]	1279	[1755, 928]	2171	[1751, 2544]	3063	[1192, 3232]
388	[664, 665]	1280	[1756, 1757]	2172	[2545, 731]	3064	[505, 3233]
389	[666, 667]	1281	[1758, 1759]	2173	[2546, 832]	3065	[576, 2423]
390	[668, 452]	1282	[256, 1760]	2174	[370, 849]	3066	[2978, 1379]
391	[669, 670]	1283	[105, 1761]	2175	[2547, 371]	3067	[440, 153]
392	[671, 672]	1284	[1762, 288]	2176	[1597, 2548]	3068	[3234, 2342]
393	[673, 674]	1285	[1763, 382]	2177	[2549, 2550]	3069	[3235, 2436]
394	[653, 675]	1286	[1764, 1765]	2178	[2551, 382]	3070	[3236, 493]
395	[676, 677]	1287	[1766, 1767]	2179	[1698, 2552]	3071	[3237, 1165]
396	[678, 513]	1288	[1768, 1769]	2180	[2553, 2554]	3072	[3238, 1459]
397	[679, 202]	1289	[1770, 261]	2181	[2555, 2556]	3073	[3239, 2852]
398	[516, 144]	1290	[355, 1771]	2182	[906, 1127]	3074	[3237, 1391]
399	[680, 681]	1291	[1772, 1773]	2183	[2557, 1623]	3075	[2231, 1316]

400	[629, 682]	1292	[990, 1648]	2184	[2558, 2559]	3076	[3240, 59]
401	[683, 133]	1293	[1774, 943]	2185	[2560, 2001]	3077	[3241, 2865]
402	[549, 684]	1294	[1775, 84]	2186	[2561, 2562]	3078	[2842, 124]
403	[126, 685]	1295	[1776, 941]	2187	[2563, 2564]	3079	[3242, 544]
404	[686, 667]	1296	[1777, 1778]	2188	[2565, 2566]	3080	[470, 2285]
405	[687, 125]	1297	[1779, 1780]	2189	[233, 2567]	3081	[2925, 1165]
406	[669, 688]	1298	[1781, 1003]	2190	[2568, 356]	3082	[1498, 1450]
407	[689, 564]	1299	[1782, 1783]	2191	[2569, 2570]	3083	[3243, 52]
408	[690, 645]	1300	[1784, 1785]	2192	[113, 2571]	3084	[3244, 1360]
409	[646, 691]	1301	[341, 1786]	2193	[2572, 1800]	3085	[3245, 674]
410	[692, 578]	1302	[1787, 951]	2194	[2573, 2510]	3086	[625, 2199]
411	[693, 681]	1303	[1788, 1789]	2195	[260, 2574]	3087	[1459, 1162]
412	[493, 618]	1304	[1790, 1791]	2196	[1919, 2575]	3088	[3246, 1332]
413	[694, 171]	1305	[1792, 1793]	2197	[1734, 436]	3089	[3009, 529]
414	[695, 583]	1306	[895, 1794]	2198	[2576, 1903]	3090	[1160, 2228]
415	[696, 697]	1307	[1795, 413]	2199	[2577, 1608]	3091	[525, 2403]
416	[596, 589]	1308	[1796, 1669]	2200	[2578, 2579]	3092	[3016, 1458]
417	[599, 698]	1309	[1797, 1798]	2201	[2580, 840]	3093	[3247, 2104]
418	[699, 700]	1310	[373, 901]	2202	[389, 2581]	3094	[1266, 1149]
419	[701, 702]	1311	[1799, 1800]	2203	[2582, 383]	3095	[2883, 469]
420	[703, 704]	1312	[1801, 103]	2204	[2583, 333]	3096	[2162, 723]
421	[705, 706]	1313	[1802, 1651]	2205	[2584, 270]	3097	[3248, 1526]
422	[707, 613]	1314	[1803, 1804]	2206	[2585, 278]	3098	[2318, 535]
423	[708, 709]	1315	[1689, 1805]	2207	[2060, 2571]	3099	[664, 2844]
424	[710, 471]	1316	[1806, 772]	2208	[1705, 2586]	3100	[3249, 1264]
425	[475, 660]	1317	[1006, 756]	2209	[2587, 315]	3101	[1296, 1316]
426	[711, 712]	1318	[1807, 768]	2210	[1625, 1577]	3102	[128, 1160]
427	[713, 714]	1319	[1689, 1808]	2211	[2588, 1745]	3103	[2820, 1402]
428	[715, 716]	1320	[1809, 916]	2212	[2589, 98]	3104	[1521, 621]
429	[717, 718]	1321	[1810, 307]	2213	[2590, 2591]	3105	[1534, 2116]
430	[719, 595]	1322	[65, 256]	2214	[1933, 1927]	3106	[3250, 493]
431	[720, 721]	1323	[1811, 1812]	2215	[2592, 2593]	3107	[3251, 2967]
432	[722, 723]	1324	[1813, 1814]	2216	[322, 2065]	3108	[658, 2262]
433	[40, 724]	1325	[20, 887]	2217	[2594, 1142]	3109	[2448, 1449]
434	[8, 483]	1326	[1815, 1712]	2218	[2001, 2595]	3110	[3252, 555]
435	[725, 524]	1327	[1816, 1120]	2219	[2596, 2597]	3111	[3253, 1193]
436	[726, 595]	1328	[1817, 1599]	2220	[908, 2598]	3112	[1414, 613]
437	[167, 727]	1329	[1818, 1819]	2221	[2599, 1901]	3113	[3254, 2858]
438	[728, 729]	1330	[896, 1820]	2222	[2600, 109]	3114	[3255, 2342]
439	[730, 381]	1331	[1821, 1822]	2223	[2601, 2602]	3115	[3256, 1239]
440	[731, 732]	1332	[1823, 18]	2224	[2603, 1664]	3116	[3257, 2365]
441	[90, 88]	1333	[1022, 404]	2225	[2604, 862]	3117	[3258, 1279]
442	[733, 734]	1334	[1824, 1825]	2226	[1800, 831]	3118	[3259, 704]
443	[735, 736]	1335	[1826, 1827]	2227	[1750, 1793]	3119	[2320, 1504]

444	[737, 738]	1336	[1828, 1046]	2228	[245, 2605]	3120	[3260, 2273]
445	[739, 740]	1337	[1829, 390]	2229	[1650, 767]	3121	[2197, 2319]
446	[83, 741]	1338	[778, 1830]	2230	[2606, 2607]	3122	[559, 1538]
447	[742, 308]	1339	[1831, 1832]	2231	[334, 917]	3123	[2234, 3015]
448	[404, 743]	1340	[1833, 353]	2232	[2608, 1733]	3124	[2823, 1272]
449	[739, 744]	1341	[1834, 1835]	2233	[1760, 1986]	3125	[3261, 180]
450	[745, 746]	1342	[1687, 1836]	2234	[2016, 401]	3126	[3262, 590]
451	[747, 748]	1343	[1837, 63]	2235	[2609, 2610]	3127	[50, 2160]
452	[749, 750]	1344	[1838, 845]	2236	[2611, 1773]	3128	[3263, 1333]
453	[751, 752]	1345	[1839, 928]	2237	[1655, 2612]	3129	[3264, 2217]
454	[753, 119]	1346	[1840, 265]	2238	[2613, 284]	3130	[1343, 636]
455	[318, 754]	1347	[1841, 1633]	2239	[1117, 2614]	3131	[2210, 1562]
456	[309, 273]	1348	[1842, 1843]	2240	[2615, 2616]	3132	[3265, 2284]
457	[755, 756]	1349	[1844, 1845]	2241	[2570, 2581]	3133	[3266, 1214]
458	[757, 758]	1350	[991, 1809]	2242	[2617, 1593]	3134	[3267, 1557]
459	[759, 760]	1351	[1846, 1847]	2243	[2618, 259]	3135	[2356, 2]
460	[761, 762]	1352	[1848, 1007]	2244	[404, 1713]	3136	[3230, 550]
461	[763, 764]	1353	[1849, 1850]	2245	[2035, 2619]	3137	[2950, 2396]
462	[765, 766]	1354	[307, 68]	2246	[1723, 855]	3138	[3268, 1256]
463	[767, 768]	1355	[1851, 1051]	2247	[2620, 1032]	3139	[3269, 3018]
464	[769, 770]	1356	[1852, 1853]	2248	[2621, 416]	3140	[1243, 484]
465	[771, 772]	1357	[257, 1854]	2249	[897, 990]	3141	[2962, 1319]
466	[773, 774]	1358	[1855, 1125]	2250	[2622, 2623]	3142	[3270, 1214]
467	[770, 775]	1359	[1856, 1085]	2251	[2624, 824]	3143	[2112, 2937]
468	[776, 777]	1360	[435, 1857]	2252	[2625, 2626]	3144	[1374, 216]
469	[778, 779]	1361	[1858, 755]	2253	[2627, 1687]	3145	[3271, 48]
470	[780, 294]	1362	[1142, 999]	2254	[1110, 2628]	3146	[3272, 2865]
471	[781, 782]	1363	[1859, 357]	2255	[877, 344]	3147	[3273, 2389]
472	[783, 784]	1364	[1860, 1068]	2256	[832, 243]	3148	[3274, 454]
473	[785, 786]	1365	[86, 1861]	2257	[2629, 2477]	3149	[3275, 521]
474	[787, 382]	1366	[1862, 1713]	2258	[1706, 2630]	3150	[3276, 549]
475	[233, 788]	1367	[1863, 1610]	2259	[397, 285]	3151	[3277, 1149]
476	[789, 106]	1368	[1864, 920]	2260	[1849, 1129]	3152	[3278, 1239]
477	[790, 791]	1369	[1865, 20]	2261	[2631, 286]	3153	[3279, 1532]
478	[792, 793]	1370	[1866, 1867]	2262	[2632, 287]	3154	[3280, 1289]
479	[794, 795]	1371	[1868, 1869]	2263	[2021, 426]	3155	[3281, 1557]
480	[796, 92]	1372	[1870, 929]	2264	[2633, 2634]	3156	[2124, 2810]
481	[797, 798]	1373	[1126, 253]	2265	[2635, 2636]	3157	[3282, 1367]
482	[769, 799]	1374	[1871, 1872]	2266	[2637, 1917]	3158	[3283, 2155]
483	[16, 800]	1375	[1873, 1785]	2267	[64, 413]	3159	[3277, 1267]
484	[352, 435]	1376	[1874, 1875]	2268	[2638, 993]	3160	[3284, 2960]
485	[801, 802]	1377	[843, 1876]	2269	[803, 2639]	3161	[3285, 165]
486	[803, 804]	1378	[1877, 1878]	2270	[2640, 91]	3162	[2402, 2810]
487	[805, 806]	1379	[263, 802]	2271	[2641, 1033]	3163	[3286, 2852]

