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

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ABSTRACT. The continued fraction conjecture claims that the continued fraction defined by the (a, b)-Thue-Morse sequence is algebraic over $\mathbb{F}_2(x)$ for all pairs of distinct elements (a, b) in $\mathbb{F}_2[x] \setminus \mathbb{F}_2$. In this paper we prove the conjecture for $(a, b) = (z^6 + z^3 + z, z + 1)$.

1. INTRODUCTION

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

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Theorem 1.1. *When* $(a,b)=(z^6+z^3+z,z+1)$*, the two power series* $\mathrm{CF}(a,b)$ *and* $\mathrm{CF}(b,a)$ *are algebraic over* $\mathbb{F}_2(z)$*, with minimal polynomials of the form*

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

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

$$\begin{aligned}
p_0(z)&=z^{21}+z^{20}+z^{18}+z^{17}+z^{16}+z^8+z+1,\\
p_1(z)&=z^{27}+z^{26}+z^{22}+z^{20}+z^{19}+z^{16}+z^{15}+z^{14}+z^9+z^8+z^7+z^6+z^5\\
&\quad+z^4+z^2+z,\\
p_2(z)&=z^{28}+z^{26}+z^{14}+z^{12}+z^{10}+z^8+z^6+z^2,\\
p_3(z)&=z^{27}+z^{26}+z^{22}+z^{20}+z^{19}+z^{16}+z^{15}+z^{14}+z^9+z^8+z^7+z^6+z^5\\
&\quad+z^4+z^2+z,\\
p_4(z)&=z^{26}+z^{21}+z^{20}+z^{18}+z^{17}+z^{14}+z^{12}+z^{10}+z^8+z^6+z^4+z^2+z,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z)&=z^{24}+z^{21}+z^{20}+z^{18}+z^{17}+z^{16}+z^{12}+z^8+z,\\
p_1(z)&=z^{27}+z^{26}+z^{22}+z^{20}+z^{19}+z^{16}+z^{15}+z^{14}+z^9+z^8+z^7+z^6+z^5\\
&\quad+z^4+z^2+z,\\
p_2(z)&=z^{28}+z^{26}+z^{14}+z^{12}+z^{10}+z^8+z^6+z^2,\\
p_3(z)&=z^{27}+z^{26}+z^{22}+z^{20}+z^{19}+z^{16}+z^{15}+z^{14}+z^9+z^8+z^7+z^6+z^5\\
&\quad+z^4+z^2+z,\\
p_4(z)&=z^{26}+z^{24}+z^{21}+z^{20}+z^{18}+z^{17}+z^{14}+z^{10}+z^8+z^6+z^4+z^2+z+1\\
&.
\end{aligned}$$

2. Proof

Define the sequences of polynomials $(P_n(z))_{n\ge0}$ and $(Q_n(z))_{n\ge0}$ by

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

By the basic properties of continued fractions, we have

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

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

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

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

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

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

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

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

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

for some positive integer d_n. Hence,

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

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

Actually, we will prove that for all $0 \leq i, j \leq 1$ 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 $a_0, a_1, \ldots, a_{n-1} \in \mathbb{F}_2$ $P(x, \sum_{j=0}^{n-1} a_j x^j) = O(x^n)$ and $Q(x, y) := P(x, \sum_{j=0}^{n-1} a_j x^j + x^n y)$ can be written as $x^m \sum_{j=0}^{\infty} q_j(x) y^j$ where $q_j(x)$ are polynomials for $j \geq 0$, $q_1(0) = 1$, and $q_j(0) = 0$ for $j > 1$, then there exists a unique solution $f(x) \in \mathbb{F}_2[[x]]$ of $P(x, f(x)) = 0$ that satisfies the initial condition $f_n(x) = \sum_{j=0}^{n-1} a_j x^j$.

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

Lemma 2.1. *We have*

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

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

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

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

Proof. We give the proof of the identity

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

the proofs of the others being similar.

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

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

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

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

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

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

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

Define

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

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

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

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

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

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

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 $u = 2^{2k}$,

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

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

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

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

which can be rewritten as

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

$$0 = T[[w]_2] + T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.8}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.9}$$

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

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

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

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

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

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

$$0 = T[[w]_2] + T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.15}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1001w]_2], \tag{2.16}$$

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

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

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

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

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 4035 states; its transition function and output function can be found in the annex. Let $A(s, w)$ denote the state reached after reading w from right to left starting from the state s, and τ the output function. Define

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

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

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,11)) + \tau(A(s,101)) + \tau(A(s,110)) + \tau(A(s,111)), \tag{2.21}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100))$$

$$+\tau(A(s,101))+\tau(A(s,1000)), \tag{2.22}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,100))\\&\quad+\tau(A(s,101))+\tau(A(s,110))+\tau(A(s,1001)),\end{aligned} \tag{2.23}$$

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

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))\\&\quad+\tau(A(s,1011)),\end{aligned} \tag{2.25}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,100))\\&\quad+\tau(A(s,1100)),\end{aligned} \tag{2.26}$$

$$\begin{aligned}0 &= \tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,100))\\&\quad+\tau(A(s,101))+\tau(A(s,1101)),\end{aligned} \tag{2.27}$$

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

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

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

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,100))\\&\quad+\tau(A(s,101))+\tau(A(s,110))+\tau(A(s,1001)),\end{aligned} \tag{2.30}$$

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

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))\\&\quad+\tau(A(s,1011)),\end{aligned} \tag{2.32}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,100))\\&\quad+\tau(A(s,1100)),\end{aligned} \tag{2.33}$$

$$\begin{aligned}0 &= \tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,100))\\&\quad+\tau(A(s,101))+\tau(A(s,1101)),\end{aligned} \tag{2.34}$$

for $s = A(i, 0^{2k})$. We find that $(A(i,0^{76}), E_{76}) = (A(i,0^{16}), E_{16})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 38$, 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 $u = 2^{2k-1}$,*

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

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

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

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

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

We give the proof of

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

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

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

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

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

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

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

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

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 $0 \le j, k \le 1$,

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

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

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

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

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

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

Define

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

where

$$\begin{aligned}
q_0(x) &= x^{28} + x^{27} + x^{20} + x^{12} + x^{11} + x^{10} + x^8 + x^7,\\
q_1(x) &= x^{27} + x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{14} + x^{13} + x^{12} + x^9\\
&\quad + x^8 + x^6 + x^2 + x,\\
q_2(x) &= x^{26} + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^2 + 1,\\
q_3(x) &= x^{27} + x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{14} + x^{13} + x^{12} + x^9\\
&\quad + x^8 + x^6 + x^2 + x,\\
q_4(x) &= x^{27} + x^{26} + x^{24} + x^{22} + x^{20} + x^{18} + x^{16} + x^{14} + x^{11} + x^{10} + x^8 + x^7\\
&\quad + x^2.
\end{aligned}$$

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

$$\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{126} + x^{124} + x^{122} + x^{114} + x^{112} + x^{110} + x^{108} + x^{106}\\
&\quad + x^{102} + x^{98} + x^{92} + x^{90} + x^{86} + x^{82} + x^{80} + x^{76} + x^{66} + x^{64} + x^{62}\\
&\quad + x^{60} + x^{56} + x^{54} + x^{52} + x^{50} + x^{44} + x^{42} + x^{24} + x^{18} + x^{12},\\
p_3(x) &= x^{128} + x^{120} + x^{118} + x^{110} + x^{106} + x^{102} + x^{100} + x^{96} + x^{92} + x^{90}\\
&\quad + x^{84} + x^{82} + x^{76} + x^{74} + x^{72} + x^{68} + x^{66} + x^{64} + x^{56} + x^{54} + x^{52}\\
&\quad + x^{50} + x^{46} + x^{42} + x^{36} + x^{30} + x^{26} + x^{22} + x^{20} + x^{12} + x^{10} + x^8,\\
p_6(x) &= x^{126} + x^{118} + x^{110} + x^{108} + x^{102} + x^{100} + x^{98} + x^{86} + x^{84} + x^{76}\\
&\quad + x^{72} + x^{70} + x^{68} + x^{66} + x^{62} + x^{56} + x^{54} + x^{52} + x^{46} + x^{44} + x^{42}\\
&\quad + x^{38} + x^{36} + x^{32} + x^{26} + x^{24} + x^{20} + x^{18} + x^{16} + x^{14} + x^{10} + x^8
\end{aligned}$$

