PROOF OF THE CONTINUED FRACTION CONJECTURE FOR $(a,b) = (z, z^6 + z^5 + z^3 + 1)$

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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 $(a,b) = (z, z^6 + z^5 + z^3 + 1)$.

1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

Date: 9/04/2020 19:39:45 .

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

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

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

Theorem 1.1. *When* $(a,b)=(z,z^6+z^5+z^3+1)$*, 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 $\mathrm{CF}(a,b)$*,*

$$\begin{aligned}
p_0(z) &= z^{24}+z^{21}+z^{18}+z^{17}+z^{16}+z^{14}+z^{13}+z^{11}+z^{10}+z^9+z^8+z^6+z^4\\
&\quad +z^2+z+1,\\
p_1(z) &= z^{27}+z^{25}+z^{23}+z^{22}+z^{19}+z^{18}+z^{17}+z^{14}+z^{12}+z^{11}+z^{10}+z^9\\
&\quad +z^7+z^5+z^2+z,\\
p_2(z) &= z^{28}+z^{26}+z^{24}+z^{22}+z^{10}+z^2,\\
p_3(z) &= z^{27}+z^{25}+z^{23}+z^{22}+z^{19}+z^{18}+z^{17}+z^{14}+z^{12}+z^{11}+z^{10}+z^9\\
&\quad +z^7+z^5+z^2+z,\\
p_4(z) &= z^{26}+z^{22}+z^{21}+z^{20}+z^{18}+z^{17}+z^{14}+z^{13}+z^{12}+z^{11}+z^9+z^8+z^6\\
&\quad +z^4+z,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z) &= z^{21}+z^{20}+z^{18}+z^{17}+z^{16}+z^{14}+z^{13}+z^{12}+z^{11}+z^{10}+z^9+z^8+z^6\\
&\quad +z^2+z,\\
p_1(z) &= z^{27}+z^{25}+z^{23}+z^{22}+z^{19}+z^{18}+z^{17}+z^{14}+z^{12}+z^{11}+z^{10}+z^9\\
&\quad +z^7+z^5+z^2+z,\\
p_2(z) &= z^{28}+z^{26}+z^{24}+z^{22}+z^{10}+z^2,\\
p_3(z) &= z^{27}+z^{25}+z^{23}+z^{22}+z^{19}+z^{18}+z^{17}+z^{14}+z^{12}+z^{11}+z^{10}+z^9\\
&\quad +z^7+z^5+z^2+z,\\
p_4(z) &= z^{26}+z^{24}+z^{22}+z^{21}+z^{18}+z^{17}+z^{14}+z^{13}+z^{11}+z^9+z^8+z^6+z\\
&\quad +1.
\end{aligned}$$

2. Proof

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

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

By the basic properties of continued fractions, we have

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

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

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

$$W_n(x) = x^{\deg(\bar{t}_{2^n-1})} \begin{pmatrix} \bar{t}_{2^n-1}(1/x) & 1 \\ 1 & 0 \end{pmatrix} \times x^{\deg(\bar{t}_{2^n-2})} \begin{pmatrix} \bar{t}_{2^n-2}(1/x) & 1 \\ 1 & 0 \end{pmatrix} \times \cdots \times x^{\deg(\bar{t}_0)} \begin{pmatrix} \bar{t}_0(1/x) & 1 \\ 1 & 0 \end{pmatrix},$$

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

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

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

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

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

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

for some positive integer d_n. Hence,

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

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

Actually, we will prove that for all $0 \leq i,j \leq 1$ 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 $0 \leq i,j \leq 1$, $T_{i,j}$ 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 $0 \leq i,j \leq 1$, 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 $n \geq 0$. If for some $n \geq 0$ and $a_0, a_1, \ldots, a_{n-1} \in \mathbb{F}_2$

$P(x,\sum_{j=0}^{n-1}a_jx^j)=O(x^n)$ and $Q(x,y):=P(x,\sum_{j=0}^{n-1}a_jx^j+x^ny)$ 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 $f_n(x)=\sum_{j=0}^{n-1}a_jx^j$.

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.*

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

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

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

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

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

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

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

which can be rewritten as

$$0 = T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.7}$$
$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.8}$$
$$0 = T[[1w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.9}$$
$$0 = T[[10w]_2] + T[[11w]_2] + T[[1010w]_2], \tag{2.10}$$
$$0 = T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.11}$$
$$0 = T[[w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.12}$$
$$0 = T[[1w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.13}$$

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

$$0 = T[[11w]_2] + T[[101w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.14}$$
$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.15}$$
$$0 = T[[1w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.16}$$
$$0 = T[[10w]_2] + T[[11w]_2] + T[[1010w]_2], \tag{2.17}$$
$$0 = T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.18}$$
$$0 = T[[w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.19}$$
$$0 = T[[1w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.20}$$

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 2950 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

$$0 = \tau(A(s, 11)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 111)), \tag{2.21}$$
$$\begin{aligned}0 = {} & \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 101)) \\ & + \tau(A(s, 1000)),\end{aligned} \tag{2.22}$$
$$\begin{aligned}0 = {} & \tau(A(s, 1)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 110)) \\ & + \tau(A(s, 1001)),\end{aligned} \tag{2.23}$$
$$0 = \tau(A(s, 10)) + \tau(A(s, 11)) + \tau(A(s, 1010)), \tag{2.24}$$
$$0 = \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 1011)), \tag{2.25}$$
$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 1100)), \tag{2.26}$$
$$0 = \tau(A(s, 1)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 1101)), \tag{2.27}$$

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

$$0 = \tau(A(s, 11)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 111)), \tag{2.28}$$
$$\begin{aligned}0 = {} & \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 101)) \\ & + \tau(A(s, 1000)),\end{aligned} \tag{2.29}$$
$$0 = \tau(A(s, 1)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 110))$$

$$+\tau(A(s,1001)), \tag{2.30}$$
$$0=\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,1010)), \tag{2.31}$$
$$0=\tau(A(s,11))+\tau(A(s,100))+\tau(A(s,1011)), \tag{2.32}$$
$$0=\tau(A(s,\epsilon))+\tau(A(s,100))+\tau(A(s,101))+\tau(A(s,1100)), \tag{2.33}$$
$$0=\tau(A(s,1))+\tau(A(s,101))+\tau(A(s,110))+\tau(A(s,1101)), \tag{2.34}$$

for $s=A(i,0^{2k})$. We find that $(A(i,0^{58}),E_{58})=(A(i,0^{30}),E_{30})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2\le k\le 29$, which turns out to be true. □

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

Lemma 2.3. *For all integer $k\ge 2$, and $u=2^{2k-1}$,*
$$M_{2k}=M^e[:7u]+x^uM^e[:6u]+x^{2u}M^e[:5u]+x^{4u}M^e[:3u]+x^{7u}R^e,$$
$$W_{2k}=W^e[:7u]+x^uW^e[:6u]+x^{2u}W^e[:5u]+x^{4u}W^e[:3u]+x^{7u}R^e.$$
For all integer $k\ge 2$, and $u=2^{2k}$,
$$M_{2k+1}=M^o[:7u]+x^uM^o[:6u]+x^{2u}M^o[:5u]+x^{4u}M^o[:3u]+x^{7u}R^o,$$
$$W_{2k+1}=W^o[:7u]+x^uW^o[:6u]+x^{2u}W^o[:5u]+x^{4u}W^o[:3u]+x^{7u}R^o.$$

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 $n\ge 2$, we claim that
$$M_{2k}\wedge W_{2k}\Rightarrow M_{2k+1}\wedge W_{2k+1},$$
$$M_{2k+1}\wedge W_{2k+1}\Rightarrow M_{2k+2}\wedge W_{2k+2}.$$
We give the proof of
$$M_{2k}\wedge W_{2k}\Rightarrow M_{2k+1},$$
the other ones being similar. Set $u=2^{2k}$ and $v=2^{2k-1}$. By definition and induction hypothesis, the left side of identity M_{2k+1} is equal to
$$W_{2k}M_{2k}=\big(W^e[:7v]+x^vW^e[:6v]+x^{2v}W^e[:5v]+x^{4v}W^e[:3v]+x^{7u}R^e\big)\times\big($$
$$M^e[:7v]+x^vM^e[:6v]+x^{2v}M^e[:5v]+x^{4v}M^e[:3v]+x^{7u}R^e\big); \tag{2.35}$$
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
$$W^e[:14v]M^e[:14v]+x^{2v}W^e[:12v]M^e[:12v]+x^{4v}W^e[:10v]M^e[:10v]$$
$$+x^{8v}W^e[:6v]M^e[:6v].$$
For all $n\le 14$, 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
$$X:=x^v,$$
$$a_n:=W^e[n\cdot v:(n+1)\cdot v]/X^n,$$
$$b_n:=M^e[n\cdot v:(n+1)\cdot v]/X^n,$$

$$c := R^e.$$

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

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

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

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

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

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

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

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

Define

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

where

$$\begin{aligned}
q_0(x) &= x^{28} + x^{27} + x^{26} + x^{24} + x^{22} + x^{20} + x^{19} + x^{18} + x^{17} + x^{15} + x^{14} + x^{12} \\
&\quad + x^{11} + x^{10} + x^7 + x^4,\\
q_1(x) &= x^{27} + x^{26} + x^{23} + x^{21} + x^{19} + x^{18} + x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^9 \\
&\quad + x^6 + x^5 + x^3 + x,\\
q_2(x) &= x^{26} + x^{18} + x^6 + x^4 + x^2 + 1,\\
q_3(x) &= x^{27} + x^{26} + x^{23} + x^{21} + x^{19} + x^{18} + x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^9 \\
&\quad + x^6 + x^5 + x^3 + x,\\
q_4(x) &= x^{27} + x^{24} + x^{22} + x^{20} + x^{19} + x^{17} + x^{16} + x^{15} + x^{14} + x^{11} + x^{10} + x^8 \\
&\quad + x^7 + x^6 + x^2.
\end{aligned}$$

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

$$\begin{aligned} p_0(x) = {} & x^{162} + x^{156} + x^{152} + x^{150} + x^{148} + x^{146} + x^{144} + x^{138} + x^{136} + x^{132} \\ & + x^{130} + x^{122} + x^{114} + x^{112} + x^{110} + x^{108} + x^{104} + x^{98} + x^{96} + x^{94} \\ & + x^{86} + x^{78} + x^{74} + x^{70} + x^{68} + x^{66} + x^{62} + x^{60} + x^{58} + x^{56} + x^{54} \\ & + x^{50} + x^{46} + x^{40} + x^{36} + x^{32} + x^{30} + x^{24} + x^{22} + x^{20} + x^{12}, \\ p_3(x) = {} & x^{156} + x^{142} + x^{140} + x^{132} + x^{130} + x^{124} + x^{120} + x^{116} + x^{100} + x^{98} \\ & + x^{96} + x^{90} + x^{88} + x^{86} + x^{84} + x^{76} + x^{74} + x^{72} + x^{70} + x^{68} + x^{66} \\ & + x^{62} + x^{60} + x^{58} + x^{56} + x^{54} + x^{50} + x^{44} + x^{40} + x^{36} + x^{34} + x^{26} \\ & + x^{22} + x^{18} + x^{16} + x^{8}, \\ p_6(x) = {} & x^{158} + x^{156} + x^{154} + x^{152} + x^{148} + x^{146} + x^{144} + x^{142} + x^{140} + x^{138} \\ & + x^{136} + x^{132} + x^{130} + x^{128} + x^{126} + x^{122} + x^{108} + x^{100} + x^{98} + x^{92} \\ & + x^{90} + x^{88} + x^{86} + x^{84} + x^{82} + x^{80} + x^{78} + x^{74} + x^{72} + x^{66} + x^{52} \\ & + x^{44} + x^{34} + x^{32} + x^{26} + x^{24} + x^{22} + x^{18} + x^{16} + x^{12} + x^{8} + x^{4} + x^{2} \\ & + 1, \\ p_9(x) = {} & x^{160} + x^{158} + x^{150} + x^{146} + x^{142} + x^{138} + x^{132} + x^{124} + x^{122} + x^{120} \\ & + x^{118} + x^{112} + x^{108} + x^{100} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{82} \\ & + x^{76} + x^{74} + x^{72} + x^{66} + x^{64} + x^{62} + x^{56} + x^{54} + x^{52} + x^{48} + x^{46} \\ & + x^{42} + x^{34} + x^{32} + x^{28} + x^{26} + x^{24} + x^{18} + x^{14} + x^{12} + x^{8} + x^{6} + x^{4} \\ & + x^{2}, \\ p_{12}(x) = {} & x^{160} + x^{136} + x^{120} + x^{96} + x^{88} + x^{80} + x^{64} + x^{40} + x^{32} + x^{24} + x^{8} + 1 \\ & , \end{aligned}$$

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

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

$$\begin{aligned} p_0(x) = {} & x^{147} + x^{146} + x^{144} + x^{143} + x^{142} + x^{138} + x^{137} + x^{134} + x^{131} + x^{129} \\ & + x^{127} + x^{124} + x^{123} + x^{120} + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} \\ & + x^{112} + x^{111} + x^{110} + x^{107} + x^{106} + x^{103} + x^{99} + x^{98} + x^{97} + x^{96} \\ & + x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{77} \\ & + x^{75} + x^{72} + x^{71} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{62} + x^{53} + x^{52} \\ & + x^{48} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{36} \end{aligned}$$