488	[807, 808]	1380	[254, 940]	2272	[2642, 2505]	3164	[3287, 3018]
489	[91, 809]	1381	[1879, 961]	2273	[1775, 741]	3165	[1150, 10]
490	[810, 29]	1382	[1880, 1881]	2274	[2643, 2644]	3166	[2334, 54]
491	[106, 811]	1383	[1882, 948]	2275	[1993, 1003]	3167	[1222, 2922]
492	[812, 813]	1384	[23, 329]	2276	[1578, 803]	3168	[3288, 599]
493	[814, 815]	1385	[1883, 1884]	2277	[376, 2645]	3169	[3289, 593]
494	[816, 817]	1386	[1885, 1812]	2278	[2646, 1604]	3170	[2393, 2973]
495	[752, 398]	1387	[24, 762]	2279	[2647, 1984]	3171	[3290, 2140]
496	[818, 819]	1388	[1886, 1887]	2280	[2648, 994]	3172	[1233, 1424]
497	[820, 821]	1389	[1888, 1889]	2281	[2598, 2649]	3173	[1490, 216]
498	[822, 823]	1390	[1890, 1891]	2282	[1758, 405]	3174	[3291, 2927]
499	[824, 825]	1391	[1892, 771]	2283	[1647, 412]	3175	[2220, 2262]
500	[826, 827]	1392	[253, 1893]	2284	[2650, 2651]	3176	[546, 1402]
501	[828, 829]	1393	[1894, 430]	2285	[2652, 922]	3177	[3292, 569]
502	[830, 831]	1394	[1895, 1778]	2286	[1089, 866]	3178	[3293, 651]
503	[832, 833]	1395	[1896, 1897]	2287	[2653, 2654]	3179	[3294, 2214]
504	[834, 835]	1396	[1800, 1898]	2288	[2655, 2002]	3180	[496, 157]
505	[836, 837]	1397	[1899, 1011]	2289	[2656, 1640]	3181	[3295, 1273]
506	[838, 839]	1398	[986, 1126]	2290	[2523, 1051]	3182	[3296, 488]
507	[840, 841]	1399	[1900, 1685]	2291	[2657, 2658]	3183	[3297, 468]
508	[508, 508]	1400	[1901, 80]	2292	[859, 2068]	3184	[3298, 2268]
509	[842, 843]	1401	[1902, 1903]	2293	[1979, 1756]	3185	[3299, 2844]
510	[844, 827]	1402	[275, 402]	2294	[2659, 1699]	3186	[3300, 2927]
511	[308, 319]	1403	[1904, 1875]	2295	[2660, 16]	3187	[3301, 226]
512	[282, 845]	1404	[1905, 113]	2296	[318, 2661]	3188	[3302, 1289]
513	[837, 275]	1405	[1906, 1907]	2297	[2662, 2035]	3189	[3303, 468]
514	[846, 847]	1406	[966, 1908]	2298	[2663, 2612]	3190	[3304, 2890]
515	[848, 281]	1407	[1909, 1756]	2299	[2664, 2665]	3191	[2972, 2326]
516	[18, 849]	1408	[1910, 915]	2300	[1810, 67]	3192	[3305, 222]
517	[850, 851]	1409	[1911, 1060]	2301	[1937, 744]	3193	[3306, 1226]
518	[852, 277]	1410	[1912, 410]	2302	[2666, 1633]	3194	[3307, 1183]
519	[853, 846]	1411	[1913, 1914]	2303	[2667, 1997]	3195	[3308, 1183]
520	[854, 855]	1412	[877, 29]	2304	[2668, 1126]	3196	[3309, 56]
521	[856, 857]	1413	[1793, 1654]	2305	[2669, 1725]	3197	[3310, 1403]
522	[858, 859]	1414	[1915, 1137]	2306	[2670, 2671]	3198	[3311, 720]
523	[860, 861]	1415	[1916, 1917]	2307	[976, 1908]	3199	[2964, 2973]
524	[862, 863]	1416	[1763, 1918]	2308	[2672, 2673]	3200	[2438, 2224]
525	[24, 864]	1417	[1919, 816]	2309	[2674, 1884]	3201	[547, 1185]
526	[752, 251]	1418	[1920, 298]	2310	[2675, 1997]	3202	[551, 685]
527	[865, 866]	1419	[1921, 1922]	2311	[2676, 2677]	3203	[2851, 2410]
528	[867, 868]	1420	[1923, 1924]	2312	[2678, 1812]	3204	[2106, 212]
529	[869, 766]	1421	[1925, 1926]	2313	[2679, 2680]	3205	[3285, 455]
530	[870, 871]	1422	[759, 1927]	2314	[1082, 752]	3206	[3312, 123]
531	[94, 872]	1423	[1928, 1929]	2315	[378, 759]	3207	[644, 2937]

532	[873, 276]	1424	[1930, 1931]	2316	[2681, 365]	3208	[3313, 1385]
533	[874, 875]	1425	[785, 1932]	2317	[2682, 256]	3209	[2221, 597]
534	[876, 877]	1426	[1933, 760]	2318	[2683, 2684]	3210	[3314, 2091]
535	[878, 879]	1427	[1934, 378]	2319	[2685, 903]	3211	[2324, 2405]
536	[855, 293]	1428	[1935, 875]	2320	[2686, 827]	3212	[649, 2245]
537	[880, 881]	1429	[1936, 1937]	2321	[405, 2687]	3213	[681, 3315]
538	[329, 864]	1430	[1667, 1725]	2322	[2688, 2689]	3214	[3316, 3317]
539	[882, 883]	1431	[1938, 1939]	2323	[329, 762]	3215	[3318, 1593]
540	[884, 885]	1432	[1594, 28]	2324	[352, 1745]	3216	[3319, 979]
541	[886, 887]	1433	[1640, 1706]	2325	[1976, 734]	3217	[1682, 3120]
542	[843, 325]	1434	[1940, 1941]	2326	[2690, 380]	3218	[3320, 2502]
543	[888, 840]	1435	[1942, 101]	2327	[2691, 996]	3219	[3321, 857]
544	[847, 842]	1436	[1943, 1944]	2328	[2692, 2693]	3220	[3322, 749]
545	[889, 838]	1437	[382, 1945]	2329	[2694, 1729]	3221	[1138, 1907]
546	[890, 891]	1438	[1946, 1947]	2330	[2695, 2696]	3222	[3323, 361]
547	[281, 387]	1439	[1948, 341]	2331	[2697, 2698]	3223	[3324, 3325]
548	[892, 893]	1440	[1092, 1949]	2332	[1692, 1932]	3224	[3326, 376]
549	[894, 895]	1441	[1950, 1776]	2333	[2699, 2636]	3225	[3327, 2628]
550	[896, 897]	1442	[1951, 238]	2334	[2700, 1650]	3226	[3328, 361]
551	[898, 899]	1443	[1952, 265]	2335	[2701, 436]	3227	[301, 3329]
552	[900, 901]	1444	[1953, 1729]	2336	[2702, 257]	3228	[3330, 2728]
553	[238, 902]	1445	[1954, 258]	2337	[2703, 893]	3229	[1952, 78]
554	[736, 903]	1446	[1955, 376]	2338	[2704, 2587]	3230	[3331, 1621]
555	[904, 771]	1447	[1956, 803]	2339	[2705, 917]	3231	[3332, 120]
556	[70, 905]	1448	[1957, 1958]	2340	[2706, 1066]	3232	[3333, 1805]
557	[906, 253]	1449	[308, 836]	2341	[1855, 318]	3233	[1713, 3334]
558	[907, 237]	1450	[1959, 358]	2342	[2707, 829]	3234	[783, 2610]
559	[908, 909]	1451	[1960, 1793]	2343	[2708, 928]	3235	[3335, 943]
560	[910, 911]	1452	[1961, 1701]	2344	[2709, 2710]	3236	[3336, 1997]
561	[912, 879]	1453	[1962, 1963]	2345	[27, 899]	3237	[2803, 1599]
562	[913, 914]	1454	[729, 1964]	2346	[2711, 2712]	3238	[3337, 3029]
563	[915, 916]	1455	[1965, 1966]	2347	[731, 1025]	3239	[3338, 3339]
564	[917, 918]	1456	[994, 1926]	2348	[2713, 114]	3240	[1967, 1986]
565	[919, 920]	1457	[256, 1967]	2349	[2714, 2715]	3241	[3340, 981]
566	[921, 922]	1458	[245, 1968]	2350	[2716, 1026]	3242	[2561, 1633]
567	[923, 816]	1459	[1969, 1970]	2351	[2717, 288]	3243	[3341, 1140]
568	[241, 924]	1460	[1007, 1063]	2352	[2718, 2626]	3244	[3342, 2610]
569	[925, 926]	1461	[1971, 994]	2353	[795, 2719]	3245	[4, 434]
570	[915, 425]	1462	[1777, 1972]	2354	[1010, 2720]	3246	[3343, 920]
571	[927, 928]	1463	[1137, 1637]	2355	[2721, 2722]	3247	[3344, 1092]
572	[929, 930]	1464	[1973, 932]	2356	[2723, 2724]	3248	[801, 264]
573	[931, 932]	1465	[1974, 1975]	2357	[2725, 2544]	3249	[3345, 1055]
574	[933, 934]	1466	[1976, 1977]	2358	[1831, 1066]	3250	[3346, 1000]
575	[935, 936]	1467	[1978, 1979]	2359	[1922, 746]	3251	[1818, 2571]