$$
\begin{aligned}
&+ x^2 + 1,\\
p_9(x) &= x^{130} + x^{128} + x^{126} + x^{124} + x^{118} + x^{114} + x^{110} + x^{108} + x^{102} + x^{100}\\
&+ x^{98} + x^{96} + x^{86} + x^{76} + x^{74} + x^{72} + x^{68} + x^{66} + x^{64} + x^{58} + x^{46}\\
&+ x^{44} + x^{40} + x^{36} + x^{34} + x^{28} + x^{26} + x^{10} + x^8 + x^2,\\
p_{12}(x) &= x^{130} + x^{126} + x^{122} + x^{120} + x^{118} + x^{114} + x^{112} + x^{110} + x^{106} + x^{104}\\
&+ x^{102} + x^{98} + x^{96} + x^{94} + x^{90} + x^{88} + x^{86} + x^{80} + x^{66} + x^{62} + x^{58}\\
&+ x^{56} + x^{54} + x^{48} + x^{18} + x^{14} + x^{10} + x^8 + x^6 + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{137} + x^{135} + x^{133}\\
&+ x^{131} + x^{130} + x^{129} + x^{128} + x^{126} + x^{124} + x^{121} + x^{120} + x^{119}\\
&+ x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107}\\
&+ x^{106} + x^{105} + x^{101} + x^{100} + x^{98} + x^{97} + x^{96} + x^{93} + x^{92} + x^{91}\\
&+ x^{88} + x^{86} + x^{83} + x^{81} + x^{78} + x^{77} + x^{76} + x^{74} + x^{69} + x^{67} + x^{65}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{49} + x^{47}\\
&+ x^{46} + x^{45} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37} + x^{36} + x^{34} + x^{32} + x^{27},\\
p_3(x) &= x^{145} + x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{127} + x^{125} + x^{124} + x^{123} + x^{120} + x^{118} + x^{117} + x^{112} + x^{106}\\
&+ x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{88} + x^{87} + x^{85}\\
&+ x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{72} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{49} + x^{41} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32}\\
&+ x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{17} + x^{15} + x^{14} + x^{12} + x^{11}\\
&+ x^9,\\
p_6(x) &= x^{144} + x^{143} + x^{140} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{120} + x^{119} + x^{117} + x^{113} + x^{112} + x^{111} + x^{106} + x^{104}\\
&+ x^{99} + x^{98} + x^{96} + x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{85} + x^{81} + x^{78}\\
&+ x^{77} + x^{75} + x^{72} + x^{68} + x^{65} + x^{62} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{53} + x^{51} + x^{49} + x^{45} + x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{33}\\
&+ x^{31} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17}\\
&+ x^{16} + x^{14} + x^{13} + x^{10} + x^8 + x^7 + x^6,\\
p_9(x) &= x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{131} + x^{130}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{117} + x^{115} + x^{112} + x^{109} + x^{107}\\
&+ x^{104} + x^{98} + x^{97} + x^{94} + x^{93} + x^{92} + x^{90} + x^{88} + x^{87} + x^{86} + x^{82}\\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65}\\
&+ x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{52} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{44} + x^{40} + x^{39} + x^{38} + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{25} + x^{24}\\
&+ x^{19} + x^{18} + x^{16} + x^{15} + x^{10} + x^{9} + x^{7} + x^{6} + x^{3},\\
p_{12}(x) &= x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{131} + x^{130} + x^{127}\\
&+ x^{126} + x^{123} + x^{121} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110}\\
&+ x^{107} + x^{105} + x^{104} + x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74}\\
&+ x^{71} + x^{70} + x^{67} + x^{66} + x^{63} + x^{61} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55}\\
&+ x^{54} + x^{51} + x^{49} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{22}\\
&+ x^{19} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{146} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{137} + x^{135} + x^{133}\\
&+ x^{131} + x^{130} + x^{129} + x^{128} + x^{126} + x^{124} + x^{121} + x^{120} + x^{119}\\
&+ x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107}\\
&+ x^{106} + x^{105} + x^{101} + x^{100} + x^{98} + x^{97} + x^{96} + x^{93} + x^{92} + x^{91}\\
&+ x^{88} + x^{86} + x^{83} + x^{81} + x^{78} + x^{77} + x^{76} + x^{74} + x^{69} + x^{67} + x^{65}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{57} + x^{54} + x^{52} + x^{50} + x^{49} + x^{47}\\
&+ x^{46} + x^{45} + x^{42} + x^{41} + x^{40} + x^{39} + x^{37} + x^{36} + x^{34} + x^{32} + x^{27},\\
p_3(x) &= x^{145} + x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{127} + x^{125} + x^{124} + x^{123} + x^{120} + x^{118} + x^{117} + x^{112} + x^{106}\\
&+ x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{88} + x^{87} + x^{85}\\
&+ x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{72} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{49} + x^{41} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32}\\
&+ x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{17} + x^{15} + x^{14} + x^{12} + x^{11}\\
&+ x^{9},\\
p_6(x) &= x^{144} + x^{143} + x^{140} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{120} + x^{119} + x^{117} + x^{113} + x^{112} + x^{111} + x^{106} + x^{104}\\
&+ x^{99} + x^{98} + x^{96} + x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{85} + x^{81} + x^{78}\\
&+ x^{77} + x^{75} + x^{72} + x^{68} + x^{65} + x^{62} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{53} + x^{51} + x^{49} + x^{45} + x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{33}\\
&+ x^{31} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17}\\
&+ x^{16} + x^{14} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_9(x) &= x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{131} + x^{130}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{117} + x^{115} + x^{112} + x^{109} + x^{107}\\
&+ x^{104} + x^{98} + x^{97} + x^{94} + x^{93} + x^{92} + x^{90} + x^{88} + x^{87} + x^{86} + x^{82}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65}\\
&+ x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{52} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45}\\
&+ x^{44} + x^{40} + x^{39} + x^{38} + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{25} + x^{24}\\
&+ x^{19} + x^{18} + x^{16} + x^{15} + x^{10} + x^{9} + x^{7} + x^{6} + x^{3},\\
p_{12}(x) = {}& x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{131} + x^{130} + x^{127}\\
&+ x^{126} + x^{123} + x^{121} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110}\\
&+ x^{107} + x^{105} + x^{104} + x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74}\\
&+ x^{71} + x^{70} + x^{67} + x^{66} + x^{63} + x^{61} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55}\\
&+ x^{54} + x^{51} + x^{49} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{22}\\
&+ x^{19} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{162} + x^{146} + x^{144} + x^{142} + x^{140} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130}\\
&+ x^{128} + x^{126} + x^{118} + x^{112} + x^{110} + x^{104} + x^{102} + x^{96} + x^{94} + x^{92}\\
&+ x^{90} + x^{88} + x^{86} + x^{84} + x^{82} + x^{74} + x^{72} + x^{66} + x^{58} + x^{56} + x^{52}\\
&+ x^{48} + x^{42},\\
p_3(x) = {}& x^{156} + x^{152} + x^{148} + x^{140} + x^{138} + x^{134} + x^{130} + x^{126} + x^{124} + x^{118}\\
&+ x^{116} + x^{114} + x^{112} + x^{110} + x^{100} + x^{98} + x^{94} + x^{90} + x^{86} + x^{84}\\
&+ x^{80} + x^{66} + x^{64} + x^{60} + x^{58} + x^{54} + x^{50} + x^{44} + x^{42} + x^{36} + x^{34}\\
&+ x^{32} + x^{28} + x^{26} + x^{22} + x^{20} + x^{8} + x^{6},\\
p_6(x) = {}& x^{156} + x^{154} + x^{152} + x^{150} + x^{136} + x^{132} + x^{130} + x^{122} + x^{116} + x^{114}\\
&+ x^{112} + x^{102} + x^{100} + x^{94} + x^{86} + x^{84} + x^{82} + x^{80} + x^{76} + x^{72} + x^{68}\\
&+ x^{66} + x^{60} + x^{56} + x^{52} + x^{46} + x^{44} + x^{42} + x^{40} + x^{24} + x^{22} + x^{12}\\
&+ x^{6} + 1,\\
p_9(x) = {}& x^{154} + x^{150} + x^{146} + x^{144} + x^{140} + x^{136} + x^{134} + x^{128} + x^{126} + x^{118}\\
&+ x^{116} + x^{112} + x^{108} + x^{106} + x^{104} + x^{92} + x^{86} + x^{82} + x^{74} + x^{72}\\
&+ x^{70} + x^{68} + x^{60} + x^{54} + x^{48} + x^{46} + x^{44} + x^{36} + x^{34} + x^{32} + x^{28}\\
&+ x^{26} + x^{20} + x^{16} + x^{14} + x^{12} + x^{4} + x^{2},\\
p_{12}(x) = {}& x^{154} + x^{152} + x^{114} + x^{112} + x^{106} + x^{104} + x^{98} + x^{96} + x^{90} + x^{88}\\
&+ x^{82} + x^{80} + x^{74} + x^{72} + x^{50} + x^{48} + x^{42} + x^{40} + x^{26} + x^{24} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{162} + x^{158} + x^{156} + x^{154} + x^{150} + x^{146} + x^{144} + x^{138} + x^{134} + x^{130}\\
&+ x^{122} + x^{118} + x^{116} + x^{110} + x^{108} + x^{106} + x^{102} + x^{96} + x^{88} + x^{84}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{82} + x^{74} + x^{68} + x^{64} + x^{52} + x^{50} + x^{42} + x^{38} + x^{36} + x^{34} + x^{28}\\
&+ x^{26} + x^{22} + x^{18} + x^{16} + x^{14} + x^{12},\\
p_3(x) &= x^{156} + x^{148} + x^{146} + x^{142} + x^{140} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124}\\
&+ x^{118} + x^{116} + x^{114} + x^{112} + x^{106} + x^{102} + x^{98} + x^{94} + x^{88} + x^{78}\\
&+ x^{76} + x^{74} + x^{72} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} + x^{54} + x^{48} + x^{46}\\
&+ x^{44} + x^{42} + x^{40} + x^{38} + x^{34} + x^{32} + x^{30} + x^{24} + x^{22} + x^{18} + x^{16}\\
&+ x^{10} + x^{8},\\
p_6(x) &= x^{156} + x^{154} + x^{148} + x^{144} + x^{142} + x^{130} + x^{126} + x^{124} + x^{122} + x^{116}\\
&+ x^{110} + x^{106} + x^{102} + x^{100} + x^{94} + x^{90} + x^{88} + x^{86} + x^{84} + x^{82}\\
&+ x^{76} + x^{74} + x^{68} + x^{66} + x^{64} + x^{54} + x^{46} + x^{42} + x^{24} + x^{22} + x^{20}\\
&+ x^{18} + x^{16} + x^{12} + x^{8} + x^{6} + x^{4} + 1,\\
p_9(x) &= x^{154} + x^{150} + x^{146} + x^{144} + x^{140} + x^{136} + x^{134} + x^{128} + x^{126} + x^{118}\\
&+ x^{116} + x^{112} + x^{108} + x^{106} + x^{104} + x^{92} + x^{86} + x^{82} + x^{74} + x^{72}\\
&+ x^{70} + x^{68} + x^{60} + x^{54} + x^{48} + x^{46} + x^{44} + x^{36} + x^{34} + x^{32} + x^{28}\\
&+ x^{26} + x^{20} + x^{16} + x^{14} + x^{12} + x^{4} + x^{2},\\
p_{12}(x) &= x^{154} + x^{152} + x^{114} + x^{112} + x^{106} + x^{104} + x^{98} + x^{96} + x^{90} + x^{88}\\
&+ x^{82} + x^{80} + x^{74} + x^{72} + x^{50} + x^{48} + x^{42} + x^{40} + x^{26} + x^{24} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{135} + x^{134} + x^{131} + x^{129} + x^{128} + x^{124} + x^{121} + x^{120}\\
&+ x^{119} + x^{117} + x^{115} + x^{111} + x^{108} + x^{106} + x^{102} + x^{100} + x^{97} + x^{95}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{81} + x^{80} + x^{76}\\
&+ x^{75} + x^{74} + x^{69} + x^{68} + x^{65} + x^{61} + x^{60} + x^{59} + x^{56} + x^{54} + x^{52}\\
&+ x^{51} + x^{49} + x^{48} + x^{45} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{30} + x^{29}\\
&+ x^{27} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{18},\\
p_3(x) &= x^{145} + x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{127} + x^{125} + x^{124} + x^{123} + x^{120} + x^{118} + x^{117} + x^{112} + x^{106}\\
&+ x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{88} + x^{87} + x^{85}\\
&+ x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{72} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{49} + x^{41} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32}\\
&+ x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{17} + x^{15} + x^{14} + x^{12} + x^{11}\\
&+ x^{9},\\
p_6(x) &= x^{144} + x^{143} + x^{140} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{120} + x^{119} + x^{117} + x^{113} + x^{112} + x^{111} + x^{106} + x^{104}\\
&+ x^{99} + x^{98} + x^{96} + x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{85} + x^{81} + x^{78}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{77} + x^{75} + x^{72} + x^{68} + x^{65} + x^{62} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{53} + x^{51} + x^{49} + x^{45} + x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{33}\\
&+ x^{31} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17}\\
&+ x^{16} + x^{14} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_9(x) = {}& x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{131} + x^{130}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{117} + x^{115} + x^{112} + x^{109} + x^{107}\\
&+ x^{104} + x^{98} + x^{97} + x^{94} + x^{93} + x^{92} + x^{90} + x^{88} + x^{87} + x^{86} + x^{82}\\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65}\\
&+ x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{52} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45}\\
&+ x^{44} + x^{40} + x^{39} + x^{38} + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{25} + x^{24}\\
&+ x^{19} + x^{18} + x^{16} + x^{15} + x^{10} + x^{9} + x^{7} + x^{6} + x^{3},\\
p_{12}(x) = {}& x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{131} + x^{130} + x^{127}\\
&+ x^{126} + x^{123} + x^{121} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110}\\
&+ x^{107} + x^{105} + x^{104} + x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74}\\
&+ x^{71} + x^{70} + x^{67} + x^{66} + x^{63} + x^{61} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55}\\
&+ x^{54} + x^{51} + x^{49} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{22}\\
&+ x^{19} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{144} + x^{135} + x^{134} + x^{131} + x^{129} + x^{128} + x^{124} + x^{121} + x^{120}\\
&+ x^{119} + x^{117} + x^{115} + x^{111} + x^{108} + x^{106} + x^{102} + x^{100} + x^{97} + x^{95}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{81} + x^{80} + x^{76}\\
&+ x^{75} + x^{74} + x^{69} + x^{68} + x^{65} + x^{61} + x^{60} + x^{59} + x^{56} + x^{54} + x^{52}\\
&+ x^{51} + x^{49} + x^{48} + x^{45} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{30} + x^{29}\\
&+ x^{27} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{18},\\
p_3(x) = {}& x^{145} + x^{142} + x^{141} + x^{138} + x^{136} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128}\\
&+ x^{127} + x^{125} + x^{124} + x^{123} + x^{120} + x^{118} + x^{117} + x^{112} + x^{106}\\
&+ x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{88} + x^{87} + x^{85}\\
&+ x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{72} + x^{66} + x^{65} + x^{62} + x^{60} + x^{59}\\
&+ x^{55} + x^{54} + x^{52} + x^{51} + x^{49} + x^{41} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32}\\
&+ x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{17} + x^{15} + x^{14} + x^{12} + x^{11}\\
&+ x^{9},\\
p_6(x) = {}& x^{144} + x^{143} + x^{140} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{125} + x^{124}\\
&+ x^{123} + x^{120} + x^{119} + x^{117} + x^{113} + x^{112} + x^{111} + x^{106} + x^{104}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{99} + x^{98} + x^{96} + x^{93} + x^{92} + x^{91} + x^{88} + x^{87} + x^{85} + x^{81} + x^{78}\\
&+ x^{77} + x^{75} + x^{72} + x^{68} + x^{65} + x^{62} + x^{61} + x^{59} + x^{58} + x^{57} + x^{56}\\
&+ x^{53} + x^{51} + x^{49} + x^{45} + x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{33}\\
&+ x^{31} + x^{30} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{22} + x^{20} + x^{18} + x^{17}\\
&+ x^{16} + x^{14} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_9(x) = {}& x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{136} + x^{135} + x^{134} + x^{131} + x^{130}\\
&+ x^{124} + x^{123} + x^{121} + x^{120} + x^{117} + x^{115} + x^{112} + x^{109} + x^{107}\\
&+ x^{104} + x^{98} + x^{97} + x^{94} + x^{93} + x^{92} + x^{90} + x^{88} + x^{87} + x^{86} + x^{82}\\
&+ x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{65}\\
&+ x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{52} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45}\\
&+ x^{44} + x^{40} + x^{39} + x^{38} + x^{36} + x^{35} + x^{34} + x^{30} + x^{28} + x^{25} + x^{24}\\
&+ x^{19} + x^{18} + x^{16} + x^{15} + x^{10} + x^{9} + x^{7} + x^{6} + x^{3},\\
p_{12}(x) = {}& x^{142} + x^{141} + x^{140} + x^{139} + x^{138} + x^{135} + x^{134} + x^{131} + x^{130} + x^{127}\\
&+ x^{126} + x^{123} + x^{121} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110}\\
&+ x^{107} + x^{105} + x^{104} + x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74}\\
&+ x^{71} + x^{70} + x^{67} + x^{66} + x^{63} + x^{61} + x^{60} + x^{58} + x^{57} + x^{56} + x^{55}\\
&+ x^{54} + x^{51} + x^{49} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{22}\\
&+ x^{19} + x^{18} + x^{15} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{7} + x^{6} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{132} + x^{128} + x^{122} + x^{118} + x^{116} + x^{114} + x^{112} + x^{110} + x^{108} + x^{104}\\
&+ x^{98} + x^{90} + x^{88} + x^{82} + x^{80} + x^{78} + x^{72} + x^{64} + x^{62} + x^{60} + x^{58}\\
&+ x^{56} + x^{54} + x^{52} + x^{48} + x^{46} + x^{40} + x^{36} + x^{34} + x^{32} + x^{24},\\
p_3(x) = {}& x^{126} + x^{122} + x^{120} + x^{114} + x^{112} + x^{104} + x^{100} + x^{96} + x^{86} + x^{82}\\
&+ x^{80} + x^{78} + x^{72} + x^{70} + x^{66} + x^{64} + x^{58} + x^{56} + x^{50} + x^{36} + x^{26}\\
&+ x^{20} + x^{18} + x^{16} + x^{10} + x^{6},\\
p_6(x) = {}& x^{128} + x^{126} + x^{122} + x^{116} + x^{110} + x^{104} + x^{98} + x^{92} + x^{82} + x^{78}\\
&+ x^{76} + x^{72} + x^{64} + x^{60} + x^{58} + x^{56} + x^{52} + x^{48} + x^{42} + x^{40} + x^{38}\\
&+ x^{34} + x^{32} + x^{22} + x^{20} + x^{16} + x^{14} + x^{8} + x^{6} + x^{4} + x^{2} + 1,\\
p_9(x) = {}& x^{130} + x^{128} + x^{126} + x^{124} + x^{118} + x^{114} + x^{110} + x^{108} + x^{102} + x^{100}\\
&+ x^{98} + x^{96} + x^{86} + x^{76} + x^{74} + x^{72} + x^{68} + x^{66} + x^{64} + x^{58} + x^{46}\\
&+ x^{44} + x^{40} + x^{36} + x^{34} + x^{28} + x^{26} + x^{10} + x^{8} + x^{2},\\
p_{12}(x) = {}& x^{130} + x^{126} + x^{122} + x^{120} + x^{118} + x^{114} + x^{112} + x^{110} + x^{106} + x^{104}\\
&+ x^{102} + x^{98} + x^{96} + x^{94} + x^{90} + x^{88} + x^{86} + x^{80} + x^{66} + x^{62} + x^{58}
\end{aligned}
$$

$$+ x^{56} + x^{54} + x^{48} + x^{18} + x^{14} + x^{10} + x^{8} + x^{6} + 1,$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{147} + x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} \\
& + x^{134} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128} + x^{123} + x^{122} + x^{121} \\
& + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{111} + x^{109} + x^{103} + x^{101} \\
& + x^{98} + x^{95} + x^{92} + x^{90} + x^{89} + x^{84} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} \\
& + x^{73} + x^{72} + x^{66} + x^{64} + x^{61} + x^{58} + x^{57} + x^{53} + x^{52} + x^{49} + x^{48} \\
& + x^{43} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{33} + x^{29} + x^{28} + x^{27} + x^{24} \\
& + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12}, \\
p_3(x) = {} & x^{146} + x^{142} + x^{141} + x^{140} + x^{137} + x^{136} + x^{133} + x^{130} + x^{129} + x^{126} \\
& + x^{124} + x^{121} + x^{119} + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{107} \\
& + x^{105} + x^{104} + x^{102} + x^{101} + x^{96} + x^{94} + x^{93} + x^{92} + x^{89} + x^{84} \\
& + x^{83} + x^{81} + x^{80} + x^{78} + x^{76} + x^{74} + x^{72} + x^{71} + x^{70} + x^{68} + x^{64} \\
& + x^{63} + x^{62} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{47} + x^{46} + x^{44} + x^{37} \\
& + x^{36} + x^{35} + x^{31} + x^{30} + x^{28} + x^{26} + x^{25} + x^{22} + x^{20} + x^{19} + x^{15} \\
& + x^{13} + x^{10} + x^{9} + x^{8}, \\
p_6(x) = {} & x^{146} + x^{142} + x^{139} + x^{138} + x^{135} + x^{134} + x^{133} + x^{131} + x^{130} + x^{127} \\
& + x^{125} + 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^{104} + x^{103} + x^{102} + x^{101} + x^{100} \\
& + x^{99} + x^{96} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{89} + x^{85} + x^{84} + x^{83} \\
& + x^{81} + x^{77} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} \\
& + x^{57} + x^{56} + x^{52} + x^{51} + x^{50} + x^{46} + x^{45} + x^{44} + x^{43} + x^{40} + x^{39} \\
& + x^{35} + x^{34} + x^{30} + x^{28} + x^{26} + x^{25} + x^{23} + x^{21} + x^{19} + x^{16} + x^{13} \\
& + x^{12} + x^{11} + x^{10} + x^{8} + x^{7} + x^{5} + x^{4} + x^{3} + x + 1, \\
p_9(x) = {} & x^{146} + x^{145} + x^{144} + x^{143} + x^{141} + x^{140} + x^{134} + x^{133} + x^{132} + x^{131} \\
& + x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} \\
& + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} \\
& + x^{102} + x^{99} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{82} \\
& + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{70} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} \\
& + x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{52} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} \\
& + x^{28} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} \\
& + x^{4}, \\
p_{12}(x) = {} & x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{135} + x^{133} + x^{132} \\
& + x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{119} + x^{118} + x^{115} + x^{113}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106} + x^{103} + x^{102} + x^{99} + x^{98}\\
&+ x^{95} + x^{93} + x^{92} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{79} + x^{78} + x^{75}\\
&+ x^{74} + x^{71} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{54}\\
&+ x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{27}\\
&+ x^{26} + x^{23} + x^{21} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^{6}\\
&+ x^{5} + x^{4} + x^{3} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{164} + x^{161} + x^{159} + x^{156} + x^{153} + x^{152} + x^{151} + x^{150} + x^{149} + x^{148}\\
&+ x^{145} + x^{144} + x^{140} + x^{139} + x^{138} + x^{137} + x^{135} + x^{134} + x^{133}\\
&+ x^{132} + x^{131} + x^{128} + x^{125} + x^{123} + x^{122} + x^{120} + x^{117} + x^{115}\\
&+ x^{108} + x^{105} + x^{104} + x^{99} + x^{96} + x^{92} + x^{91} + x^{89} + x^{86} + x^{84} + x^{82}\\
&+ x^{80} + x^{79} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{65} + x^{64} + x^{63}\\
&+ x^{62} + x^{53} + x^{51} + x^{50} + x^{49} + x^{48} + x^{46} + x^{41} + x^{40} + x^{38} + x^{37}\\
&+ x^{36} + x^{35} + x^{33} + x^{32} + x^{30} + x^{28} + x^{27},\\
p_3(x) = {} & x^{157} + x^{156} + x^{154} + x^{153} + x^{152} + x^{149} + x^{148} + x^{147} + x^{146} + x^{144}\\
&+ x^{143} + x^{142} + x^{141} + x^{138} + x^{137} + x^{135} + x^{132} + x^{127} + x^{124}\\
&+ x^{123} + x^{120} + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{109}\\
&+ x^{107} + x^{105} + x^{104} + x^{103} + x^{98} + x^{97} + x^{95} + x^{94} + x^{91} + x^{90}\\
&+ x^{89} + x^{87} + x^{84} + x^{83} + x^{80} + x^{79} + x^{78} + x^{75} + x^{74} + x^{72} + x^{68}\\
&+ x^{66} + x^{65} + x^{62} + x^{61} + x^{54} + x^{53} + x^{51} + x^{48} + x^{43} + x^{41} + x^{39}\\
&+ x^{38} + x^{36} + x^{35} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{21}\\
&+ x^{20} + x^{19} + x^{18} + x^{17} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9},\\
p_6(x) = {} & x^{158} + x^{156} + x^{152} + x^{150} + x^{148} + x^{142} + x^{140} + x^{134} + x^{132} + x^{128}\\
&+ x^{126} + x^{122} + x^{120} + x^{116} + x^{114} + x^{112} + x^{108} + x^{104} + x^{100}\\
&+ x^{90} + x^{88} + x^{86} + x^{84} + x^{80} + x^{78} + x^{72} + x^{68} + x^{66} + x^{62} + x^{56}\\
&+ x^{54} + x^{52} + x^{46} + x^{44} + x^{42} + x^{40} + x^{38} + x^{36} + x^{26} + x^{22} + x^{20}\\
&+ x^{16} + x^{8} + x^{6},\\
p_9(x) = {} & x^{159} + x^{158} + x^{157} + x^{155} + x^{150} + x^{148} + x^{145} + x^{143} + x^{139} + x^{138}\\
&+ x^{136} + x^{135} + x^{131} + x^{127} + x^{125} + x^{119} + x^{116} + x^{110} + x^{107}\\
&+ x^{103} + x^{102} + x^{97} + x^{95} + x^{94} + x^{90} + x^{88} + x^{86} + x^{83} + x^{81} + x^{78}\\
&+ x^{77} + x^{74} + x^{72} + x^{71} + x^{70} + x^{68} + x^{67} + x^{65} + x^{61} + x^{59} + x^{58}\\
&+ x^{56} + x^{52} + x^{51} + x^{47} + x^{46} + x^{45} + x^{43} + x^{38} + x^{36} + x^{33} + x^{30}\\
&+ x^{29} + x^{26} + x^{24} + x^{23} + x^{22} + x^{20} + x^{19} + x^{17} + x^{13} + x^{11} + x^{10}\\
&+ x^{8} + x^{4} + x^{3},
\end{aligned}
$$