$$
\begin{aligned}
&+x^{33}+x^{32}+x^{31}+x^{30}+x^{29}+x^{23}+x^{22}+x^{19}+x^{18},\\
p_3(x) &= x^{145}+x^{144}+x^{142}+x^{140}+x^{139}+x^{129}+x^{128}+x^{126}+x^{125}+x^{121}\\
&+x^{120}+x^{118}+x^{116}+x^{114}+x^{112}+x^{110}+x^{109}+x^{107}+x^{106}\\
&+x^{104}+x^{102}+x^{100}+x^{99}+x^{89}+x^{88}+x^{86}+x^{85}+x^{75}+x^{74}+x^{73}\\
&+x^{69}+x^{68}+x^{66}+x^{64}+x^{62}+x^{61}+x^{57}+x^{56}+x^{54}+x^{53}+x^{51}\\
&+x^{50}+x^{49}+x^{45}+x^{44}+x^{43}+x^{41}+x^{40}+x^{38}+x^{36}+x^{34}+x^{33}\\
&+x^{27}+x^{26}+x^{24}+x^{22}+x^{20}+x^{18}+x^{16}+x^{14}+x^{13}+x^{11}+x^{10}\\
&+x^{9},\\
p_6(x) &= x^{144}+x^{142}+x^{141}+x^{140}+x^{134}+x^{131}+x^{129}+x^{125}+x^{124}+x^{123}\\
&+x^{122}+x^{121}+x^{120}+x^{119}+x^{117}+x^{114}+x^{113}+x^{109}+x^{108}\\
&+x^{107}+x^{106}+x^{105}+x^{103}+x^{102}+x^{92}+x^{90}+x^{89}+x^{88}+x^{84}\\
&+x^{81}+x^{80}+x^{79}+x^{77}+x^{74}+x^{73}+x^{72}+x^{70}+x^{68}+x^{67}+x^{63}\\
&+x^{62}+x^{61}+x^{59}+x^{56}+x^{55}+x^{54}+x^{50}+x^{47}+x^{45}+x^{41}+x^{39}\\
&+x^{36}+x^{35}+x^{34}+x^{30}+x^{28}+x^{27}+x^{26}+x^{24}+x^{21}+x^{20}+x^{19}\\
&+x^{17}+x^{16}+x^{12}+x^{9}+x^{7}+x^{6},\\
p_9(x) &= x^{143}+x^{142}+x^{141}+x^{137}+x^{136}+x^{135}+x^{133}+x^{132}+x^{131}+x^{127}\\
&+x^{126}+x^{124}+x^{123}+x^{121}+x^{120}+x^{119}+x^{111}+x^{110}+x^{109}\\
&+x^{105}+x^{104}+x^{103}+x^{101}+x^{100}+x^{98}+x^{97}+x^{95}+x^{94}+x^{93}\\
&+x^{91}+x^{90}+x^{89}+x^{87}+x^{86}+x^{84}+x^{83}+x^{81}+x^{80}+x^{79}+x^{77}\\
&+x^{76}+x^{75}+x^{71}+x^{70}+x^{68}+x^{66}+x^{64}+x^{63}+x^{61}+x^{60}+x^{59}\\
&+x^{57}+x^{56}+x^{55}+x^{49}+x^{48}+x^{47}+x^{43}+x^{42}+x^{40}+x^{38}+x^{36}\\
&+x^{34}+x^{32}+x^{30}+x^{29}+x^{27}+x^{26}+x^{25}+x^{23}+x^{22}+x^{20}+x^{18}\\
&+x^{16}+x^{14}+x^{13}+x^{11}+x^{10}+x^{9}+x^{5}+x^{4}+x^{3},\\
p_{12}(x) &= x^{142}+x^{139}+x^{137}+x^{136}+x^{130}+x^{127}+x^{125}+x^{124}+x^{122}+x^{119}\\
&+x^{118}+x^{117}+x^{116}+x^{115}+x^{113}+x^{112}+x^{94}+x^{91}+x^{89}+x^{88}\\
&+x^{82}+x^{79}+x^{78}+x^{77}+x^{76}+x^{75}+x^{74}+x^{73}+x^{72}+x^{71}+x^{70}\\
&+x^{69}+x^{68}+x^{67}+x^{66}+x^{65}+x^{64}+x^{63}+x^{62}+x^{61}+x^{60}+x^{59}\\
&+x^{58}+x^{57}+x^{56}+x^{55}+x^{54}+x^{53}+x^{52}+x^{51}+x^{50}+x^{49}+x^{48}\\
&+x^{47}+x^{45}+x^{44}+x^{42}+x^{39}+x^{38}+x^{37}+x^{36}+x^{35}+x^{33}+x^{32}\\
&+x^{30}+x^{27}+x^{25}+x^{24}+x^{18}+x^{15}+x^{13}+x^{12}+x^{10}+x^{7}+x^{6}+x^{5}\\
&+x^{4}+x^{3}+x+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147}+x^{146}+x^{144}+x^{143}+x^{142}+x^{138}+x^{137}+x^{134}+x^{131}+x^{129}\\
&+x^{127}+x^{124}+x^{123}+x^{120}+x^{118}+x^{117}+x^{116}+x^{115}+x^{113}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{112} + x^{111} + x^{110} + x^{107} + x^{106} + x^{103} + x^{99} + x^{98} + x^{97} + x^{96} \\
&+ x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{77} \\
&+ x^{75} + x^{72} + x^{71} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{62} + x^{53} + x^{52} \\
&+ x^{48} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{36} \\
&+ x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{23} + x^{22} + x^{19} + x^{18}, \\
p_3(x) &= x^{145} + x^{144} + x^{142} + x^{140} + x^{139} + x^{129} + x^{128} + x^{126} + x^{125} + x^{121} \\
&+ x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{109} + x^{107} + x^{106} \\
&+ x^{104} + x^{102} + x^{100} + x^{99} + x^{89} + x^{88} + x^{86} + x^{85} + x^{75} + x^{74} + x^{73} \\
&+ x^{69} + x^{68} + x^{66} + x^{64} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{53} + x^{51} \\
&+ x^{50} + x^{49} + x^{45} + x^{44} + x^{43} + x^{41} + x^{40} + x^{38} + x^{36} + x^{34} + x^{33} \\
&+ x^{27} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} \\
&+ x^{9}, \\
p_6(x) &= x^{144} + x^{142} + x^{141} + x^{140} + x^{134} + x^{131} + x^{129} + x^{125} + x^{124} + x^{123} \\
&+ x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} \\
&+ x^{107} + x^{106} + x^{105} + x^{103} + x^{102} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
&+ x^{81} + x^{80} + x^{79} + x^{77} + x^{74} + x^{73} + x^{72} + x^{70} + x^{68} + x^{67} + x^{63} \\
&+ x^{62} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{50} + x^{47} + x^{45} + x^{41} + x^{39} \\
&+ x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{27} + x^{26} + x^{24} + x^{21} + x^{20} + x^{19} \\
&+ x^{17} + x^{16} + x^{12} + x^{9} + x^{7} + x^{6}, \\
p_9(x) &= x^{143} + x^{142} + x^{141} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{127} \\
&+ x^{126} + x^{124} + x^{123} + x^{121} + x^{120} + x^{119} + x^{111} + x^{110} + x^{109} \\
&+ x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{98} + x^{97} + x^{95} + x^{94} + x^{93} \\
&+ x^{91} + x^{90} + x^{89} + x^{87} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{79} + x^{77} \\
&+ x^{76} + x^{75} + x^{71} + x^{70} + x^{68} + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} \\
&+ x^{57} + x^{56} + x^{55} + x^{49} + x^{48} + x^{47} + x^{43} + x^{42} + x^{40} + x^{38} + x^{36} \\
&+ x^{34} + x^{32} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{23} + x^{22} + x^{20} + x^{18} \\
&+ x^{16} + x^{14} + x^{13} + x^{11} + x^{10} + x^{9} + x^{5} + x^{4} + x^{3}, \\
p_{12}(x) &= x^{142} + x^{139} + x^{137} + x^{136} + x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{119} \\
&+ x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{112} + x^{94} + x^{91} + x^{89} + x^{88} \\
&+ x^{82} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} \\
&+ x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} \\
&+ x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{49} + x^{48} \\
&+ x^{47} + x^{45} + x^{44} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33} + x^{32} \\
&+ x^{30} + x^{27} + x^{25} + x^{24} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6} + x^{5} \\
&+ x^{4} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{114} + x^{106} + x^{100} + x^{96} + x^{92} + x^{90} + x^{88} + x^{78} + x^{68} \\
&\quad + x^{62} + x^{58} + x^{56} + x^{50} + x^{48} + x^{44} + x^{38} + x^{34} + x^{26} + x^{24}, \\
p_3(x) &= x^{126} + x^{124} + x^{122} + x^{120} + x^{112} + x^{108} + x^{96} + x^{90} + x^{86} + x^{84} \\
&\quad + x^{80} + x^{78} + x^{76} + x^{70} + x^{64} + x^{62} + x^{60} + x^{54} + x^{46} + x^{44} + x^{42} \\
&\quad + x^{34} + x^{32} + x^{30} + x^{28} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{6}, \\
p_6(x) &= x^{126} + x^{112} + x^{106} + x^{104} + x^{102} + x^{100} + x^{94} + x^{92} + x^{90} + x^{86} \\
&\quad + x^{82} + x^{78} + x^{76} + x^{72} + x^{70} + x^{68} + x^{66} + x^{64} + x^{60} + x^{58} + x^{56} \\
&\quad + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{38} + x^{36} + x^{34} + x^{26} + x^{22} + x^{20} \\
&\quad + x^{18} + x^{12} + x^{10} + x^{8} + x^{4} + 1, \\
p_9(x) &= x^{124} + x^{122} + x^{118} + x^{116} + x^{108} + x^{106} + x^{100} + x^{96} + x^{88} + x^{80} \\
&\quad + x^{78} + x^{76} + x^{74} + x^{70} + x^{66} + x^{64} + x^{62} + x^{58} + x^{56} + x^{52} + x^{50} \\
&\quad + x^{48} + x^{46} + x^{42} + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{20} + x^{16} + x^{10} \\
&\quad + x^{8} + x^{2}, \\
p_{12}(x) &= x^{124} + x^{118} + x^{114} + x^{112} + x^{76} + x^{70} + x^{66} + x^{64} + x^{60} + x^{54} + x^{50} \\
&\quad + x^{48} + x^{44} + x^{38} + x^{34} + x^{32} + x^{12} + x^{6} + x^{2} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{128} + x^{124} + x^{114} + x^{112} + x^{110} + x^{106} + x^{104} + x^{100} \\
&\quad + x^{92} + x^{88} + x^{86} + x^{84} + x^{82} + x^{76} + x^{74} + x^{72} + x^{70} + x^{68} + x^{64} \\
&\quad + x^{62} + x^{60} + x^{58} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46} + x^{44} + x^{38} + x^{34} \\
&\quad + x^{30} + x^{26} + x^{22} + x^{20} + x^{16} + x^{14} + x^{12}, \\
p_3(x) &= x^{126} + x^{124} + x^{118} + x^{112} + x^{110} + x^{104} + x^{100} + x^{98} + x^{96} + x^{94} \\
&\quad + x^{92} + x^{86} + x^{84} + x^{82} + x^{78} + x^{74} + x^{70} + x^{66} + x^{62} + x^{56} + x^{50} \\
&\quad + x^{48} + x^{44} + x^{40} + x^{36} + x^{32} + x^{30} + x^{28} + x^{26} + x^{24} + x^{16} + x^{14} \\
&\quad + x^{12} + x^{8}, \\
p_6(x) &= x^{126} + x^{122} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{102} + x^{96} + x^{94} \\
&\quad + x^{92} + x^{90} + x^{88} + x^{82} + x^{78} + x^{74} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} \\
&\quad + x^{50} + x^{48} + x^{44} + x^{42} + x^{32} + x^{30} + x^{26} + x^{22} + x^{20} + x^{18} + x^{16} \\
&\quad + x^{12} + 1, \\
p_9(x) &= x^{124} + x^{122} + x^{118} + x^{116} + x^{108} + x^{106} + x^{100} + x^{96} + x^{88} + x^{80} \\
&\quad + x^{78} + x^{76} + x^{74} + x^{70} + x^{66} + x^{64} + x^{62} + x^{58} + x^{56} + x^{52} + x^{50} \\
&\quad + x^{48} + x^{46} + x^{42} + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{20} + x^{16} + x^{10} \\
&\quad + x^{8} + x^{2},
\end{aligned}$$

$$
\begin{aligned}
p_{12}(x) = {} & x^{124} + x^{118} + x^{114} + x^{112} + x^{76} + x^{70} + x^{66} + x^{64} + x^{60} + x^{54} + x^{50} \\
& + x^{48} + x^{44} + x^{38} + x^{34} + x^{32} + x^{12} + x^{6} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{147} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{136} + x^{133} + x^{130} \\
& + x^{125} + x^{124} + x^{123} + x^{122} + x^{118} + x^{116} + x^{114} + x^{111} + x^{110} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{99} + x^{97} + x^{95} + x^{94} + x^{92} + x^{87} \\
& + x^{85} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} \\
& + x^{67} + x^{66} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{47} \\
& + x^{43} + x^{38} + x^{37} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{27}, \\
p_3(x) = {} & x^{145} + x^{144} + x^{142} + x^{140} + x^{139} + x^{129} + x^{128} + x^{126} + x^{125} + x^{121} \\
& + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{109} + x^{107} + x^{106} \\
& + x^{104} + x^{102} + x^{100} + x^{99} + x^{89} + x^{88} + x^{86} + x^{85} + x^{75} + x^{74} + x^{73} \\
& + x^{69} + x^{68} + x^{66} + x^{64} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{53} + x^{51} \\
& + x^{50} + x^{49} + x^{45} + x^{44} + x^{43} + x^{41} + x^{40} + x^{38} + x^{36} + x^{34} + x^{33} \\
& + x^{27} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} \\
& + x^{9}, \\
p_6(x) = {} & x^{144} + x^{142} + x^{141} + x^{140} + x^{134} + x^{131} + x^{129} + x^{125} + x^{124} + x^{123} \\
& + x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{102} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
& + x^{81} + x^{80} + x^{79} + x^{77} + x^{74} + x^{73} + x^{72} + x^{70} + x^{68} + x^{67} + x^{63} \\
& + x^{62} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{50} + x^{47} + x^{45} + x^{41} + x^{39} \\
& + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{27} + x^{26} + x^{24} + x^{21} + x^{20} + x^{19} \\
& + x^{17} + x^{16} + x^{12} + x^{9} + x^{7} + x^{6}, \\
p_9(x) = {} & x^{143} + x^{142} + x^{141} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{127} \\
& + x^{126} + x^{124} + x^{123} + x^{121} + x^{120} + x^{119} + x^{111} + x^{110} + x^{109} \\
& + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{98} + x^{97} + x^{95} + x^{94} + x^{93} \\
& + x^{91} + x^{90} + x^{89} + x^{87} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{79} + x^{77} \\
& + x^{76} + x^{75} + x^{71} + x^{70} + x^{68} + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} \\
& + x^{57} + x^{56} + x^{55} + x^{49} + x^{48} + x^{47} + x^{43} + x^{42} + x^{40} + x^{38} + x^{36} \\
& + x^{34} + x^{32} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{23} + x^{22} + x^{20} + x^{18} \\
& + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} + x^{9} + x^{5} + x^{4} + x^{3}, \\
p_{12}(x) = {} & x^{142} + x^{139} + x^{137} + x^{136} + x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{119} \\
& + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{112} + x^{94} + x^{91} + x^{89} + x^{88} \\
& + x^{82} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70}
\end{aligned}
$$

$$+ x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{49} + x^{48} + x^{47} + x^{45} + x^{44} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33} + x^{32} + x^{30} + x^{27} + x^{25} + x^{24} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6} + x^{5} + x^{4} + x^{3} + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{147} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{136} + x^{133} + x^{130} \\
& + x^{125} + x^{124} + x^{123} + x^{122} + x^{118} + x^{116} + x^{114} + x^{111} + x^{110} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{99} + x^{97} + x^{95} + x^{94} + x^{92} + x^{87} \\
& + x^{85} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} \\
& + x^{67} + x^{66} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{47} \\
& + x^{43} + x^{38} + x^{37} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{27}, \\
p_3(x) = {} & x^{145} + x^{144} + x^{142} + x^{140} + x^{139} + x^{129} + x^{128} + x^{126} + x^{125} + x^{121} \\
& + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{109} + x^{107} + x^{106} \\
& + x^{104} + x^{102} + x^{100} + x^{99} + x^{89} + x^{88} + x^{86} + x^{85} + x^{75} + x^{74} + x^{73} \\
& + x^{69} + x^{68} + x^{66} + x^{64} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{53} + x^{51} \\
& + x^{50} + x^{49} + x^{45} + x^{44} + x^{43} + x^{41} + x^{40} + x^{38} + x^{36} + x^{34} + x^{33} \\
& + x^{27} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} \\
& + x^{9}, \\
p_6(x) = {} & x^{144} + x^{142} + x^{141} + x^{140} + x^{134} + x^{131} + x^{129} + x^{125} + x^{124} + x^{123} \\
& + x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{102} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
& + x^{81} + x^{80} + x^{79} + x^{77} + x^{74} + x^{73} + x^{72} + x^{70} + x^{68} + x^{67} + x^{63} \\
& + x^{62} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{50} + x^{47} + x^{45} + x^{41} + x^{39} \\
& + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{27} + x^{26} + x^{24} + x^{21} + x^{20} + x^{19} \\
& + x^{17} + x^{16} + x^{12} + x^{9} + x^{7} + x^{6}, \\
p_9(x) = {} & x^{143} + x^{142} + x^{141} + x^{137} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{127} \\
& + x^{126} + x^{124} + x^{123} + x^{121} + x^{120} + x^{119} + x^{111} + x^{110} + x^{109} \\
& + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{98} + x^{97} + x^{95} + x^{94} + x^{93} \\
& + x^{91} + x^{90} + x^{89} + x^{87} + x^{86} + x^{84} + x^{83} + x^{81} + x^{80} + x^{79} + x^{77} \\
& + x^{76} + x^{75} + x^{71} + x^{70} + x^{68} + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} \\
& + x^{57} + x^{56} + x^{55} + x^{49} + x^{48} + x^{47} + x^{43} + x^{42} + x^{40} + x^{38} + x^{36} \\
& + x^{34} + x^{32} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{23} + x^{22} + x^{20} + x^{18} \\
& + x^{16} + x^{14} + x^{13} + x^{11} + x^{10} + x^{9} + x^{5} + x^{4} + x^{3},
\end{aligned}$$

$$\begin{aligned}p_{12}(x) = {} & x^{142} + x^{139} + x^{137} + x^{136} + x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{119} \\ & + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{112} + x^{94} + x^{91} + x^{89} + x^{88} \\ & + x^{82} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} \\ & + x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} \\ & + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{49} + x^{48} \\ & + x^{47} + x^{45} + x^{44} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33} + x^{32} \\ & + x^{30} + x^{27} + x^{25} + x^{24} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{7} + x^{6} + x^{5} \\ & + x^{4} + x^{3} + x + 1,\end{aligned}$$

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

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

$$\begin{aligned}p_{0}(x) = {} & x^{162} + x^{160} + x^{158} + x^{156} + x^{152} + x^{146} + x^{142} + x^{140} + x^{126} + x^{124} \\ & + x^{122} + x^{120} + x^{116} + x^{114} + x^{110} + x^{108} + x^{106} + x^{104} + x^{98} + x^{88} \\ & + x^{86} + x^{82} + x^{80} + x^{78} + x^{74} + x^{68} + x^{66} + x^{64} + x^{56} + x^{50} + x^{46} \\ & + x^{44} + x^{42}, \\ p_{3}(x) = {} & x^{158} + x^{154} + x^{152} + x^{150} + x^{142} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} \\ & + x^{126} + x^{124} + x^{120} + x^{116} + x^{110} + x^{108} + x^{106} + x^{104} + x^{102} \\ & + x^{100} + x^{98} + x^{96} + x^{92} + x^{84} + x^{70} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} \\ & + x^{50} + x^{44} + x^{40} + x^{36} + x^{34} + x^{30} + x^{28} + x^{24} + x^{22} + x^{20} + x^{8} \\ & + x^{6}, \\ p_{6}(x) = {} & x^{156} + x^{152} + x^{150} + x^{148} + x^{146} + x^{144} + x^{142} + x^{140} + x^{134} + x^{132} \\ & + x^{130} + x^{124} + x^{122} + x^{120} + x^{116} + x^{110} + x^{106} + x^{104} + x^{102} \\ & + x^{100} + x^{98} + x^{96} + x^{82} + x^{80} + x^{78} + x^{76} + x^{72} + x^{56} + x^{54} + x^{52} \\ & + x^{40} + x^{34} + x^{30} + x^{28} + x^{24} + x^{22} + x^{20} + x^{12} + x^{8} + x^{6} + x^{2} + 1, \\ p_{9}(x) = {} & x^{160} + x^{158} + x^{150} + x^{146} + x^{142} + x^{138} + x^{132} + x^{124} + x^{122} + x^{120} \\ & + x^{118} + x^{112} + x^{108} + x^{100} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{82} \\ & + x^{76} + x^{74} + x^{72} + x^{66} + x^{64} + x^{62} + x^{56} + x^{54} + x^{52} + x^{48} + x^{46} \\ & + x^{42} + x^{34} + x^{32} + x^{28} + x^{26} + x^{24} + x^{18} + x^{14} + x^{12} + x^{8} + x^{6} + x^{4} \\ & + x^{2}, \\ p_{12}(x) = {} & x^{160} + x^{136} + x^{120} + x^{96} + x^{88} + x^{80} + x^{64} + x^{40} + x^{32} + x^{24} + x^{8} + 1 \\ & ,\end{aligned}$$

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

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

$$\begin{aligned}p_{0}(x) = {} & x^{147} + x^{146} + x^{145} + x^{144} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{133} \\ & + x^{130} + x^{129} + x^{126} + x^{125} + x^{122} + x^{121} + x^{117} + x^{112} + x^{107} \\ & + x^{106} + x^{105} + x^{101} + x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{89}\end{aligned}$$