576	[937, 938]	1468	[1980, 360]	2360	[2726, 1689]	3252	[3347, 769]
577	[939, 253]	1469	[1793, 1981]	2361	[935, 106]	3253	[3348, 767]
578	[940, 941]	1470	[1982, 322]	2362	[2727, 2728]	3254	[1965, 774]
579	[942, 943]	1471	[1983, 1984]	2363	[1762, 2729]	3255	[1043, 315]
580	[944, 945]	1472	[1985, 1986]	2364	[1141, 749]	3256	[3349, 291]
581	[946, 947]	1473	[729, 1987]	2365	[2730, 2731]	3257	[1802, 291]
582	[948, 260]	1474	[1988, 1989]	2366	[1049, 877]	3258	[3350, 1756]
583	[949, 841]	1475	[1858, 1006]	2367	[2732, 2733]	3259	[2007, 2766]
584	[767, 312]	1476	[1990, 1007]	2368	[408, 1921]	3260	[3351, 3352]
585	[950, 951]	1477	[1991, 749]	2369	[2734, 2735]	3261	[3353, 1065]
586	[952, 953]	1478	[1992, 729]	2370	[2736, 1959]	3262	[3354, 508]
587	[954, 955]	1479	[1993, 400]	2371	[2737, 736]	3263	[3355, 845]
588	[956, 905]	1480	[1832, 1067]	2372	[2738, 430]	3264	[3356, 2724]
589	[957, 958]	1481	[1994, 1995]	2373	[313, 2479]	3265	[1913, 430]
590	[959, 960]	1482	[1996, 1741]	2374	[2739, 1083]	3266	[3357, 86]
591	[840, 961]	1483	[1997, 1998]	2375	[933, 947]	3267	[105, 3358]
592	[962, 338]	1484	[1999, 2000]	2376	[2621, 1674]	3268	[3359, 855]
593	[963, 964]	1485	[2001, 2002]	2377	[2740, 75]	3269	[1946, 284]
594	[965, 887]	1486	[1840, 78]	2378	[2598, 2741]	3270	[3360, 1725]
595	[966, 967]	1487	[2003, 2004]	2379	[2742, 281]	3271	[1678, 1825]
596	[968, 770]	1488	[2005, 881]	2380	[2743, 2477]	3272	[3361, 3362]
597	[969, 970]	1489	[2006, 356]	2381	[2744, 2745]	3273	[3363, 78]
598	[971, 16]	1490	[2007, 338]	2382	[838, 2746]	3274	[3364, 2762]
599	[972, 973]	1491	[1079, 370]	2383	[2747, 1889]	3275	[3365, 1635]
600	[974, 975]	1492	[2004, 1751]	2384	[2748, 1745]	3276	[3366, 419]
601	[976, 967]	1493	[2008, 824]	2385	[2704, 1623]	3277	[3367, 1919]
602	[977, 978]	1494	[2009, 2010]	2386	[2749, 408]	3278	[3368, 732]
603	[373, 979]	1495	[2011, 79]	2387	[2750, 1708]	3279	[3106, 990]
604	[980, 857]	1496	[288, 2012]	2388	[2751, 1924]	3280	[3369, 1662]
605	[981, 982]	1497	[2013, 1033]	2389	[310, 2752]	3281	[3370, 3371]
606	[983, 984]	1498	[248, 298]	2390	[2058, 1752]	3282	[3372, 731]
607	[985, 115]	1499	[1017, 1941]	2391	[2753, 2522]	3283	[3373, 1901]
608	[986, 906]	1500	[2014, 118]	2392	[1087, 2719]	3284	[3203, 1027]
609	[987, 988]	1501	[2015, 1897]	2393	[2754, 2665]	3285	[1676, 1937]
610	[989, 762]	1502	[2016, 275]	2394	[2755, 1118]	3286	[1651, 2051]
611	[990, 412]	1503	[2017, 2018]	2395	[2756, 87]	3287	[974, 247]
612	[991, 915]	1504	[1745, 1857]	2396	[2757, 1888]	3288	[3374, 250]
613	[992, 993]	1505	[2019, 2020]	2397	[1690, 413]	3289	[3375, 1872]
614	[994, 995]	1506	[2021, 1687]	2398	[1997, 970]	3290	[3147, 729]
615	[736, 996]	1507	[2022, 2023]	2399	[2758, 18]	3291	[834, 2581]
616	[997, 275]	1508	[2024, 902]	2400	[2759, 430]	3292	[3376, 915]
617	[998, 999]	1509	[804, 966]	2401	[2760, 1118]	3293	[1860, 868]
618	[1000, 1001]	1510	[826, 2025]	2402	[2761, 1089]	3294	[3377, 3378]
619	[353, 1002]	1511	[2026, 926]	2403	[2762, 1102]	3295	[2059, 1907]

620	[399, 1003]	1512	[2027, 1761]	2404	[1973, 973]	3296	[3379, 106]
621	[1004, 743]	1513	[2028, 2002]	2405	[2763, 851]	3297	[3380, 322]
622	[1005, 1006]	1514	[2029, 1635]	2406	[2764, 855]	3298	[3381, 813]
623	[1007, 1008]	1515	[1879, 841]	2407	[2765, 732]	3299	[3382, 2598]
624	[770, 1009]	1516	[2030, 882]	2408	[2766, 339]	3300	[320, 1099]
625	[1010, 1011]	1517	[2031, 1989]	2409	[2767, 1116]	3301	[3383, 412]
626	[1012, 1013]	1518	[2032, 83]	2410	[2768, 1944]	3302	[3384, 322]
627	[1014, 978]	1519	[2033, 508]	2411	[2769, 1789]	3303	[3385, 3120]
628	[1015, 247]	1520	[241, 1072]	2412	[2770, 791]	3304	[3364, 846]
629	[1016, 1017]	1521	[384, 1085]	2413	[2771, 1604]	3305	[3386, 118]
630	[1018, 1019]	1522	[2034, 273]	2414	[2772, 854]	3306	[3387, 2783]
631	[753, 1020]	1523	[2035, 2036]	2415	[2773, 2774]	3307	[3388, 911]
632	[1021, 1022]	1524	[2037, 1582]	2416	[2775, 82]	3308	[3389, 763]
633	[1023, 301]	1525	[89, 87]	2417	[2776, 381]	3309	[1122, 840]
634	[1024, 1025]	1526	[2038, 2039]	2418	[2777, 1958]	3310	[3390, 3179]
635	[824, 1026]	1527	[2040, 1927]	2419	[2778, 2779]	3311	[3391, 2788]
636	[1027, 843]	1528	[872, 940]	2420	[2780, 2781]	3312	[3392, 1919]
637	[1028, 1029]	1529	[2041, 2042]	2421	[2782, 2783]	3313	[2489, 2053]
638	[842, 1030]	1530	[2043, 2044]	2422	[236, 2784]	3314	[3393, 307]
639	[946, 934]	1531	[2045, 1789]	2423	[936, 811]	3315	[1769, 2586]
640	[1031, 1032]	1532	[2046, 1793]	2424	[2785, 238]	3316	[2270, 2940]
641	[1033, 1034]	1533	[2047, 893]	2425	[2786, 1623]	3317	[2338, 1562]
642	[1035, 273]	1534	[2048, 1660]	2426	[860, 2626]	3318	[3394, 2337]
643	[1036, 1037]	1535	[746, 1131]	2427	[2078, 2035]	3319	[1229, 2199]
644	[1038, 739]	1536	[1999, 1065]	2428	[2596, 2023]	3320	[3395, 686]
645	[1039, 254]	1537	[2049, 2050]	2429	[436, 2787]	3321	[2383, 134]
646	[1040, 242]	1538	[291, 2051]	2430	[1609, 806]	3322	[3396, 2434]
647	[1041, 1042]	1539	[2052, 1140]	2431	[323, 2788]	3323	[3397, 555]
648	[21, 241]	1540	[2033, 1101]	2432	[2789, 1878]	3324	[1528, 2109]
649	[1043, 1044]	1541	[2053, 1579]	2433	[1143, 1071]	3325	[2125, 619]
650	[855, 1045]	1542	[2054, 1060]	2434	[2790, 2791]	3326	[3398, 2337]
651	[1046, 1047]	1543	[2055, 2056]	2435	[2792, 838]	3327	[3399, 1429]
652	[1048, 87]	1544	[2057, 2058]	2436	[2466, 2793]	3328	[3400, 1410]
653	[1049, 810]	1545	[2059, 1139]	2437	[2794, 91]	3329	[484, 1180]
654	[1050, 1051]	1546	[1905, 2060]	2438	[2795, 1751]	3330	[3401, 1348]
655	[1052, 432]	1547	[1756, 2061]	2439	[2796, 1778]	3331	[1506, 2199]
656	[430, 1053]	1548	[2062, 1085]	2440	[2797, 1004]	3332	[3402, 3018]
657	[1054, 109]	1549	[2063, 2064]	2441	[2798, 1013]	3333	[3403, 1232]
658	[90, 1055]	1550	[1123, 2065]	2442	[2799, 846]	3334	[667, 3404]
659	[1056, 1057]	1551	[1918, 383]	2443	[1971, 1925]	3335	[3405, 2890]
660	[285, 752]	1552	[2066, 1837]	2444	[2800, 307]	3336	[3406, 180]
661	[1058, 917]	1553	[2067, 806]	2445	[2801, 1033]	3337	[1409, 563]
662	[1000, 958]	1554	[1637, 2068]	2446	[2802, 1993]	3338	[187, 1434]
663	[1059, 1060]	1555	[2069, 769]	2447	[2803, 1108]	3339	[2900, 2116]