$$
\begin{aligned}
p_{12}(x) = {} & x^{160} + x^{156} + x^{148} + x^{144} + x^{132} + x^{128} + x^{116} + x^{112} + x^{108} + x^{92} \\
& + x^{84} + x^{80} + x^{76} + x^{44} + x^{36} + x^{28} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{142} + x^{141} + x^{140} + x^{136} + x^{133} + x^{131} + x^{130} + x^{126} + x^{124} + x^{123} \\
& + x^{122} + x^{120} + x^{117} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110} \\
& + x^{107} + x^{106} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98} + x^{97} + x^{96} \\
& + x^{95} + x^{94} + x^{92} + x^{91} + x^{90} + x^{89} + x^{86} + x^{85} + x^{84} + x^{81} + x^{79} \\
& + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{66} + x^{64} \\
& + x^{62} + x^{61} + x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{47} + x^{41} + x^{39} + x^{37} \\
& + x^{36} + x^{35} + x^{34} + x^{33} + x^{28} + x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{18}, \\
p_3(x) = {} & x^{141} + x^{140} + x^{138} + x^{134} + x^{133} + x^{132} + x^{131} + x^{129} + x^{126} + x^{120} \\
& + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111} \\
& + x^{110} + x^{107} + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{96} + x^{95} + x^{94} \\
& + x^{90} + x^{86} + x^{80} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} \\
& + x^{71} + x^{70} + x^{67} + x^{65} + x^{64} + x^{63} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} \\
& + x^{51} + x^{50} + x^{49} + x^{37} + x^{36} + x^{34} + x^{30} + x^{27} + x^{26} + x^{25} + x^{21} \\
& + x^{20} + x^{19} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^{9}, \\
p_6(x) = {} & x^{142} + x^{140} + x^{138} + x^{132} + x^{128} + x^{126} + x^{120} + x^{118} + x^{116} + x^{114} \\
& + x^{108} + x^{104} + x^{102} + x^{94} + x^{88} + x^{86} + x^{84} + x^{82} + x^{78} + x^{76} + x^{74} \\
& + x^{72} + x^{70} + x^{66} + x^{62} + x^{60} + x^{58} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} \\
& + x^{38} + x^{30} + x^{26} + x^{20} + x^{18} + x^{16} + x^{12} + x^{10} + x^{8} + x^{6}, \\
p_9(x) = {} & x^{143} + x^{142} + x^{141} + x^{138} + x^{137} + x^{133} + x^{132} + x^{128} + x^{127} + x^{124} \\
& + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{112} + x^{111} + x^{108} + x^{107} \\
& + x^{105} + x^{103} + x^{101} + x^{99} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{87} \\
& + x^{84} + x^{83} + x^{79} + x^{78} + x^{77} + x^{74} + x^{73} + x^{69} + x^{68} + x^{64} + x^{62} \\
& + x^{61} + x^{60} + x^{59} + x^{58} + x^{55} + x^{52} + x^{51} + x^{31} + x^{30} + x^{29} + x^{26} \\
& + x^{25} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{7} + x^{4} + x^{3}, \\
p_{12}(x) = {} & x^{144} + x^{132} + x^{124} + x^{112} + x^{108} + x^{92} + x^{84} + x^{68} + x^{64} + x^{60} + x^{52} \\
& + x^{48} + x^{32} + x^{20} + x^{16} + x^{12} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{147} + x^{145} + x^{142} + x^{140} + x^{137} + x^{136} + x^{135} + x^{134} + x^{131} + x^{130} \\
& + x^{129} + x^{128} + x^{121} + x^{120} + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} \\
& + x^{109} + x^{107} + x^{105} + x^{104} + x^{103} + x^{100} + x^{98} + x^{95} + x^{94} + x^{91}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{90} + x^{88} + x^{85} + x^{84} + x^{82} + x^{81} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} \\
&+ x^{71} + x^{68} + x^{64} + x^{63} + x^{60} + x^{56} + x^{49} + x^{47} + x^{46} + x^{43} + x^{41} \\
&+ x^{39} + x^{37} + x^{36} + x^{33}, \\
p_3(x) = {}& x^{146} + x^{144} + x^{143} + x^{138} + x^{137} + x^{133} + x^{131} + x^{129} + x^{127} + x^{124} \\
&+ x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116} + x^{114} + x^{113} \\
&+ x^{112} + x^{108} + x^{106} + x^{104} + x^{103} + x^{102} + x^{97} + x^{95} + x^{94} + x^{93} \\
&+ x^{91} + x^{88} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{75} + x^{74} + x^{73} + x^{70} \\
&+ x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{63} + x^{60} + x^{59} + x^{57} + x^{56} + x^{55} \\
&+ x^{54} + x^{53} + x^{52} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{44} + x^{40} + x^{39} \\
&+ x^{38} + x^{35} + x^{34} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{20} + x^{19} \\
&+ x^{16} + x^{13} + x^{12}, \\
p_6(x) = {}& x^{146} + x^{144} + x^{143} + x^{141} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132} + x^{131} \\
&+ x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} \\
&+ x^{116} + x^{115} + x^{112} + x^{110} + x^{109} + x^{108} + x^{106} + x^{101} + x^{100} \\
&+ x^{99} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{92} + x^{90} + x^{89} + x^{88} + x^{87} \\
&+ x^{86} + x^{85} + x^{81} + x^{80} + x^{78} + x^{75} + x^{73} + x^{72} + x^{70} + x^{62} + x^{61} \\
&+ x^{60} + x^{59} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{46} + x^{44} \\
&+ x^{43} + x^{39} + x^{37} + x^{36} + x^{34} + x^{32} + x^{31} + x^{27} + x^{26} + x^{25} + x^{21} \\
&+ x^{20} + x^{18} + x^{16} + x^{13} + x^{10} + x^{7} + x^{6} + x^{3} + x + 1, \\
p_9(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{141} + x^{140} + x^{134} + x^{133} + x^{132} + x^{131} \\
&+ x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} \\
&+ x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} \\
&+ x^{102} + x^{99} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{82} \\
&+ x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{70} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} \\
&+ x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{52} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} \\
&+ x^{28} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} \\
&+ x^{4}, \\
p_{12}(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{135} + x^{133} + x^{132} \\
&+ x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{119} + x^{118} + x^{115} + x^{113} \\
&+ x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106} + x^{103} + x^{102} + x^{99} + x^{98} \\
&+ x^{95} + x^{93} + x^{92} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{79} + x^{78} + x^{75} \\
&+ x^{74} + x^{71} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{54} \\
&+ x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{27} \\
&+ x^{26} + x^{23} + x^{21} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^{6} \\
&+ x^{5} + x^{4} + 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, 1, 1].

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

$$
\begin{aligned}
p_0(x) = {} & x^{147} + x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{141} + x^{139} + x^{138} + x^{137} \\
& + x^{134} + x^{133} + x^{132} + x^{131} + x^{129} + x^{128} + x^{123} + x^{122} + x^{121} \\
& + x^{118} + x^{117} + x^{116} + x^{115} + x^{113} + x^{111} + x^{109} + x^{103} + x^{101} \\
& + x^{98} + x^{95} + x^{92} + x^{90} + x^{89} + x^{84} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} \\
& + x^{73} + x^{72} + x^{66} + x^{64} + x^{61} + x^{58} + x^{57} + x^{53} + x^{52} + x^{49} + x^{48} \\
& + x^{43} + x^{42} + x^{41} + x^{39} + x^{37} + x^{36} + x^{33} + x^{29} + x^{28} + x^{27} + x^{24} \\
& + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12}, \\
p_3(x) = {} & x^{146} + x^{142} + x^{141} + x^{140} + x^{137} + x^{136} + x^{133} + x^{130} + x^{129} + x^{126} \\
& + x^{124} + x^{121} + x^{119} + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{107} \\
& + x^{105} + x^{104} + x^{102} + x^{101} + x^{96} + x^{94} + x^{93} + x^{92} + x^{89} + x^{84} \\
& + x^{83} + x^{81} + x^{80} + x^{78} + x^{76} + x^{74} + x^{72} + x^{71} + x^{70} + x^{68} + x^{64} \\
& + x^{63} + x^{62} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{47} + x^{46} + x^{44} + x^{37} \\
& + x^{36} + x^{35} + x^{31} + x^{30} + x^{28} + x^{26} + x^{25} + x^{22} + x^{20} + x^{19} + x^{15} \\
& + x^{13} + x^{10} + x^{9} + x^{8}, \\
p_6(x) = {} & x^{146} + x^{142} + x^{139} + x^{138} + x^{135} + x^{134} + x^{133} + x^{131} + x^{130} + x^{127} \\
& + x^{125} + 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^{104} + x^{103} + x^{102} + x^{101} + x^{100} \\
& + x^{99} + x^{96} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{89} + x^{85} + x^{84} + x^{83} \\
& + x^{81} + x^{77} + x^{73} + x^{70} + x^{68} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} \\
& + x^{57} + x^{56} + x^{52} + x^{51} + x^{50} + x^{46} + x^{45} + x^{44} + x^{43} + x^{40} + x^{39} \\
& + x^{35} + x^{34} + x^{30} + x^{28} + x^{26} + x^{25} + x^{23} + x^{21} + x^{19} + x^{16} + x^{13} \\
& + x^{12} + x^{11} + x^{10} + x^{8} + x^{7} + x^{5} + x^{4} + x^{3} + x + 1, \\
p_9(x) = {} & x^{146} + x^{145} + x^{144} + x^{143} + x^{141} + x^{140} + x^{134} + x^{133} + x^{132} + x^{131} \\
& + x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} \\
& + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} \\
& + x^{102} + x^{99} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{82} \\
& + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{70} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} \\
& + x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{52} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} \\
& + x^{28} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} \\
& + x^{4}, \\
p_{12}(x) = {} & x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{135} + x^{133} + x^{132} \\
& + x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{119} + x^{118} + x^{115} + x^{113} \\
& + x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106} + x^{103} + x^{102} + x^{99} + x^{98}
\end{aligned}
$$