$$
\begin{aligned}
&+ x^{88} + x^{79} + x^{77} + x^{74} + x^{72} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{59}\\
&+ x^{57} + x^{54} + x^{53} + x^{52} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43}\\
&+ x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31}\\
&+ x^{30} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13}\\
&+ x^{12},\\
p_3(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{132} + x^{130} + x^{128} + x^{126} + x^{125}\\
&+ x^{124} + x^{121} + x^{115} + x^{112} + x^{109} + x^{104} + x^{103} + x^{102} + x^{101}\\
&+ x^{100} + x^{99} + x^{97} + x^{94} + x^{93} + x^{88} + x^{87} + x^{83} + x^{82} + x^{81} + x^{80}\\
&+ x^{79} + x^{77} + x^{76} + x^{75} + x^{73} + x^{72} + x^{69} + x^{68} + x^{65} + x^{64} + x^{62}\\
&+ x^{60} + x^{59} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{50} + x^{48} + x^{47}\\
&+ x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{34} + x^{33} + x^{29} + x^{23} + x^{22} + x^{19}\\
&+ x^{16} + x^{13} + x^{10} + x^{9} + x^{8},\\
p_6(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{141} + x^{140} + x^{135} + x^{133} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{121} + x^{118} + x^{116} + x^{115} + x^{112} + x^{109}\\
&+ x^{108} + x^{107} + x^{106} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} + x^{96} + x^{92}\\
&+ x^{90} + x^{87} + x^{85} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{74}\\
&+ x^{73} + x^{66} + x^{65} + x^{63} + x^{62} + x^{60} + x^{57} + x^{56} + x^{55} + x^{53} + x^{51}\\
&+ x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{39} + x^{36} + x^{33}\\
&+ x^{32} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{22} + x^{16} + x^{8} + x^{7} + x^{3}\\
&+ x + 1,\\
p_9(x) = {}& x^{146} + x^{143} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{136} + x^{134} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{117}\\
&+ x^{116} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{83}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{71} + x^{70} + x^{69} + x^{68}\\
&+ x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{58} + x^{55} + x^{54} + x^{53}\\
&+ x^{52} + x^{51} + x^{49} + x^{48} + x^{46} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37}\\
&+ x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} + x^{22} + x^{19}\\
&+ x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} + x^{4},\\
p_{12}(x) = {}& x^{146} + x^{143} + x^{141} + x^{140} + x^{134} + x^{131} + x^{130} + x^{129} + x^{128} + x^{127}\\
&+ x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{120} + x^{118} + x^{115} + x^{113}\\
&+ x^{112} + x^{98} + x^{95} + x^{93} + x^{92} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{75}\\
&+ x^{73} + x^{72} + x^{62} + x^{59} + x^{57} + x^{56} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44}\\
&+ x^{43} + x^{41} + x^{40} + x^{38} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{28}\\
&+ x^{22} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{9}\\
&+ x^{8} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{144} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{127} + x^{125} + x^{124} \\
& + x^{122} + x^{121} + x^{116} + x^{115} + x^{111} + x^{110} + x^{109} + x^{108} + x^{107} \\
& + x^{103} + x^{101} + x^{99} + x^{98} + x^{92} + x^{91} + x^{89} + x^{87} + x^{86} + x^{82} + x^{80} \\
& + x^{79} + x^{76} + x^{73} + x^{72} + x^{70} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{53} \\
& + x^{52} + x^{50} + x^{46} + x^{44} + x^{43} + x^{42} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} \\
& + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{22} + x^{21} + x^{20} \\
& + x^{18}, \\
p_3(x) = {} & x^{137} + x^{136} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{120} \\
& + x^{117} + x^{115} + x^{113} + x^{112} + x^{111} + x^{110} + x^{109} + x^{105} + x^{97} + x^{96} \\
& + x^{93} + x^{91} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{80} + x^{77} + x^{75} + x^{71} \\
& + x^{70} + x^{67} + x^{65} + x^{63} + x^{62} + x^{59} + x^{57} + x^{55} + x^{54} + x^{51} + x^{48} \\
& + x^{47} + x^{46} + x^{45} + x^{41} + x^{25} + x^{24} + x^{21} + x^{19} + x^{17} + x^{16} + x^{15} \\
& + x^{14} + x^{13} + x^{9}, \\
p_6(x) = {} & x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124} + x^{120} + x^{116} + x^{110} \\
& + x^{108} + x^{104} + x^{100} + x^{98} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{78} + x^{74} \\
& + x^{72} + x^{64} + x^{62} + x^{58} + x^{52} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} + x^{36} \\
& + x^{34} + x^{24} + x^{22} + x^{20} + x^{16} + x^{6}, \\
p_9(x) = {} & x^{139} + x^{138} + x^{137} + x^{136} + x^{135} + x^{130} + x^{129} + x^{128} + x^{127} + x^{122} \\
& + x^{121} + x^{120} + x^{119} + x^{115} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{82} \\
& + x^{81} + x^{80} + x^{79} + x^{75} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{59} + x^{51} \\
& + x^{50} + x^{49} + x^{48} + x^{47} + x^{42} + x^{41} + x^{40} + x^{39} + x^{35} + x^{27} + x^{26} \\
& + x^{25} + x^{24} + x^{23} + x^{18} + x^{17} + x^{16} + x^{15} + x^{10} + x^{9} + x^{8} + x^{7} + x^{3}, \\
p_{12}(x) = {} & x^{140} + x^{128} + x^{124} + x^{120} + x^{112} + x^{92} + x^{80} + x^{72} + x^{56} + x^{44} + x^{40} \\
& + x^{32} + x^{28} + x^{16} + x^{12} + x^{8} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{162} + x^{161} + x^{160} + x^{158} + x^{157} + x^{156} + x^{155} + x^{152} + x^{151} + x^{150} \\
& + x^{149} + x^{148} + x^{147} + x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{137} \\
& + x^{136} + x^{135} + x^{134} + x^{132} + x^{131} + x^{128} + x^{126} + x^{125} + x^{124} \\
& + x^{123} + x^{121} + x^{120} + x^{118} + x^{117} + x^{116} + x^{113} + x^{112} + x^{111} \\
& + x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{94} + x^{93} + x^{88} + x^{87} \\
& + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{74} + x^{72} + x^{67} + x^{64} + x^{63} \\
& + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{52} + x^{50} + x^{49} + x^{48} + x^{46} + x^{45}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{44} + x^{41} + x^{37} + x^{34} + x^{33} + x^{29} + x^{28} + x^{27},\\
p_3(x) &= x^{161} + x^{160} + x^{157} + x^{155} + x^{153} + x^{152} + x^{151} + x^{150} + x^{148} + x^{145}\\
&+ x^{144} + x^{143} + x^{141} + x^{138} + x^{134} + x^{133} + x^{130} + x^{128} + x^{126}\\
&+ x^{123} + x^{122} + x^{121} + x^{119} + x^{116} + x^{115} + x^{114} + x^{113} + x^{108}\\
&+ x^{104} + x^{103} + x^{101} + x^{98} + x^{97} + x^{96} + x^{94} + x^{91} + x^{90} + x^{88} + x^{87}\\
&+ x^{85} + x^{84} + x^{82} + x^{80} + x^{79} + x^{78} + x^{72} + x^{69} + x^{67} + x^{63} + x^{62}\\
&+ x^{61} + x^{60} + x^{59} + x^{54} + x^{53} + x^{52} + x^{50} + x^{47} + x^{46} + x^{45} + x^{43}\\
&+ x^{40} + x^{39} + x^{38} + x^{36} + x^{31} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21}\\
&+ x^{20} + x^{18} + x^{16} + x^{15} + x^{14} + x^{9},\\
p_6(x) &= x^{162} + x^{160} + x^{158} + x^{156} + x^{154} + x^{146} + x^{138} + x^{136} + x^{134} + x^{132}\\
&+ x^{128} + x^{126} + x^{124} + x^{118} + x^{116} + x^{112} + x^{108} + x^{106} + x^{104}\\
&+ x^{102} + x^{100} + x^{98} + x^{96} + x^{84} + x^{76} + x^{74} + x^{68} + x^{64} + x^{62} + x^{58}\\
&+ x^{56} + x^{52} + x^{48} + x^{42} + x^{40} + x^{38} + x^{32} + x^{30} + x^{26} + x^{22} + x^{18}\\
&+ x^{16} + x^{10} + x^{6},\\
p_9(x) &= x^{163} + x^{162} + x^{161} + x^{160} + x^{159} + x^{154} + x^{153} + x^{152} + x^{150} + x^{149}\\
&+ x^{148} + x^{147} + x^{146} + x^{145} + x^{144} + x^{138} + x^{137} + x^{136} + x^{135}\\
&+ x^{130} + x^{129} + x^{128} + x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121}\\
&+ x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{106} + x^{105} + x^{104} + x^{102}\\
&+ x^{101} + x^{100} + x^{95} + x^{87} + x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{55} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{38}\\
&+ x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{26} + x^{25} + x^{24} + x^{23} + x^{18} + x^{17}\\
&+ x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{3},\\
p_{12}(x) &= x^{164} + x^{148} + x^{124} + x^{120} + x^{112} + x^{76} + x^{72} + x^{64} + x^{60} + x^{56} + x^{48}\\
&+ x^{44} + x^{40} + x^{32} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{143} + x^{142} + x^{141} + x^{139} + x^{136} + x^{134} + x^{132} + x^{128} + x^{127}\\
&+ x^{126} + x^{122} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111}\\
&+ x^{110} + x^{109} + x^{105} + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95}\\
&+ x^{91} + x^{86} + x^{81} + x^{79} + x^{77} + x^{72} + x^{71} + x^{70} + x^{67} + x^{66} + x^{64}\\
&+ x^{63} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{45} + x^{44}\\
&+ x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{33},\\
p_3(x) &= x^{146} + x^{145} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{132} + x^{130} + x^{126}\\
&+ x^{123} + x^{120} + x^{115} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{103} + x^{102} + x^{100} + x^{98} + x^{97} + x^{94} + x^{93} + x^{87} + x^{85} + x^{84} + x^{82}\\
&+ x^{80} + x^{79} + x^{76} + x^{74} + x^{73} + x^{67} + x^{64} + x^{62} + x^{61} + x^{55} + x^{54}\\
&+ x^{53} + x^{49} + x^{47} + x^{45} + x^{42} + x^{37} + x^{34} + x^{33} + x^{32} + x^{27} + x^{26}\\
&+ x^{23} + x^{22} + x^{19} + x^{16} + x^{13} + x^{12},\\
p_6(x) = {}& x^{146} + x^{145} + x^{143} + x^{142} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132}\\
&+ x^{130} + x^{128} + x^{127} + x^{122} + x^{121} + x^{119} + x^{118} + x^{117} + x^{116}\\
&+ x^{115} + x^{114} + x^{113} + x^{112} + x^{110} + x^{107} + x^{106} + x^{104} + x^{100}\\
&+ x^{99} + x^{98} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{86} + x^{81} + x^{80} + x^{78}\\
&+ x^{75} + x^{74} + x^{72} + x^{71} + x^{69} + x^{64} + x^{63} + x^{62} + x^{56} + x^{53} + x^{49}\\
&+ x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{26} + x^{25} + x^{24} + x^{16}\\
&+ x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{5} + x^{4} + x^{3} + x + 1,\\
p_9(x) = {}& x^{146} + x^{143} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{136} + x^{134} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{117}\\
&+ x^{116} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{83}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{71} + x^{70} + x^{69} + x^{68}\\
&+ x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{58} + x^{55} + x^{54} + x^{53}\\
&+ x^{52} + x^{51} + x^{49} + x^{48} + x^{46} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37}\\
&+ x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} + x^{22} + x^{19}\\
&+ x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} + x^{4},\\
p_{12}(x) = {}& x^{146} + x^{143} + x^{141} + x^{140} + x^{134} + x^{131} + x^{130} + x^{129} + x^{128} + x^{127}\\
&+ x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{120} + x^{118} + x^{115} + x^{113}\\
&+ x^{112} + x^{98} + x^{95} + x^{93} + x^{92} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{75}\\
&+ x^{73} + x^{72} + x^{62} + x^{59} + x^{57} + x^{56} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44}\\
&+ x^{43} + x^{41} + x^{40} + x^{38} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{28}\\
&+ x^{22} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{9}\\
&+ x^{8} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{146} + x^{145} + x^{144} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{133}\\
&+ x^{130} + x^{129} + x^{126} + x^{125} + x^{122} + x^{121} + x^{117} + x^{112} + x^{107}\\
&+ x^{106} + x^{105} + x^{101} + x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{89}\\
&+ x^{88} + x^{79} + x^{77} + x^{74} + x^{72} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{59}\\
&+ x^{57} + x^{54} + x^{53} + x^{52} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43}\\
&+ x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31}\\
&+ x^{30} + x^{28} + x^{26} + x^{25} + x^{24} + x^{23} + x^{19} + x^{18} + x^{17} + x^{14} + x^{13}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{12},\\
p_3(x) &= x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{132} + x^{130} + x^{128} + x^{126} + x^{125}\\
&+ x^{124} + x^{121} + x^{115} + x^{112} + x^{109} + x^{104} + x^{103} + x^{102} + x^{101}\\
&+ x^{100} + x^{99} + x^{97} + x^{94} + x^{93} + x^{88} + x^{87} + x^{83} + x^{82} + x^{81} + x^{80}\\
&+ x^{79} + x^{77} + x^{76} + x^{75} + x^{73} + x^{72} + x^{69} + x^{68} + x^{65} + x^{64} + x^{62}\\
&+ x^{60} + x^{59} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{50} + x^{48} + x^{47}\\
&+ x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{34} + x^{33} + x^{29} + x^{23} + x^{22} + x^{19}\\
&+ x^{16} + x^{13} + x^{10} + x^{9} + x^{8},\\
p_6(x) &= x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{141} + x^{140} + x^{135} + x^{133} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{121} + x^{118} + x^{116} + x^{115} + x^{112} + x^{109}\\
&+ x^{108} + x^{107} + x^{106} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} + x^{96} + x^{92}\\
&+ x^{90} + x^{87} + x^{85} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{74}\\
&+ x^{73} + x^{66} + x^{65} + x^{63} + x^{62} + x^{60} + x^{57} + x^{56} + x^{55} + x^{53} + x^{51}\\
&+ x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{39} + x^{36} + x^{33}\\
&+ x^{32} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{22} + x^{16} + x^{8} + x^{7} + x^{3}\\
&+ x + 1,\\
p_9(x) &= x^{146} + x^{143} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{136} + x^{134} + x^{131}\\
&+ x^{129} + x^{128} + x^{126} + x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{117}\\
&+ x^{116} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{83}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{71} + x^{70} + x^{69} + x^{68}\\
&+ x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{58} + x^{55} + x^{54} + x^{53}\\
&+ x^{52} + x^{51} + x^{49} + x^{48} + x^{46} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37}\\
&+ x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} + x^{22} + x^{19}\\
&+ x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} + x^{4},\\
p_{12}(x) &= x^{146} + x^{143} + x^{141} + x^{140} + x^{134} + x^{131} + x^{130} + x^{129} + x^{128} + x^{127}\\
&+ x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{120} + x^{118} + x^{115} + x^{113}\\
&+ x^{112} + x^{98} + x^{95} + x^{93} + x^{92} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{75}\\
&+ x^{73} + x^{72} + x^{62} + x^{59} + x^{57} + x^{56} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44}\\
&+ x^{43} + x^{41} + x^{40} + x^{38} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{28}\\
&+ x^{22} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{9}\\
&+ x^{8} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{162} + x^{161} + x^{160} + x^{158} + x^{157} + x^{156} + x^{155} + x^{152} + x^{151} + x^{150}\\
&+ x^{149} + x^{148} + x^{147} + x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{137}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{136} + x^{135} + x^{134} + x^{132} + x^{131} + x^{128} + x^{126} + x^{125} + x^{124} \\
&+ x^{123} + x^{121} + x^{120} + x^{118} + x^{117} + x^{116} + x^{113} + x^{112} + x^{111} \\
&+ x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{94} + x^{93} + x^{88} + x^{87} \\
&+ x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{74} + x^{72} + x^{67} + x^{64} + x^{63} \\
&+ x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{52} + x^{50} + x^{49} + x^{48} + x^{46} + x^{45} \\
&+ x^{44} + x^{41} + x^{37} + x^{34} + x^{33} + x^{29} + x^{28} + x^{27}, \\
p_3(x) = {}& x^{161} + x^{160} + x^{157} + x^{155} + x^{153} + x^{152} + x^{151} + x^{150} + x^{148} + x^{145} \\
&+ x^{144} + x^{143} + x^{141} + x^{138} + x^{134} + x^{133} + x^{130} + x^{128} + x^{126} \\
&+ x^{123} + x^{122} + x^{121} + x^{119} + x^{116} + x^{115} + x^{114} + x^{113} + x^{108} \\
&+ x^{104} + x^{103} + x^{101} + x^{98} + x^{97} + x^{96} + x^{94} + x^{91} + x^{90} + x^{88} + x^{87} \\
&+ x^{85} + x^{84} + x^{82} + x^{80} + x^{79} + x^{78} + x^{72} + x^{69} + x^{67} + x^{63} + x^{62} \\
&+ x^{61} + x^{60} + x^{59} + x^{54} + x^{53} + x^{52} + x^{50} + x^{47} + x^{46} + x^{45} + x^{43} \\
&+ x^{40} + x^{39} + x^{38} + x^{36} + x^{31} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{21} \\
&+ x^{20} + x^{18} + x^{16} + x^{15} + x^{14} + x^{9}, \\
p_6(x) = {}& x^{162} + x^{160} + x^{158} + x^{156} + x^{154} + x^{146} + x^{138} + x^{136} + x^{134} + x^{132} \\
&+ x^{128} + x^{126} + x^{124} + x^{118} + x^{116} + x^{112} + x^{108} + x^{106} + x^{104} \\
&+ x^{102} + x^{100} + x^{98} + x^{96} + x^{84} + x^{76} + x^{74} + x^{68} + x^{64} + x^{62} + x^{58} \\
&+ x^{56} + x^{52} + x^{48} + x^{42} + x^{40} + x^{38} + x^{32} + x^{30} + x^{26} + x^{22} + x^{18} \\
&+ x^{16} + x^{10} + x^{6}, \\
p_9(x) = {}& x^{163} + x^{162} + x^{161} + x^{160} + x^{159} + x^{154} + x^{153} + x^{152} + x^{150} + x^{149} \\
&+ x^{148} + x^{147} + x^{146} + x^{145} + x^{144} + x^{138} + x^{137} + x^{136} + x^{135} \\
&+ x^{130} + x^{129} + x^{128} + x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} \\
&+ x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{106} + x^{105} + x^{104} + x^{102} \\
&+ x^{101} + x^{100} + x^{95} + x^{87} + x^{86} + x^{85} + x^{84} + x^{82} + x^{81} + x^{80} + x^{79} \\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} \\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{55} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{38} \\
&+ x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{26} + x^{25} + x^{24} + x^{23} + x^{18} + x^{17} \\
&+ x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{3}, \\
p_{12}(x) = {}& x^{164} + x^{148} + x^{124} + x^{120} + x^{112} + x^{76} + x^{72} + x^{64} + x^{60} + x^{56} + x^{48} \\
&+ x^{44} + x^{40} + x^{32} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{144} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{127} + x^{125} + x^{124} \\
&+ x^{122} + x^{121} + x^{116} + x^{115} + x^{111} + x^{110} + x^{109} + x^{108} + x^{107} \\
&+ x^{103} + x^{101} + x^{99} + x^{98} + x^{92} + x^{91} + x^{89} + x^{87} + x^{86} + x^{82} + x^{80}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{79} + x^{76} + x^{73} + x^{72} + x^{70} + x^{65} + x^{62} + x^{60} + x^{58} + x^{57} + x^{53}\\
&+ x^{52} + x^{50} + x^{46} + x^{44} + x^{43} + x^{42} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36}\\
&+ x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{22} + x^{21} + x^{20}\\
&+ x^{18},\\
p_3(x) &= x^{137} + x^{136} + x^{133} + x^{131} + x^{129} + x^{128} + x^{127} + x^{126} + x^{125} + x^{120}\\
&+ x^{117} + x^{115} + x^{113} + x^{112} + x^{111} + x^{110} + x^{109} + x^{105} + x^{97} + x^{96}\\
&+ x^{93} + x^{91} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{80} + x^{77} + x^{75} + x^{71}\\
&+ x^{70} + x^{67} + x^{65} + x^{63} + x^{62} + x^{59} + x^{57} + x^{55} + x^{54} + x^{51} + x^{48}\\
&+ x^{47} + x^{46} + x^{45} + x^{41} + x^{25} + x^{24} + x^{21} + x^{19} + x^{17} + x^{16} + x^{15}\\
&+ x^{14} + x^{13} + x^{9},\\
p_6(x) &= x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124} + x^{120} + x^{116} + x^{110}\\
&+ x^{108} + x^{104} + x^{100} + x^{98} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{78} + x^{74}\\
&+ x^{72} + x^{64} + x^{62} + x^{58} + x^{52} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} + x^{36}\\
&+ x^{34} + x^{24} + x^{22} + x^{20} + x^{16} + x^{6},\\
p_9(x) &= x^{139} + x^{138} + x^{137} + x^{136} + x^{135} + x^{130} + x^{129} + x^{128} + x^{127} + x^{122}\\
&+ x^{121} + x^{120} + x^{119} + x^{115} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{82}\\
&+ x^{81} + x^{80} + x^{79} + x^{75} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{59} + x^{51}\\
&+ x^{50} + x^{49} + x^{48} + x^{47} + x^{42} + x^{41} + x^{40} + x^{39} + x^{35} + x^{27} + x^{26}\\
&+ x^{25} + x^{24} + x^{23} + x^{18} + x^{17} + x^{16} + x^{15} + x^{10} + x^{9} + x^{8} + x^{7} + x^{3},\\
p_{12}(x) &= x^{140} + x^{128} + x^{124} + x^{120} + x^{112} + x^{92} + x^{80} + x^{72} + x^{56} + x^{44} + x^{40}\\
&+ x^{32} + x^{28} + x^{16} + x^{12} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{143} + x^{142} + x^{141} + x^{139} + x^{136} + x^{134} + x^{132} + x^{128} + x^{127}\\
&+ x^{126} + x^{122} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111}\\
&+ x^{110} + x^{109} + x^{105} + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95}\\
&+ x^{91} + x^{86} + x^{81} + x^{79} + x^{77} + x^{72} + x^{71} + x^{70} + x^{67} + x^{66} + x^{64}\\
&+ x^{63} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{45} + x^{44}\\
&+ x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{33},\\
p_3(x) &= x^{146} + x^{145} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{132} + x^{130} + x^{126}\\
&+ x^{123} + x^{120} + x^{115} + x^{112} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104}\\
&+ x^{103} + x^{102} + x^{100} + x^{98} + x^{97} + x^{94} + x^{93} + x^{87} + x^{85} + x^{84} + x^{82}\\
&+ x^{80} + x^{79} + x^{76} + x^{74} + x^{73} + x^{67} + x^{64} + x^{62} + x^{61} + x^{55} + x^{54}\\
&+ x^{53} + x^{49} + x^{47} + x^{45} + x^{42} + x^{37} + x^{34} + x^{33} + x^{32} + x^{27} + x^{26}\\
&+ x^{23} + x^{22} + x^{19} + x^{16} + x^{13} + x^{12},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) = {} & x^{146} + x^{145} + x^{143} + x^{142} + x^{139} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132} \\
& + x^{130} + x^{128} + x^{127} + x^{122} + x^{121} + x^{119} + x^{118} + x^{117} + x^{116} \\
& + x^{115} + x^{114} + x^{113} + x^{112} + x^{110} + x^{107} + x^{106} + x^{104} + x^{100} \\
& + x^{99} + x^{98} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{86} + x^{81} + x^{80} + x^{78} \\
& + x^{75} + x^{74} + x^{72} + x^{71} + x^{69} + x^{64} + x^{63} + x^{62} + x^{56} + x^{53} + x^{49} \\
& + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{26} + x^{25} + x^{24} + x^{16} \\
& + x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{5} + x^{4} + x^{3} + x + 1, \\
p_9(x) = {} & x^{146} + x^{143} + x^{142} + x^{141} + x^{140} + x^{139} + x^{137} + x^{136} + x^{134} + x^{131} \\
& + x^{129} + x^{128} + x^{126} + x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{117} \\
& + x^{116} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{83} \\
& + x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{71} + x^{70} + x^{69} + x^{68} \\
& + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{58} + x^{55} + x^{54} + x^{53} \\
& + x^{52} + x^{51} + x^{49} + x^{48} + x^{46} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37} \\
& + x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{25} + x^{24} + x^{22} + x^{19} \\
& + x^{17} + x^{16} + x^{14} + x^{11} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} + x^{4}, \\
p_{12}(x) = {} & x^{146} + x^{143} + x^{141} + x^{140} + x^{134} + x^{131} + x^{130} + x^{129} + x^{128} + x^{127} \\
& + x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{120} + x^{118} + x^{115} + x^{113} \\
& + x^{112} + x^{98} + x^{95} + x^{93} + x^{92} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{75} \\
& + x^{73} + x^{72} + x^{62} + x^{59} + x^{57} + x^{56} + x^{50} + x^{47} + x^{46} + x^{45} + x^{44} \\
& + x^{43} + x^{41} + x^{40} + x^{38} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} + x^{28} \\
& + x^{22} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{11} + x^{9} \\
& + x^{8} + x^{6} + x^{3} + x + 1,
\end{aligned}$$