664	[1061, 1045]	1556	[1650, 311]	2448	[2804, 2805]	3340	[2276, 1434]
665	[1062, 1063]	1557	[1142, 750]	2449	[1045, 2806]	3341	[3407, 602]
666	[1064, 1065]	1558	[2070, 263]	2450	[7, 521]	3342	[3408, 1503]
667	[1066, 1067]	1559	[2071, 298]	2451	[2807, 561]	3343	[3409, 522]
668	[867, 1068]	1560	[2072, 2073]	2452	[2808, 1241]	3344	[3410, 2153]
669	[1069, 821]	1561	[2074, 2075]	2453	[2809, 495]	3345	[3411, 1367]
670	[1022, 1004]	1562	[282, 1744]	2454	[1502, 501]	3346	[2317, 1456]
671	[1070, 1071]	1563	[854, 292]	2455	[565, 2810]	3347	[3412, 1196]
672	[22, 1072]	1564	[2076, 896]	2456	[2811, 665]	3348	[3413, 549]
673	[1073, 1074]	1565	[2077, 331]	2457	[2371, 2315]	3349	[3414, 1552]
674	[1075, 902]	1566	[928, 2078]	2458	[2812, 1279]	3350	[3415, 1403]
675	[1076, 298]	1567	[2079, 257]	2459	[2813, 1157]	3351	[1382, 2940]
676	[1077, 909]	1568	[2080, 408]	2460	[464, 1317]	3352	[2370, 638]
677	[376, 1078]	1569	[2081, 759]	2461	[2814, 713]	3353	[3416, 2170]
678	[1079, 18]	1570	[2082, 1891]	2462	[2815, 2375]	3354	[3417, 1279]
679	[1080, 75]	1571	[2047, 2083]	2463	[2816, 1482]	3355	[3418, 468]
680	[1081, 1071]	1572	[2084, 1722]	2464	[1353, 1562]	3356	[3419, 1341]
681	[1082, 250]	1573	[2085, 341]	2465	[1567, 1390]	3357	[3420, 2170]
682	[75, 1083]	1574	[1092, 2086]	2466	[52, 1454]	3358	[3421, 2216]
683	[1084, 1085]	1575	[2087, 1312]	2467	[1386, 597]	3359	[3422, 523]
684	[118, 1020]	1576	[2088, 2089]	2468	[2817, 2818]	3360	[3423, 1359]
685	[985, 326]	1577	[1218, 1422]	2469	[2819, 1362]	3361	[1533, 2319]
686	[1086, 1087]	1578	[2090, 681]	2470	[2820, 547]	3362	[1516, 2113]
687	[942, 1088]	1579	[2091, 1354]	2471	[1312, 1396]	3363	[3424, 127]
688	[1089, 1090]	1580	[1433, 672]	2472	[2821, 564]	3364	[3425, 208]
689	[1091, 1092]	1581	[2092, 1442]	2473	[2308, 1309]	3365	[3426, 2095]
690	[1093, 238]	1582	[2093, 486]	2474	[648, 1160]	3366	[3427, 474]
691	[1094, 1095]	1583	[556, 465]	2475	[719, 2123]	3367	[3428, 651]
692	[1096, 1003]	1584	[2094, 1245]	2476	[2822, 439]	3368	[3429, 523]
693	[886, 433]	1585	[35, 1246]	2477	[2218, 1362]	3369	[3430, 2104]
694	[1097, 382]	1586	[2095, 2096]	2478	[2823, 1570]	3370	[3431, 150]
695	[1098, 1099]	1587	[2097, 2091]	2479	[2432, 1342]	3371	[3432, 1425]
696	[1100, 389]	1588	[2098, 631]	2480	[2824, 1289]	3372	[3433, 1152]
697	[508, 1101]	1589	[2099, 1160]	2481	[2825, 533]	3373	[3434, 2967]
698	[846, 1102]	1590	[2100, 1449]	2482	[1499, 2113]	3374	[3435, 468]
699	[1103, 798]	1591	[2101, 2102]	2483	[2290, 1450]	3375	[3436, 1356]
700	[1104, 1105]	1592	[1159, 129]	2484	[1324, 1274]	3376	[3437, 475]
701	[1106, 1107]	1593	[2103, 531]	2485	[2826, 1487]	3377	[2385, 484]
702	[1108, 1109]	1594	[620, 558]	2486	[2343, 578]	3378	[2142, 2256]
703	[1110, 1111]	1595	[1497, 1300]	2487	[2827, 1316]	3379	[3438, 205]
704	[1112, 1113]	1596	[1227, 1315]	2488	[189, 2113]	3380	[3439, 2416]
705	[1114, 1115]	1597	[2104, 1440]	2489	[2828, 1241]	3381	[3440, 605]
706	[338, 1116]	1598	[2105, 1267]	2490	[1568, 2247]	3382	[3441, 1335]
707	[1117, 1118]	1599	[2106, 204]	2491	[226, 2829]	3383	[3442, 1532]

708	[1119, 1036]	1600	[32, 2107]	2492	[2830, 2436]	3384	[3443, 563]
709	[291, 1120]	1601	[2108, 2109]	2493	[199, 1182]	3385	[3444, 1378]
710	[1121, 819]	1602	[2110, 1219]	2494	[2831, 1503]	3386	[2865, 605]
711	[1122, 949]	1603	[2111, 1312]	2495	[2832, 2833]	3387	[3445, 2164]
712	[1123, 323]	1604	[2112, 645]	2496	[2834, 1205]	3388	[3446, 1202]
713	[1124, 1125]	1605	[629, 638]	2497	[2835, 2139]	3389	[3447, 481]
714	[1126, 1127]	1606	[2113, 539]	2498	[2836, 1223]	3390	[3448, 1256]
715	[1128, 1129]	1607	[2114, 2115]	2499	[2237, 1436]	3391	[3449, 1241]
716	[1130, 1131]	1608	[655, 14]	2500	[2837, 2208]	3392	[3450, 1189]
717	[1132, 367]	1609	[1303, 1572]	2501	[2838, 2436]	3393	[2149, 134]
718	[746, 1133]	1610	[2110, 1422]	2502	[2839, 1362]	3394	[3451, 3047]
719	[1134, 1135]	1611	[465, 2116]	2503	[2840, 675]	3395	[952, 2710]
720	[1136, 273]	1612	[218, 656]	2504	[1321, 1194]	3396	[1134, 1706]
721	[1137, 859]	1613	[1529, 1524]	2505	[2841, 1496]	3397	[3452, 3085]
722	[1138, 1139]	1614	[2117, 697]	2506	[2247, 706]	3398	[3453, 416]
723	[1140, 346]	1615	[2118, 2119]	2507	[2422, 2206]	3399	[3454, 851]
724	[78, 1104]	1616	[2120, 495]	2508	[659, 1437]	3400	[3455, 3031]
725	[1141, 1142]	1617	[2121, 12]	2509	[2391, 1467]	3401	[1030, 325]
726	[1143, 337]	1618	[1545, 1396]	2510	[1364, 677]	3402	[3159, 75]
727	[315, 1144]	1619	[1384, 2122]	2511	[2842, 448]	3403	[3456, 3457]
728	[1145, 1146]	1620	[726, 2123]	2512	[2193, 2410]	3404	[1087, 3458]
729	[1147, 526]	1621	[1241, 2123]	2513	[1180, 1360]	3405	[2578, 74]
730	[1148, 1149]	1622	[2124, 566]	2514	[1322, 2319]	3406	[3459, 1087]
731	[1150, 1151]	1623	[2125, 42]	2515	[1346, 1315]	3407	[3460, 373]
732	[1152, 1153]	1624	[2126, 672]	2516	[2843, 2844]	3408	[3456, 851]
733	[1154, 602]	1625	[1405, 1151]	2517	[582, 1172]	3409	[3461, 1812]
734	[1155, 1156]	1626	[2127, 1363]	2518	[2845, 704]	3410	[3462, 1993]
735	[173, 1157]	1627	[1468, 486]	2519	[2846, 727]	3411	[3463, 393]
736	[1158, 667]	1628	[2128, 2129]	2520	[2847, 481]	3412	[3464, 1599]
737	[1159, 1160]	1629	[2130, 145]	2521	[2848, 561]	3413	[3465, 896]
738	[1161, 1162]	1630	[2131, 1406]	2522	[2849, 712]	3414	[1040, 832]
739	[1163, 1164]	1631	[2132, 208]	2523	[2850, 448]	3415	[3466, 1800]
740	[1165, 623]	1632	[2133, 2134]	2524	[2420, 1240]	3416	[3076, 2733]
741	[1166, 1167]	1633	[2135, 161]	2525	[2394, 1409]	3417	[3467, 94]
742	[1168, 1169]	1634	[2136, 2137]	2526	[2811, 2844]	3418	[3468, 1662]
743	[1170, 46]	1635	[2138, 2139]	2527	[1372, 2275]	3419	[3469, 1011]
744	[40, 1171]	1636	[1539, 2140]	2528	[2851, 2194]	3420	[2057, 1751]
745	[1172, 1173]	1637	[1429, 547]	2529	[1557, 2852]	3421	[3470, 2543]
746	[1174, 182]	1638	[1295, 553]	2530	[2853, 2854]	3422	[1796, 862]
747	[1175, 1176]	1639	[2141, 448]	2531	[667, 2855]	3423	[3145, 2658]
748	[1177, 1178]	1640	[2142, 171]	2532	[162, 2856]	3424	[3471, 245]
749	[1179, 1164]	1641	[2143, 2134]	2533	[2404, 1236]	3425	[3472, 731]
750	[554, 1180]	1642	[2144, 724]	2534	[2857, 2858]	3426	[336, 1071]
751	[1181, 1182]	1643	[2145, 1554]	2535	[668, 1538]	3427	[3473, 2469]