$$+ x^{95} + x^{93} + x^{92} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{79} + x^{78} + x^{75} + x^{74} + x^{71} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{27} + x^{26} + x^{23} + x^{21} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^6 + x^5 + x^4 + x^3 + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) &= x^{142} + x^{141} + x^{140} + x^{136} + x^{133} + x^{131} + x^{130} + x^{126} + x^{124} + x^{123} \\
&\quad + x^{122} + x^{120} + x^{117} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111} + x^{110} \\
&\quad + x^{107} + x^{106} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98} + x^{97} + x^{96} \\
&\quad + x^{95} + x^{94} + x^{92} + x^{91} + x^{90} + x^{89} + x^{86} + x^{85} + x^{84} + x^{81} + x^{79} \\
&\quad + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{66} + x^{64} \\
&\quad + x^{62} + x^{61} + x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{47} + x^{41} + x^{39} + x^{37} \\
&\quad + x^{36} + x^{35} + x^{34} + x^{33} + x^{28} + x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{18}, \\
p_3(x) &= x^{141} + x^{140} + x^{138} + x^{134} + x^{133} + x^{132} + x^{131} + x^{129} + x^{126} + x^{120} \\
&\quad + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{114} + x^{113} + x^{112} + x^{111} \\
&\quad + x^{110} + x^{107} + x^{105} + x^{104} + x^{103} + x^{101} + x^{100} + x^{96} + x^{95} + x^{94} \\
&\quad + x^{90} + x^{86} + x^{80} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} \\
&\quad + x^{71} + x^{70} + x^{67} + x^{65} + x^{64} + x^{63} + x^{58} + x^{56} + x^{55} + x^{53} + x^{52} \\
&\quad + x^{51} + x^{50} + x^{49} + x^{37} + x^{36} + x^{34} + x^{30} + x^{27} + x^{26} + x^{25} + x^{21} \\
&\quad + x^{20} + x^{19} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^{11} + x^{10} + x^9, \\
p_6(x) &= x^{142} + x^{140} + x^{138} + x^{132} + x^{128} + x^{126} + x^{120} + x^{118} + x^{116} + x^{114} \\
&\quad + x^{108} + x^{104} + x^{102} + x^{94} + x^{88} + x^{86} + x^{84} + x^{82} + x^{78} + x^{76} + x^{74} \\
&\quad + x^{72} + x^{70} + x^{66} + x^{62} + x^{60} + x^{58} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} \\
&\quad + x^{38} + x^{30} + x^{26} + x^{20} + x^{18} + x^{16} + x^{12} + x^{10} + x^8 + x^6, \\
p_9(x) &= x^{143} + x^{142} + x^{141} + x^{138} + x^{137} + x^{133} + x^{132} + x^{128} + x^{127} + x^{124} \\
&\quad + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{112} + x^{111} + x^{108} + x^{107} \\
&\quad + x^{105} + x^{103} + x^{101} + x^{99} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{87} \\
&\quad + x^{84} + x^{83} + x^{79} + x^{78} + x^{77} + x^{74} + x^{73} + x^{69} + x^{68} + x^{64} + x^{62} \\
&\quad + x^{61} + x^{60} + x^{59} + x^{58} + x^{55} + x^{52} + x^{51} + x^{31} + x^{30} + x^{29} + x^{26} \\
&\quad + x^{25} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^7 + x^4 + x^3, \\
p_{12}(x) &= x^{144} + x^{132} + x^{124} + x^{112} + x^{108} + x^{92} + x^{84} + x^{68} + x^{64} + x^{60} + x^{52} \\
&\quad + x^{48} + x^{32} + x^{20} + x^{16} + x^{12} + x^4 + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{164}+x^{161}+x^{159}+x^{156}+x^{153}+x^{152}+x^{151}+x^{150}+x^{149}+x^{148}\\
&\quad+x^{145}+x^{144}+x^{140}+x^{139}+x^{138}+x^{137}+x^{135}+x^{134}+x^{133}\\
&\quad+x^{132}+x^{131}+x^{128}+x^{125}+x^{123}+x^{122}+x^{120}+x^{117}+x^{115}\\
&\quad+x^{108}+x^{105}+x^{104}+x^{99}+x^{96}+x^{92}+x^{91}+x^{89}+x^{86}+x^{84}+x^{82}\\
&\quad+x^{80}+x^{79}+x^{77}+x^{74}+x^{73}+x^{72}+x^{71}+x^{69}+x^{65}+x^{64}+x^{63}\\
&\quad+x^{62}+x^{53}+x^{51}+x^{50}+x^{49}+x^{48}+x^{46}+x^{41}+x^{40}+x^{38}+x^{37}\\
&\quad+x^{36}+x^{35}+x^{33}+x^{32}+x^{30}+x^{28}+x^{27},\\
p_3(x) &= x^{157}+x^{156}+x^{154}+x^{153}+x^{152}+x^{149}+x^{148}+x^{147}+x^{146}+x^{144}\\
&\quad+x^{143}+x^{142}+x^{141}+x^{138}+x^{137}+x^{135}+x^{132}+x^{127}+x^{124}\\
&\quad+x^{123}+x^{120}+x^{119}+x^{118}+x^{117}+x^{116}+x^{115}+x^{113}+x^{109}\\
&\quad+x^{107}+x^{105}+x^{104}+x^{103}+x^{98}+x^{97}+x^{95}+x^{94}+x^{91}+x^{90}\\
&\quad+x^{89}+x^{87}+x^{84}+x^{83}+x^{80}+x^{79}+x^{78}+x^{75}+x^{74}+x^{72}+x^{68}\\
&\quad+x^{66}+x^{65}+x^{62}+x^{61}+x^{54}+x^{53}+x^{51}+x^{48}+x^{43}+x^{41}+x^{39}\\
&\quad+x^{38}+x^{36}+x^{35}+x^{33}+x^{32}+x^{30}+x^{29}+x^{28}+x^{26}+x^{25}+x^{21}\\
&\quad+x^{20}+x^{19}+x^{18}+x^{17}+x^{14}+x^{12}+x^{11}+x^{10}+x^{9},\\
p_6(x) &= x^{158}+x^{156}+x^{152}+x^{150}+x^{148}+x^{142}+x^{140}+x^{134}+x^{132}+x^{128}\\
&\quad+x^{126}+x^{122}+x^{120}+x^{116}+x^{114}+x^{112}+x^{108}+x^{104}+x^{100}\\
&\quad+x^{90}+x^{88}+x^{86}+x^{84}+x^{80}+x^{78}+x^{72}+x^{68}+x^{66}+x^{62}+x^{56}\\
&\quad+x^{54}+x^{52}+x^{46}+x^{44}+x^{42}+x^{40}+x^{38}+x^{36}+x^{26}+x^{22}+x^{20}\\
&\quad+x^{16}+x^{8}+x^{6},\\
p_9(x) &= x^{159}+x^{158}+x^{157}+x^{155}+x^{150}+x^{148}+x^{145}+x^{143}+x^{139}+x^{138}\\
&\quad+x^{136}+x^{135}+x^{131}+x^{127}+x^{125}+x^{119}+x^{116}+x^{110}+x^{107}\\
&\quad+x^{103}+x^{102}+x^{97}+x^{95}+x^{94}+x^{90}+x^{88}+x^{86}+x^{83}+x^{81}+x^{78}\\
&\quad+x^{77}+x^{74}+x^{72}+x^{71}+x^{70}+x^{68}+x^{67}+x^{65}+x^{61}+x^{59}+x^{58}\\
&\quad+x^{56}+x^{52}+x^{51}+x^{47}+x^{46}+x^{45}+x^{43}+x^{38}+x^{36}+x^{33}+x^{30}\\
&\quad+x^{29}+x^{26}+x^{24}+x^{23}+x^{22}+x^{20}+x^{19}+x^{17}+x^{13}+x^{11}+x^{10}\\
&\quad+x^{8}+x^{4}+x^{3},\\
p_{12}(x) &= x^{160}+x^{156}+x^{148}+x^{144}+x^{132}+x^{128}+x^{116}+x^{112}+x^{108}+x^{92}\\
&\quad+x^{84}+x^{80}+x^{76}+x^{44}+x^{36}+x^{28}+1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{147}+x^{145}+x^{142}+x^{140}+x^{137}+x^{136}+x^{135}+x^{134}+x^{131}+x^{130}\\
&\quad+x^{129}+x^{128}+x^{121}+x^{120}+x^{118}+x^{117}+x^{116}+x^{115}+x^{113}\\
&\quad+x^{109}+x^{107}+x^{105}+x^{104}+x^{103}+x^{100}+x^{98}+x^{95}+x^{94}+x^{91}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{90} + x^{88} + x^{85} + x^{84} + x^{82} + x^{81} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} \\
&+ x^{71} + x^{68} + x^{64} + x^{63} + x^{60} + x^{56} + x^{49} + x^{47} + x^{46} + x^{43} + x^{41} \\
&+ x^{39} + x^{37} + x^{36} + x^{33}, \\
p_3(x) = {}& x^{146} + x^{144} + x^{143} + x^{138} + x^{137} + x^{133} + x^{131} + x^{129} + x^{127} + x^{124} \\
&+ x^{123} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{116} + x^{114} + x^{113} \\
&+ x^{112} + x^{108} + x^{106} + x^{104} + x^{103} + x^{102} + x^{97} + x^{95} + x^{94} + x^{93} \\
&+ x^{91} + x^{88} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{75} + x^{74} + x^{73} + x^{70} \\
&+ x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{63} + x^{60} + x^{59} + x^{57} + x^{56} + x^{55} \\
&+ x^{54} + x^{53} + x^{52} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{44} + x^{40} + x^{39} \\
&+ x^{38} + x^{35} + x^{34} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{20} + x^{19} \\
&+ x^{16} + x^{13} + x^{12}, \\
p_6(x) = {}& x^{146} + x^{144} + x^{143} + x^{141} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132} + x^{131} \\
&+ x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} \\
&+ x^{116} + x^{115} + x^{112} + x^{110} + x^{109} + x^{108} + x^{106} + x^{101} + x^{100} \\
&+ x^{99} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{92} + x^{90} + x^{89} + x^{88} + x^{87} \\
&+ x^{86} + x^{85} + x^{81} + x^{80} + x^{78} + x^{75} + x^{73} + x^{72} + x^{70} + x^{62} + x^{61} \\
&+ x^{60} + x^{59} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{46} + x^{44} \\
&+ x^{43} + x^{39} + x^{37} + x^{36} + x^{34} + x^{32} + x^{31} + x^{27} + x^{26} + x^{25} + x^{21} \\
&+ x^{20} + x^{18} + x^{16} + x^{13} + x^{10} + x^{7} + x^{6} + x^{3} + x + 1, \\
p_9(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{141} + x^{140} + x^{134} + x^{133} + x^{132} + x^{131} \\
&+ x^{130} + x^{127} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} \\
&+ x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} \\
&+ x^{102} + x^{99} + x^{97} + x^{96} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84} + x^{82} \\
&+ x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{70} + x^{69} + x^{68} + x^{67} + x^{65} + x^{64} \\
&+ x^{58} + x^{57} + x^{56} + x^{55} + x^{53} + x^{52} + x^{34} + x^{33} + x^{32} + x^{31} + x^{29} \\
&+ x^{28} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{10} + x^{9} + x^{8} + x^{7} + x^{5} \\
&+ x^{4}, \\
p_{12}(x) = {}& x^{146} + x^{145} + x^{144} + x^{143} + x^{142} + x^{139} + x^{138} + x^{135} + x^{133} + x^{132} \\
&+ x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{119} + x^{118} + x^{115} + x^{113} \\
&+ x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106} + x^{103} + x^{102} + x^{99} + x^{98} \\
&+ x^{95} + x^{93} + x^{92} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{79} + x^{78} + x^{75} \\
&+ x^{74} + x^{71} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{63} + x^{61} + x^{60} + x^{54} \\
&+ x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{27} \\
&+ x^{26} + x^{23} + x^{21} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15} + x^{13} + x^{12} + x^{6} \\
&+ x^{5} + x^{4} + 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, 1, 1].

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]	1009	[1628, 1629]	2018	[889, 1253]	3027	[1033, 2491]
1	[3, 4]	1010	[2, 1630]	2019	[2437, 387]	3028	[3586, 3587]
2	[5, 6]	1011	[1631, 1632]	2020	[2586, 2354]	3029	[3558, 1253]
3	[7, 8]	1012	[1633, 1634]	2021	[302, 361]	3030	[2352, 1093]
4	[9, 10]	1013	[1635, 1636]	2022	[854, 2088]	3031	[2182, 391]
5	[11, 12]	1014	[1637, 1638]	2023	[243, 2390]	3032	[331, 3588]
6	[13, 14]	1015	[1639, 1640]	2024	[87, 2587]	3033	[959, 3589]
7	[15, 16]	1016	[1641, 1642]	2025	[1013, 2345]	3034	[1157, 108]
8	[17, 18]	1017	[1643, 767]	2026	[2588, 2461]	3035	[3534, 1200]
9	[19, 20]	1018	[1644, 1645]	2027	[2429, 1107]	3036	[871, 1128]
10	[21, 22]	1019	[1646, 1647]	2028	[2589, 2590]	3037	[3527, 984]
11	[23, 24]	1020	[1648, 1649]	2029	[871, 1207]	3038	[2448, 3590]
12	[25, 26]	1021	[1650, 1651]	2030	[390, 2591]	3039	[2133, 879]
13	[27, 28]	1022	[1652, 1653]	2031	[2592, 2593]	3040	[837, 1073]
14	[29, 30]	1023	[661, 1654]	2032	[379, 2594]	3041	[3475, 1093]
15	[31, 32]	1024	[1655, 1284]	2033	[901, 2210]	3042	[3591, 2532]
16	[33, 34]	1025	[1348, 1656]	2034	[2595, 2596]	3043	[2209, 1107]
17	[35, 36]	1026	[1657, 1658]	2035	[2200, 2289]	3044	[1147, 1063]
18	[37, 38]	1027	[537, 1659]	2036	[2597, 2444]	3045	[2567, 2280]
19	[39, 40]	1028	[1660, 1661]	2037	[87, 386]	3046	[832, 3592]
20	[41, 42]	1029	[1662, 1663]	2038	[369, 99]	3047	[3593, 2269]
21	[43, 44]	1030	[1551, 1664]	2039	[831, 249]	3048	[260, 3594]
22	[45, 35]	1031	[1665, 1666]	2040	[2598, 964]	3049	[438, 116]
23	[46, 47]	1032	[1667, 1668]	2041	[2388, 996]	3050	[1025, 3505]
24	[48, 49]	1033	[1669, 39]	2042	[431, 29]	3051	[2415, 327]
25	[50, 51]	1034	[1670, 1362]	2043	[425, 1260]	3052	[948, 3595]
26	[52, 53]	1035	[1671, 734]	2044	[117, 431]	3053	[300, 2513]
27	[54, 55]	1036	[1672, 1673]	2045	[1258, 2435]	3054	[73, 2077]
28	[56, 57]	1037	[1674, 1675]	2046	[2435, 432]	3055	[3566, 2374]
29	[58, 59]	1038	[1676, 1372]	2047	[432, 424]	3056	[1099, 892]
30	[60, 61]	1039	[1677, 1678]	2048	[437, 2179]	3057	[3596, 2149]
31	[62, 63]	1040	[1679, 1680]	2049	[2599, 607]	3058	[1252, 890]
32	[64, 65]	1041	[1681, 1682]	2050	[2600, 2601]	3059	[27, 3576]
33	[66, 62]	1042	[34, 1683]	2051	[2602, 548]	3060	[3561, 2525]
34	[67, 68]	1043	[1684, 1685]	2052	[731, 2603]	3061	[809, 253]
35	[69, 70]	1044	[1686, 1687]	2053	[2604, 2605]	3062	[1148, 1139]
36	[71, 72]	1045	[1688, 1689]	2054	[2606, 2607]	3063	[26, 3597]
37	[73, 74]	1046	[1690, 1691]	2055	[530, 2608]	3064	[3598, 72]
38	[75, 76]	1047	[1692, 1693]	2056	[2609, 2610]	3065	[1038, 404]

39	[77, 78]	1048	[1694, 1695]	2057	[2611, 2612]	3066	[1237, 1204]
40	[79, 80]	1049	[1696, 1697]	2058	[1484, 2613]	3067	[3599, 820]
41	[81, 82]	1050	[1407, 1698]	2059	[2614, 2615]	3068	[275, 1172]
42	[83, 84]	1051	[561, 1699]	2060	[2616, 2021]	3069	[2471, 299]
43	[85, 86]	1052	[1700, 1701]	2061	[1477, 2617]	3070	[2277, 2563]
44	[87, 88]	1053	[1702, 1703]	2062	[2618, 1347]	3071	[2475, 1038]
45	[89, 90]	1054	[1704, 1705]	2063	[2619, 625]	3072	[3467, 2482]
46	[91, 92]	1055	[1706, 1707]	2064	[2620, 2621]	3073	[840, 996]
47	[93, 94]	1056	[1708, 1709]	2065	[2622, 2623]	3074	[2082, 2105]
48	[95, 96]	1057	[1710, 1711]	2066	[2624, 2625]	3075	[2086, 1164]
49	[97, 98]	1058	[1712, 1713]	2067	[2626, 2627]	3076	[927, 1237]
50	[99, 100]	1059	[1714, 1715]	2068	[2628, 2629]	3077	[2557, 3600]
51	[101, 102]	1060	[1716, 1717]	2069	[2630, 2631]	3078	[3601, 2054]
52	[103, 104]	1061	[138, 1718]	2070	[2632, 2633]	3079	[2339, 2303]
53	[65, 105]	1062	[1304, 1517]	2071	[2634, 2635]	3080	[3602, 2507]
54	[106, 107]	1063	[1719, 1720]	2072	[526, 542]	3081	[2089, 1057]
55	[108, 109]	1064	[1721, 1722]	2073	[2636, 2637]	3082	[3500, 3603]
56	[110, 111]	1065	[1723, 775]	2074	[2638, 219]	3083	[2324, 1184]
57	[112, 113]	1066	[1724, 1725]	2075	[2639, 1721]	3084	[81, 309]
58	[114, 115]	1067	[553, 1726]	2076	[1653, 2640]	3085	[2540, 338]
59	[116, 117]	1068	[1727, 1728]	2077	[2641, 2642]	3086	[3436, 381]
60	[118, 30]	1069	[188, 1729]	2078	[675, 1311]	3087	[2132, 1145]
61	[119, 120]	1070	[1730, 1731]	2079	[2643, 2644]	3088	[2575, 2403]
62	[121, 122]	1071	[1732, 1733]	2080	[2645, 2646]	3089	[3556, 6]
63	[123, 124]	1072	[1734, 1735]	2081	[1296, 1397]	3090	[2541, 2386]
64	[125, 126]	1073	[1736, 1737]	2082	[2647, 2648]	3091	[318, 322]
65	[127, 128]	1074	[1303, 1738]	2083	[2649, 1578]	3092	[2107, 912]
66	[129, 130]	1075	[1739, 1740]	2084	[2650, 1430]	3093	[427, 429]
67	[131, 132]	1076	[745, 1741]	2085	[2651, 1681]	3094	[874, 3604]
68	[133, 134]	1077	[1742, 1743]	2086	[2652, 173]	3095	[423, 1042]
69	[135, 136]	1078	[1744, 1745]	2087	[1663, 2653]	3096	[362, 822]
70	[137, 138]	1079	[1746, 1747]	2088	[2654, 634]	3097	[1011, 3605]
71	[139, 140]	1080	[1693, 1748]	2089	[2655, 2656]	3098	[2060, 2104]
72	[141, 142]	1081	[1749, 1750]	2090	[2657, 2658]	3099	[1000, 2209]
73	[143, 144]	1082	[1751, 1752]	2091	[2659, 2660]	3100	[869, 3555]
74	[145, 146]	1083	[1753, 1754]	2092	[1449, 717]	3101	[2526, 2585]
75	[147, 148]	1084	[1755, 1756]	2093	[624, 2661]	3102	[2562, 2538]
76	[149, 150]	1085	[1757, 1758]	2094	[2662, 1559]	3103	[2058, 3575]
77	[151, 152]	1086	[1441, 1759]	2095	[2663, 589]	3104	[359, 97]
78	[153, 154]	1087	[1760, 1708]	2096	[2664, 2665]	3105	[1157, 884]
79	[155, 156]	1088	[8, 1761]	2097	[1553, 2666]	3106	[353, 1235]
80	[157, 158]	1089	[1762, 491]	2098	[2667, 2668]	3107	[1167, 832]
81	[159, 160]	1090	[1763, 1764]	2099	[142, 2669]	3108	[360, 3606]
82	[161, 162]	1091	[1765, 1766]	2100	[2670, 2671]	3109	[2268, 2558]