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

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

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

n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$
0	[1, 2]	738	[80, 1134]	1476	[1870, 345]	2214	[918, 404]
1	[3, 4]	739	[450, 356]	1477	[1629, 1885]	2215	[2377, 2418]
2	[5, 6]	740	[838, 1135]	1478	[1610, 1886]	2216	[2463, 64]
3	[7, 8]	741	[116, 1136]	1479	[918, 1041]	2217	[1773, 1890]
4	[9, 10]	742	[1137, 1138]	1480	[1887, 1588]	2218	[2464, 2465]
5	[11, 12]	743	[302, 790]	1481	[763, 1888]	2219	[2466, 277]
6	[13, 14]	744	[1139, 874]	1482	[1889, 1890]	2220	[1117, 1837]
7	[15, 16]	745	[978, 1140]	1483	[770, 1891]	2221	[2467, 432]
8	[17, 18]	746	[1141, 930]	1484	[362, 1892]	2222	[2468, 2469]
9	[19, 20]	747	[1142, 1137]	1485	[782, 316]	2223	[1132, 2470]
10	[21, 22]	748	[1143, 1134]	1486	[1893, 1894]	2224	[384, 1848]

11	[23, 24]	749	[1144, 1145]	1487	[1895, 281]	2225	[1857, 1089]
12	[25, 26]	750	[1146, 1147]	1488	[1896, 1886]	2226	[2434, 2471]
13	[27, 28]	751	[1148, 332]	1489	[1897, 1898]	2227	[886, 2472]
14	[29, 30]	752	[1149, 1150]	1490	[1899, 1042]	2228	[962, 2473]
15	[31, 32]	753	[1151, 1152]	1491	[1900, 1901]	2229	[285, 2474]
16	[33, 34]	754	[89, 1153]	1492	[1902, 1903]	2230	[2475, 317]
17	[35, 36]	755	[1105, 1154]	1493	[1904, 1905]	2231	[2476, 20]
18	[37, 38]	756	[1155, 1156]	1494	[1906, 1907]	2232	[1030, 1159]
19	[39, 40]	757	[1157, 397]	1495	[1908, 1909]	2233	[2406, 2477]
20	[41, 42]	758	[1049, 1138]	1496	[1910, 1592]	2234	[1928, 1884]
21	[43, 44]	759	[1090, 1158]	1497	[929, 1911]	2235	[2478, 2479]
22	[45, 46]	760	[111, 1159]	1498	[1740, 1701]	2236	[1867, 433]
23	[47, 48]	761	[1160, 31]	1499	[1912, 1056]	2237	[906, 2480]
24	[49, 50]	762	[593, 550]	1500	[1129, 1913]	2238	[401, 2481]
25	[51, 52]	763	[169, 454]	1501	[1914, 1755]	2239	[383, 865]
26	[53, 54]	764	[168, 1161]	1502	[1915, 792]	2240	[2482, 2483]
27	[55, 56]	765	[56, 720]	1503	[1667, 108]	2241	[1725, 274]
28	[57, 58]	766	[1162, 1163]	1504	[278, 356]	2242	[2484, 85]
29	[59, 60]	767	[225, 1164]	1505	[1916, 431]	2243	[2485, 1947]
30	[61, 62]	768	[1165, 1166]	1506	[262, 1795]	2244	[2486, 2487]
31	[63, 64]	769	[1167, 1168]	1507	[1917, 1807]	2245	[2488, 806]
32	[65, 66]	770	[228, 1169]	1508	[1918, 1665]	2246	[2423, 2306]
33	[67, 68]	771	[548, 1170]	1509	[1788, 1919]	2247	[2489, 902]
34	[69, 70]	772	[1171, 1172]	1510	[243, 1587]	2248	[2490, 2491]
35	[71, 72]	773	[588, 572]	1511	[1680, 1920]	2249	[1817, 2403]
36	[73, 74]	774	[726, 1173]	1512	[945, 312]	2250	[1836, 947]
37	[75, 76]	775	[1174, 1175]	1513	[1921, 124]	2251	[2384, 272]
38	[77, 78]	776	[1176, 1177]	1514	[1024, 1724]	2252	[1948, 1907]
39	[79, 80]	777	[1178, 563]	1515	[1922, 1668]	2253	[2492, 2336]
40	[81, 82]	778	[452, 538]	1516	[1923, 1924]	2254	[2493, 1783]
41	[83, 84]	779	[1179, 1180]	1517	[858, 339]	2255	[1811, 253]
42	[85, 86]	780	[610, 738]	1518	[1925, 315]	2256	[1966, 315]
43	[87, 88]	781	[591, 221]	1519	[1086, 333]	2257	[2494, 965]
44	[89, 90]	782	[707, 1181]	1520	[1926, 6]	2258	[1937, 2495]
45	[91, 92]	783	[140, 197]	1521	[1927, 810]	2259	[2496, 1677]
46	[93, 94]	784	[497, 1182]	1522	[1928, 441]	2260	[1139, 1792]
47	[95, 94]	785	[697, 601]	1523	[247, 1929]	2261	[442, 820]
48	[96, 97]	786	[1183, 1184]	1524	[1004, 1626]	2262	[2497, 2498]
49	[98, 99]	787	[1185, 581]	1525	[1780, 437]	2263	[2499, 2418]
50	[100, 101]	788	[1186, 493]	1526	[821, 1930]	2264	[2500, 1051]
51	[102, 103]	789	[463, 1187]	1527	[1931, 1932]	2265	[964, 2501]
52	[104, 105]	790	[1188, 1189]	1528	[1933, 1934]	2266	[2337, 991]
53	[106, 107]	791	[1190, 1191]	1529	[1935, 1038]	2267	[2420, 2502]
54	[108, 109]	792	[1192, 1193]	1530	[1621, 1846]	2268	[2503, 873]

55	[110, 111]	793	[1194, 744]	1531	[337, 1004]	2269	[1978, 1833]
56	[112, 113]	794	[1195, 1196]	1532	[1936, 1672]	2270	[1952, 2504]
57	[114, 115]	795	[1197, 629]	1533	[1937, 1938]	2271	[443, 2505]
58	[116, 117]	796	[1188, 522]	1534	[1939, 844]	2272	[2506, 854]
59	[118, 119]	797	[1198, 460]	1535	[1741, 883]	2273	[2507, 1879]
60	[120, 121]	798	[711, 1199]	1536	[1940, 1941]	2274	[410, 1886]
61	[122, 123]	799	[1200, 1201]	1537	[1942, 1131]	2275	[1853, 2508]
62	[124, 125]	800	[1202, 1203]	1538	[118, 1943]	2276	[2509, 1792]
63	[126, 127]	801	[178, 1204]	1539	[1663, 968]	2277	[2457, 2510]
64	[128, 129]	802	[560, 1205]	1540	[1944, 1945]	2278	[2511, 2386]
65	[130, 131]	803	[1206, 1207]	1541	[768, 1946]	2279	[976, 868]
66	[132, 133]	804	[728, 758]	1542	[1944, 1947]	2280	[2489, 835]
67	[134, 135]	805	[1183, 1208]	1543	[1948, 1949]	2281	[1849, 2512]
68	[136, 137]	806	[1209, 1210]	1544	[1950, 1951]	2282	[2513, 932]
69	[138, 139]	807	[37, 230]	1545	[1952, 897]	2283	[2514, 1659]
70	[140, 141]	808	[1211, 1212]	1546	[1953, 1954]	2284	[1721, 2515]
71	[142, 143]	809	[1213, 1214]	1547	[1955, 1956]	2285	[2321, 1669]
72	[144, 145]	810	[1215, 1216]	1548	[1957, 1150]	2286	[2323, 2516]
73	[146, 147]	811	[607, 607]	1549	[269, 66]	2287	[1969, 2517]
74	[148, 149]	812	[1217, 738]	1550	[1958, 870]	2288	[306, 2518]
75	[55, 150]	813	[1218, 1219]	1551	[871, 1959]	2289	[2519, 1586]
76	[151, 152]	814	[1220, 1221]	1552	[1888, 86]	2290	[2520, 2521]
77	[153, 154]	815	[1222, 1223]	1553	[1119, 1960]	2291	[812, 1628]
78	[155, 156]	816	[1224, 1225]	1554	[1961, 1962]	2292	[2522, 2523]
79	[157, 158]	817	[605, 1226]	1555	[810, 1689]	2293	[1603, 2524]
80	[159, 14]	818	[664, 1227]	1556	[988, 1963]	2294	[1029, 1633]
81	[160, 161]	819	[1228, 1229]	1557	[1942, 955]	2295	[927, 1150]
82	[162, 163]	820	[1230, 1231]	1558	[1588, 1964]	2296	[2350, 908]
83	[164, 165]	821	[1232, 1233]	1559	[119, 378]	2297	[2525, 2526]
84	[166, 167]	822	[1234, 515]	1560	[1965, 1786]	2298	[2317, 2527]
85	[168, 169]	823	[1235, 1236]	1561	[1966, 782]	2299	[1065, 2404]
86	[170, 171]	824	[1237, 1238]	1562	[1967, 1968]	2300	[2528, 301]
87	[172, 173]	825	[1206, 1239]	1563	[1969, 1970]	2301	[2529, 958]
88	[40, 174]	826	[1240, 1241]	1564	[23, 1685]	2302	[2530, 273]
89	[175, 176]	827	[1242, 1243]	1565	[1971, 1874]	2303	[634, 736]
90	[45, 177]	828	[1244, 1245]	1566	[1972, 1973]	2304	[1430, 2075]
91	[178, 179]	829	[1246, 727]	1567	[1974, 974]	2305	[2531, 2532]
92	[180, 181]	830	[1247, 650]	1568	[1975, 1089]	2306	[1476, 180]
93	[182, 183]	831	[1247, 1248]	1569	[1976, 905]	2307	[2023, 2141]
94	[165, 184]	832	[666, 1249]	1570	[1977, 69]	2308	[2083, 155]
95	[185, 186]	833	[742, 1250]	1571	[1978, 1750]	2309	[505, 745]
96	[187, 188]	834	[1251, 1252]	1572	[1823, 774]	2310	[2533, 2534]
97	[189, 190]	835	[1253, 509]	1573	[1111, 924]	2311	[2535, 2536]
98	[191, 192]	836	[701, 1254]	1574	[1602, 1964]	2312	[2537, 2538]

99	[193, 194]	837	[616, 234]	1575	[1979, 693]	2313	[2539, 1375]
100	[128, 195]	838	[1255, 617]	1576	[719, 219]	2314	[2267, 2250]
101	[196, 197]	839	[1256, 560]	1577	[1395, 1252]	2315	[2540, 1487]
102	[198, 184]	840	[138, 1257]	1578	[1980, 748]	2316	[2541, 1402]
103	[199, 200]	841	[157, 1258]	1579	[1981, 477]	2317	[1271, 456]
104	[201, 202]	842	[1259, 1260]	1580	[1447, 722]	2318	[468, 2170]
105	[203, 204]	843	[1261, 197]	1581	[1982, 1379]	2319	[2542, 2543]
106	[205, 206]	844	[1262, 1263]	1582	[1343, 1545]	2320	[2544, 744]
107	[207, 208]	845	[1264, 1265]	1583	[1227, 1983]	2321	[1414, 493]
108	[209, 210]	846	[1266, 177]	1584	[682, 1984]	2322	[1369, 1270]
109	[211, 212]	847	[1267, 1268]	1585	[1985, 1986]	2323	[2148, 2139]
110	[213, 214]	848	[1269, 472]	1586	[1987, 131]	2324	[1190, 2172]
111	[215, 216]	849	[1270, 1175]	1587	[1353, 565]	2325	[2093, 1425]
112	[217, 56]	850	[1271, 479]	1588	[1988, 700]	2326	[2545, 1361]
113	[218, 219]	851	[1272, 1180]	1589	[1989, 1428]	2327	[1542, 192]
114	[220, 221]	852	[692, 692]	1590	[625, 1260]	2328	[2546, 1526]
115	[222, 223]	853	[160, 1273]	1591	[1990, 1991]	2329	[2547, 2152]
116	[224, 225]	854	[1274, 558]	1592	[1992, 1993]	2330	[2236, 2548]
117	[226, 227]	855	[1275, 1202]	1593	[1220, 671]	2331	[1491, 1989]
118	[228, 229]	856	[455, 479]	1594	[1994, 43]	2332	[621, 1367]
119	[230, 231]	857	[1276, 145]	1595	[1500, 547]	2333	[2549, 726]
120	[200, 232]	858	[59, 1277]	1596	[200, 1995]	2334	[42, 2060]
121	[233, 234]	859	[143, 533]	1597	[1464, 45]	2335	[2550, 2543]
122	[235, 236]	860	[667, 1164]	1598	[1996, 1997]	2336	[2004, 621]
123	[237, 238]	861	[736, 695]	1599	[1998, 1554]	2337	[1988, 2551]
124	[239, 240]	862	[1278, 1279]	1600	[1999, 2000]	2338	[1540, 2552]
125	[241, 242]	863	[668, 1280]	1601	[1414, 1531]	2339	[1235, 1409]
126	[243, 244]	864	[1281, 1248]	1602	[1425, 2001]	2340	[1449, 233]
127	[245, 246]	865	[623, 1282]	1603	[1408, 1236]	2341	[2553, 1171]
128	[247, 248]	866	[175, 182]	1604	[148, 2002]	2342	[2187, 2554]
129	[249, 250]	867	[1283, 1284]	1605	[1164, 549]	2343	[2555, 1296]
130	[251, 252]	868	[1285, 1286]	1606	[1384, 2003]	2344	[2556, 2557]
131	[253, 254]	869	[568, 1287]	1607	[2004, 736]	2345	[189, 154]
132	[255, 256]	870	[196, 141]	1608	[687, 154]	2346	[2558, 2559]
133	[257, 258]	871	[1288, 1289]	1609	[2005, 480]	2347	[2259, 2560]
134	[259, 260]	872	[1290, 1291]	1610	[1465, 2006]	2348	[2561, 1307]
135	[261, 262]	873	[1292, 1293]	1611	[2007, 2008]	2349	[2562, 1991]
136	[263, 264]	874	[560, 1294]	1612	[10, 571]	2350	[1315, 2563]
137	[265, 266]	875	[1295, 1296]	1613	[2009, 1506]	2351	[2564, 744]
138	[267, 268]	876	[1297, 689]	1614	[2010, 1410]	2352	[2007, 2100]
139	[269, 270]	877	[187, 1298]	1615	[2011, 1282]	2353	[2565, 2254]
140	[271, 272]	878	[1299, 757]	1616	[1200, 2012]	2354	[2291, 2566]
141	[273, 274]	879	[1300, 1268]	1617	[1571, 1169]	2355	[2201, 2567]
142	[275, 276]	880	[1301, 1302]	1618	[2013, 138]	2356	[651, 602]