752	[1183, 639]	1644	[2146, 1156]	2536	[1316, 1224]	3428	[1077, 2598]
753	[1184, 1185]	1645	[1466, 2147]	2537	[598, 2285]	3429	[2672, 2497]
754	[586, 138]	1646	[1277, 1452]	2538	[2859, 1402]	3430	[3474, 916]
755	[1186, 619]	1647	[1435, 2140]	2539	[693, 1551]	3431	[3370, 798]
756	[1170, 491]	1648	[1333, 2148]	2540	[2860, 1205]	3432	[3475, 2556]
757	[1187, 230]	1649	[2149, 548]	2541	[2861, 1169]	3433	[3476, 862]
758	[622, 1188]	1650	[519, 509]	2542	[2862, 2317]	3434	[2005, 120]
759	[1189, 171]	1651	[217, 156]	2543	[1371, 1338]	3435	[3477, 778]
760	[139, 1190]	1652	[2150, 2151]	2544	[472, 2245]	3436	[3478, 1889]
761	[1191, 471]	1653	[2152, 131]	2545	[2863, 1273]	3437	[3479, 285]
762	[48, 531]	1654	[2153, 1373]	2546	[2864, 2155]	3438	[3480, 390]
763	[1192, 225]	1655	[2154, 2155]	2547	[1423, 2810]	3439	[3481, 378]
764	[481, 1193]	1656	[2156, 2157]	2548	[1185, 2865]	3440	[387, 845]
765	[657, 507]	1657	[2158, 1351]	2549	[2866, 675]	3441	[3482, 94]
766	[1194, 512]	1658	[2159, 2160]	2550	[2867, 2189]	3442	[3072, 2684]
767	[201, 149]	1659	[1519, 2161]	2551	[2868, 1537]	3443	[3483, 917]
768	[509, 514]	1660	[2162, 1454]	2552	[2869, 2833]	3444	[3484, 951]
769	[1195, 1151]	1661	[2163, 2164]	2553	[2870, 141]	3445	[401, 276]
770	[1196, 1164]	1662	[2165, 607]	2554	[2288, 556]	3446	[3485, 1765]
771	[175, 536]	1663	[2166, 704]	2555	[1444, 2122]	3447	[3486, 70]
772	[443, 186]	1664	[610, 1412]	2556	[2236, 1162]	3448	[3487, 264]
773	[1197, 616]	1665	[1237, 1399]	2557	[2871, 2434]	3449	[3488, 1783]
774	[1161, 581]	1666	[2167, 1274]	2558	[2099, 129]	3450	[3489, 832]
775	[523, 635]	1667	[2168, 626]	2559	[2872, 660]	3451	[3490, 472]
776	[1198, 1199]	1668	[1417, 660]	2560	[2873, 539]	3452	[3491, 1186]
777	[1200, 718]	1669	[2169, 454]	2561	[2874, 517]	3453	[3492, 59]
778	[1201, 182]	1670	[1569, 716]	2562	[2875, 1406]	3454	[3493, 1183]
779	[1202, 1203]	1671	[2170, 2171]	2563	[2876, 686]	3455	[3494, 700]
780	[1204, 1205]	1672	[2172, 1202]	2564	[2877, 674]	3456	[2984, 2410]
781	[1206, 1207]	1673	[2173, 1482]	2565	[2369, 1494]	3457	[3495, 1406]
782	[1208, 143]	1674	[166, 2174]	2566	[1383, 591]	3458	[583, 3496]
783	[1209, 1210]	1675	[59, 1330]	2567	[439, 1473]	3459	[3497, 1359]
784	[1211, 446]	1676	[1366, 2151]	2568	[2878, 1370]	3460	[3498, 1429]
785	[1212, 1213]	1677	[482, 1496]	2569	[2446, 1399]	3461	[51, 1453]
786	[1214, 1215]	1678	[1489, 1412]	2570	[1163, 1460]	3462	[3499, 1459]
787	[1216, 1217]	1679	[2175, 2157]	2571	[1257, 724]	3463	[3500, 439]
788	[1218, 1219]	1680	[2176, 2177]	2572	[2879, 2818]	3464	[3501, 32]
789	[1220, 1221]	1681	[2159, 61]	2573	[2215, 2880]	3465	[3502, 1332]
790	[1222, 1223]	1682	[583, 1173]	2574	[2217, 1361]	3466	[3503, 1273]
791	[142, 1224]	1683	[2178, 1348]	2575	[1189, 2256]	3467	[3504, 474]
792	[1225, 1226]	1684	[2179, 2180]	2576	[2881, 493]	3468	[3505, 481]
793	[1227, 1228]	1685	[2181, 1373]	2577	[2263, 2355]	3469	[3506, 32]
794	[1229, 626]	1686	[2108, 197]	2578	[2882, 36]	3470	[476, 2940]
795	[1230, 131]	1687	[2182, 204]	2579	[2883, 2216]	3471	[3507, 1210]

796	[1231, 1232]	1688	[2183, 2137]	2580	[2884, 2858]	3472	[3508, 2818]
797	[1233, 1217]	1689	[2184, 163]	2581	[1480, 1190]	3473	[3509, 1273]
798	[1234, 463]	1690	[1477, 153]	2582	[2885, 1279]	3474	[3510, 1385]
799	[686, 1235]	1691	[2185, 2134]	2583	[2886, 1487]	3475	[1191, 2285]
800	[32, 1236]	1692	[2186, 693]	2584	[1560, 1157]	3476	[3511, 2095]
801	[1237, 1238]	1693	[2187, 1378]	2585	[1394, 2398]	3477	[3512, 1202]
802	[1239, 1240]	1694	[2188, 702]	2586	[457, 1224]	3478	[3513, 563]
803	[1241, 595]	1695	[144, 1194]	2587	[2887, 467]	3479	[3514, 1183]
804	[681, 1242]	1696	[1268, 514]	2588	[2888, 2268]	3480	[632, 669]
805	[1243, 554]	1697	[123, 2189]	2589	[2889, 2890]	3481	[3515, 1256]
806	[1244, 1245]	1698	[2190, 1306]	2590	[520, 1480]	3482	[3516, 700]
807	[159, 1246]	1699	[2191, 1550]	2591	[41, 619]	3483	[3517, 1359]
808	[1234, 151]	1700	[1308, 1331]	2592	[2891, 1459]	3484	[2115, 1295]
809	[1146, 1247]	1701	[1447, 1412]	2593	[695, 1172]	3485	[3518, 1256]
810	[1248, 50]	1702	[2192, 636]	2594	[1478, 1453]	3486	[1442, 1295]
811	[602, 1249]	1703	[1511, 1483]	2595	[488, 54]	3487	[3519, 1552]
812	[1250, 226]	1704	[1470, 1210]	2596	[2892, 193]	3488	[3520, 1456]
813	[1251, 1252]	1705	[634, 524]	2597	[2893, 2375]	3489	[3521, 164]
814	[1253, 1254]	1706	[448, 125]	2598	[2894, 125]	3490	[1891, 1694]
815	[1255, 491]	1707	[44, 677]	2599	[2813, 174]	3491	[3522, 734]
816	[1256, 536]	1708	[439, 1245]	2600	[2895, 1431]	3492	[1701, 896]
817	[1257, 1171]	1709	[2193, 2194]	2601	[2896, 2269]	3493	[3523, 3029]
818	[1258, 713]	1710	[205, 2195]	2602	[2897, 631]	3494	[3524, 1761]
819	[1259, 195]	1711	[2114, 1442]	2603	[2447, 2102]	3495	[3525, 964]
820	[1260, 1157]	1712	[676, 1365]	2604	[2898, 2137]	3496	[390, 262]
821	[1261, 1219]	1713	[441, 452]	2605	[457, 143]	3497	[1950, 940]
822	[1262, 200]	1714	[123, 2196]	2606	[2141, 124]	3498	[3526, 275]
823	[38, 514]	1715	[2197, 230]	2607	[1179, 1460]	3499	[879, 946]
824	[1263, 34]	1716	[475, 1437]	2608	[2899, 521]	3500	[3527, 2612]
825	[1264, 1265]	1717	[2198, 2153]	2609	[2827, 457]	3501	[880, 120]
826	[1266, 1267]	1718	[2168, 2199]	2610	[2900, 624]	3502	[3528, 1022]
827	[1268, 210]	1719	[2200, 454]	2611	[1209, 1471]	3503	[1801, 1640]
828	[219, 1269]	1720	[2201, 1173]	2612	[2901, 2139]	3504	[3529, 233]
829	[213, 1270]	1721	[2179, 609]	2613	[2902, 2284]	3505	[3530, 304]
830	[1271, 1272]	1722	[705, 1178]	2614	[2903, 2833]	3506	[3531, 98]
831	[1273, 1274]	1723	[612, 1415]	2615	[2904, 675]	3507	[3532, 778]
832	[1275, 526]	1724	[2202, 583]	2616	[1443, 520]	3508	[3533, 405]
833	[1166, 1276]	1725	[717, 1357]	2617	[2905, 2365]	3509	[3534, 1584]
834	[1277, 1226]	1726	[2203, 599]	2618	[2906, 535]	3510	[2653, 2073]
835	[1278, 58]	1727	[2090, 1551]	2619	[563, 2907]	3511	[3535, 1769]
836	[1279, 1280]	1728	[2204, 1301]	2620	[2294, 1372]	3512	[3536, 290]
837	[149, 509]	1729	[2205, 1550]	2621	[2908, 1306]	3513	[3537, 1778]
838	[1281, 459]	1730	[579, 2206]	2622	[2909, 2137]	3514	[3538, 946]
839	[230, 1282]	1731	[530, 1547]	2623	[2910, 2314]	3515	[3539, 87]