83	[163, 164]	1092	[1767, 764]	2101	[2672, 2673]	3110	[433, 438]
84	[165, 166]	1093	[1768, 1769]	2102	[2674, 2675]	3111	[1080, 3607]
85	[167, 168]	1094	[1770, 1771]	2103	[2676, 2677]	3112	[839, 311]
86	[169, 170]	1095	[639, 1772]	2104	[1836, 2678]	3113	[2181, 3608]
87	[171, 172]	1096	[1773, 1774]	2105	[2679, 1537]	3114	[2567, 1023]
88	[173, 174]	1097	[1775, 1776]	2106	[2680, 2040]	3115	[3481, 2507]
89	[175, 176]	1098	[1777, 1778]	2107	[2681, 2682]	3116	[398, 2121]
90	[177, 178]	1099	[1779, 1780]	2108	[1789, 2683]	3117	[1200, 1229]
91	[179, 180]	1100	[1500, 1781]	2109	[130, 2684]	3118	[3459, 904]
92	[181, 182]	1101	[1782, 1783]	2110	[1542, 499]	3119	[3497, 6]
93	[183, 184]	1102	[1784, 1785]	2111	[2661, 2685]	3120	[1060, 2209]
94	[185, 186]	1103	[1786, 1787]	2112	[2686, 2687]	3121	[3586, 259]
95	[187, 188]	1104	[1788, 1789]	2113	[1350, 2688]	3122	[1219, 351]
96	[189, 190]	1105	[1790, 1519]	2114	[2689, 2690]	3123	[103, 1172]
97	[191, 192]	1106	[1791, 1792]	2115	[2691, 2692]	3124	[1046, 2376]
98	[193, 194]	1107	[1612, 1793]	2116	[1922, 2693]	3125	[2530, 289]
99	[195, 196]	1108	[1794, 752]	2117	[2694, 2695]	3126	[309, 2151]
100	[197, 198]	1109	[1795, 1796]	2118	[2696, 2697]	3127	[2160, 2086]
101	[199, 200]	1110	[1797, 1282]	2119	[2698, 2699]	3128	[3609, 3610]
102	[201, 202]	1111	[1798, 1799]	2120	[2700, 2701]	3129	[2227, 2322]
103	[203, 204]	1112	[1800, 1801]	2121	[2702, 2703]	3130	[2163, 2094]
104	[205, 206]	1113	[1802, 1803]	2122	[2704, 2705]	3131	[2544, 3611]
105	[207, 208]	1114	[1804, 1805]	2123	[2706, 2676]	3132	[381, 3551]
106	[209, 210]	1115	[1508, 1806]	2124	[2707, 2708]	3133	[1014, 280]
107	[211, 212]	1116	[1807, 1808]	2125	[2709, 2710]	3134	[2102, 2240]
108	[213, 214]	1117	[1809, 1810]	2126	[2711, 721]	3135	[265, 1133]
109	[215, 216]	1118	[582, 1811]	2127	[2712, 1896]	3136	[423, 396]
110	[217, 218]	1119	[1812, 1325]	2128	[2713, 654]	3137	[2265, 1023]
111	[219, 220]	1120	[1813, 1814]	2129	[2714, 2715]	3138	[939, 1099]
112	[221, 222]	1121	[1815, 1816]	2130	[2716, 2717]	3139	[1141, 842]
113	[223, 224]	1122	[1817, 1818]	2131	[2718, 2719]	3140	[3612, 2341]
114	[225, 226]	1123	[1819, 1615]	2132	[2720, 2721]	3141	[968, 1094]
115	[227, 228]	1124	[1820, 564]	2133	[2722, 2723]	3142	[329, 27]
116	[229, 230]	1125	[1821, 1404]	2134	[2724, 2725]	3143	[347, 991]
117	[231, 232]	1126	[1822, 1823]	2135	[2726, 2727]	3144	[1098, 1149]
118	[233, 234]	1127	[1824, 1825]	2136	[2728, 2729]	3145	[2524, 3613]
119	[235, 233]	1128	[1826, 1562]	2137	[2730, 2731]	3146	[1080, 371]
120	[236, 237]	1129	[1827, 1828]	2138	[2732, 779]	3147	[3581, 1115]
121	[238, 239]	1130	[1829, 1830]	2139	[2733, 203]	3148	[3614, 3603]
122	[240, 241]	1131	[160, 1831]	2140	[2734, 2735]	3149	[2220, 940]
123	[242, 243]	1132	[1832, 1354]	2141	[2736, 2737]	3150	[2053, 2593]
124	[244, 245]	1133	[1833, 691]	2142	[2738, 2739]	3151	[853, 996]
125	[246, 247]	1134	[1834, 1480]	2143	[2740, 2741]	3152	[1108, 1175]
126	[248, 249]	1135	[1835, 1836]	2144	[1733, 2742]	3153	[2105, 406]

127	[250, 251]	1136	[1837, 781]	2145	[1399, 2743]	3154	[2240, 861]
128	[252, 253]	1137	[1838, 1839]	2146	[2744, 1826]	3155	[2592, 3615]
129	[254, 255]	1138	[1840, 1841]	2147	[2745, 2746]	3156	[2501, 1083]
130	[256, 257]	1139	[1842, 1843]	2148	[2747, 2748]	3157	[2446, 3616]
131	[258, 259]	1140	[144, 1844]	2149	[2749, 2750]	3158	[2408, 1092]
132	[260, 261]	1141	[1845, 1846]	2150	[2751, 2752]	3159	[1044, 881]
133	[262, 263]	1142	[1847, 1848]	2151	[2753, 2754]	3160	[2565, 257]
134	[264, 265]	1143	[1849, 1850]	2152	[2755, 2756]	3161	[3617, 2567]
135	[266, 267]	1144	[1851, 1321]	2153	[2757, 2758]	3162	[2186, 377]
136	[268, 269]	1145	[1852, 1853]	2154	[2759, 2760]	3163	[2352, 2543]
137	[270, 271]	1146	[1854, 1855]	2155	[2761, 460]	3164	[2455, 927]
138	[272, 273]	1147	[1856, 1857]	2156	[2762, 2763]	3165	[2410, 97]
139	[274, 275]	1148	[1858, 1859]	2157	[2764, 769]	3166	[405, 959]
140	[276, 277]	1149	[1860, 1861]	2158	[2765, 2766]	3167	[2459, 3618]
141	[278, 279]	1150	[1862, 1863]	2159	[2767, 2768]	3168	[3543, 1179]
142	[264, 280]	1151	[1864, 1865]	2160	[2769, 171]	3169	[3548, 3619]
143	[65, 281]	1152	[1866, 1867]	2161	[2770, 2771]	3170	[301, 360]
144	[282, 283]	1153	[567, 1868]	2162	[2772, 2773]	3171	[3620, 2414]
145	[284, 285]	1154	[1869, 1870]	2163	[2774, 2775]	3172	[3621, 2593]
146	[111, 286]	1155	[1647, 1871]	2164	[1846, 2776]	3173	[3622, 2483]
147	[287, 288]	1156	[1872, 1873]	2165	[2766, 1507]	3174	[3544, 3623]
148	[289, 290]	1157	[1874, 215]	2166	[2777, 2778]	3175	[293, 1195]
149	[291, 292]	1158	[1707, 1875]	2167	[2779, 2780]	3176	[2423, 240]
150	[293, 294]	1159	[1876, 1877]	2168	[2781, 2782]	3177	[3493, 2201]
151	[295, 296]	1160	[1878, 1879]	2169	[2783, 2784]	3178	[3624, 1040]
152	[297, 298]	1161	[1880, 1881]	2170	[1510, 2785]	3179	[883, 326]
153	[299, 300]	1162	[1882, 1585]	2171	[2786, 2787]	3180	[3625, 1049]
154	[301, 302]	1163	[1883, 1884]	2172	[2788, 2789]	3181	[1090, 900]
155	[303, 304]	1164	[1885, 1886]	2173	[2790, 2791]	3182	[3515, 1121]
156	[305, 306]	1165	[1887, 1888]	2174	[2792, 1550]	3183	[2225, 1008]
157	[307, 308]	1166	[1889, 449]	2175	[2793, 2794]	3184	[3626, 80]
158	[309, 310]	1167	[1294, 1890]	2176	[2795, 2796]	3185	[2371, 2310]
159	[311, 312]	1168	[1891, 1892]	2177	[2737, 2797]	3186	[804, 2136]
160	[313, 314]	1169	[1893, 209]	2178	[2798, 2799]	3187	[923, 2336]
161	[315, 316]	1170	[1894, 1895]	2179	[2179, 2179]	3188	[2259, 3627]
162	[317, 318]	1171	[1896, 1897]	2180	[1950, 2800]	3189	[2253, 24]
163	[319, 320]	1172	[510, 1898]	2181	[2801, 2802]	3190	[254, 302]
164	[321, 322]	1173	[1899, 1900]	2182	[678, 2803]	3191	[2165, 341]
165	[323, 324]	1174	[1901, 1902]	2183	[2804, 161]	3192	[2375, 3628]
166	[325, 326]	1175	[1903, 1904]	2184	[2805, 2806]	3193	[1254, 393]
167	[327, 328]	1176	[1905, 1906]	2185	[2807, 2808]	3194	[866, 874]
168	[329, 330]	1177	[1907, 1908]	2186	[2809, 2810]	3195	[409, 1248]
169	[331, 332]	1178	[1909, 1910]	2187	[2811, 2812]	3196	[2132, 3629]
170	[333, 334]	1179	[1911, 1912]	2188	[778, 673]	3197	[278, 2078]

171	[335, 336]	1180	[1913, 1914]	2189	[541, 2813]	3198	[3630, 2169]
172	[315, 337]	1181	[1915, 1916]	2190	[2814, 2815]	3199	[891, 1100]
173	[338, 67]	1182	[1917, 1918]	2191	[622, 2816]	3200	[2435, 426]
174	[339, 340]	1183	[1549, 1919]	2192	[2817, 2818]	3201	[1257, 437]
175	[341, 342]	1184	[1920, 1921]	2193	[1859, 2819]	3202	[3443, 1144]
176	[343, 72]	1185	[470, 1922]	2194	[2820, 2821]	3203	[2502, 245]
177	[344, 345]	1186	[1923, 1924]	2195	[2822, 2823]	3204	[3464, 2172]
178	[346, 94]	1187	[1556, 1925]	2196	[2617, 2824]	3205	[74, 3519]
179	[347, 348]	1188	[1926, 1927]	2197	[2825, 2826]	3206	[3631, 1014]
180	[349, 350]	1189	[1512, 1928]	2198	[2827, 2828]	3207	[3593, 3524]
181	[351, 352]	1190	[1929, 1930]	2199	[2829, 2830]	3208	[2385, 3632]
182	[353, 283]	1191	[1673, 1931]	2200	[2831, 2832]	3209	[2278, 2534]
183	[354, 355]	1192	[1932, 1933]	2201	[1385, 2833]	3210	[935, 350]
184	[356, 357]	1193	[1934, 1935]	2202	[2834, 2835]	3211	[118, 427]
185	[358, 359]	1194	[1936, 1937]	2203	[2836, 2837]	3212	[3633, 984]
186	[360, 361]	1195	[766, 1938]	2204	[2838, 2839]	3213	[2295, 3634]
187	[362, 363]	1196	[1451, 1939]	2205	[2840, 2841]	3214	[2354, 340]
188	[364, 24]	1197	[1940, 223]	2206	[2842, 2843]	3215	[2439, 3600]
189	[365, 290]	1198	[1941, 1942]	2207	[2844, 2845]	3216	[2079, 1196]
190	[366, 367]	1199	[1943, 1944]	2208	[2846, 2847]	3217	[2589, 2256]
191	[368, 369]	1200	[1945, 1946]	2209	[2848, 2811]	3218	[2571, 992]
192	[370, 371]	1201	[1947, 1948]	2210	[455, 2849]	3219	[1176, 1078]
193	[372, 317]	1202	[1949, 1950]	2211	[1985, 2850]	3220	[400, 2178]
194	[94, 108]	1203	[1951, 1952]	2212	[2851, 2852]	3221	[2499, 3635]
195	[373, 374]	1204	[1953, 1954]	2213	[522, 2853]	3222	[2213, 1126]
196	[375, 24]	1205	[1300, 1955]	2214	[2854, 2855]	3223	[2284, 27]
197	[376, 377]	1206	[1956, 1957]	2215	[1978, 2856]	3224	[2303, 1078]
198	[378, 379]	1207	[1608, 1958]	2216	[2857, 2858]	3225	[2105, 907]
199	[380, 381]	1208	[1959, 1960]	2217	[2859, 2860]	3226	[3438, 3636]
200	[382, 90]	1209	[1961, 1962]	2218	[1895, 1499]	3227	[3548, 2422]
201	[383, 384]	1210	[1423, 1963]	2219	[2861, 191]	3228	[1197, 345]
202	[385, 386]	1211	[1964, 1965]	2220	[2862, 2863]	3229	[269, 23]
203	[387, 388]	1212	[1966, 1967]	2221	[2864, 2865]	3230	[3483, 372]
204	[389, 364]	1213	[1968, 1327]	2222	[1928, 1529]	3231	[982, 1032]
205	[390, 391]	1214	[1969, 1970]	2223	[2866, 1702]	3232	[2520, 3588]
206	[392, 290]	1215	[1971, 1972]	2224	[2867, 1934]	3233	[999, 3513]
207	[374, 393]	1216	[1973, 1974]	2225	[2868, 2869]	3234	[1064, 3637]
208	[394, 395]	1217	[463, 1975]	2226	[2870, 2871]	3235	[3638, 2507]
209	[396, 397]	1218	[1976, 1977]	2227	[2872, 2873]	3236	[1154, 108]
210	[398, 399]	1219	[573, 1978]	2228	[2874, 2875]	3237	[3527, 2079]
211	[400, 401]	1220	[1979, 1980]	2229	[2876, 2877]	3238	[900, 972]
212	[114, 402]	1221	[1443, 1981]	2230	[2878, 2879]	3239	[82, 1131]
213	[403, 404]	1222	[1982, 1983]	2231	[2880, 2881]	3240	[3598, 344]
214	[405, 406]	1223	[1984, 1985]	2232	[2882, 2883]	3241	[2257, 2070]

215	[407, 408]	1224	[1986, 1987]	2233	[2884, 2885]	3242	[2167, 3639]
216	[248, 65]	1225	[1988, 1989]	2234	[2886, 2887]	3243	[416, 3640]
217	[409, 410]	1226	[1990, 1991]	2235	[2888, 2889]	3244	[374, 1255]
218	[411, 412]	1227	[1992, 1993]	2236	[1379, 2890]	3245	[3440, 400]
219	[413, 414]	1228	[1994, 1995]	2237	[2891, 2892]	3246	[27, 2322]
220	[415, 416]	1229	[1996, 1997]	2238	[2893, 2894]	3247	[2092, 1041]
221	[417, 418]	1230	[1998, 1418]	2239	[2895, 2774]	3248	[1137, 1163]
222	[419, 420]	1231	[1999, 2000]	2240	[2896, 189]	3249	[3584, 1117]
223	[421, 422]	1232	[2001, 2002]	2241	[1410, 2897]	3250	[852, 995]
224	[423, 322]	1233	[178, 193]	2242	[2898, 2899]	3251	[1073, 2164]
225	[424, 425]	1234	[2003, 670]	2243	[2900, 1686]	3252	[3529, 260]
226	[426, 427]	1235	[2004, 2005]	2244	[2901, 1692]	3253	[3641, 2324]
227	[427, 428]	1236	[2006, 10]	2245	[2902, 2903]	3254	[76, 2200]
228	[424, 429]	1237	[2007, 2008]	2246	[2904, 2905]	3255	[3460, 3491]
229	[430, 431]	1238	[2009, 2010]	2247	[2906, 2907]	3256	[2560, 2134]
230	[432, 30]	1239	[2011, 2012]	2248	[2908, 2909]	3257	[3642, 2089]
231	[30, 433]	1240	[2013, 2014]	2249	[2910, 2911]	3258	[3540, 1222]
232	[120, 118]	1241	[2015, 2016]	2250	[2912, 2913]	3259	[379, 3562]
233	[434, 430]	1242	[2017, 2018]	2251	[2883, 2914]	3260	[2062, 2480]
234	[435, 432]	1243	[2019, 2020]	2252	[2915, 2916]	3261	[3625, 943]
235	[117, 435]	1244	[2021, 2022]	2253	[2917, 2918]	3262	[1144, 1016]
236	[436, 437]	1245	[2023, 1652]	2254	[2919, 2920]	3263	[3596, 400]
237	[438, 402]	1246	[2024, 2025]	2255	[2658, 2921]	3264	[2202, 949]
238	[439, 440]	1247	[2026, 2027]	2256	[2922, 2923]	3265	[1093, 1037]
239	[441, 442]	1248	[2028, 2029]	2257	[2924, 2700]	3266	[3643, 2152]
240	[443, 444]	1249	[1839, 1478]	2258	[2925, 2926]	3267	[3524, 2270]
241	[445, 446]	1250	[2030, 2031]	2259	[2927, 2928]	3268	[867, 3644]
242	[447, 448]	1251	[2032, 2033]	2260	[2929, 2930]	3269	[314, 241]
243	[449, 450]	1252	[2034, 2035]	2261	[2931, 1988]	3270	[2567, 1053]
244	[451, 452]	1253	[2036, 2037]	2262	[2932, 2933]	3271	[2228, 2304]
245	[208, 453]	1254	[2038, 2039]	2263	[2934, 2935]	3272	[947, 2322]
246	[454, 455]	1255	[2040, 2041]	2264	[2936, 2019]	3273	[3560, 83]
247	[456, 457]	1256	[61, 231]	2265	[2937, 2938]	3274	[998, 871]
248	[458, 459]	1257	[2042, 800]	2266	[2939, 2940]	3275	[3557, 3509]
249	[460, 461]	1258	[2043, 2044]	2267	[2941, 2942]	3276	[832, 1022]
250	[462, 463]	1259	[2045, 2046]	2268	[2943, 2944]	3277	[1065, 2172]
251	[464, 197]	1260	[2047, 2048]	2269	[2945, 2946]	3278	[3596, 3474]
252	[465, 466]	1261	[2049, 325]	2270	[2897, 2947]	3279	[3499, 2132]
253	[467, 468]	1262	[940, 2050]	2271	[2948, 719]	3280	[1070, 904]
254	[469, 470]	1263	[2051, 2052]	2272	[2949, 2950]	3281	[3524, 851]
255	[471, 472]	1264	[2053, 2054]	2273	[664, 2951]	3282	[2506, 1050]
256	[473, 474]	1265	[2055, 2056]	2274	[2952, 2953]	3283	[2354, 3568]
257	[475, 476]	1266	[2055, 2057]	2275	[2954, 2955]	3284	[405, 907]
258	[477, 478]	1267	[2058, 245]	2276	[2956, 2957]	3285	[2569, 3645]