143	[277, 278]	881	[144, 1303]	1619	[1171, 2014]	2357	[1521, 630]
144	[279, 280]	882	[1304, 1259]	1620	[1346, 1245]	2358	[2091, 2568]
145	[281, 282]	883	[1259, 626]	1621	[1215, 2015]	2359	[1987, 1441]
146	[283, 284]	884	[684, 1305]	1622	[1488, 2016]	2360	[1403, 458]
147	[285, 286]	885	[1306, 1307]	1623	[199, 2017]	2361	[2537, 1994]
148	[287, 288]	886	[1308, 1309]	1624	[1383, 1305]	2362	[2569, 194]
149	[289, 290]	887	[594, 1310]	1625	[1227, 2018]	2363	[2570, 678]
150	[85, 291]	888	[514, 1311]	1626	[2019, 2020]	2364	[136, 2188]
151	[292, 293]	889	[1312, 465]	1627	[2021, 2022]	2365	[1423, 2163]
152	[294, 295]	890	[1313, 1314]	1628	[2023, 724]	2366	[2571, 2572]
153	[296, 297]	891	[1315, 1316]	1629	[1448, 147]	2367	[2165, 574]
154	[298, 299]	892	[1317, 1318]	1630	[1237, 2024]	2368	[2573, 570]
155	[300, 301]	893	[501, 476]	1631	[50, 1449]	2369	[2574, 628]
156	[302, 303]	894	[509, 1319]	1632	[2025, 675]	2370	[2575, 2159]
157	[304, 305]	895	[1320, 1219]	1633	[475, 502]	2371	[202, 2224]
158	[306, 307]	896	[1321, 1322]	1634	[1505, 1440]	2372	[1420, 2137]
159	[308, 309]	897	[1323, 1324]	1635	[2026, 2027]	2373	[2576, 2577]
160	[310, 311]	898	[639, 1182]	1636	[2028, 2029]	2374	[2535, 2578]
161	[312, 313]	899	[1207, 1325]	1637	[675, 1413]	2375	[1301, 1351]
162	[276, 314]	900	[1326, 1327]	1638	[2030, 2031]	2376	[2579, 2156]
163	[315, 316]	901	[1253, 473]	1639	[2032, 681]	2377	[1165, 2027]
164	[317, 302]	902	[1328, 1329]	1640	[1306, 205]	2378	[2580, 2043]
165	[318, 319]	903	[1330, 1240]	1641	[1300, 1434]	2379	[2131, 1172]
166	[320, 321]	904	[1331, 1204]	1642	[2005, 2033]	2380	[2581, 2582]
167	[322, 323]	905	[690, 171]	1643	[2034, 2035]	2381	[2583, 2072]
168	[308, 324]	906	[729, 674]	1644	[1176, 2036]	2382	[2209, 2584]
169	[325, 112]	907	[1332, 1333]	1645	[2037, 149]	2383	[2025, 1412]
170	[326, 327]	908	[1222, 1334]	1646	[1389, 2038]	2384	[1523, 2585]
171	[328, 329]	909	[734, 1335]	1647	[570, 1525]	2385	[2586, 464]
172	[330, 331]	910	[452, 1336]	1648	[127, 667]	2386	[2587, 2167]
173	[316, 332]	911	[1246, 1173]	1649	[1239, 1325]	2387	[2588, 1360]
174	[333, 334]	912	[1244, 1337]	1650	[2039, 2040]	2388	[2589, 1239]
175	[335, 336]	913	[1338, 638]	1651	[1363, 1372]	2389	[2094, 2052]
176	[337, 338]	914	[1339, 1340]	1652	[2041, 2042]	2390	[1994, 552]
177	[72, 339]	915	[749, 1341]	1653	[2043, 741]	2391	[1230, 2590]
178	[340, 341]	916	[1342, 1324]	1654	[2044, 2045]	2392	[597, 553]
179	[342, 343]	917	[1343, 579]	1655	[677, 2046]	2393	[1388, 1269]
180	[344, 313]	918	[1344, 713]	1656	[2047, 2048]	2394	[2269, 2591]
181	[345, 346]	919	[1345, 1346]	1657	[2049, 1993]	2395	[748, 1368]
182	[347, 348]	920	[1347, 1348]	1658	[1347, 2050]	2396	[2592, 514]
183	[336, 349]	921	[1349, 1350]	1659	[1474, 1318]	2397	[1979, 703]
184	[18, 350]	922	[1351, 1352]	1660	[2051, 2052]	2398	[2593, 2594]
185	[351, 352]	923	[1353, 1354]	1661	[2053, 132]	2399	[1573, 1371]
186	[353, 354]	924	[1355, 1356]	1662	[1981, 666]	2400	[2595, 2596]

187	[355, 356]	925	[1357, 1358]	1663	[1437, 1433]	2401	[2597, 1524]
188	[357, 358]	926	[222, 1359]	1664	[1518, 465]	2402	[1472, 2598]
189	[359, 360]	927	[1360, 1361]	1665	[2054, 1212]	2403	[1349, 138]
190	[361, 362]	928	[1362, 137]	1666	[1202, 609]	2404	[2589, 1207]
191	[363, 364]	929	[1363, 34]	1667	[2055, 211]	2405	[2102, 1478]
192	[365, 366]	930	[489, 1364]	1668	[731, 2056]	2406	[539, 2216]
193	[367, 368]	931	[596, 1365]	1669	[1186, 1531]	2407	[1285, 2599]
194	[369, 370]	932	[1346, 1337]	1670	[36, 1453]	2408	[2600, 1479]
195	[371, 372]	933	[503, 1366]	1671	[2057, 2058]	2409	[2601, 2065]
196	[373, 374]	934	[736, 1367]	1672	[2059, 169]	2410	[2602, 628]
197	[375, 376]	935	[40, 1368]	1673	[1519, 610]	2411	[2603, 1439]
198	[377, 378]	936	[1369, 1174]	1674	[1224, 710]	2412	[2604, 535]
199	[379, 380]	937	[744, 506]	1675	[461, 2060]	2413	[2605, 223]
200	[381, 382]	938	[1370, 158]	1676	[1983, 2061]	2414	[699, 2551]
201	[383, 384]	939	[1279, 1371]	1677	[2062, 2063]	2415	[2606, 1314]
202	[385, 386]	940	[33, 1372]	1678	[1308, 2064]	2416	[2607, 231]
203	[387, 388]	941	[1197, 1373]	1679	[2065, 477]	2417	[2608, 1980]
204	[389, 390]	942	[1374, 1277]	1680	[2051, 2066]	2418	[2226, 557]
205	[391, 392]	943	[150, 714]	1681	[1477, 2067]	2419	[2288, 2609]
206	[393, 256]	944	[1375, 1376]	1682	[2013, 1350]	2420	[2299, 1441]
207	[394, 395]	945	[1377, 127]	1683	[2068, 143]	2421	[2570, 2046]
208	[396, 397]	946	[1378, 1379]	1684	[2069, 2070]	2422	[61, 722]
209	[398, 399]	947	[1380, 743]	1685	[2071, 2072]	2423	[2610, 2089]
210	[400, 375]	948	[1381, 1382]	1686	[2073, 2074]	2424	[2569, 512]
211	[401, 402]	949	[1383, 685]	1687	[1481, 2075]	2425	[2611, 2264]
212	[403, 404]	950	[9, 570]	1688	[2076, 161]	2426	[2612, 2613]
213	[405, 244]	951	[608, 1203]	1689	[2019, 754]	2427	[2614, 2615]
214	[406, 407]	952	[1384, 1385]	1690	[2077, 1421]	2428	[2616, 726]
215	[408, 409]	953	[1386, 732]	1691	[2078, 2079]	2429	[2617, 2171]
216	[410, 411]	954	[1387, 458]	1692	[2080, 240]	2430	[2618, 1174]
217	[412, 390]	955	[737, 611]	1693	[1192, 2081]	2431	[1503, 2619]
218	[113, 413]	956	[1352, 678]	1694	[1467, 1329]	2432	[2620, 1508]
219	[414, 415]	957	[1388, 50]	1695	[2082, 1330]	2433	[2205, 40]
220	[416, 417]	958	[1389, 54]	1696	[1435, 1282]	2434	[751, 555]
221	[418, 419]	959	[1390, 576]	1697	[1483, 1984]	2435	[528, 2029]
222	[420, 400]	960	[716, 715]	1698	[2083, 165]	2436	[459, 1418]
223	[421, 422]	961	[589, 217]	1699	[602, 2084]	2437	[697, 2260]
224	[423, 424]	962	[155, 184]	1700	[2012, 1247]	2438	[656, 1407]
225	[406, 425]	963	[1391, 1286]	1701	[2085, 1247]	2439	[1270, 2007]
226	[426, 427]	964	[1392, 1393]	1702	[2085, 649]	2440	[2039, 2621]
227	[428, 343]	965	[1394, 129]	1703	[2086, 1407]	2441	[2622, 501]
228	[429, 119]	966	[1395, 1396]	1704	[1326, 2087]	2442	[1462, 2623]
229	[430, 431]	967	[1397, 1398]	1705	[753, 2020]	2443	[2624, 1518]
230	[91, 432]	968	[679, 1240]	1706	[2088, 2089]	2444	[2625, 2626]

231	[433, 434]	969	[573, 668]	1707	[2090, 1557]	2445	[2627, 1445]
232	[312, 435]	970	[1399, 1400]	1708	[2091, 2092]	2446	[2207, 1425]
233	[436, 437]	971	[1401, 1402]	1709	[2093, 1397]	2447	[2564, 505]
234	[438, 439]	972	[1403, 1404]	1710	[2094, 2066]	2448	[2628, 2176]
235	[440, 441]	973	[1405, 1406]	1711	[533, 2095]	2449	[2612, 2629]
236	[442, 103]	974	[158, 1333]	1712	[2096, 2097]	2450	[2288, 2140]
237	[443, 444]	975	[1355, 1376]	1713	[1258, 2098]	2451	[2630, 693]
238	[445, 338]	976	[728, 1407]	1714	[2099, 2100]	2452	[2631, 753]
239	[408, 446]	977	[1408, 1409]	1715	[635, 1291]	2453	[2632, 2283]
240	[447, 448]	978	[657, 1410]	1716	[633, 2101]	2454	[2633, 196]
241	[449, 299]	979	[660, 1241]	1717	[2102, 2067]	2455	[2271, 1361]
242	[277, 450]	980	[1321, 1284]	1718	[528, 2103]	2456	[2634, 2290]
243	[451, 452]	981	[1411, 1231]	1719	[2104, 2105]	2457	[2158, 2635]
244	[453, 454]	982	[1412, 1413]	1720	[2106, 210]	2458	[634, 621]
245	[455, 456]	983	[1248, 1414]	1721	[546, 1501]	2459	[8, 1380]
246	[457, 458]	984	[1415, 1416]	1722	[230, 2107]	2460	[2104, 2636]
247	[459, 460]	985	[580, 1417]	1723	[2108, 2109]	2461	[2637, 602]
248	[461, 462]	986	[1418, 1419]	1724	[2075, 585]	2462	[2638, 2639]
249	[463, 464]	987	[1420, 1421]	1725	[2110, 2111]	2463	[2133, 2640]
250	[465, 163]	988	[1422, 1204]	1726	[1452, 627]	2464	[2641, 2642]
251	[466, 467]	989	[1423, 1424]	1727	[2112, 2068]	2465	[2287, 663]
252	[468, 469]	990	[1425, 1398]	1728	[1381, 2113]	2466	[2643, 759]
253	[470, 471]	991	[1426, 1427]	1729	[1320, 2114]	2467	[2644, 2639]
254	[50, 472]	992	[495, 1428]	1730	[2115, 2116]	2468	[2556, 2645]
255	[172, 206]	993	[1264, 1429]	1731	[2117, 2118]	2469	[1299, 167]
256	[473, 474]	994	[477, 1249]	1732	[2119, 2120]	2470	[2646, 2647]
257	[475, 476]	995	[709, 1225]	1733	[2121, 2122]	2471	[1999, 1399]
258	[477, 478]	996	[1430, 584]	1734	[2123, 1196]	2472	[193, 512]
259	[479, 480]	997	[662, 1431]	1735	[1232, 2124]	2473	[2648, 1484]
260	[481, 482]	998	[1432, 728]	1736	[1251, 1396]	2474	[1516, 2081]
261	[483, 484]	999	[1433, 1285]	1737	[730, 2125]	2475	[1496, 1428]
262	[485, 486]	1000	[1267, 1434]	1738	[2126, 2127]	2476	[2649, 1518]
263	[487, 488]	1001	[1240, 661]	1739	[2128, 2129]	2477	[2161, 2650]
264	[489, 490]	1002	[1435, 624]	1740	[2130, 1259]	2478	[2651, 2036]
265	[491, 492]	1003	[1436, 1247]	1741	[1538, 2097]	2479	[2548, 2024]
266	[493, 494]	1004	[493, 1435]	1742	[686, 140]	2480	[1328, 1468]
267	[495, 496]	1005	[607, 517]	1743	[191, 1543]	2481	[2080, 2147]
268	[497, 498]	1006	[612, 643]	1744	[2131, 2014]	2482	[2652, 1565]
269	[499, 500]	1007	[1415, 530]	1745	[2132, 1390]	2483	[2293, 1552]
270	[501, 502]	1008	[1437, 1438]	1746	[1175, 2008]	2484	[2653, 170]
271	[503, 504]	1009	[1439, 1440]	1747	[2133, 2134]	2485	[624, 1201]
272	[505, 506]	1010	[130, 1441]	1748	[1397, 2001]	2486	[1482, 1414]
273	[507, 508]	1011	[552, 44]	1749	[527, 2028]	2487	[1436, 649]
274	[509, 474]	1012	[1442, 461]	1750	[203, 614]	2488	[240, 2137]

275	[510, 501]	1013	[652, 603]	1751	[2043, 1522]	2489	[2228, 2654]
276	[511, 512]	1014	[1443, 739]	1752	[2135, 1197]	2490	[2655, 2078]
277	[513, 509]	1015	[1444, 1445]	1753	[1527, 1433]	2491	[2656, 1279]
278	[514, 515]	1016	[1446, 1447]	1754	[2136, 2064]	2492	[1406, 2069]
279	[516, 517]	1017	[1448, 561]	1755	[1544, 1266]	2493	[2657, 2658]
280	[491, 518]	1018	[1449, 616]	1756	[2077, 2137]	2494	[2657, 2659]
281	[519, 520]	1019	[1443, 536]	1757	[2138, 2139]	2495	[755, 2006]
282	[521, 522]	1020	[1450, 1451]	1758	[1511, 2140]	2496	[2660, 747]
283	[523, 524]	1021	[1452, 1453]	1759	[723, 2141]	2497	[2661, 2179]
284	[525, 526]	1022	[1454, 1455]	1760	[31, 664]	2498	[1997, 2232]
285	[527, 528]	1023	[1456, 1390]	1761	[2142, 2143]	2499	[2662, 585]
286	[529, 530]	1024	[1457, 1458]	1762	[2144, 1458]	2500	[2663, 2252]
287	[531, 532]	1025	[1459, 675]	1763	[2145, 2146]	2501	[53, 2038]
288	[533, 534]	1026	[1460, 1461]	1764	[239, 2147]	2502	[2664, 176]
289	[535, 536]	1027	[1412, 676]	1765	[652, 2084]	2503	[2665, 560]
290	[537, 538]	1028	[1462, 1463]	1766	[2148, 2149]	2504	[567, 631]
291	[454, 56]	1029	[1464, 1266]	1767	[2150, 2069]	2505	[2223, 2666]
292	[539, 540]	1030	[1465, 756]	1768	[1377, 224]	2506	[600, 2260]
293	[541, 542]	1031	[214, 692]	1769	[2151, 2152]	2507	[2667, 2572]
294	[543, 544]	1032	[1466, 1445]	1770	[2153, 2063]	2508	[1411, 2590]
295	[545, 32]	1033	[1467, 1468]	1771	[2154, 1202]	2509	[2668, 2669]
296	[546, 547]	1034	[41, 461]	1772	[35, 1452]	2510	[2580, 2647]
297	[548, 549]	1035	[1469, 1470]	1773	[2155, 2156]	2511	[2670, 2671]
298	[550, 551]	1036	[1471, 1429]	1774	[2157, 518]	2512	[2546, 500]
299	[552, 553]	1037	[1472, 1473]	1775	[2158, 2159]	2513	[2672, 2596]
300	[554, 555]	1038	[1474, 1475]	1776	[2160, 1989]	2514	[2203, 2673]
301	[556, 557]	1039	[650, 1414]	1777	[594, 551]	2515	[2281, 2674]
302	[42, 462]	1040	[649, 1248]	1778	[2161, 1484]	2516	[1178, 632]
303	[241, 558]	1041	[1248, 712]	1779	[545, 664]	2517	[1303, 2675]
304	[559, 560]	1042	[1476, 143]	1780	[543, 2118]	2518	[2630, 703]
305	[212, 469]	1043	[1288, 532]	1781	[2162, 2163]	2519	[661, 2181]
306	[146, 561]	1044	[1477, 1478]	1782	[1392, 2164]	2520	[2571, 2676]
307	[562, 563]	1045	[1357, 135]	1783	[2165, 668]	2521	[1394, 195]
308	[216, 169]	1046	[1303, 1479]	1784	[2030, 2070]	2522	[1255, 234]
309	[564, 565]	1047	[1234, 1311]	1785	[1330, 660]	2523	[705, 2035]
310	[566, 540]	1048	[1480, 162]	1786	[1167, 238]	2524	[2677, 2069]
311	[567, 482]	1049	[1481, 584]	1787	[159, 2166]	2525	[1302, 2241]
312	[568, 569]	1050	[554, 752]	1788	[1536, 161]	2526	[2678, 1254]
313	[570, 571]	1051	[237, 1168]	1789	[1213, 2167]	2527	[1331, 179]
314	[132, 572]	1052	[1482, 712]	1790	[2168, 2169]	2528	[2679, 644]
315	[573, 574]	1053	[1483, 683]	1791	[212, 2170]	2529	[2295, 2680]
316	[575, 576]	1054	[1258, 1333]	1792	[1447, 62]	2530	[2681, 639]
317	[577, 241]	1055	[1484, 1485]	1793	[158, 2098]	2531	[2682, 1122]
318	[578, 579]	1056	[39, 748]	1794	[2171, 1269]	2532	[2683, 301]