840	[510, 516]	1732	[2207, 2208]	2624	[2911, 1264]	3516	[3540, 767]
841	[145, 161]	1733	[1546, 541]	2625	[2912, 1499]	3517	[2480, 373]
842	[149, 38]	1734	[2209, 167]	2626	[1318, 1342]	3518	[1863, 806]
843	[202, 509]	1735	[2210, 1354]	2627	[2913, 713]	3519	[2695, 1995]
844	[1283, 150]	1736	[2211, 2089]	2628	[2914, 631]	3520	[3541, 363]
845	[516, 147]	1737	[555, 464]	2629	[229, 672]	3521	[1124, 318]
846	[679, 149]	1738	[2212, 2208]	2630	[1367, 152]	3522	[3542, 205]
847	[544, 202]	1739	[2213, 2214]	2631	[1168, 2441]	3523	[3543, 2416]
848	[678, 517]	1740	[2215, 141]	2632	[1522, 2398]	3524	[548, 1535]
849	[145, 512]	1741	[13, 656]	2633	[2915, 1351]	3525	[2225, 1494]
850	[148, 202]	1742	[1283, 462]	2634	[2377, 1520]	3526	[3544, 549]
851	[1194, 161]	1743	[146, 144]	2635	[2916, 1242]	3527	[3545, 164]
852	[1284, 462]	1744	[468, 2216]	2636	[2102, 702]	3528	[3546, 686]
853	[1285, 544]	1745	[10, 229]	2637	[703, 2322]	3529	[3547, 1218]
854	[9, 1151]	1746	[2217, 2218]	2638	[2443, 1176]	3530	[3548, 1239]
855	[1186, 42]	1747	[2219, 562]	2639	[1532, 1412]	3531	[1368, 669]
856	[1286, 208]	1748	[1248, 636]	2640	[2917, 2389]	3532	[3549, 1348]
857	[1287, 463]	1749	[168, 1338]	2641	[2918, 1474]	3533	[3550, 2890]
858	[1288, 681]	1750	[2220, 529]	2642	[1352, 1199]	3534	[442, 533]
859	[1289, 169]	1751	[2221, 589]	2643	[2366, 1489]	3535	[1427, 2371]
860	[1260, 174]	1752	[1193, 1496]	2644	[1358, 2245]	3536	[675, 217]
861	[444, 553]	1753	[2222, 1173]	2645	[2337, 2919]	3537	[3551, 2170]
862	[1290, 526]	1754	[2223, 2224]	2646	[2920, 2119]	3538	[3552, 1378]
863	[1291, 1292]	1755	[2225, 2129]	2647	[2219, 576]	3539	[2982, 157]
864	[590, 697]	1756	[576, 480]	2648	[2921, 1333]	3540	[2977, 461]
865	[1293, 1294]	1757	[1403, 2226]	2649	[586, 520]	3541	[3553, 1359]
866	[1295, 445]	1758	[2227, 188]	2650	[1309, 2350]	3542	[1603, 1099]
867	[1296, 457]	1759	[1314, 1228]	2651	[2417, 2226]	3543	[3554, 1733]
868	[1297, 724]	1760	[129, 2228]	2652	[2836, 2922]	3544	[3555, 118]
869	[1298, 1280]	1761	[511, 147]	2653	[2923, 1289]	3545	[3556, 2610]
870	[1299, 1300]	1762	[161, 517]	2654	[2924, 2852]	3546	[3557, 1066]
871	[1278, 503]	1763	[2229, 150]	2655	[2925, 1391]	3547	[3558, 1623]
872	[180, 1301]	1764	[1190, 651]	2656	[2926, 2927]	3548	[3559, 2626]
873	[1302, 1169]	1765	[2230, 541]	2657	[2275, 572]	3549	[3040, 285]
874	[1303, 535]	1766	[1285, 201]	2658	[2928, 2307]	3550	[751, 250]
875	[1304, 445]	1767	[515, 511]	2659	[2929, 59]	3551	[267, 2602]
876	[1305, 1306]	1768	[2231, 457]	2660	[2930, 537]	3552	[3560, 263]
877	[1307, 574]	1769	[1432, 229]	2661	[558, 2931]	3553	[2452, 1588]
878	[1308, 1309]	1770	[1564, 222]	2662	[616, 2321]	3554	[654, 217]
879	[577, 1310]	1771	[2100, 2148]	2663	[2932, 1166]	3555	[3561, 1474]
880	[1311, 1312]	1772	[2232, 1428]	2664	[2933, 1146]	3556	[2232, 2371]
881	[1313, 524]	1773	[223, 158]	2665	[2934, 2314]	3557	[1340, 533]
882	[1314, 1315]	1774	[2233, 222]	2666	[2333, 663]	3558	[3243, 1453]
883	[1316, 143]	1775	[2234, 1232]	2667	[2935, 700]	3559	[1514, 157]

884	[556, 1317]	1776	[1426, 2174]	2668	[2936, 472]	3560	[3562, 1239]
885	[1318, 1319]	1777	[2235, 167]	2669	[1448, 2937]	3561	[3563, 1858]
886	[1320, 467]	1778	[2236, 581]	2670	[2367, 2224]	3562	[2594, 749]
887	[1165, 1188]	1779	[1387, 1434]	2671	[1561, 54]	3563	[3564, 522]
888	[1321, 145]	1780	[1513, 623]	2672	[2938, 569]	3564	[3565, 1901]
889	[1322, 230]	1781	[2237, 2140]	2673	[2939, 2157]	3565	[2295, 157]
890	[1323, 465]	1782	[2238, 2228]	2674	[1507, 2940]		
891	[1324, 1325]	1783	[691, 607]	2675	[2941, 474]		

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	595	1	1190	0	1785	0	2380	1	2975	1
1	0	596	1	1191	0	1786	0	2381	0	2976	0
2	0	597	0	1192	1	1787	0	2382	0	2977	1
3	0	598	1	1193	1	1788	0	2383	1	2978	1
4	0	599	1	1194	0	1789	1	2384	0	2979	1
5	0	600	0	1195	0	1790	0	2385	0	2980	0
6	0	601	0	1196	1	1791	0	2386	0	2981	0
7	0	602	0	1197	1	1792	1	2387	0	2982	0
8	1	603	1	1198	0	1793	0	2388	0	2983	1
9	0	604	0	1199	0	1794	1	2389	1	2984	0
10	0	605	1	1200	0	1795	1	2390	0	2985	1
11	0	606	0	1201	0	1796	0	2391	1	2986	1
12	1	607	0	1202	0	1797	0	2392	1	2987	1
13	0	608	1	1203	0	1798	1	2393	0	2988	1
14	0	609	0	1204	1	1799	0	2394	1	2989	0
15	0	610	1	1205	1	1800	1	2395	1	2990	0
16	0	611	0	1206	0	1801	0	2396	1	2991	0
17	1	612	1	1207	0	1802	1	2397	0	2992	1
18	1	613	0	1208	1	1803	0	2398	1	2993	0
19	0	614	0	1209	0	1804	1	2399	1	2994	1
20	0	615	1	1210	1	1805	1	2400	0	2995	1
21	0	616	1	1211	0	1806	0	2401	1	2996	1
22	1	617	1	1212	0	1807	0	2402	1	2997	1
23	0	618	0	1213	0	1808	0	2403	1	2998	0
24	1	619	1	1214	1	1809	1	2404	0	2999	1
25	1	620	1	1215	0	1810	0	2405	0	3000	1
26	1	621	1	1216	0	1811	1	2406	1	3001	1
27	0	622	1	1217	1	1812	1	2407	0	3002	1
28	1	623	1	1218	0	1813	1	2408	1	3003	0
29	0	624	1	1219	1	1814	0	2409	0	3004	1
30	0	625	0	1220	1	1815	1	2410	1	3005	0
31	0	626	0	1221	0	1816	0	2411	1	3006	1
32	1	627	1	1222	0	1817	1	2412	1	3007	1

33	0	628	1	1223	0	1818	0	2413	0	3008	0
34	1	629	0	1224	1	1819	1	2414	1	3009	0
35	1	630	0	1225	1	1820	1	2415	1	3010	1
36	1	631	1	1226	0	1821	1	2416	1	3011	1
37	1	632	0	1227	0	1822	0	2417	0	3012	1
38	1	633	0	1228	0	1823	0	2418	0	3013	0
39	0	634	0	1229	1	1824	0	2419	1	3014	1
40	1	635	0	1230	0	1825	1	2420	0	3015	0
41	0	636	1	1231	1	1826	0	2421	1	3016	0
42	0	637	1	1232	1	1827	0	2422	1	3017	1
43	0	638	0	1233	1	1828	0	2423	0	3018	0
44	0	639	0	1234	1	1829	0	2424	1	3019	0
45	1	640	0	1235	1	1830	1	2425	1	3020	1
46	0	641	0	1236	1	1831	1	2426	0	3021	1
47	0	642	1	1237	0	1832	1	2427	0	3022	1
48	0	643	1	1238	0	1833	0	2428	1	3023	0
49	1	644	1	1239	1	1834	0	2429	0	3024	1
50	0	645	0	1240	1	1835	1	2430	0	3025	0
51	1	646	0	1241	1	1836	1	2431	0	3026	0
52	1	647	1	1242	0	1837	0	2432	1	3027	1
53	1	648	0	1243	1	1838	0	2433	0	3028	0
54	1	649	1	1244	1	1839	0	2434	0	3029	1
55	0	650	1	1245	1	1840	1	2435	1	3030	1
56	1	651	0	1246	0	1841	0	2436	1	3031	1
57	1	652	0	1247	1	1842	0	2437	0	3032	0
58	1	653	0	1248	0	1843	1	2438	1	3033	1
59	0	654	1	1249	0	1844	0	2439	0	3034	1
60	0	655	1	1250	1	1845	1	2440	1	3035	0
61	0	656	1	1251	0	1846	1	2441	1	3036	1
62	0	657	1	1252	0	1847	1	2442	1	3037	1
63	1	658	1	1253	1	1848	1	2443	1	3038	1
64	1	659	1	1254	0	1849	1	2444	1	3039	1
65	0	660	0	1255	1	1850	1	2445	0	3040	1
66	0	661	1	1256	1	1851	0	2446	1	3041	1
67	1	662	0	1257	0	1852	0	2447	0	3042	0
68	1	663	0	1258	1	1853	1	2448	1	3043	1
69	1	664	1	1259	0	1854	0	2449	1	3044	1
70	1	665	0	1260	0	1855	1	2450	0	3045	0
71	1	666	1	1261	1	1856	1	2451	0	3046	1
72	0	667	0	1262	0	1857	1	2452	1	3047	1
73	1	668	1	1263	0	1858	0	2453	0	3048	0
74	1	669	1	1264	1	1859	0	2454	1	3049	1
75	1	670	0	1265	1	1860	0	2455	0	3050	1
76	0	671	0	1266	0	1861	1	2456	0	3051	1