259	[479, 480]	1268	[2059, 1017]	2277	[2958, 2959]	3286	[2537, 3646]
260	[481, 482]	1269	[2060, 2061]	2278	[2960, 2961]	3287	[2051, 1232]
261	[483, 484]	1270	[2062, 852]	2279	[2962, 2963]	3288	[2161, 1041]
262	[485, 486]	1271	[2063, 2064]	2280	[2964, 2965]	3289	[1241, 2538]
263	[487, 488]	1272	[2065, 2066]	2281	[2966, 2967]	3290	[3531, 2333]
264	[489, 490]	1273	[2067, 2068]	2282	[1328, 1319]	3291	[3647, 3474]
265	[491, 492]	1274	[2069, 2070]	2283	[518, 2968]	3292	[921, 2466]
266	[493, 494]	1275	[2071, 974]	2284	[2969, 1340]	3293	[1162, 3505]
267	[495, 496]	1276	[370, 2072]	2285	[2970, 2971]	3294	[2543, 3648]
268	[497, 498]	1277	[826, 2052]	2286	[2972, 2973]	3295	[2408, 932]
269	[499, 500]	1278	[2073, 2074]	2287	[2797, 1639]	3296	[410, 3649]
270	[501, 502]	1279	[2075, 1063]	2288	[2974, 2975]	3297	[986, 2100]
271	[503, 504]	1280	[2076, 2077]	2289	[1316, 2976]	3298	[826, 1232]
272	[505, 506]	1281	[1035, 394]	2290	[2977, 2978]	3299	[242, 374]
273	[507, 508]	1282	[1170, 1190]	2291	[2979, 2980]	3300	[2199, 102]
274	[509, 510]	1283	[1155, 2078]	2292	[2981, 2982]	3301	[3500, 2425]
275	[511, 512]	1284	[913, 2079]	2293	[2983, 2984]	3302	[1188, 2552]
276	[513, 514]	1285	[2080, 414]	2294	[2985, 2986]	3303	[1049, 944]
277	[515, 516]	1286	[1047, 282]	2295	[2987, 2988]	3304	[1197, 112]
278	[517, 518]	1287	[2081, 15]	2296	[2989, 2990]	3305	[1161, 2109]
279	[519, 520]	1288	[2082, 910]	2297	[2991, 2992]	3306	[2348, 1166]
280	[521, 522]	1289	[2083, 2084]	2298	[2993, 2994]	3307	[3538, 2206]
281	[523, 524]	1290	[2085, 2086]	2299	[2995, 2996]	3308	[293, 3640]
282	[525, 526]	1291	[314, 1149]	2300	[2997, 2998]	3309	[3650, 2073]
283	[527, 528]	1292	[1030, 2087]	2301	[2999, 3000]	3310	[434, 117]
284	[529, 530]	1293	[997, 873]	2302	[3001, 3002]	3311	[2281, 251]
285	[531, 532]	1294	[845, 2088]	2303	[3003, 3004]	3312	[80, 809]
286	[218, 533]	1295	[2089, 1173]	2304	[3005, 3006]	3313	[2480, 853]
287	[534, 535]	1296	[421, 2090]	2305	[3007, 3008]	3314	[2497, 369]
288	[536, 537]	1297	[2091, 2092]	2306	[3009, 3010]	3315	[808, 252]
289	[538, 539]	1298	[410, 1184]	2307	[3011, 3012]	3316	[323, 2425]
290	[540, 541]	1299	[2093, 2094]	2308	[1594, 2993]	3317	[2524, 2230]
291	[542, 543]	1300	[396, 1243]	2309	[3013, 3014]	3318	[297, 3651]
292	[544, 545]	1301	[1157, 312]	2310	[3015, 3016]	3319	[2586, 2113]
293	[546, 547]	1302	[2095, 1050]	2311	[3017, 3018]	3320	[961, 1130]
294	[548, 549]	1303	[2096, 1103]	2312	[3019, 3020]	3321	[3441, 3582]
295	[550, 551]	1304	[308, 2090]	2313	[3021, 1842]	3322	[2450, 2056]
296	[552, 553]	1305	[2097, 2098]	2314	[3022, 3023]	3323	[3568, 2108]
297	[554, 555]	1306	[345, 2099]	2315	[3024, 3025]	3324	[3633, 1230]
298	[556, 557]	1307	[2100, 2101]	2316	[2789, 1427]	3325	[2104, 1205]
299	[558, 559]	1308	[2102, 1035]	2317	[3026, 3027]	3326	[1129, 962]
300	[560, 561]	1309	[863, 2103]	2318	[3028, 3029]	3327	[2533, 2169]
301	[562, 563]	1310	[820, 932]	2319	[1588, 3030]	3328	[2519, 367]
302	[564, 565]	1311	[825, 2104]	2320	[3031, 3032]	3329	[2537, 3623]

303	[566, 567]	1312	[881, 423]	2321	[3033, 3034]	3330	[3453, 2479]
304	[568, 569]	1313	[1174, 2105]	2322	[3035, 3036]	3331	[3572, 1252]
305	[570, 571]	1314	[1230, 1196]	2323	[3037, 2788]	3332	[360, 3652]
306	[572, 573]	1315	[2106, 2059]	2324	[3038, 3039]	3333	[2406, 837]
307	[574, 575]	1316	[2107, 2108]	2325	[3040, 3041]	3334	[385, 2276]
308	[576, 577]	1317	[964, 2109]	2326	[3042, 3043]	3335	[2351, 3475]
309	[578, 579]	1318	[2110, 2111]	2327	[1678, 3044]	3336	[2371, 963]
310	[580, 163]	1319	[2112, 865]	2328	[3045, 1495]	3337	[3554, 3559]
311	[581, 582]	1320	[300, 68]	2329	[3046, 3047]	3338	[1240, 3653]
312	[184, 583]	1321	[2113, 340]	2330	[3048, 3049]	3339	[380, 1121]
313	[584, 445]	1322	[2114, 845]	2331	[1970, 3050]	3340	[2303, 328]
314	[585, 586]	1323	[2115, 2116]	2332	[3051, 1951]	3341	[402, 430]
315	[587, 588]	1324	[1098, 241]	2333	[3052, 3053]	3342	[2545, 21]
316	[589, 590]	1325	[2117, 2118]	2334	[3054, 2624]	3343	[2273, 983]
317	[591, 592]	1326	[2119, 2120]	2335	[3055, 3056]	3344	[349, 2068]
318	[32, 593]	1327	[2121, 1131]	2336	[3057, 3058]	3345	[435, 118]
319	[594, 595]	1328	[338, 300]	2337	[3059, 155]	3346	[85, 2262]
320	[596, 597]	1329	[2109, 940]	2338	[3060, 3061]	3347	[2380, 2065]
321	[598, 599]	1330	[840, 2122]	2339	[3062, 1907]	3348	[2526, 1085]
322	[592, 600]	1331	[1132, 821]	2340	[3063, 2761]	3349	[2233, 3532]
323	[601, 602]	1332	[2123, 858]	2341	[3064, 3065]	3350	[2228, 349]
324	[603, 604]	1333	[2124, 246]	2342	[3066, 536]	3351	[847, 2141]
325	[605, 606]	1334	[2125, 2126]	2343	[3067, 1309]	3352	[3638, 3492]
326	[607, 608]	1335	[243, 1255]	2344	[140, 3068]	3353	[1227, 851]
327	[609, 610]	1336	[2127, 1170]	2345	[3069, 1833]	3354	[351, 3549]
328	[611, 612]	1337	[915, 2128]	2346	[3070, 3071]	3355	[354, 2567]
329	[613, 614]	1338	[2129, 332]	2347	[3072, 3073]	3356	[2197, 3654]
330	[615, 616]	1339	[2130, 812]	2348	[1584, 3074]	3357	[2453, 993]
331	[617, 618]	1340	[2131, 2132]	2349	[3075, 3076]	3358	[2504, 916]
332	[619, 620]	1341	[2133, 2134]	2350	[3077, 3078]	3359	[3655, 1130]
333	[621, 622]	1342	[2135, 2136]	2351	[3079, 1768]	3360	[3602, 3475]
334	[623, 624]	1343	[931, 893]	2352	[3080, 3081]	3361	[910, 907]
335	[625, 626]	1344	[2137, 1248]	2353	[3082, 3083]	3362	[3601, 3530]
336	[627, 628]	1345	[2138, 2123]	2354	[545, 1448]	3363	[2300, 3635]
337	[629, 630]	1346	[963, 2139]	2355	[3084, 665]	3364	[1030, 2411]
338	[631, 133]	1347	[2140, 2141]	2356	[1453, 3085]	3365	[2475, 376]
339	[632, 633]	1348	[2142, 2143]	2357	[3086, 3087]	3366	[3626, 817]
340	[634, 635]	1349	[865, 76]	2358	[3088, 3089]	3367	[2310, 2139]
341	[636, 637]	1350	[2144, 1155]	2359	[3090, 3091]	3368	[2253, 2473]
342	[638, 639]	1351	[858, 2103]	2360	[3092, 1644]	3369	[292, 855]
343	[640, 641]	1352	[1146, 2144]	2361	[1526, 3093]	3370	[3642, 1121]
344	[642, 643]	1353	[340, 2108]	2362	[3094, 3095]	3371	[3447, 3656]
345	[644, 645]	1354	[325, 2145]	2363	[1946, 3096]	3372	[2433, 70]
346	[646, 213]	1355	[2146, 871]	2364	[3097, 2901]	3373	[3657, 2121]

347	[647, 648]	1356	[2147, 2148]	2365	[1908, 3098]	3374	[3522, 2243]
348	[649, 159]	1357	[2149, 2150]	2366	[3099, 3042]	3375	[2381, 2480]
349	[650, 651]	1358	[399, 2151]	2367	[3100, 3101]	3376	[3658, 2429]
350	[652, 653]	1359	[2152, 1080]	2368	[3102, 1712]	3377	[406, 960]
351	[654, 655]	1360	[2153, 2154]	2369	[210, 699]	3378	[2469, 1170]
352	[656, 657]	1361	[1248, 897]	2370	[3103, 3104]	3379	[3457, 3659]
353	[658, 659]	1362	[2155, 64]	2371	[3105, 487]	3380	[2444, 337]
354	[660, 661]	1363	[2156, 1182]	2372	[3106, 3107]	3381	[1240, 924]
355	[662, 153]	1364	[26, 816]	2373	[3108, 2829]	3382	[2097, 811]
356	[663, 664]	1365	[2157, 2158]	2374	[3109, 3110]	3383	[1248, 3660]
357	[665, 666]	1366	[2070, 2159]	2375	[3111, 3112]	3384	[288, 1053]
358	[667, 668]	1367	[2051, 293]	2376	[3113, 3114]	3385	[845, 855]
359	[669, 469]	1368	[2160, 2161]	2377	[444, 3115]	3386	[3471, 1159]
360	[670, 671]	1369	[2162, 1088]	2378	[3116, 3117]	3387	[3661, 3524]
361	[563, 672]	1370	[2163, 2110]	2379	[3118, 3119]	3388	[1255, 2173]
362	[673, 517]	1371	[2164, 2087]	2380	[198, 3120]	3389	[862, 422]
363	[674, 675]	1372	[367, 2134]	2381	[1699, 3121]	3390	[954, 1102]
364	[498, 676]	1373	[2156, 817]	2382	[3122, 3123]	3391	[2542, 2508]
365	[677, 678]	1374	[2165, 2166]	2383	[1718, 2007]	3392	[1112, 107]
366	[679, 680]	1375	[297, 420]	2384	[3124, 3125]	3393	[1148, 1064]
367	[681, 682]	1376	[2167, 2168]	2385	[3126, 3127]	3394	[2116, 1127]
368	[164, 683]	1377	[1067, 2169]	2386	[3128, 3129]	3395	[2506, 2444]
369	[684, 685]	1378	[807, 255]	2387	[512, 3130]	3396	[2575, 1055]
370	[686, 687]	1379	[355, 1053]	2388	[3131, 1882]	3397	[2502, 3662]
371	[659, 688]	1380	[2170, 2171]	2389	[3132, 3133]	3398	[257, 2111]
372	[689, 690]	1381	[2172, 420]	2390	[3134, 3135]	3399	[902, 309]
373	[691, 692]	1382	[80, 252]	2391	[3136, 3137]	3400	[988, 3663]
374	[693, 694]	1383	[2173, 416]	2392	[3138, 3139]	3401	[3537, 239]
375	[695, 696]	1384	[2174, 1158]	2393	[3140, 3141]	3402	[1049, 342]
376	[697, 698]	1385	[23, 925]	2394	[3142, 3143]	3403	[2286, 67]
377	[699, 700]	1386	[2161, 87]	2395	[1717, 3144]	3404	[1245, 1021]
378	[701, 702]	1387	[2175, 2176]	2396	[3145, 3146]	3405	[3664, 2554]
379	[703, 704]	1388	[2177, 26]	2397	[3147, 1941]	3406	[3554, 2494]
380	[705, 706]	1389	[2149, 2178]	2398	[3148, 513]	3407	[861, 96]
381	[707, 708]	1390	[436, 2179]	2399	[653, 3149]	3408	[3560, 3491]
382	[709, 710]	1391	[2086, 1041]	2400	[2673, 2732]	3409	[284, 2232]
383	[711, 712]	1392	[2180, 2181]	2401	[3150, 3151]	3410	[1120, 995]
384	[713, 714]	1393	[2182, 2183]	2402	[2821, 3152]	3411	[3599, 1132]
385	[715, 716]	1394	[1029, 2164]	2403	[3153, 3154]	3412	[3583, 2344]
386	[717, 718]	1395	[2184, 2185]	2404	[3155, 3156]	3413	[923, 3653]
387	[719, 720]	1396	[2186, 404]	2405	[3157, 1949]	3414	[2463, 2396]
388	[721, 722]	1397	[2187, 824]	2406	[3158, 3159]	3415	[3529, 1010]
389	[723, 724]	1398	[2090, 2188]	2407	[494, 3160]	3416	[327, 1177]
390	[725, 726]	1399	[2189, 2190]	2408	[3161, 3162]	3417	[2548, 2420]

391	[727, 728]	1400	[2191, 2192]	2409	[3163, 3164]	3418	[987, 91]
392	[729, 730]	1401	[2077, 2193]	2410	[2782, 3165]	3419	[254, 360]
393	[448, 731]	1402	[21, 2194]	2411	[1329, 2937]	3420	[939, 917]
394	[732, 733]	1403	[2195, 367]	2412	[3166, 1744]	3421	[3647, 2142]
395	[734, 735]	1404	[2196, 400]	2413	[3167, 3168]	3422	[2441, 3588]
396	[736, 737]	1405	[2197, 2198]	2414	[3169, 3170]	3423	[1235, 2072]
397	[593, 738]	1406	[2199, 2083]	2415	[1558, 3171]	3424	[3520, 26]
398	[739, 580]	1407	[2200, 2201]	2416	[1383, 3153]	3425	[1210, 2243]
399	[740, 741]	1408	[2202, 2203]	2417	[3172, 3173]	3426	[2360, 3486]
400	[742, 743]	1409	[1023, 2204]	2418	[3174, 3175]	3427	[1245, 2315]
401	[744, 745]	1410	[63, 940]	2419	[3176, 3177]	3428	[73, 1139]
402	[746, 236]	1411	[2205, 2206]	2420	[3178, 3179]	3429	[1014, 1159]
403	[747, 748]	1412	[2207, 1205]	2421	[3180, 8]	3430	[893, 2058]
404	[749, 750]	1413	[2208, 2209]	2422	[1977, 3181]	3431	[3568, 3665]
405	[453, 751]	1414	[345, 113]	2423	[3182, 1860]	3432	[426, 30]
406	[752, 753]	1415	[239, 1007]	2424	[3183, 3184]	3433	[2421, 829]
407	[128, 754]	1416	[243, 393]	2425	[3185, 3186]	3434	[339, 3568]
408	[755, 756]	1417	[247, 2210]	2426	[7, 755]	3435	[2512, 15]
409	[757, 758]	1418	[2130, 960]	2427	[1632, 3187]	3436	[3666, 1710]
410	[759, 601]	1419	[2211, 1014]	2428	[3188, 3189]	3437	[3667, 2759]
411	[698, 760]	1420	[2212, 1079]	2429	[657, 3190]	3438	[3668, 3669]
412	[761, 762]	1421	[2213, 2214]	2430	[3191, 1920]	3439	[3670, 2654]
413	[763, 613]	1422	[112, 2099]	2431	[3192, 3193]	3440	[3671, 2740]
414	[764, 765]	1423	[1220, 2215]	2432	[3194, 3195]	3441	[3672, 3373]
415	[450, 766]	1424	[2216, 1063]	2433	[3196, 3197]	3442	[2610, 3673]
416	[767, 768]	1425	[2217, 1088]	2434	[3198, 3199]	3443	[3674, 1852]
417	[769, 770]	1426	[2218, 1161]	2435	[3200, 3201]	3444	[3675, 3676]
418	[771, 772]	1427	[2219, 1043]	2436	[3202, 681]	3445	[3677, 3678]
419	[773, 774]	1428	[2220, 1099]	2437	[1873, 3203]	3446	[1292, 3679]
420	[775, 776]	1429	[2221, 21]	2438	[3204, 1864]	3447	[3680, 3681]
421	[777, 778]	1430	[1079, 2222]	2439	[3205, 3206]	3448	[3393, 3682]
422	[779, 780]	1431	[2223, 355]	2440	[3207, 2906]	3449	[3683, 3684]
423	[781, 782]	1432	[2224, 2225]	2441	[3208, 3209]	3450	[3685, 3686]
424	[783, 784]	1433	[2226, 1217]	2442	[3210, 3211]	3451	[1863, 3687]
425	[785, 786]	1434	[2227, 28]	2443	[3212, 556]	3452	[3688, 3689]
426	[787, 788]	1435	[2228, 935]	2444	[3213, 3214]	3453	[3690, 3691]
427	[789, 790]	1436	[2229, 2230]	2445	[3215, 3216]	3454	[3692, 3693]
428	[791, 746]	1437	[91, 929]	2446	[2785, 3217]	3455	[3694, 2779]
429	[59, 792]	1438	[2231, 2232]	2447	[3218, 3219]	3456	[3695, 3696]
430	[226, 793]	1439	[2132, 1016]	2448	[3220, 2618]	3457	[3697, 3698]
431	[794, 789]	1440	[2233, 2234]	2449	[2849, 652]	3458	[3699, 3700]
432	[232, 795]	1441	[2235, 1062]	2450	[3221, 3222]	3459	[3701, 3702]
433	[234, 229]	1442	[903, 2236]	2451	[3223, 3224]	3460	[3703, 2728]
434	[796, 794]	1443	[943, 2237]	2452	[3225, 1599]	3461	[1806, 1315]