319	[580, 581]	1057	[759, 1427]	1795	[1989, 496]	2533	[2684, 1681]
320	[582, 583]	1058	[1269, 1449]	1796	[8, 742]	2534	[2685, 1681]
321	[584, 585]	1059	[1274, 242]	1797	[1502, 2172]	2535	[946, 1156]
322	[586, 587]	1060	[1486, 1487]	1798	[584, 2173]	2536	[430, 361]
323	[588, 133]	1061	[1488, 1489]	1799	[134, 1358]	2537	[1900, 2686]
324	[589, 454]	1062	[1342, 1490]	1800	[2174, 170]	2538	[449, 1753]
325	[590, 218]	1063	[1491, 495]	1801	[2175, 2176]	2539	[2687, 1780]
326	[591, 592]	1064	[1492, 1493]	1802	[2177, 2178]	2540	[2688, 796]
327	[593, 594]	1065	[1494, 1495]	1803	[32, 1227]	2541	[1115, 2689]
328	[575, 595]	1066	[550, 1310]	1804	[1528, 2179]	2542	[2690, 1003]
329	[596, 227]	1067	[1496, 496]	1805	[2180, 2181]	2543	[2691, 2692]
330	[597, 44]	1068	[1497, 1340]	1806	[2182, 2183]	2544	[1851, 2693]
331	[598, 526]	1069	[1498, 1346]	1807	[2184, 1419]	2545	[1582, 2694]
332	[574, 599]	1070	[1499, 1330]	1808	[2185, 2186]	2546	[2695, 2696]
333	[600, 601]	1071	[1500, 1501]	1809	[1996, 2187]	2547	[2697, 1024]
334	[602, 603]	1072	[1502, 1191]	1810	[1362, 2188]	2548	[73, 2698]
335	[604, 36]	1073	[1503, 1504]	1811	[1432, 656]	2549	[2699, 315]
336	[605, 606]	1074	[1505, 1506]	1812	[182, 2189]	2550	[2453, 1846]
337	[517, 607]	1075	[1507, 1508]	1813	[601, 2190]	2551	[336, 1114]
338	[608, 609]	1076	[1509, 1263]	1814	[2191, 622]	2552	[805, 2700]
339	[610, 611]	1077	[1510, 1511]	1815	[2135, 628]	2553	[63, 1646]
340	[612, 583]	1078	[1512, 200]	1816	[2192, 542]	2554	[975, 433]
341	[613, 614]	1079	[1513, 509]	1817	[2193, 2194]	2555	[899, 1630]
342	[209, 615]	1080	[1514, 1515]	1818	[2195, 1223]	2556	[2496, 2701]
343	[616, 617]	1081	[1516, 1193]	1819	[1370, 1258]	2557	[2460, 2702]
344	[618, 619]	1082	[1221, 672]	1820	[667, 548]	2558	[1730, 2703]
345	[620, 621]	1083	[1279, 1517]	1821	[2196, 2197]	2559	[1668, 109]
346	[622, 212]	1084	[1323, 1490]	1822	[1494, 2198]	2560	[1809, 1905]
347	[623, 624]	1085	[696, 600]	1823	[2199, 2200]	2561	[2704, 393]
348	[625, 626]	1086	[1518, 162]	1824	[487, 1196]	2562	[2705, 1642]
349	[36, 627]	1087	[473, 1319]	1825	[2201, 2202]	2563	[300, 2706]
350	[628, 629]	1088	[1519, 737]	1826	[2203, 2204]	2564	[2707, 849]
351	[630, 631]	1089	[653, 1199]	1827	[2195, 1334]	2565	[1920, 2472]
352	[562, 632]	1090	[1520, 467]	1828	[703, 694]	2566	[2529, 100]
353	[633, 634]	1091	[1521, 1293]	1829	[2205, 748]	2567	[1856, 1930]
354	[635, 636]	1092	[143, 181]	1830	[2110, 2061]	2568	[786, 2708]
355	[637, 638]	1093	[740, 1522]	1831	[211, 468]	2569	[2709, 2710]
356	[639, 498]	1094	[574, 1280]	1832	[2206, 48]	2570	[1751, 2711]
357	[640, 641]	1095	[1523, 1524]	1833	[2207, 1397]	2571	[1896, 411]
358	[586, 642]	1096	[1345, 1244]	1834	[1211, 520]	2572	[1016, 1139]
359	[582, 643]	1097	[1194, 505]	1835	[645, 2208]	2573	[2712, 1780]
360	[601, 644]	1098	[10, 1525]	1836	[2209, 1400]	2574	[2713, 262]
361	[645, 646]	1099	[205, 173]	1837	[1344, 2210]	2575	[2714, 1068]
362	[233, 617]	1100	[577, 1274]	1838	[688, 2211]	2576	[2715, 1645]

363	[647, 648]	1101	[499, 1526]	1839	[151, 2212]	2577	[2716, 1863]
364	[649, 650]	1102	[1527, 1438]	1840	[2213, 1473]	2578	[1585, 2512]
365	[651, 652]	1103	[1438, 1285]	1841	[38, 231]	2579	[2717, 893]
366	[653, 654]	1104	[1528, 1529]	1842	[1221, 2214]	2580	[2718, 2491]
367	[655, 656]	1105	[1283, 1322]	1843	[465, 1558]	2581	[2719, 30]
368	[657, 658]	1106	[1207, 1530]	1844	[164, 155]	2582	[2720, 84]
369	[470, 659]	1107	[1531, 1435]	1845	[564, 1354]	2583	[1641, 2721]
370	[660, 661]	1108	[1532, 714]	1846	[1531, 494]	2584	[1034, 1087]
371	[662, 663]	1109	[1533, 719]	1847	[2011, 624]	2585	[1702, 1837]
372	[664, 665]	1110	[169, 217]	1848	[681, 2210]	2586	[2722, 963]
373	[43, 553]	1111	[453, 217]	1849	[2136, 1309]	2587	[2389, 2723]
374	[666, 478]	1112	[1534, 1208]	1850	[1550, 1294]	2588	[1156, 2399]
375	[224, 667]	1113	[1316, 1535]	1851	[1520, 2215]	2589	[2486, 2724]
376	[668, 599]	1114	[628, 1373]	1852	[1374, 60]	2590	[445, 1004]
377	[669, 670]	1115	[1536, 1273]	1853	[566, 2216]	2591	[948, 68]
378	[671, 672]	1116	[1457, 1537]	1854	[1512, 2017]	2592	[2725, 862]
379	[673, 674]	1117	[1538, 1539]	1855	[2217, 2218]	2593	[2726, 857]
380	[675, 676]	1118	[1540, 1541]	1856	[485, 2125]	2594	[1766, 2727]
381	[677, 678]	1119	[1542, 1543]	1857	[2219, 241]	2595	[2728, 2367]
382	[679, 660]	1120	[1544, 45]	1858	[1546, 2220]	2596	[2729, 1029]
383	[680, 681]	1121	[578, 1545]	1859	[2221, 2222]	2597	[1819, 817]
384	[682, 683]	1122	[1546, 1210]	1860	[2223, 2224]	2598	[357, 1597]
385	[684, 685]	1123	[1547, 1548]	1861	[2225, 699]	2599	[384, 983]
386	[686, 196]	1124	[604, 1452]	1862	[2226, 1555]	2600	[2730, 1807]
387	[687, 190]	1125	[1179, 1549]	1863	[1290, 636]	2601	[304, 801]
388	[688, 689]	1126	[1550, 1205]	1864	[2227, 706]	2602	[1977, 1796]
389	[690, 691]	1127	[531, 1289]	1865	[2228, 2229]	2603	[1742, 1796]
390	[692, 214]	1128	[1551, 1552]	1866	[2230, 1233]	2604	[2731, 862]
391	[693, 694]	1129	[521, 1189]	1867	[2231, 1375]	2605	[426, 2732]
392	[621, 695]	1130	[1553, 1504]	1868	[2187, 2232]	2606	[2733, 2734]
393	[696, 697]	1131	[180, 533]	1869	[1433, 1391]	2607	[2735, 2736]
394	[673, 698]	1132	[235, 1554]	1870	[2055, 622]	2608	[1086, 81]
395	[699, 700]	1133	[556, 1555]	1871	[2233, 2234]	2609	[910, 425]
396	[701, 702]	1134	[32, 665]	1872	[1566, 132]	2610	[2737, 804]
397	[703, 704]	1135	[1556, 1557]	1873	[2235, 1189]	2611	[771, 1082]
398	[534, 504]	1136	[1380, 1250]	1874	[529, 1416]	2612	[1832, 1785]
399	[705, 706]	1137	[519, 1212]	1875	[2236, 1237]	2613	[1782, 2738]
400	[707, 708]	1138	[162, 1558]	1876	[2237, 1171]	2614	[2351, 1823]
401	[709, 710]	1139	[1387, 1404]	1877	[2065, 666]	2615	[1958, 1956]
402	[711, 654]	1140	[165, 156]	1878	[207, 2079]	2616	[1776, 1588]
403	[650, 712]	1141	[1559, 1560]	1879	[2238, 742]	2617	[1625, 2739]
404	[681, 713]	1142	[1454, 1561]	1880	[2239, 1527]	2618	[2436, 2740]
405	[714, 218]	1143	[1195, 488]	1881	[2240, 627]	2619	[2382, 15]
406	[218, 715]	1144	[1562, 1548]	1882	[1386, 2056]	2620	[2741, 282]

407	[454, 150]	1145	[1563, 152]	1883	[2191, 211]	2621	[2338, 2742]
408	[716, 219]	1146	[1564, 1565]	1884	[1312, 162]	2622	[882, 830]
409	[717, 216]	1147	[1566, 588]	1885	[1351, 2241]	2623	[2743, 2364]
410	[215, 718]	1148	[1567, 1568]	1886	[537, 1336]	2624	[1661, 276]
411	[719, 715]	1149	[1569, 1551]	1887	[2242, 1442]	2625	[1926, 2692]
412	[217, 150]	1150	[1570, 550]	1888	[57, 2234]	2626	[1733, 2744]
413	[56, 714]	1151	[1571, 229]	1889	[2243, 1435]	2627	[1883, 396]
414	[590, 719]	1152	[1317, 1475]	1890	[2244, 493]	2628	[2745, 985]
415	[150, 720]	1153	[1439, 1506]	1891	[1242, 568]	2629	[261, 1735]
416	[721, 722]	1154	[541, 1572]	1892	[2068, 180]	2630	[2362, 2746]
417	[723, 724]	1155	[1278, 1573]	1893	[2245, 1451]	2631	[2747, 89]
418	[483, 725]	1156	[226, 1365]	1894	[2041, 1419]	2632	[2748, 2502]
419	[513, 473]	1157	[1484, 1574]	1895	[2246, 2247]	2633	[2749, 2750]
420	[126, 224]	1158	[457, 1404]	1896	[2248, 2058]	2634	[1767, 2320]
421	[693, 704]	1159	[1375, 1356]	1897	[1564, 2249]	2635	[2743, 327]
422	[726, 727]	1160	[1575, 793]	1898	[2180, 2250]	2636	[1598, 1628]
423	[655, 728]	1161	[415, 1576]	1899	[2199, 2251]	2637	[2751, 978]
424	[153, 190]	1162	[1577, 1578]	1900	[2252, 195]	2638	[2752, 2483]
425	[170, 691]	1163	[1579, 773]	1901	[2117, 544]	2639	[2753, 1715]
426	[729, 698]	1164	[801, 1580]	1902	[2253, 2254]	2640	[891, 1756]
427	[730, 486]	1165	[1581, 971]	1903	[2255, 508]	2641	[1153, 2710]
428	[731, 732]	1166	[1026, 895]	1904	[2021, 2256]	2642	[1146, 1715]
429	[733, 490]	1167	[1582, 1583]	1905	[1570, 594]	2643	[2313, 111]
430	[734, 735]	1168	[1584, 348]	1906	[2257, 1163]	2644	[2754, 74]
431	[620, 736]	1169	[1585, 1586]	1907	[2258, 38]	2645	[2755, 1101]
432	[737, 738]	1170	[1587, 406]	1908	[2259, 670]	2646	[1829, 1928]
433	[535, 739]	1171	[21, 1009]	1909	[1185, 1417]	2647	[1899, 2332]
434	[214, 214]	1172	[982, 1057]	1910	[2250, 2200]	2648	[1736, 1866]
435	[127, 225]	1173	[1588, 1589]	1911	[2073, 9]	2649	[2756, 345]
436	[740, 741]	1174	[1039, 1590]	1912	[242, 514]	2650	[1655, 1153]
437	[742, 743]	1175	[16, 974]	1913	[2260, 2190]	2651	[2757, 832]
438	[622, 468]	1176	[1591, 1592]	1914	[1985, 2261]	2652	[2758, 272]
439	[744, 745]	1177	[1593, 1152]	1915	[2262, 603]	2653	[2759, 328]
440	[746, 747]	1178	[1127, 1594]	1916	[1498, 1244]	2654	[920, 1827]
441	[748, 174]	1179	[1595, 908]	1917	[2263, 2264]	2655	[2760, 953]
442	[749, 750]	1180	[1596, 421]	1918	[2177, 2265]	2656	[1950, 2761]
443	[751, 752]	1181	[120, 828]	1919	[2145, 2266]	2657	[1144, 1109]
444	[558, 514]	1182	[1597, 21]	1920	[2267, 2181]	2658	[2762, 2469]
445	[753, 754]	1183	[355, 894]	1921	[2268, 1188]	2659	[2763, 29]
446	[755, 756]	1184	[1598, 813]	1922	[2269, 2270]	2660	[2764, 1013]
447	[166, 757]	1185	[1599, 1600]	1923	[1422, 179]	2661	[2765, 1135]
448	[656, 758]	1186	[1601, 799]	1924	[2271, 2272]	2662	[2766, 2734]
449	[511, 194]	1187	[1602, 1589]	1925	[1456, 575]	2663	[766, 2767]
450	[759, 760]	1188	[1603, 1604]	1926	[2273, 1365]	2664	[1674, 2768]

451	[761, 375]	1189	[999, 848]	1927	[516, 607]	2665	[2769, 1597]
452	[67, 762]	1190	[349, 1605]	1928	[507, 2274]	2666	[1705, 1705]
453	[763, 85]	1191	[1606, 1607]	1929	[2275, 1187]	2667	[2770, 324]
454	[764, 765]	1192	[1608, 1609]	1930	[1426, 760]	2668	[2504, 2450]
455	[766, 767]	1193	[1610, 411]	1931	[1198, 1418]	2669	[2771, 2405]
456	[768, 769]	1194	[83, 978]	1932	[2054, 520]	2670	[1756, 1113]
457	[770, 771]	1195	[114, 1611]	1933	[2276, 524]	2671	[2772, 769]
458	[772, 773]	1196	[840, 1612]	1934	[1266, 46]	2672	[2510, 395]
459	[774, 775]	1197	[1097, 121]	1935	[2193, 2277]	2673	[2755, 1010]
460	[776, 777]	1198	[1613, 1614]	1936	[715, 718]	2674	[1725, 898]
461	[112, 778]	1199	[400, 1098]	1937	[216, 1161]	2675	[280, 337]
462	[779, 780]	1200	[1052, 1615]	1938	[717, 718]	2676	[2387, 2345]
463	[781, 417]	1201	[1616, 811]	1939	[2278, 1568]	2677	[2458, 2322]
464	[782, 783]	1202	[1617, 1618]	1940	[2279, 2280]	2678	[1844, 825]
465	[345, 391]	1203	[257, 903]	1941	[145, 1479]	2679	[2773, 876]
466	[784, 785]	1204	[1619, 373]	1942	[1292, 630]	2680	[2358, 1693]
467	[786, 787]	1205	[836, 1620]	1943	[2281, 2186]	2681	[2774, 1597]
468	[788, 445]	1206	[1601, 1621]	1944	[2282, 2283]	2682	[462, 1334]
469	[789, 790]	1207	[794, 1021]	1945	[2284, 2015]	2683	[2663, 2775]
470	[791, 792]	1208	[1622, 1623]	1946	[2160, 495]	2684	[658, 2188]
471	[358, 21]	1209	[1624, 1625]	1947	[2285, 1201]	2685	[2776, 193]
472	[793, 438]	1210	[338, 1626]	1948	[2121, 2286]	2686	[2777, 1522]
473	[794, 795]	1211	[1627, 1628]	1949	[2287, 1431]	2687	[2778, 596]
474	[124, 796]	1212	[1033, 267]	1950	[466, 2215]	2688	[2779, 2143]
475	[797, 798]	1213	[1629, 1630]	1951	[1174, 2007]	2689	[2614, 1999]
476	[799, 800]	1214	[368, 1631]	1952	[1510, 2288]	2690	[2780, 648]
477	[801, 802]	1215	[320, 1632]	1953	[1998, 236]	2691	[2641, 2594]
478	[803, 804]	1216	[1633, 1634]	1954	[558, 1234]	2692	[2123, 488]
479	[805, 806]	1217	[1635, 1636]	1955	[2289, 2290]	2693	[1276, 1303]
480	[807, 372]	1218	[1577, 1637]	1956	[1390, 595]	2694	[2563, 1535]
481	[808, 809]	1219	[1638, 1074]	1957	[2291, 2280]	2695	[1352, 2046]
482	[810, 811]	1220	[1639, 918]	1958	[618, 2116]	2696	[1466, 2781]
483	[812, 813]	1221	[1121, 1640]	1959	[2053, 588]	2697	[2782, 2783]
484	[814, 815]	1222	[1641, 1642]	1960	[2292, 642]	2698	[2677, 2784]
485	[816, 785]	1223	[778, 413]	1961	[1569, 2293]	2699	[2146, 140]
486	[817, 818]	1224	[1643, 1091]	1962	[1218, 2114]	2700	[2561, 205]
487	[819, 820]	1225	[1644, 1645]	1963	[1405, 2294]	2701	[2785, 1274]
488	[821, 822]	1226	[1646, 1647]	1964	[1442, 42]	2702	[2786, 2208]
489	[823, 824]	1227	[64, 1648]	1965	[2225, 1988]	2703	[2777, 741]
490	[825, 826]	1228	[1609, 1649]	1966	[2295, 2296]	2704	[1513, 473]
491	[296, 827]	1229	[1650, 277]	1967	[2297, 2257]	2705	[2787, 2127]
492	[828, 829]	1230	[1651, 1652]	1968	[2298, 600]	2706	[2646, 2043]
493	[347, 364]	1231	[1584, 364]	1969	[220, 592]	2707	[2788, 610]
494	[830, 831]	1232	[1653, 1654]	1970	[2237, 2131]	2708	[2633, 140]

495	[381, 832]	1233	[322, 1633]	1971	[201, 2223]	2709	[2789, 2790]
496	[328, 833]	1234	[1655, 90]	1972	[2299, 131]	2710	[176, 183]
497	[834, 835]	1235	[1656, 1657]	1973	[1471, 1265]	2711	[1262, 2791]
498	[836, 837]	1236	[1658, 1659]	1974	[2300, 1560]	2712	[2792, 742]
499	[838, 839]	1237	[1660, 1661]	1975	[2246, 2301]	2713	[2793, 1442]
500	[840, 116]	1238	[433, 944]	1976	[2302, 452]	2714	[2794, 2183]
501	[841, 371]	1239	[853, 1129]	1977	[2132, 575]	2715	[2795, 2599]
502	[830, 842]	1240	[64, 1647]	1978	[2286, 1458]	2716	[2776, 511]
503	[843, 844]	1241	[1662, 1663]	1979	[2303, 1095]	2717	[2796, 1470]
504	[845, 846]	1242	[1069, 342]	1980	[1931, 2304]	2718	[2252, 129]
505	[847, 848]	1243	[992, 1664]	1981	[423, 803]	2719	[2797, 2577]
506	[849, 780]	1244	[995, 1665]	1982	[2305, 1054]	2720	[2128, 2798]
507	[850, 851]	1245	[266, 1666]	1983	[1784, 994]	2721	[2558, 2799]
508	[852, 389]	1246	[1667, 1668]	1984	[346, 2306]	2722	[2800, 1229]
509	[853, 854]	1247	[1669, 266]	1985	[986, 1038]	2723	[1551, 2801]
510	[855, 799]	1248	[788, 337]	1986	[1961, 2307]	2724	[2096, 1539]
511	[856, 857]	1249	[305, 1580]	1987	[2308, 1869]	2725	[2802, 668]
512	[858, 859]	1250	[18, 1670]	1988	[797, 1692]	2726	[2803, 1173]
513	[335, 860]	1251	[1671, 1672]	1989	[121, 2309]	2727	[2037, 2002]
514	[362, 861]	1252	[1673, 858]	1990	[2310, 780]	2728	[1558, 205]
515	[862, 863]	1253	[1674, 1675]	1991	[2311, 447]	2729	[2622, 475]
516	[864, 865]	1254	[84, 979]	1992	[1923, 2312]	2730	[2804, 1431]
517	[517, 517]	1255	[1676, 1677]	1993	[368, 448]	2731	[2805, 31]
518	[866, 382]	1256	[1678, 1679]	1994	[431, 912]	2732	[2230, 2124]
519	[867, 868]	1257	[1596, 438]	1995	[1694, 450]	2733	[2806, 2534]
520	[869, 870]	1258	[1680, 1681]	1996	[2313, 1030]	2734	[2545, 2272]
521	[871, 872]	1259	[1595, 1682]	1997	[1043, 2314]	2735	[2807, 659]
522	[873, 874]	1260	[1095, 1683]	1998	[2315, 2316]	2736	[2808, 2033]
523	[875, 876]	1261	[1684, 1685]	1999	[419, 1034]	2737	[2809, 2810]
524	[877, 878]	1262	[263, 1686]	2000	[773, 258]	2738	[2811, 708]
525	[879, 880]	1263	[1687, 282]	2001	[358, 1008]	2739	[2812, 619]
526	[881, 30]	1264	[816, 1688]	2002	[1839, 905]	2740	[2076, 1273]
527	[882, 883]	1265	[1616, 1689]	2003	[1061, 260]	2741	[2813, 2783]
528	[884, 885]	1266	[77, 826]	2004	[2317, 2318]	2742	[613, 204]
529	[886, 887]	1267	[1151, 1690]	2005	[1953, 1860]	2743	[1460, 2814]
530	[888, 889]	1268	[1066, 314]	2006	[1057, 889]	2744	[13, 2166]
531	[890, 22]	1269	[19, 992]	2007	[1137, 1699]	2745	[2815, 1170]
532	[891, 892]	1270	[1669, 951]	2008	[951, 1107]	2746	[2664, 182]
533	[276, 893]	1271	[1691, 1692]	2009	[2319, 2320]	2747	[2816, 1439]
534	[278, 894]	1272	[1006, 1693]	2010	[2321, 265]	2748	[2817, 2665]
535	[781, 895]	1273	[1694, 278]	2011	[1927, 1616]	2749	[2115, 619]
536	[862, 15]	1274	[431, 362]	2012	[831, 403]	2750	[2656, 1573]
537	[896, 897]	1275	[1695, 257]	2013	[1814, 1596]	2751	[2818, 660]
538	[273, 898]	1276	[1696, 1697]	2014	[1646, 1648]	2752	[1175, 2100]