77	0	672	1	1267	0	1862	1	2457	0	3052	0
78	1	673	1	1268	1	1863	1	2458	1	3053	0
79	1	674	0	1269	0	1864	1	2459	1	3054	0
80	1	675	0	1270	0	1865	1	2460	0	3055	0
81	0	676	1	1271	0	1866	0	2461	1	3056	0
82	1	677	1	1272	1	1867	1	2462	1	3057	1
83	0	678	0	1273	0	1868	1	2463	1	3058	0
84	0	679	0	1274	1	1869	1	2464	1	3059	0
85	0	680	1	1275	0	1870	0	2465	1	3060	1
86	0	681	1	1276	1	1871	0	2466	1	3061	1
87	0	682	1	1277	0	1872	0	2467	0	3062	1
88	1	683	0	1278	0	1873	1	2468	0	3063	1
89	1	684	0	1279	1	1874	0	2469	1	3064	1
90	1	685	0	1280	0	1875	0	2470	0	3065	0
91	0	686	0	1281	0	1876	0	2471	0	3066	1
92	1	687	1	1282	1	1877	0	2472	0	3067	1
93	0	688	1	1283	1	1878	0	2473	1	3068	0
94	1	689	1	1284	0	1879	0	2474	0	3069	0
95	0	690	1	1285	0	1880	0	2475	1	3070	0
96	1	691	0	1286	0	1881	0	2476	1	3071	0
97	1	692	1	1287	0	1882	0	2477	1	3072	1
98	1	693	1	1288	0	1883	1	2478	0	3073	1
99	0	694	1	1289	1	1884	1	2479	1	3074	0
100	1	695	1	1290	1	1885	0	2480	0	3075	0
101	1	696	0	1291	1	1886	1	2481	1	3076	1
102	1	697	0	1292	0	1887	1	2482	0	3077	0
103	0	698	0	1293	0	1888	0	2483	1	3078	0
104	1	699	0	1294	1	1889	1	2484	1	3079	1
105	1	700	0	1295	1	1890	1	2485	0	3080	1
106	1	701	1	1296	1	1891	1	2486	0	3081	1
107	1	702	1	1297	1	1892	1	2487	1	3082	0
108	0	703	0	1298	0	1893	1	2488	1	3083	0
109	0	704	0	1299	0	1894	0	2489	0	3084	0
110	1	705	1	1300	0	1895	0	2490	0	3085	0
111	1	706	0	1301	0	1896	1	2491	0	3086	0
112	1	707	0	1302	0	1897	1	2492	1	3087	1
113	1	708	0	1303	0	1898	1	2493	1	3088	1
114	1	709	0	1304	0	1899	1	2494	1	3089	0
115	0	710	0	1305	1	1900	1	2495	1	3090	1
116	0	711	1	1306	0	1901	0	2496	0	3091	1
117	0	712	0	1307	1	1902	0	2497	1	3092	0
118	0	713	0	1308	0	1903	0	2498	1	3093	0
119	0	714	1	1309	0	1904	1	2499	0	3094	0
120	0	715	0	1310	1	1905	0	2500	1	3095	0

121	1	716	1	1311	0	1906	1	2501	0	3096	1
122	0	717	1	1312	0	1907	1	2502	0	3097	0
123	1	718	0	1313	1	1908	0	2503	1	3098	0
124	1	719	1	1314	0	1909	0	2504	0	3099	1
125	1	720	0	1315	1	1910	0	2505	1	3100	1
126	1	721	1	1316	0	1911	1	2506	1	3101	1
127	1	722	0	1317	0	1912	1	2507	1	3102	0
128	0	723	1	1318	0	1913	1	2508	1	3103	0
129	0	724	1	1319	1	1914	0	2509	1	3104	1
130	0	725	1	1320	1	1915	1	2510	0	3105	0
131	1	726	0	1321	0	1916	1	2511	0	3106	0
132	1	727	1	1322	0	1917	1	2512	1	3107	0
133	1	728	0	1323	1	1918	0	2513	1	3108	1
134	1	729	0	1324	1	1919	0	2514	0	3109	1
135	1	730	1	1325	0	1920	1	2515	1	3110	0
136	1	731	1	1326	1	1921	0	2516	0	3111	0
137	0	732	1	1327	0	1922	0	2517	0	3112	1
138	1	733	1	1328	1	1923	1	2518	0	3113	0
139	0	734	1	1329	0	1924	0	2519	0	3114	1
140	1	735	1	1330	1	1925	1	2520	0	3115	0
141	1	736	1	1331	1	1926	1	2521	1	3116	1
142	0	737	1	1332	0	1927	1	2522	0	3117	0
143	0	738	1	1333	0	1928	0	2523	1	3118	1
144	1	739	0	1334	0	1929	1	2524	0	3119	0
145	1	740	0	1335	0	1930	0	2525	1	3120	0
146	1	741	1	1336	0	1931	1	2526	0	3121	0
147	0	742	1	1337	0	1932	0	2527	0	3122	0
148	1	743	0	1338	0	1933	1	2528	1	3123	1
149	0	744	1	1339	1	1934	0	2529	0	3124	0
150	0	745	1	1340	0	1935	1	2530	1	3125	1
151	0	746	0	1341	0	1936	0	2531	0	3126	0
152	0	747	0	1342	0	1937	1	2532	0	3127	0
153	0	748	0	1343	0	1938	1	2533	0	3128	1
154	1	749	1	1344	0	1939	0	2534	0	3129	1
155	1	750	1	1345	0	1940	1	2535	1	3130	0
156	0	751	1	1346	1	1941	1	2536	0	3131	1
157	1	752	0	1347	0	1942	0	2537	1	3132	1
158	0	753	1	1348	0	1943	0	2538	1	3133	0
159	0	754	1	1349	0	1944	1	2539	1	3134	1
160	1	755	1	1350	1	1945	1	2540	0	3135	0
161	0	756	0	1351	1	1946	0	2541	0	3136	1
162	0	757	1	1352	1	1947	1	2542	0	3137	1
163	0	758	1	1353	1	1948	1	2543	1	3138	0
164	0	759	0	1354	0	1949	1	2544	0	3139	0

165	1	760	0	1355	0	1950	0	2545	0	3140	1
166	0	761	0	1356	0	1951	0	2546	1	3141	1
167	1	762	0	1357	1	1952	0	2547	0	3142	1
168	0	763	1	1358	1	1953	1	2548	0	3143	0
169	1	764	1	1359	1	1954	0	2549	1	3144	0
170	0	765	1	1360	1	1955	1	2550	0	3145	1
171	1	766	0	1361	0	1956	0	2551	1	3146	1
172	1	767	1	1362	0	1957	0	2552	0	3147	1
173	1	768	0	1363	0	1958	0	2553	1	3148	1
174	0	769	0	1364	0	1959	1	2554	1	3149	1
175	1	770	1	1365	0	1960	1	2555	1	3150	1
176	0	771	1	1366	1	1961	1	2556	0	3151	1
177	1	772	1	1367	1	1962	0	2557	1	3152	1
178	0	773	1	1368	1	1963	1	2558	1	3153	0
179	0	774	1	1369	1	1964	1	2559	0	3154	1
180	1	775	0	1370	0	1965	0	2560	1	3155	1
181	1	776	0	1371	1	1966	0	2561	1	3156	1
182	0	777	0	1372	0	1967	1	2562	1	3157	0
183	0	778	0	1373	1	1968	0	2563	1	3158	1
184	1	779	0	1374	0	1969	1	2564	0	3159	1
185	1	780	1	1375	1	1970	1	2565	0	3160	1
186	1	781	0	1376	0	1971	1	2566	0	3161	1
187	1	782	1	1377	1	1972	1	2567	1	3162	1
188	0	783	0	1378	0	1973	0	2568	0	3163	1
189	1	784	0	1379	1	1974	0	2569	1	3164	0
190	0	785	0	1380	0	1975	1	2570	0	3165	1
191	0	786	1	1381	0	1976	0	2571	0	3166	1
192	1	787	0	1382	0	1977	0	2572	1	3167	0
193	0	788	0	1383	0	1978	1	2573	0	3168	0
194	1	789	1	1384	0	1979	1	2574	0	3169	1
195	0	790	0	1385	1	1980	0	2575	0	3170	0
196	1	791	0	1386	0	1981	0	2576	1	3171	1
197	0	792	1	1387	1	1982	1	2577	1	3172	1
198	0	793	0	1388	1	1983	0	2578	0	3173	1
199	1	794	1	1389	0	1984	0	2579	0	3174	0
200	0	795	0	1390	1	1985	1	2580	1	3175	0
201	1	796	1	1391	1	1986	0	2581	1	3176	1
202	1	797	1	1392	0	1987	0	2582	1	3177	0
203	1	798	1	1393	0	1988	1	2583	0	3178	0
204	1	799	0	1394	0	1989	0	2584	0	3179	0
205	1	800	1	1395	1	1990	0	2585	0	3180	1
206	1	801	0	1396	1	1991	0	2586	1	3181	1
207	0	802	1	1397	1	1992	0	2587	0	3182	0
208	0	803	1	1398	1	1993	0	2588	1	3183	0