435	[797, 60]	1444	[2238, 254]	2453	[3226, 3227]	3462	[3704, 3705]
436	[798, 799]	1445	[353, 1080]	2454	[3228, 1413]	3463	[3706, 3172]
437	[800, 801]	1446	[956, 2239]	2455	[3229, 3230]	3464	[3707, 3708]
438	[784, 802]	1447	[2240, 394]	2456	[1771, 2003]	3465	[1740, 3709]
439	[803, 804]	1448	[965, 2061]	2457	[3231, 3232]	3466	[3710, 3711]
440	[805, 806]	1449	[967, 1183]	2458	[3233, 1694]	3467	[3712, 3713]
441	[97, 807]	1450	[2241, 1227]	2459	[3234, 3235]	3468	[626, 3714]
442	[808, 809]	1451	[2242, 2243]	2460	[3236, 3237]	3469	[1355, 3035]
443	[810, 811]	1452	[2244, 2245]	2461	[762, 3238]	3470	[3715, 3716]
444	[406, 812]	1453	[1074, 1193]	2462	[3239, 3240]	3471	[3717, 1878]
445	[813, 814]	1454	[112, 2246]	2463	[3029, 3241]	3472	[3718, 1969]
446	[815, 816]	1455	[2138, 862]	2464	[3242, 3239]	3473	[3719, 3720]
447	[817, 809]	1456	[1024, 2247]	2465	[3243, 3244]	3474	[3721, 3722]
448	[818, 819]	1457	[275, 286]	2466	[3245, 3246]	3475	[3723, 1674]
449	[820, 821]	1458	[1033, 2248]	2467	[1538, 3247]	3476	[3724, 711]
450	[822, 278]	1459	[2092, 87]	2468	[1892, 3248]	3477	[3725, 3726]
451	[300, 823]	1460	[2164, 2176]	2469	[3249, 1929]	3478	[1792, 3727]
452	[824, 825]	1461	[2144, 278]	2470	[3250, 3251]	3479	[3728, 3729]
453	[393, 826]	1462	[2249, 2250]	2471	[3252, 131]	3480	[3730, 3731]
454	[827, 828]	1463	[2251, 2252]	2472	[2942, 3253]	3481	[2666, 1552]
455	[829, 22]	1464	[269, 2253]	2473	[3254, 1940]	3482	[3732, 3733]
456	[830, 831]	1465	[366, 379]	2474	[3255, 3256]	3483	[3734, 591]
457	[832, 833]	1466	[2055, 2254]	2475	[3257, 3258]	3484	[750, 3735]
458	[834, 835]	1467	[2255, 2256]	2476	[3259, 3260]	3485	[620, 1349]
459	[836, 837]	1468	[2257, 2258]	2477	[3261, 3262]	3486	[3736, 3737]
460	[838, 839]	1469	[304, 261]	2478	[1272, 3263]	3487	[3738, 3739]
461	[840, 841]	1470	[2259, 2260]	2479	[3264, 3265]	3488	[3740, 3672]
462	[842, 843]	1471	[2261, 2262]	2480	[3266, 3267]	3489	[3741, 3742]
463	[844, 845]	1472	[2263, 330]	2481	[3268, 3269]	3490	[3743, 11]
464	[846, 378]	1473	[2070, 2120]	2482	[2957, 3270]	3491	[3744, 3745]
465	[847, 848]	1474	[1186, 842]	2483	[3271, 3272]	3492	[3746, 1770]
466	[27, 849]	1475	[2264, 396]	2484	[3273, 2747]	3493	[3747, 3062]
467	[850, 851]	1476	[2223, 2265]	2485	[3091, 3274]	3494	[3748, 3749]
468	[852, 853]	1477	[914, 985]	2486	[1488, 2015]	3495	[1459, 2036]
469	[854, 855]	1478	[2266, 2267]	2487	[3275, 3276]	3496	[3750, 3751]
470	[856, 857]	1479	[2268, 2159]	2488	[3277, 1380]	3497	[3752, 3753]
471	[858, 859]	1480	[2269, 2270]	2489	[3278, 2672]	3498	[1473, 3754]
472	[860, 861]	1481	[1236, 2060]	2490	[3279, 1438]	3499	[3755, 1641]
473	[862, 863]	1482	[1020, 278]	2491	[3280, 3281]	3500	[3756, 3757]
474	[864, 865]	1483	[1156, 2271]	2492	[3282, 2765]	3501	[3758, 1696]
475	[75, 866]	1484	[283, 2072]	2493	[583, 2767]	3502	[3759, 749]
476	[15, 317]	1485	[2272, 930]	2494	[3283, 3284]	3503	[3760, 1847]
477	[867, 868]	1486	[2253, 925]	2495	[3285, 1568]	3504	[3761, 3762]
478	[869, 870]	1487	[2273, 2274]	2496	[3286, 2840]	3505	[3763, 3764]

479	[871, 872]	1488	[2275, 2203]	2497	[2727, 195]	3506	[555, 3765]
480	[873, 874]	1489	[87, 2276]	2498	[3287, 3288]	3507	[3766, 3767]
481	[875, 876]	1490	[2277, 1187]	2499	[3289, 3290]	3508	[3768, 3769]
482	[877, 414]	1491	[2278, 2279]	2500	[3291, 2962]	3509	[3770, 3677]
483	[878, 315]	1492	[884, 1118]	2501	[3292, 3293]	3510	[3771, 3772]
484	[367, 879]	1493	[2127, 1102]	2502	[3294, 3295]	3511	[3773, 3774]
485	[804, 880]	1494	[2280, 1027]	2503	[3296, 3009]	3512	[3775, 2657]
486	[881, 318]	1495	[899, 861]	2504	[606, 3297]	3513	[3776, 3777]
487	[882, 883]	1496	[930, 65]	2505	[3298, 3299]	3514	[3778, 1271]
488	[884, 109]	1497	[2281, 970]	2506	[3300, 3301]	3515	[3779, 1406]
489	[885, 353]	1498	[2101, 929]	2507	[3302, 3303]	3516	[3780, 3781]
490	[381, 886]	1499	[2282, 966]	2508	[3304, 3305]	3517	[3782, 1493]
491	[887, 888]	1500	[2283, 833]	2509	[3306, 3307]	3518	[3137, 2038]
492	[889, 890]	1501	[271, 326]	2510	[3308, 3309]	3519	[3783, 3784]
493	[891, 892]	1502	[2076, 1139]	2511	[2930, 3310]	3520	[3785, 3786]
494	[893, 407]	1503	[2284, 947]	2512	[134, 3311]	3521	[3787, 3788]
495	[894, 895]	1504	[2285, 2286]	2513	[2973, 3312]	3522	[3789, 3790]
496	[896, 897]	1505	[815, 2287]	2514	[3313, 3314]	3523	[2837, 3791]
497	[898, 899]	1506	[837, 842]	2515	[3315, 127]	3524	[3792, 3793]
498	[853, 841]	1507	[2288, 403]	2516	[3316, 3317]	3525	[3794, 1339]
499	[257, 900]	1508	[971, 2289]	2517	[2625, 3236]	3526	[3795, 1827]
500	[901, 387]	1509	[2290, 2183]	2518	[3318, 3319]	3527	[3796, 3797]
501	[902, 82]	1510	[2291, 1179]	2519	[2020, 2724]	3528	[3798, 3799]
502	[903, 904]	1511	[112, 2292]	2520	[3320, 3321]	3529	[190, 483]
503	[905, 906]	1512	[825, 2061]	2521	[2735, 3289]	3530	[2839, 2781]
504	[907, 812]	1513	[2293, 2294]	2522	[3322, 3323]	3531	[687, 2970]
505	[908, 909]	1514	[2295, 388]	2523	[3324, 3325]	3532	[3800, 3801]
506	[910, 406]	1515	[2189, 90]	2524	[3326, 3327]	3533	[3802, 3803]
507	[911, 912]	1516	[2296, 2297]	2525	[1394, 3328]	3534	[3804, 1807]
508	[64, 249]	1517	[972, 364]	2526	[3329, 3330]	3535	[3805, 3806]
509	[913, 914]	1518	[2154, 1007]	2527	[3331, 1617]	3536	[3807, 3808]
510	[915, 916]	1519	[2298, 953]	2528	[3332, 3333]	3537	[3809, 3810]
511	[917, 918]	1520	[2299, 1052]	2529	[3334, 3335]	3538	[3811, 3812]
512	[279, 832]	1521	[329, 947]	2530	[3336, 540]	3539	[2920, 3813]
513	[919, 920]	1522	[2065, 993]	2531	[3337, 1755]	3540	[1861, 3814]
514	[921, 922]	1523	[2300, 2301]	2532	[3338, 3092]	3541	[3361, 458]
515	[923, 924]	1524	[2191, 1224]	2533	[1787, 3339]	3542	[3815, 3182]
516	[375, 925]	1525	[2302, 2303]	2534	[3340, 3341]	3543	[3816, 3817]
517	[926, 927]	1526	[2304, 936]	2535	[3342, 3343]	3544	[3818, 3819]
518	[928, 929]	1527	[2305, 365]	2536	[3344, 3345]	3545	[3820, 3821]
519	[930, 931]	1528	[867, 412]	2537	[2665, 3346]	3546	[3822, 3823]
520	[932, 877]	1529	[2061, 1205]	2538	[3347, 3210]	3547	[3824, 3825]
521	[933, 934]	1530	[2173, 2052]	2539	[3348, 3349]	3548	[3826, 3225]
522	[935, 936]	1531	[304, 1153]	2540	[3350, 3351]	3549	[3827, 3828]

523	[937, 938]	1532	[2306, 2268]	2541	[3352, 3353]	3550	[3247, 3829]
524	[939, 940]	1533	[1238, 2307]	2542	[3354, 3355]	3551	[3830, 493]
525	[941, 942]	1534	[422, 2103]	2543	[3356, 3357]	3552	[3831, 3313]
526	[943, 944]	1535	[2308, 2309]	2544	[3358, 1264]	3553	[595, 3832]
527	[945, 946]	1536	[2135, 84]	2545	[3047, 3359]	3554	[3833, 3834]
528	[947, 849]	1537	[2100, 928]	2546	[1306, 3360]	3555	[2669, 3412]
529	[948, 949]	1538	[981, 375]	2547	[718, 3361]	3556	[3835, 3836]
530	[950, 951]	1539	[2310, 2311]	2548	[3170, 185]	3557	[3837, 3838]
531	[952, 953]	1540	[2312, 2195]	2549	[3362, 2013]	3558	[3839, 3840]
532	[244, 408]	1541	[2195, 2133]	2550	[3363, 3364]	3559	[2905, 3841]
533	[410, 897]	1542	[2271, 901]	2551	[3365, 1851]	3560	[3842, 3843]
534	[954, 955]	1543	[2172, 298]	2552	[3366, 3367]	3561	[3844, 3845]
535	[417, 336]	1544	[1234, 254]	2553	[3368, 3369]	3562	[3846, 3847]
536	[931, 105]	1545	[2313, 2076]	2554	[3370, 707]	3563	[3272, 3848]
537	[817, 956]	1546	[2314, 1254]	2555	[3371, 3372]	3564	[3849, 3850]
538	[957, 958]	1547	[2315, 1022]	2556	[3373, 3374]	3565	[3851, 2733]
539	[959, 960]	1548	[251, 2277]	2557	[2860, 3375]	3566	[3808, 3852]
540	[961, 962]	1549	[1043, 1234]	2558	[3376, 3377]	3567	[2705, 3853]
541	[963, 263]	1550	[2316, 2317]	2559	[1415, 3378]	3568	[3854, 3855]
542	[942, 283]	1551	[2318, 2319]	2560	[3379, 3380]	3569	[3856, 2770]
543	[66, 964]	1552	[2320, 2321]	2561	[2885, 560]	3570	[3032, 2927]
544	[927, 965]	1553	[330, 2322]	2562	[3381, 3382]	3571	[3857, 3858]
545	[966, 967]	1554	[1227, 2323]	2563	[3383, 3384]	3572	[3859, 3860]
546	[968, 969]	1555	[71, 344]	2564	[1975, 3385]	3573	[3861, 3862]
547	[970, 99]	1556	[102, 2084]	2565	[3386, 1426]	3574	[3364, 3863]
548	[866, 971]	1557	[2324, 897]	2566	[3387, 3280]	3575	[3864, 3865]
549	[268, 972]	1558	[2325, 2326]	2567	[3388, 3389]	3576	[3866, 649]
550	[973, 974]	1559	[1233, 97]	2568	[506, 3390]	3577	[3867, 3868]
551	[975, 976]	1560	[2327, 2328]	2569	[3391, 3392]	3578	[3869, 3870]
552	[977, 978]	1561	[2329, 2330]	2570	[2819, 3393]	3579	[3806, 3871]
553	[979, 361]	1562	[2078, 832]	2571	[3394, 3395]	3580	[3872, 1714]
554	[312, 980]	1563	[288, 1023]	2572	[1726, 3396]	3581	[3873, 1996]
555	[981, 364]	1564	[2331, 2332]	2573	[3397, 3398]	3582	[3874, 3875]
556	[982, 983]	1565	[957, 2333]	2574	[3399, 1992]	3583	[1474, 3876]
557	[984, 985]	1566	[2334, 2335]	2575	[3400, 3401]	3584	[3852, 2650]
558	[986, 987]	1567	[2268, 2120]	2576	[2012, 1317]	3585	[3877, 447]
559	[988, 989]	1568	[952, 2336]	2577	[3402, 3403]	3586	[3878, 3697]
560	[990, 991]	1569	[2337, 2338]	2578	[3404, 581]	3587	[3769, 3879]
561	[992, 993]	1570	[2339, 1176]	2579	[3405, 3406]	3588	[3880, 3881]
562	[831, 994]	1571	[2119, 2159]	2580	[3377, 3407]	3589	[3882, 3883]
563	[835, 874]	1572	[2101, 2340]	2581	[3408, 3409]	3590	[3884, 3885]
564	[995, 996]	1573	[2341, 2109]	2582	[3410, 3411]	3591	[3886, 3887]
565	[997, 76]	1574	[2175, 2342]	2583	[3412, 674]	3592	[3888, 1858]
566	[998, 999]	1575	[836, 967]	2584	[3413, 3414]	3593	[1865, 3889]