539	[388, 899]	1277	[1101, 1011]	2015	[2322, 1042]	2753	[2819, 2820]
540	[900, 901]	1278	[1698, 369]	2016	[2323, 1575]	2754	[2821, 1325]
541	[834, 902]	1279	[113, 1014]	2017	[121, 829]	2755	[640, 2822]
542	[773, 903]	1280	[1049, 1699]	2018	[421, 439]	2756	[1294, 693]
543	[251, 904]	1281	[1700, 1701]	2019	[2324, 2325]	2757	[2823, 2582]
544	[325, 905]	1282	[1702, 1039]	2020	[912, 1892]	2758	[2824, 2048]
545	[906, 901]	1283	[1703, 981]	2021	[2326, 1941]	2759	[2825, 596]
546	[907, 908]	1284	[1704, 427]	2022	[1865, 1737]	2760	[2826, 2241]
547	[909, 428]	1285	[81, 334]	2023	[1824, 1894]	2761	[1272, 1549]
548	[424, 804]	1286	[1705, 517]	2024	[76, 289]	2762	[2588, 2790]
549	[910, 407]	1287	[1619, 1663]	2025	[2327, 2328]	2763	[1446, 61]
550	[271, 911]	1288	[1706, 1707]	2026	[2329, 88]	2764	[2827, 2671]
551	[69, 328]	1289	[1708, 1709]	2027	[2330, 1854]	2765	[2828, 2222]
552	[70, 833]	1290	[1710, 1711]	2028	[122, 2331]	2766	[2829, 1180]
553	[912, 861]	1291	[389, 975]	2029	[1621, 800]	2767	[2830, 606]
554	[913, 914]	1292	[1002, 1712]	2030	[1653, 2316]	2768	[2275, 464]
555	[915, 916]	1293	[371, 1713]	2031	[2322, 2332]	2769	[2239, 1437]
556	[917, 4]	1294	[1597, 1008]	2032	[2333, 438]	2770	[2831, 2197]
557	[842, 918]	1295	[1714, 1715]	2033	[2334, 250]	2771	[2819, 2832]
558	[344, 435]	1296	[1716, 1717]	2034	[2335, 2336]	2772	[2608, 39]
559	[919, 836]	1297	[1599, 1718]	2035	[2337, 1047]	2773	[2833, 757]
560	[419, 267]	1298	[1719, 1720]	2036	[2338, 2325]	2774	[2834, 43]
561	[920, 921]	1299	[1721, 1722]	2037	[2339, 2340]	2775	[365, 1764]
562	[823, 922]	1300	[1723, 1724]	2038	[772, 257]	2776	[71, 858]
563	[923, 924]	1301	[1079, 1725]	2039	[2326, 2341]	2777	[2695, 2835]
564	[925, 926]	1302	[1010, 1102]	2040	[1593, 1690]	2778	[1594, 1662]
565	[393, 784]	1303	[940, 1726]	2041	[287, 2342]	2779	[2836, 2435]
566	[927, 928]	1304	[1727, 1095]	2042	[881, 1850]	2780	[2837, 1831]
567	[929, 930]	1305	[1728, 1729]	2043	[323, 1934]	2781	[2459, 1612]
568	[436, 931]	1306	[1730, 1731]	2044	[1745, 1958]	2782	[2838, 1786]
569	[342, 932]	1307	[1638, 846]	2045	[1668, 1828]	2783	[2839, 123]
570	[933, 934]	1308	[1732, 1615]	2046	[828, 2309]	2784	[1612, 1136]
571	[20, 935]	1309	[1733, 1734]	2047	[2343, 448]	2785	[379, 2840]
572	[936, 937]	1310	[1735, 1012]	2048	[2344, 2345]	2786	[2841, 2842]
573	[938, 939]	1311	[450, 894]	2049	[1608, 2346]	2787	[2407, 2479]
574	[940, 941]	1312	[1736, 1737]	2050	[2347, 2348]	2788	[2843, 80]
575	[856, 942]	1313	[1738, 962]	2051	[2349, 937]	2789	[2844, 996]
576	[943, 944]	1314	[1739, 77]	2052	[2350, 1682]	2790	[2347, 2845]
577	[945, 344]	1315	[1740, 1741]	2053	[2351, 936]	2791	[1083, 1726]
578	[946, 947]	1316	[318, 1742]	2054	[925, 2352]	2792	[2846, 302]
579	[948, 762]	1317	[1743, 1744]	2055	[1639, 403]	2793	[1976, 112]
580	[949, 950]	1318	[1612, 117]	2056	[447, 1631]	2794	[2847, 2848]
581	[265, 951]	1319	[860, 349]	2057	[2353, 1930]	2795	[2849, 2848]
582	[809, 321]	1320	[1745, 869]	2058	[2354, 1962]	2796	[2850, 427]

583	[952, 953]	1321	[780, 1746]	2059	[27, 764]	2797	[1941, 1128]
584	[954, 955]	1322	[1747, 969]	2060	[84, 1140]	2798	[1914, 2851]
585	[905, 113]	1323	[394, 1748]	2061	[1155, 947]	2799	[1579, 257]
586	[956, 957]	1324	[323, 1634]	2062	[1651, 2355]	2800	[2852, 68]
587	[958, 959]	1325	[883, 831]	2063	[1787, 1021]	2801	[905, 778]
588	[783, 332]	1326	[259, 1062]	2064	[2356, 1137]	2802	[2356, 1049]
589	[960, 961]	1327	[1749, 1750]	2065	[245, 2357]	2803	[2853, 2526]
590	[75, 414]	1328	[1751, 1752]	2066	[2358, 1007]	2804	[1957, 928]
591	[962, 963]	1329	[298, 1753]	2067	[924, 389]	2805	[2854, 65]
592	[964, 965]	1330	[1754, 1755]	2068	[2327, 2359]	2806	[981, 1758]
593	[966, 967]	1331	[1071, 1756]	2069	[1830, 441]	2807	[2855, 1605]
594	[373, 968]	1332	[1757, 1758]	2070	[1633, 1934]	2808	[1624, 2856]
595	[414, 289]	1333	[803, 1058]	2071	[2360, 2361]	2809	[1810, 1868]
596	[420, 969]	1334	[923, 852]	2072	[825, 78]	2810	[2857, 872]
597	[970, 971]	1335	[1728, 1759]	2073	[2362, 2363]	2811	[2858, 2859]
598	[972, 973]	1336	[375, 1760]	2074	[100, 959]	2812	[1772, 1787]
599	[939, 974]	1337	[1701, 883]	2075	[1000, 962]	2813	[908, 2694]
600	[412, 975]	1338	[1761, 1762]	2076	[326, 2364]	2814	[1644, 2860]
601	[847, 976]	1339	[808, 1763]	2077	[972, 2365]	2815	[2861, 1781]
602	[977, 352]	1340	[1764, 1765]	2078	[2366, 2367]	2816	[2862, 262]
603	[978, 979]	1341	[1766, 1767]	2079	[1029, 323]	2817	[2863, 965]
604	[382, 93]	1342	[1768, 840]	2080	[1110, 1839]	2818	[2864, 1662]
605	[980, 981]	1343	[1769, 1770]	2081	[924, 412]	2819	[1153, 2865]
606	[982, 888]	1344	[340, 1709]	2082	[2368, 64]	2820	[2762, 1614]
607	[865, 983]	1345	[1771, 266]	2083	[2369, 18]	2821	[2866, 1762]
608	[791, 984]	1346	[1772, 794]	2084	[849, 1092]	2822	[2330, 2508]
609	[936, 774]	1347	[1773, 1774]	2085	[279, 788]	2823	[2867, 388]
610	[385, 985]	1348	[1775, 1776]	2086	[2370, 2371]	2824	[2868, 2365]
611	[333, 82]	1349	[98, 1777]	2087	[1658, 2372]	2825	[2869, 428]
612	[986, 987]	1350	[1093, 295]	2088	[2373, 1781]	2826	[2870, 2401]
613	[988, 989]	1351	[1097, 828]	2089	[2374, 424]	2827	[2871, 123]
614	[28, 765]	1352	[1098, 376]	2090	[387, 2375]	2828	[2872, 2736]
615	[990, 991]	1353	[867, 1778]	2091	[2376, 1626]	2829	[2873, 1913]
616	[992, 935]	1354	[316, 1779]	2092	[2377, 2378]	2830	[1799, 1759]
617	[993, 994]	1355	[980, 1078]	2093	[1678, 2379]	2831	[2874, 1964]
618	[995, 996]	1356	[1780, 931]	2094	[2380, 2381]	2832	[2763, 881]
619	[997, 350]	1357	[1781, 1046]	2095	[2382, 863]	2833	[1037, 987]
620	[998, 999]	1358	[1782, 1783]	2096	[1797, 2383]	2834	[2875, 89]
621	[1000, 1001]	1359	[1784, 1785]	2097	[2384, 911]	2835	[598, 2876]
622	[17, 997]	1360	[1775, 1786]	2098	[305, 802]	2836	[2260, 644]
623	[1002, 1003]	1361	[1787, 795]	2099	[2385, 2386]	2837	[2877, 2171]
624	[1004, 1005]	1362	[1788, 1789]	2100	[1741, 830]	2838	[14, 204]
625	[1006, 1007]	1363	[1790, 1649]	2101	[2387, 2388]	2839	[2625, 2802]
626	[1008, 1009]	1364	[1791, 92]	2102	[2389, 2390]	2840	[1980, 40]

627	[93, 370]	1365	[1662, 373]	2103	[883, 842]	2841	[534, 1366]
628	[1010, 1011]	1366	[346, 392]	2104	[1881, 921]	2842	[1256, 1550]
629	[262, 1012]	1367	[873, 1792]	2105	[1622, 2391]	2843	[2878, 32]
630	[249, 1013]	1368	[80, 1793]	2106	[2392, 2393]	2844	[2879, 1182]
631	[842, 403]	1369	[938, 16]	2107	[76, 415]	2845	[1209, 2220]
632	[778, 1014]	1370	[1794, 803]	2108	[1054, 297]	2846	[2880, 1188]
633	[1015, 97]	1371	[369, 94]	2109	[2394, 345]	2847	[2881, 2532]
634	[1016, 873]	1372	[1735, 1795]	2110	[398, 1657]	2848	[733, 1364]
635	[1017, 1018]	1373	[1796, 328]	2111	[1057, 2395]	2849	[2882, 1226]
636	[28, 1019]	1374	[1797, 1798]	2112	[2396, 277]	2850	[2567, 2647]
637	[1020, 1021]	1375	[1799, 1729]	2113	[776, 2397]	2851	[2292, 587]
638	[1022, 366]	1376	[20, 1664]	2114	[391, 2306]	2852	[1495, 2163]
639	[1023, 100]	1377	[1800, 406]	2115	[2398, 2399]	2853	[2883, 2218]
640	[1024, 1025]	1378	[1801, 1789]	2116	[789, 303]	2854	[2799, 132]
641	[1026, 417]	1379	[1802, 402]	2117	[2308, 1000]	2855	[2884, 2204]
642	[1027, 20]	1380	[16, 1803]	2118	[415, 290]	2856	[2563, 2885]
643	[1028, 1029]	1381	[1123, 944]	2119	[2400, 2401]	2857	[2601, 1981]
644	[1030, 1031]	1382	[1804, 1805]	2120	[2402, 2403]	2858	[1261, 141]
645	[330, 1032]	1383	[1806, 1087]	2121	[1015, 2404]	2859	[2044, 1163]
646	[1033, 1034]	1384	[1807, 1808]	2122	[1897, 2405]	2860	[2150, 2784]
647	[1035, 1036]	1385	[1809, 1810]	2123	[2406, 2407]	2861	[2886, 60]
648	[1037, 1038]	1386	[1811, 1812]	2124	[1157, 1831]	2862	[1373, 1989]
649	[1039, 1040]	1387	[1072, 1813]	2125	[366, 1843]	2863	[2887, 2018]
650	[403, 1041]	1388	[1814, 793]	2126	[2408, 872]	2864	[2888, 1437]
651	[1042, 849]	1389	[843, 1815]	2127	[2409, 1044]	2865	[2889, 659]
652	[1043, 1044]	1390	[367, 447]	2128	[1075, 2410]	2866	[2890, 1199]
653	[1045, 1046]	1391	[1143, 1793]	2129	[909, 342]	2867	[2891, 2810]
654	[990, 1047]	1392	[1609, 1816]	2130	[2411, 1008]	2868	[2892, 2669]
655	[1048, 1049]	1393	[1817, 1818]	2131	[933, 1683]	2869	[2893, 616]
656	[1050, 1051]	1394	[1819, 1820]	2132	[2412, 414]	2870	[2820, 732]
657	[1052, 1053]	1395	[1821, 291]	2133	[780, 2413]	2871	[1371, 1193]
658	[817, 1054]	1396	[1822, 878]	2134	[1708, 341]	2872	[2894, 186]
659	[1055, 837]	1397	[255, 784]	2135	[966, 2414]	2873	[2895, 1515]
660	[1056, 888]	1398	[1055, 1620]	2136	[2376, 1005]	2874	[2896, 2257]
661	[428, 932]	1399	[1823, 937]	2137	[289, 1576]	2875	[2897, 45]
662	[292, 899]	1400	[294, 1094]	2138	[2415, 331]	2876	[1812, 2438]
663	[1027, 992]	1401	[1824, 1825]	2139	[1118, 984]	2877	[2898, 835]
664	[793, 421]	1402	[807, 1713]	2140	[1587, 910]	2878	[2899, 1056]
665	[1056, 1057]	1403	[1826, 1827]	2141	[338, 1005]	2879	[2900, 2739]
666	[424, 1058]	1404	[108, 1828]	2142	[2416, 1909]	2880	[2393, 999]
667	[244, 910]	1405	[1829, 1830]	2143	[2417, 2418]	2881	[105, 2371]
668	[281, 1059]	1406	[396, 1831]	2144	[1017, 2419]	2882	[2901, 1746]
669	[1060, 437]	1407	[939, 1803]	2145	[2420, 2421]	2883	[2902, 1041]
670	[1061, 1062]	1408	[1832, 994]	2146	[969, 375]	2884	[2903, 341]

671	[1050, 1063]	1409	[1749, 1833]	2147	[1125, 2422]	2885	[951, 1666]
672	[280, 445]	1410	[366, 1765]	2148	[2423, 392]	2886	[2904, 1750]
673	[1064, 409]	1411	[1834, 1024]	2149	[814, 1618]	2887	[2905, 1903]
674	[1065, 97]	1412	[87, 1086]	2150	[2424, 1036]	2888	[2906, 517]
675	[70, 329]	1413	[1835, 346]	2151	[2425, 1670]	2889	[1617, 815]
676	[1066, 893]	1414	[1701, 830]	2152	[2426, 798]	2890	[2907, 260]
677	[1067, 1068]	1415	[1096, 120]	2153	[1834, 2427]	2891	[2908, 2516]
678	[866, 832]	1416	[1836, 1156]	2154	[2428, 936]	2892	[2909, 1717]
679	[1069, 428]	1417	[1837, 1590]	2155	[2429, 2430]	2893	[2910, 993]
680	[1070, 993]	1418	[1804, 1717]	2156	[1826, 921]	2894	[1628, 2498]
681	[1071, 892]	1419	[1812, 254]	2157	[359, 2431]	2895	[2911, 1690]
682	[1072, 1073]	1420	[879, 1838]	2158	[2432, 376]	2896	[2912, 1120]
683	[845, 1074]	1421	[1839, 112]	2159	[1875, 1084]	2897	[1673, 72]
684	[1075, 1076]	1422	[1840, 1841]	2160	[2433, 1085]	2898	[2913, 1399]
685	[1077, 1078]	1423	[917, 1842]	2161	[1925, 782]	2899	[2914, 759]
686	[1079, 273]	1424	[1764, 1843]	2162	[2434, 2435]	2900	[2915, 2659]
687	[1080, 1081]	1425	[783, 1779]	2163	[1820, 818]	2901	[2916, 2022]
688	[949, 1082]	1426	[1844, 77]	2164	[1971, 1081]	2902	[2917, 2120]
689	[1083, 941]	1427	[390, 433]	2165	[2436, 2437]	2903	[2642, 1214]
690	[310, 1084]	1428	[1085, 88]	2166	[253, 2438]	2904	[2918, 2109]
691	[1085, 1086]	1429	[831, 918]	2167	[2439, 1126]	2905	[2919, 2125]
692	[244, 406]	1430	[960, 1845]	2168	[2422, 1611]	2906	[2920, 753]
693	[267, 1087]	1431	[958, 101]	2169	[2440, 1856]	2907	[2921, 2169]
694	[1008, 22]	1432	[15, 939]	2170	[997, 1670]	2908	[2170, 1231]
695	[999, 976]	1433	[517, 1705]	2171	[2441, 65]	2909	[2189, 724]
696	[998, 847]	1434	[1835, 391]	2172	[2442, 65]	2910	[2922, 477]
697	[764, 1019]	1435	[799, 1846]	2173	[1888, 291]	2911	[1225, 490]
698	[1088, 954]	1436	[1696, 1847]	2174	[2443, 1085]	2912	[2923, 534]
699	[841, 807]	1437	[79, 1143]	2175	[1724, 1636]	2913	[2924, 1968]
700	[1089, 125]	1438	[865, 1848]	2176	[2444, 1133]	2914	[2925, 390]
701	[1090, 1091]	1439	[1849, 1586]	2177	[283, 2445]	2915	[2926, 413]
702	[779, 1092]	1440	[1796, 70]	2178	[418, 1033]	2916	[2927, 311]
703	[1093, 1094]	1441	[29, 1850]	2179	[104, 2446]	2917	[2928, 1102]
704	[1095, 934]	1442	[1851, 1852]	2180	[2447, 2384]	2918	[1873, 1081]
705	[1096, 1097]	1443	[1853, 1854]	2181	[888, 2395]	2919	[2691, 6]
706	[969, 1098]	1444	[1855, 953]	2182	[2448, 334]	2920	[2929, 912]
707	[1099, 1100]	1445	[1856, 822]	2183	[2449, 1932]	2921	[102, 820]
708	[1101, 1102]	1446	[1857, 124]	2184	[2339, 2450]	2922	[2930, 305]
709	[1032, 1103]	1447	[884, 1858]	2185	[1916, 361]	2923	[2931, 2430]
710	[1104, 354]	1448	[1859, 861]	2186	[1098, 1760]	2924	[2932, 700]
711	[1105, 1106]	1449	[65, 270]	2187	[977, 2451]	2925	[2933, 535]
712	[266, 1107]	1450	[1081, 1860]	2188	[1837, 1040]	2926	[2934, 1493]
713	[438, 422]	1451	[1861, 1862]	2189	[1089, 796]	2927	[2215, 689]
714	[390, 943]	1452	[1660, 1863]	2190	[975, 943]	2928	[2935, 2665]