209	0	804	1	1399	1	1994	0	2589	0	3184	0
210	1	805	1	1400	0	1995	0	2590	0	3185	1
211	1	806	1	1401	0	1996	1	2591	0	3186	0
212	0	807	0	1402	1	1997	1	2592	0	3187	1
213	1	808	1	1403	1	1998	1	2593	1	3188	0
214	1	809	0	1404	0	1999	0	2594	0	3189	1
215	1	810	0	1405	1	2000	1	2595	0	3190	1
216	0	811	0	1406	1	2001	1	2596	1	3191	1
217	1	812	1	1407	0	2002	1	2597	0	3192	1
218	1	813	0	1408	0	2003	0	2598	0	3193	0
219	1	814	1	1409	1	2004	0	2599	1	3194	1
220	1	815	1	1410	1	2005	1	2600	0	3195	0
221	0	816	1	1411	1	2006	1	2601	0	3196	1
222	0	817	0	1412	1	2007	1	2602	0	3197	1
223	0	818	1	1413	0	2008	1	2603	0	3198	1
224	0	819	0	1414	1	2009	0	2604	1	3199	1
225	1	820	0	1415	1	2010	1	2605	1	3200	1
226	0	821	1	1416	0	2011	0	2606	0	3201	0
227	1	822	0	1417	0	2012	0	2607	1	3202	0
228	0	823	1	1418	1	2013	1	2608	1	3203	1
229	0	824	0	1419	0	2014	0	2609	1	3204	0
230	1	825	1	1420	1	2015	1	2610	1	3205	1
231	0	826	0	1421	1	2016	1	2611	0	3206	0
232	0	827	1	1422	0	2017	0	2612	0	3207	1
233	1	828	1	1423	0	2018	0	2613	0	3208	0
234	1	829	1	1424	0	2019	1	2614	1	3209	1
235	1	830	0	1425	0	2020	1	2615	0	3210	0
236	1	831	0	1426	1	2021	1	2616	0	3211	0
237	1	832	0	1427	0	2022	0	2617	0	3212	1
238	1	833	1	1428	1	2023	1	2618	1	3213	1
239	0	834	0	1429	0	2024	1	2619	0	3214	1
240	1	835	0	1430	0	2025	0	2620	1	3215	1
241	0	836	1	1431	1	2026	0	2621	1	3216	1
242	1	837	0	1432	1	2027	0	2622	0	3217	0
243	0	838	0	1433	1	2028	0	2623	1	3218	1
244	0	839	1	1434	1	2029	1	2624	0	3219	1
245	1	840	1	1435	0	2030	0	2625	1	3220	1
246	0	841	1	1436	0	2031	0	2626	0	3221	0
247	1	842	0	1437	1	2032	0	2627	0	3222	1
248	0	843	1	1438	0	2033	1	2628	1	3223	1
249	1	844	1	1439	1	2034	1	2629	0	3224	0
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251	0	846	0	1441	0	2036	1	2631	1	3226	0
252	1	847	0	1442	0	2037	0	2632	1	3227	0

253	0	848	0	1443	0	2038	1	2633	1	3228	0
254	0	849	1	1444	1	2039	0	2634	1	3229	0
255	1	850	1	1445	0	2040	0	2635	0	3230	1
256	1	851	0	1446	1	2041	0	2636	1	3231	1
257	1	852	0	1447	0	2042	1	2637	0	3232	0
258	1	853	0	1448	0	2043	1	2638	1	3233	1
259	1	854	0	1449	0	2044	0	2639	0	3234	0
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261	0	856	0	1451	1	2046	0	2641	0	3236	0
262	0	857	0	1452	1	2047	1	2642	1	3237	0
263	1	858	0	1453	0	2048	0	2643	0	3238	1
264	0	859	1	1454	0	2049	1	2644	1	3239	1
265	0	860	0	1455	0	2050	1	2645	1	3240	1
266	1	861	1	1456	0	2051	0	2646	1	3241	0
267	1	862	1	1457	1	2052	1	2647	1	3242	1
268	1	863	1	1458	1	2053	1	2648	0	3243	0
269	1	864	1	1459	1	2054	0	2649	1	3244	0
270	0	865	0	1460	1	2055	0	2650	0	3245	0
271	0	866	1	1461	1	2056	0	2651	0	3246	1
272	0	867	1	1462	1	2057	0	2652	1	3247	0
273	0	868	1	1463	1	2058	0	2653	1	3248	0
274	1	869	0	1464	0	2059	1	2654	0	3249	1
275	1	870	0	1465	0	2060	0	2655	1	3250	0
276	0	871	0	1466	0	2061	0	2656	1	3251	0
277	1	872	1	1467	1	2062	0	2657	0	3252	0
278	1	873	0	1468	0	2063	0	2658	0	3253	0
279	1	874	0	1469	0	2064	1	2659	1	3254	0
280	0	875	0	1470	1	2065	1	2660	0	3255	1
281	0	876	1	1471	0	2066	1	2661	0	3256	0
282	1	877	1	1472	1	2067	0	2662	1	3257	1
283	1	878	0	1473	0	2068	0	2663	1	3258	0
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285	0	880	0	1475	0	2070	0	2665	0	3260	0
286	0	881	1	1476	0	2071	1	2666	1	3261	1
287	1	882	0	1477	0	2072	0	2667	1	3262	0
288	0	883	0	1478	0	2073	1	2668	0	3263	1
289	1	884	1	1479	0	2074	0	2669	0	3264	1
290	0	885	0	1480	1	2075	0	2670	0	3265	1
291	0	886	1	1481	0	2076	1	2671	0	3266	0
292	0	887	0	1482	1	2077	1	2672	1	3267	1
293	0	888	0	1483	1	2078	0	2673	0	3268	0
294	1	889	0	1484	0	2079	1	2674	0	3269	0
295	0	890	1	1485	1	2080	0	2675	0	3270	1
296	1	891	1	1486	1	2081	1	2676	0	3271	1

297	0	892	0	1487	0	2082	0	2677	1	3272	1
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303	0	898	0	1493	1	2088	0	2683	0	3278	1
304	1	899	0	1494	0	2089	0	2684	0	3279	0
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310	1	905	0	1500	0	2095	0	2690	1	3285	1
311	0	906	0	1501	1	2096	1	2691	1	3286	1
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315	1	910	0	1505	1	2100	0	2695	1	3290	1
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321	1	916	0	1511	0	2106	0	2701	0	3296	0
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325	1	920	0	1515	0	2110	0	2705	1	3300	0
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329	0	924	1	1519	1	2114	0	2709	1	3304	1
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331	0	926	0	1521	1	2116	0	2711	1	3306	0
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333	0	928	1	1523	1	2118	0	2713	0	3308	0
334	0	929	0	1524	0	2119	1	2714	1	3309	1
335	0	930	0	1525	1	2120	1	2715	1	3310	1
336	1	931	0	1526	1	2121	0	2716	1	3311	1
337	1	932	0	1527	0	2122	0	2717	0	3312	0
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341	0	936	0	1531	1	2126	1	2721	0	3316	1
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344	1	939	0	1534	0	2129	1	2724	1	3319	1
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346	0	941	0	1536	0	2131	0	2726	0	3321	1
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352	0	947	1	1542	0	2137	1	2732	0	3327	1
353	1	948	0	1543	0	2138	1	2733	1	3328	0
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355	1	950	1	1545	1	2140	1	2735	0	3330	0
356	1	951	1	1546	0	2141	0	2736	0	3331	1
357	0	952	1	1547	0	2142	1	2737	0	3332	1
358	0	953	0	1548	0	2143	1	2738	1	3333	0
359	1	954	1	1549	0	2144	0	2739	0	3334	0
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361	1	956	0	1551	0	2146	0	2741	0	3336	0
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363	1	958	1	1553	0	2148	1	2743	1	3338	1
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366	0	961	0	1556	0	2151	0	2746	0	3341	0
367	0	962	0	1557	0	2152	1	2747	1	3342	0
368	1	963	0	1558	0	2153	1	2748	0	3343	1
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370	0	965	0	1560	0	2155	1	2750	0	3345	1
371	0	966	1	1561	0	2156	1	2751	0	3346	0
372	1	967	1	1562	1	2157	0	2752	0	3347	0
373	1	968	1	1563	0	2158	0	2753	1	3348	0
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376	1	971	1	1566	1	2161	0	2756	1	3351	0
377	1	972	1	1567	1	2162	1	2757	1	3352	0
378	0	973	1	1568	0	2163	0	2758	1	3353	1
379	0	974	0	1569	1	2164	1	2759	0	3354	0
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381	1	976	0	1571	1	2166	1	2761	1	3356	1
382	1	977	0	1572	1	2167	1	2762	1	3357	0
383	0	978	0	1573	0	2168	0	2763	0	3358	1
384	1	979	0	1574	0	2169	0	2764	1	3359	0

385	1	980	0	1575	0	2170	0	2765	0	3360	1
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387	0	982	1	1577	0	2172	0	2767	0	3362	0
388	1	983	0	1578	0	2173	1	2768	1	3363	1
389	1	984	0	1579	0	2174	0	2769	1	3364	1
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391	1	986	1	1581	1	2176	0	2771	0	3366	1
392	0	987	0	1582	1	2177	1	2772	1	3367	1
393	1	988	0	1583	1	2178	1	2773	1	3368	1
394	0	989	1	1584	0	2179	0	2774	1	3369	1
395	1	990	0	1585	1	2180	1	2775	1	3370	1
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399	1	994	0	1589	1	2184	1	2779	0	3374	0
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425	1	1020	1	1615	0	2210	1	2805	0	3400	0
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