715	[943, 434]	1453	[72, 859]	2191	[2452, 788]	2929	[2936, 2068]
716	[1108, 1109]	1454	[1591, 1864]	2192	[1023, 958]	2930	[2937, 1447]
717	[1110, 325]	1455	[1865, 1866]	2193	[2453, 800]	2931	[2938, 702]
718	[852, 412]	1456	[1867, 943]	2194	[1908, 2454]	2932	[2939, 767]
719	[1111, 852]	1457	[1710, 1868]	2195	[2360, 2455]	2933	[2940, 450]
720	[111, 1031]	1458	[1869, 1001]	2196	[2456, 1731]	2934	[2941, 1648]
721	[1112, 1113]	1459	[1870, 1835]	2197	[1627, 813]	2935	[2942, 1578]
722	[860, 1114]	1460	[1671, 1871]	2198	[2457, 1862]	2936	[950, 344]
723	[1115, 1116]	1461	[1104, 1872]	2199	[1099, 1770]	2937	[2410, 860]
724	[1117, 1039]	1462	[1873, 1874]	2200	[1663, 374]	2938	[2943, 1103]
725	[1118, 792]	1463	[1875, 311]	2201	[2458, 1899]	2939	[2944, 2286]
726	[1119, 1120]	1464	[1698, 93]	2202	[2459, 116]	2940	[2945, 639]
727	[315, 783]	1465	[1045, 1876]	2203	[1807, 1841]	2941	[2946, 2078]
728	[1121, 1122]	1466	[1743, 1877]	2204	[2460, 2336]	2942	[2615, 1399]
729	[1123, 434]	1467	[1067, 1878]	2205	[2461, 333]	2943	[2947, 1495]
730	[1124, 1083]	1468	[361, 912]	2206	[2462, 1924]	2944	[2948, 252]
731	[850, 775]	1469	[1640, 1879]	2207	[919, 1055]	2945	[2949, 836]
732	[1125, 1126]	1470	[1880, 1010]	2208	[869, 1956]	2946	[288, 1877]
733	[1127, 1128]	1471	[1124, 940]	2209	[956, 2381]	2947	[1878, 248]
734	[1129, 1130]	1472	[1881, 1827]	2210	[993, 1785]	2948	[2227, 2035]
735	[1077, 981]	1473	[1719, 1882]	2211	[1687, 1059]	2949	[472, 616]
736	[954, 1131]	1474	[1883, 1157]	2212	[1034, 268]		
737	[1132, 1133]	1475	[1830, 1884]	2213	[334, 1813]		

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	492	1	984	0	1476	0	1968	1	2460	0
1	0	493	1	985	1	1477	0	1969	0	2461	0
2	0	494	0	986	0	1478	0	1970	1	2462	0
3	0	495	1	987	1	1479	0	1971	0	2463	1
4	0	496	1	988	0	1480	0	1972	1	2464	1
5	0	497	1	989	1	1481	0	1973	0	2465	0
6	0	498	1	990	0	1482	1	1974	0	2466	0
7	0	499	0	991	0	1483	1	1975	1	2467	0
8	0	500	1	992	1	1484	0	1976	0	2468	0
9	0	501	0	993	1	1485	1	1977	0	2469	1
10	1	502	0	994	0	1486	0	1978	1	2470	0
11	0	503	0	995	1	1487	1	1979	0	2471	0
12	0	504	1	996	1	1488	1	1980	1	2472	0
13	0	505	1	997	1	1489	0	1981	0	2473	1
14	1	506	0	998	0	1490	1	1982	1	2474	0
15	0	507	1	999	0	1491	1	1983	0	2475	1
16	0	508	0	1000	1	1492	1	1984	0	2476	0
17	0	509	1	1001	1	1493	1	1985	0	2477	0

18	0	510	0	1002	1	1494	1	1986	0	2478	1
19	0	511	1	1003	1	1495	0	1987	0	2479	0
20	0	512	1	1004	1	1496	1	1988	1	2480	0
21	1	513	0	1005	1	1497	0	1989	0	2481	0
22	0	514	0	1006	0	1498	0	1990	1	2482	0
23	0	515	0	1007	0	1499	0	1991	1	2483	0
24	1	516	0	1008	0	1500	1	1992	0	2484	0
25	0	517	0	1009	1	1501	0	1993	1	2485	1
26	1	518	0	1010	1	1502	0	1994	0	2486	1
27	0	519	1	1011	0	1503	0	1995	1	2487	1
28	0	520	0	1012	1	1504	0	1996	0	2488	0
29	1	521	1	1013	1	1505	0	1997	1	2489	0
30	0	522	1	1014	1	1506	1	1998	0	2490	1
31	0	523	0	1015	1	1507	1	1999	0	2491	1
32	1	524	0	1016	0	1508	0	2000	0	2492	1
33	0	525	1	1017	0	1509	1	2001	1	2493	1
34	1	526	0	1018	1	1510	0	2002	1	2494	1
35	0	527	0	1019	1	1511	1	2003	1	2495	1
36	0	528	1	1020	0	1512	0	2004	1	2496	0
37	0	529	1	1021	1	1513	0	2005	0	2497	0
38	1	530	0	1022	1	1514	1	2006	1	2498	1
39	0	531	1	1023	0	1515	1	2007	1	2499	1
40	1	532	0	1024	1	1516	0	2008	0	2500	1
41	0	533	1	1025	0	1517	1	2009	1	2501	1
42	1	534	0	1026	1	1518	0	2010	0	2502	1
43	1	535	0	1027	1	1519	0	2011	0	2503	0
44	0	536	0	1028	1	1520	1	2012	0	2504	0
45	0	537	1	1029	0	1521	0	2013	0	2505	0
46	1	538	1	1030	0	1522	1	2014	0	2506	0
47	0	539	1	1031	1	1523	1	2015	0	2507	1
48	0	540	0	1032	1	1524	1	2016	1	2508	1
49	1	541	1	1033	1	1525	1	2017	0	2509	0
50	1	542	0	1034	0	1526	0	2018	1	2510	1
51	0	543	1	1035	1	1527	1	2019	0	2511	0
52	0	544	0	1036	0	1528	0	2020	1	2512	1
53	1	545	1	1037	0	1529	1	2021	1	2513	1
54	0	546	1	1038	0	1530	0	2022	0	2514	0
55	0	547	1	1039	1	1531	0	2023	0	2515	1
56	0	548	1	1040	1	1532	1	2024	1	2516	1
57	0	549	0	1041	0	1533	1	2025	1	2517	0
58	0	550	0	1042	0	1534	0	2026	1	2518	1
59	1	551	1	1043	1	1535	1	2027	0	2519	1
60	1	552	0	1044	0	1536	1	2028	0	2520	1
61	0	553	1	1045	0	1537	1	2029	0	2521	0

62	1	554	0	1046	0	1538	1	2030	0	2522	0
63	0	555	1	1047	1	1539	0	2031	0	2523	0
64	1	556	1	1048	0	1540	1	2032	0	2524	0
65	1	557	1	1049	0	1541	1	2033	1	2525	1
66	1	558	1	1050	0	1542	1	2034	1	2526	0
67	0	559	0	1051	0	1543	1	2035	1	2527	1
68	0	560	0	1052	1	1544	1	2036	1	2528	0
69	1	561	1	1053	1	1545	0	2037	0	2529	1
70	0	562	0	1054	1	1546	0	2038	1	2530	0
71	0	563	1	1055	0	1547	1	2039	1	2531	1
72	0	564	0	1056	0	1548	1	2040	0	2532	1
73	0	565	0	1057	1	1549	0	2041	1	2533	1
74	1	566	1	1058	0	1550	1	2042	0	2534	0
75	0	567	0	1059	0	1551	1	2043	0	2535	1
76	1	568	0	1060	0	1552	0	2044	0	2536	1
77	1	569	0	1061	1	1553	1	2045	1	2537	1
78	0	570	0	1062	0	1554	0	2046	1	2538	1
79	0	571	0	1063	1	1555	0	2047	0	2539	0
80	1	572	0	1064	1	1556	0	2048	0	2540	0
81	1	573	0	1065	1	1557	1	2049	1	2541	1
82	1	574	0	1066	0	1558	1	2050	0	2542	1
83	0	575	1	1067	1	1559	0	2051	1	2543	1
84	0	576	1	1068	0	1560	0	2052	0	2544	1
85	1	577	0	1069	0	1561	1	2053	0	2545	1
86	0	578	1	1070	0	1562	1	2054	0	2546	1
87	1	579	1	1071	1	1563	0	2055	0	2547	1
88	1	580	1	1072	0	1564	0	2056	0	2548	0
89	0	581	1	1073	0	1565	0	2057	1	2549	0
90	0	582	0	1074	0	1566	1	2058	1	2550	1
91	0	583	0	1075	1	1567	0	2059	0	2551	1
92	1	584	0	1076	1	1568	1	2060	0	2552	0
93	1	585	1	1077	0	1569	0	2061	0	2553	0
94	1	586	1	1078	0	1570	0	2062	0	2554	1
95	0	587	0	1079	0	1571	1	2063	1	2555	0
96	0	588	0	1080	1	1572	1	2064	0	2556	0
97	0	589	1	1081	0	1573	0	2065	1	2557	0
98	1	590	0	1082	1	1574	0	2066	1	2558	1
99	0	591	0	1083	1	1575	0	2067	1	2559	1
100	1	592	0	1084	1	1576	0	2068	1	2560	0
101	1	593	1	1085	0	1577	1	2069	0	2561	0
102	0	594	1	1086	0	1578	1	2070	1	2562	1
103	1	595	0	1087	0	1579	0	2071	0	2563	0
104	0	596	0	1088	0	1580	1	2072	0	2564	0
105	1	597	1	1089	0	1581	1	2073	1	2565	1

106	1	598	0	1090	1	1582	1	2074	1	2566	1
107	1	599	1	1091	0	1583	1	2075	1	2567	1
108	0	600	0	1092	0	1584	0	2076	0	2568	0
109	1	601	1	1093	0	1585	0	2077	0	2569	1
110	0	602	0	1094	0	1586	0	2078	1	2570	0
111	1	603	1	1095	1	1587	1	2079	0	2571	1
112	0	604	0	1096	0	1588	1	2080	0	2572	0
113	1	605	1	1097	0	1589	0	2081	1	2573	0
114	0	606	1	1098	1	1590	0	2082	0	2574	0
115	0	607	1	1099	1	1591	1	2083	0	2575	1
116	0	608	0	1100	0	1592	0	2084	0	2576	1
117	1	609	0	1101	0	1593	0	2085	0	2577	0
118	1	610	1	1102	1	1594	0	2086	1	2578	0
119	0	611	0	1103	1	1595	1	2087	1	2579	1
120	1	612	0	1104	0	1596	1	2088	1	2580	1
121	0	613	0	1105	1	1597	0	2089	1	2581	1
122	0	614	0	1106	0	1598	0	2090	1	2582	1
123	0	615	0	1107	0	1599	0	2091	1	2583	1
124	1	616	1	1108	1	1600	0	2092	1	2584	0
125	1	617	1	1109	1	1601	0	2093	1	2585	0
126	0	618	1	1110	0	1602	0	2094	1	2586	0
127	1	619	1	1111	0	1603	0	2095	1	2587	1
128	1	620	0	1112	0	1604	1	2096	0	2588	1
129	0	621	1	1113	1	1605	0	2097	1	2589	1
130	1	622	0	1114	1	1606	0	2098	1	2590	1
131	0	623	1	1115	1	1607	1	2099	0	2591	1
132	1	624	1	1116	1	1608	1	2100	1	2592	0
133	1	625	0	1117	1	1609	0	2101	1	2593	1
134	0	626	0	1118	1	1610	0	2102	1	2594	1
135	1	627	1	1119	1	1611	1	2103	1	2595	1
136	0	628	1	1120	1	1612	1	2104	0	2596	0
137	1	629	1	1121	1	1613	1	2105	1	2597	0
138	1	630	0	1122	0	1614	0	2106	1	2598	1
139	0	631	1	1123	1	1615	0	2107	1	2599	0
140	0	632	0	1124	0	1616	1	2108	1	2600	1
141	1	633	1	1125	1	1617	1	2109	1	2601	0
142	0	634	0	1126	1	1618	0	2110	0	2602	0
143	0	635	0	1127	1	1619	1	2111	1	2603	0
144	0	636	0	1128	1	1620	0	2112	0	2604	0
145	1	637	0	1129	1	1621	0	2113	1	2605	1
146	0	638	1	1130	1	1622	1	2114	1	2606	1
147	0	639	0	1131	1	1623	1	2115	1	2607	0
148	1	640	1	1132	0	1624	1	2116	0	2608	0
149	0	641	1	1133	1	1625	1	2117	0	2609	0

150	1	642	1	1134	1	1626	0	2118	1	2610	1
151	1	643	1	1135	0	1627	1	2119	1	2611	1
152	1	644	0	1136	0	1628	0	2120	0	2612	0
153	1	645	1	1137	1	1629	0	2121	1	2613	0
154	0	646	1	1138	1	1630	1	2122	0	2614	0
155	0	647	1	1139	0	1631	1	2123	1	2615	1
156	1	648	0	1140	1	1632	1	2124	0	2616	0
157	0	649	1	1141	0	1633	1	2125	0	2617	1
158	0	650	1	1142	1	1634	0	2126	1	2618	1
159	1	651	0	1143	0	1635	1	2127	0	2619	1
160	1	652	1	1144	1	1636	0	2128	1	2620	1
161	0	653	0	1145	0	1637	0	2129	1	2621	1
162	1	654	0	1146	0	1638	0	2130	0	2622	0
163	0	655	0	1147	1	1639	0	2131	0	2623	1
164	0	656	0	1148	0	1640	1	2132	0	2624	0
165	1	657	1	1149	0	1641	1	2133	1	2625	1
166	0	658	1	1150	0	1642	0	2134	1	2626	1
167	1	659	0	1151	1	1643	1	2135	1	2627	0
168	1	660	0	1152	1	1644	1	2136	1	2628	1
169	0	661	1	1153	1	1645	0	2137	0	2629	1
170	0	662	1	1154	1	1646	0	2138	1	2630	1
171	1	663	1	1155	0	1647	0	2139	1	2631	0
172	1	664	0	1156	1	1648	1	2140	1	2632	1
173	1	665	0	1157	0	1649	1	2141	0	2633	1
174	0	666	1	1158	1	1650	1	2142	0	2634	1
175	0	667	0	1159	0	1651	0	2143	0	2635	1
176	0	668	1	1160	0	1652	1	2144	0	2636	0
177	0	669	0	1161	1	1653	0	2145	1	2637	0
178	0	670	1	1162	1	1654	0	2146	0	2638	0
179	0	671	0	1163	0	1655	1	2147	1	2639	1
180	1	672	1	1164	0	1656	0	2148	1	2640	0
181	0	673	1	1165	1	1657	1	2149	0	2641	1
182	1	674	1	1166	1	1658	1	2150	1	2642	0
183	1	675	0	1167	1	1659	0	2151	1	2643	0
184	0	676	0	1168	0	1660	1	2152	0	2644	0
185	0	677	1	1169	0	1661	0	2153	1	2645	1
186	1	678	0	1170	1	1662	0	2154	0	2646	0
187	0	679	0	1171	1	1663	0	2155	1	2647	1
188	1	680	0	1172	1	1664	0	2156	0	2648	1
189	0	681	1	1173	1	1665	0	2157	0	2649	0
190	1	682	0	1174	1	1666	1	2158	1	2650	1
191	1	683	1	1175	0	1667	0	2159	0	2651	1
192	0	684	1	1176	1	1668	1	2160	0	2652	0
193	0	685	0	1177	0	1669	0	2161	0	2653	0

194	0	686	0	1178	1	1670	0	2162	0	2654	1
195	1	687	1	1179	1	1671	1	2163	0	2655	1
196	1	688	1	1180	1	1672	0	2164	0	2656	1
197	0	689	1	1181	1	1673	0	2165	1	2657	1
198	0	690	1	1182	0	1674	1	2166	0	2658	1
199	1	691	0	1183	0	1675	0	2167	0	2659	0
200	1	692	0	1184	0	1676	0	2168	0	2660	0
201	0	693	1	1185	0	1677	0	2169	1	2661	0
202	1	694	0	1186	0	1678	1	2170	1	2662	1
203	1	695	0	1187	0	1679	1	2171	0	2663	1
204	1	696	0	1188	0	1680	1	2172	1	2664	1
205	1	697	1	1189	0	1681	0	2173	0	2665	0
206	0	698	0	1190	0	1682	0	2174	0	2666	1
207	1	699	0	1191	0	1683	1	2175	1	2667	1
208	1	700	0	1192	1	1684	0	2176	1	2668	0
209	0	701	1	1193	0	1685	0	2177	0	2669	1
210	1	702	1	1194	0	1686	1	2178	1	2670	0
211	1	703	0	1195	0	1687	0	2179	0	2671	0
212	1	704	1	1196	1	1688	0	2180	0	2672	1
213	0	705	0	1197	0	1689	0	2181	0	2673	1
214	1	706	0	1198	1	1690	0	2182	1	2674	0
215	1	707	1	1199	1	1691	1	2183	0	2675	1
216	1	708	0	1200	1	1692	0	2184	0	2676	1
217	0	709	1	1201	1	1693	1	2185	0	2677	0
218	1	710	0	1202	1	1694	1	2186	1	2678	0
219	0	711	1	1203	1	1695	0	2187	0	2679	0
220	0	712	1	1204	1	1696	1	2188	0	2680	1
221	1	713	0	1205	1	1697	1	2189	0	2681	0
222	0	714	0	1206	0	1698	0	2190	1	2682	1
223	1	715	1	1207	0	1699	0	2191	0	2683	1
224	0	716	1	1208	1	1700	0	2192	0	2684	1
225	1	717	0	1209	1	1701	0	2193	1	2685	0
226	1	718	0	1210	0	1702	0	2194	0	2686	1
227	1	719	0	1211	1	1703	1	2195	0	2687	0
228	1	720	1	1212	1	1704	0	2196	1	2688	0
229	1	721	0	1213	0	1705	1	2197	1	2689	0
230	0	722	0	1214	1	1706	1	2198	1	2690	1
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241	1	733	1	1225	1	1717	1	2209	1	2701	1
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