567	[1000, 1001]	1576	[1020, 2343]	2585	[3415, 3416]	3594	[3890, 3891]
568	[1002, 1003]	1577	[2220, 891]	2586	[3417, 2681]	3595	[1627, 3892]
569	[312, 109]	1578	[2344, 113]	2587	[3418, 3419]	3596	[2845, 2751]
570	[1004, 412]	1579	[1089, 2345]	2588	[3420, 1591]	3597	[3893, 3894]
571	[1005, 1006]	1580	[2346, 1220]	2589	[1366, 3421]	3598	[3895, 3896]
572	[1007, 1008]	1581	[2299, 2347]	2590	[3422, 3423]	3599	[3897, 1485]
573	[821, 857]	1582	[1064, 1140]	2591	[3424, 578]	3600	[3898, 3899]
574	[1009, 1010]	1583	[2348, 2349]	2592	[3425, 3426]	3601	[3900, 3901]
575	[1011, 1012]	1584	[262, 2139]	2593	[3427, 3428]	3602	[3902, 3903]
576	[1013, 1014]	1585	[2263, 2227]	2594	[3429, 3430]	3603	[3904, 3905]
577	[351, 70]	1586	[2350, 2064]	2595	[3431, 3257]	3604	[3906, 3907]
578	[1015, 1016]	1587	[2351, 2352]	2596	[3219, 3432]	3605	[1341, 3908]
579	[1017, 826]	1588	[1212, 2222]	2597	[3433, 629]	3606	[3909, 2744]
580	[1018, 914]	1589	[1144, 2353]	2598	[3434, 3435]	3607	[3910, 3670]
581	[1019, 1020]	1590	[855, 2354]	2599	[3436, 1056]	3608	[3911, 3912]
582	[1021, 1022]	1591	[2355, 102]	2600	[293, 3437]	3609	[3913, 3914]
583	[355, 1023]	1592	[917, 1100]	2601	[930, 249]	3610	[1414, 3915]
584	[1024, 815]	1593	[2356, 2357]	2602	[2094, 268]	3611	[484, 3194]
585	[1025, 1026]	1594	[2358, 870]	2603	[819, 821]	3612	[1530, 3916]
586	[1023, 1027]	1595	[907, 2359]	2604	[2402, 2576]	3613	[3430, 2912]
587	[857, 1028]	1596	[965, 2104]	2605	[3438, 1072]	3614	[3039, 3917]
588	[1029, 1030]	1597	[2360, 2361]	2606	[826, 293]	3615	[154, 3918]
589	[1031, 1032]	1598	[971, 2201]	2607	[828, 1007]	3616	[3919, 3920]
590	[1033, 290]	1599	[274, 2362]	2608	[1223, 2479]	3617	[3921, 3922]
591	[1034, 1035]	1600	[907, 960]	2609	[2306, 2119]	3618	[3923, 3015]
592	[1036, 1037]	1601	[2363, 834]	2610	[330, 849]	3619	[3924, 3925]
593	[63, 891]	1602	[2364, 1160]	2611	[2412, 1077]	3620	[3926, 3927]
594	[1038, 1039]	1603	[2350, 2365]	2612	[2453, 2066]	3621	[3928, 3929]
595	[1040, 1041]	1604	[2067, 936]	2613	[2271, 2437]	3622	[3173, 3930]
596	[1042, 397]	1605	[2123, 422]	2614	[1161, 2220]	3623	[3931, 3932]
597	[1043, 97]	1606	[2366, 2325]	2615	[2059, 393]	3624	[3933, 3934]
598	[1044, 1045]	1607	[16, 2264]	2616	[3439, 854]	3625	[3935, 2891]
599	[1046, 96]	1608	[1134, 2101]	2617	[2265, 1053]	3626	[2921, 3936]
600	[1035, 861]	1609	[2367, 2368]	2618	[3440, 2142]	3627	[3937, 3938]
601	[1041, 88]	1610	[1095, 1229]	2619	[2476, 895]	3628	[3939, 701]
602	[1047, 942]	1611	[2369, 403]	2620	[1198, 2246]	3629	[3940, 3941]
603	[1048, 1049]	1612	[19, 2183]	2621	[94, 312]	3630	[3942, 3387]
604	[1050, 337]	1613	[1187, 2370]	2622	[2296, 2252]	3631	[2816, 521]
605	[1051, 1052]	1614	[339, 2107]	2623	[2104, 1244]	3632	[1465, 3943]
606	[1053, 1027]	1615	[911, 2108]	2624	[1101, 1170]	3633	[3836, 1583]
607	[1054, 1055]	1616	[2371, 2073]	2625	[2077, 1140]	3634	[3944, 3945]
608	[1056, 1057]	1617	[1152, 261]	2626	[3441, 3442]	3635	[3946, 1727]
609	[1058, 1059]	1618	[1258, 431]	2627	[387, 320]	3636	[1522, 3947]
610	[917, 892]	1619	[1007, 2372]	2628	[3443, 1015]	3637	[3948, 3949]

611	[1060, 1061]	1620	[1249, 2100]	2629	[1064, 2193]	3638	[1274, 3950]
612	[1007, 1062]	1621	[89, 2190]	2630	[2161, 1164]	3639	[2607, 3951]
613	[1063, 1064]	1622	[2373, 2374]	2631	[3444, 1200]	3640	[3952, 3953]
614	[1065, 1066]	1623	[2264, 2375]	2632	[2251, 3445]	3641	[3309, 3954]
615	[1067, 1068]	1624	[1197, 2344]	2633	[2080, 3446]	3642	[2828, 3955]
616	[272, 1069]	1625	[804, 84]	2634	[3447, 3448]	3643	[3956, 3957]
617	[1070, 1071]	1626	[2352, 1036]	2635	[3449, 2374]	3644	[3958, 1966]
618	[875, 1072]	1627	[321, 1042]	2636	[955, 3450]	3645	[3784, 3959]
619	[1073, 843]	1628	[2076, 74]	2637	[2390, 826]	3646	[3960, 3961]
620	[239, 1074]	1629	[110, 275]	2638	[2221, 2162]	3647	[3962, 3963]
621	[1075, 1076]	1630	[2376, 1069]	2639	[1060, 2429]	3648	[3964, 3965]
622	[1077, 1078]	1631	[2377, 2378]	2640	[2552, 2101]	3649	[3966, 3967]
623	[1079, 989]	1632	[2379, 2230]	2641	[3451, 3452]	3650	[3968, 3969]
624	[282, 1080]	1633	[2225, 2372]	2642	[1200, 1116]	3651	[3970, 3971]
625	[1081, 1006]	1634	[76, 971]	2643	[3453, 3454]	3652	[3972, 3973]
626	[1082, 1083]	1635	[2380, 2335]	2644	[2280, 78]	3653	[3974, 3975]
627	[1084, 1085]	1636	[2147, 2321]	2645	[289, 3455]	3654	[2752, 3666]
628	[255, 361]	1637	[2381, 1213]	2646	[2154, 1074]	3655	[608, 3976]
629	[1086, 1087]	1638	[341, 2237]	2647	[3456, 1200]	3656	[1912, 1763]
630	[829, 1088]	1639	[395, 1069]	2648	[3457, 2171]	3657	[1596, 3977]
631	[1089, 264]	1640	[1073, 1030]	2649	[2337, 3458]	3658	[3978, 3979]
632	[1090, 1091]	1641	[1004, 2382]	2650	[3459, 1071]	3659	[3980, 3981]
633	[1092, 857]	1642	[2162, 22]	2651	[3460, 83]	3660	[3982, 3983]
634	[1093, 1094]	1643	[2383, 1236]	2652	[2088, 339]	3661	[3984, 1344]
635	[75, 835]	1644	[2384, 2166]	2653	[2393, 2078]	3662	[3985, 1444]
636	[1095, 1096]	1645	[2385, 814]	2654	[3461, 75]	3663	[3986, 1973]
637	[16, 423]	1646	[2286, 2386]	2655	[1102, 3462]	3664	[3987, 3988]
638	[1097, 1098]	1647	[2387, 860]	2656	[1124, 98]	3665	[3989, 3990]
639	[1099, 1100]	1648	[860, 1046]	2657	[3463, 2198]	3666	[1218, 1187]
640	[1101, 1102]	1649	[1090, 2111]	2658	[2304, 350]	3667	[2277, 3548]
641	[295, 1103]	1650	[2388, 2389]	2659	[3464, 419]	3668	[416, 3437]
642	[938, 1104]	1651	[369, 1217]	2660	[3465, 2418]	3669	[3625, 2166]
643	[80, 956]	1652	[1154, 312]	2661	[3466, 1132]	3670	[3492, 1093]
644	[1105, 1106]	1653	[2390, 415]	2662	[2240, 95]	3671	[2086, 385]
645	[1001, 1107]	1654	[103, 286]	2663	[2530, 1033]	3672	[2052, 294]
646	[1108, 405]	1655	[1092, 2080]	2664	[3467, 2547]	3673	[431, 432]
647	[1109, 1110]	1656	[2380, 992]	2665	[3468, 2056]	3674	[2566, 289]
648	[948, 1111]	1657	[2379, 2391]	2666	[3469, 330]	3675	[3641, 896]
649	[1041, 386]	1658	[863, 2188]	2667	[3470, 2203]	3676	[3991, 2128]
650	[1112, 1113]	1659	[105, 2058]	2668	[995, 841]	3677	[3474, 2143]
651	[96, 273]	1660	[832, 2392]	2669	[279, 2283]	3678	[117, 120]
652	[1114, 275]	1661	[937, 2088]	2670	[2211, 3471]	3679	[15, 881]
653	[1074, 1062]	1662	[363, 2393]	2671	[399, 1131]	3680	[399, 3992]
654	[1115, 1116]	1663	[2126, 2210]	2672	[3472, 3473]	3681	[3617, 355]

655	[249, 105]	1664	[2317, 901]	2673	[3474, 2150]	3682	[2408, 821]
656	[101, 1117]	1665	[2280, 2204]	2674	[807, 979]	3683	[2375, 3993]
657	[108, 1118]	1666	[2394, 852]	2675	[2174, 2406]	3684	[1048, 341]
658	[1119, 1120]	1667	[2241, 850]	2676	[2166, 2237]	3685	[3664, 2378]
659	[1121, 1057]	1668	[2209, 2395]	2677	[3475, 968]	3686	[240, 1149]
660	[110, 103]	1669	[2261, 2396]	2678	[1175, 907]	3687	[2331, 951]
661	[1122, 1123]	1670	[2354, 911]	2679	[900, 981]	3688	[3994, 2500]
662	[1124, 301]	1671	[2397, 1197]	2680	[852, 2388]	3689	[2375, 397]
663	[1125, 1126]	1672	[2398, 2399]	2681	[3476, 2513]	3690	[2149, 401]
664	[1127, 1128]	1673	[1010, 261]	2682	[2420, 94]	3691	[2302, 327]
665	[1129, 1130]	1674	[69, 2215]	2683	[1124, 254]	3692	[3496, 1239]
666	[309, 1131]	1675	[808, 956]	2684	[255, 1185]	3693	[2101, 2319]
667	[308, 422]	1676	[2400, 2401]	2685	[1080, 2072]	3694	[2385, 3541]
668	[898, 860]	1677	[2402, 2403]	2686	[1167, 2315]	3695	[1018, 2079]
669	[1132, 856]	1678	[2269, 851]	2687	[2409, 1043]	3696	[3995, 2382]
670	[280, 1133]	1679	[2393, 1245]	2688	[76, 874]	3697	[3470, 1111]
671	[346, 311]	1680	[2123, 2090]	2689	[1014, 2364]	3698	[3545, 2451]
672	[994, 105]	1681	[2404, 2405]	2690	[2407, 819]	3699	[3621, 2054]
673	[1134, 928]	1682	[83, 2136]	2691	[878, 2444]	3700	[265, 1160]
674	[1135, 825]	1683	[62, 2109]	2692	[3451, 1215]	3701	[2433, 352]
675	[1136, 881]	1684	[2226, 1218]	2693	[2152, 283]	3702	[2091, 1040]
676	[899, 394]	1685	[2094, 900]	2694	[894, 3477]	3703	[2355, 2083]
677	[1137, 1138]	1686	[819, 932]	2695	[973, 2307]	3704	[2273, 3618]
678	[1139, 1140]	1687	[2406, 967]	2696	[2280, 2470]	3705	[1038, 377]
679	[1141, 1029]	1688	[2407, 2408]	2697	[247, 387]	3706	[1031, 983]
680	[942, 1080]	1689	[91, 2319]	2698	[3478, 1072]	3707	[1097, 240]
681	[1142, 1143]	1690	[2409, 2410]	2699	[2210, 320]	3708	[390, 20]
682	[1144, 1145]	1691	[2175, 2411]	2700	[3479, 1066]	3709	[2300, 978]
683	[1146, 1020]	1692	[2412, 327]	2701	[2235, 1193]	3710	[423, 2375]
684	[1147, 1148]	1693	[2413, 1012]	2702	[2429, 3480]	3711	[3567, 966]
685	[908, 1149]	1694	[856, 877]	2703	[97, 254]	3712	[3996, 3997]
686	[1150, 1151]	1695	[2180, 883]	2704	[341, 2523]	3713	[2293, 2330]
687	[1152, 1153]	1696	[2414, 1145]	2705	[1182, 956]	3714	[2400, 2396]
688	[1120, 840]	1697	[2238, 98]	2706	[3481, 3475]	3715	[1054, 18]
689	[839, 1154]	1698	[807, 360]	2707	[1073, 2175]	3716	[3998, 2294]
690	[363, 1155]	1699	[2415, 1077]	2708	[2314, 2059]	3717	[3512, 862]
691	[299, 67]	1700	[973, 2416]	2709	[3482, 2195]	3718	[3995, 3644]
692	[1156, 246]	1701	[252, 334]	2710	[2079, 985]	3719	[74, 3637]
693	[93, 1157]	1702	[2417, 2418]	2711	[3483, 1044]	3720	[1217, 100]
694	[1158, 837]	1703	[1228, 1116]	2712	[882, 271]	3721	[3999, 2297]
695	[1159, 1160]	1704	[1227, 2419]	2713	[2460, 1212]	3722	[100, 2564]
696	[1161, 939]	1705	[2115, 998]	2714	[3484, 3485]	3723	[79, 808]
697	[1162, 1163]	1706	[2116, 999]	2715	[5, 3486]	3724	[3503, 4000]
698	[1164, 386]	1707	[2420, 311]	2716	[3487, 3488]	3725	[2177, 2518]

699	[1165, 1166]	1708	[1066, 420]	2717	[266, 316]	3726	[266, 337]
700	[399, 310]	1709	[1255, 415]	2718	[270, 883]	3727	[2472, 262]
701	[1155, 1167]	1710	[2421, 21]	2719	[2439, 2477]	3728	[2288, 1038]
702	[987, 928]	1711	[1187, 2422]	2720	[2104, 3489]	3729	[3614, 324]
703	[1168, 1169]	1712	[302, 1185]	2721	[105, 407]	3730	[3991, 4001]
704	[1170, 1171]	1713	[2241, 2269]	2722	[2531, 3490]	3731	[356, 2084]
705	[932, 413]	1714	[992, 2066]	2723	[3491, 2136]	3732	[1114, 2362]
706	[1097, 314]	1715	[437, 437]	2724	[3492, 968]	3733	[2308, 2428]
707	[111, 1172]	1716	[2423, 1098]	2725	[2354, 2107]	3734	[3475, 1036]
708	[1045, 423]	1717	[2424, 2425]	2726	[3493, 3494]	3735	[3624, 2086]
709	[381, 1173]	1718	[2426, 2058]	2727	[972, 375]	3736	[304, 2484]
710	[1174, 1175]	1719	[1091, 389]	2728	[2290, 20]	3737	[2179, 437]
711	[1176, 1177]	1720	[852, 840]	2729	[2083, 357]	3738	[2202, 3595]
712	[1009, 304]	1721	[2427, 2428]	2730	[1226, 850]	3739	[2446, 3580]
713	[1178, 1179]	1722	[2429, 2395]	2731	[2249, 1166]	3740	[3622, 2585]
714	[283, 371]	1723	[2430, 1248]	2732	[3495, 1252]	3741	[3568, 3569]
715	[1180, 1181]	1724	[2376, 2431]	2733	[2305, 289]	3742	[2410, 1234]
716	[1102, 1171]	1725	[826, 416]	2734	[411, 2382]	3743	[3468, 2451]
717	[1182, 809]	1726	[2432, 2433]	2735	[3496, 2307]	3744	[877, 3446]
718	[1183, 1030]	1727	[2434, 1253]	2736	[385, 2587]	3745	[1167, 2283]
719	[896, 1184]	1728	[2435, 118]	2737	[95, 395]	3746	[3631, 2345]
720	[73, 1064]	1729	[363, 278]	2738	[3497, 3498]	3747	[2083, 4002]
721	[979, 1185]	1730	[850, 2270]	2739	[940, 1100]	3748	[255, 3606]
722	[1044, 317]	1731	[2436, 2195]	2740	[3499, 2414]	3749	[822, 1155]
723	[836, 1186]	1732	[2161, 385]	2741	[385, 88]	3750	[813, 1222]
724	[99, 1187]	1733	[2317, 2437]	2742	[359, 1234]	3751	[3999, 2252]
725	[999, 872]	1734	[1252, 2438]	2743	[26, 2287]	3752	[255, 3652]
726	[1188, 987]	1735	[432, 427]	2744	[2343, 2078]	3753	[2588, 988]
727	[1189, 988]	1736	[2406, 1141]	2745	[3500, 3501]	3754	[1260, 402]
728	[1102, 1190]	1737	[861, 395]	2746	[2071, 1239]	3755	[4003, 2162]
729	[1191, 1192]	1738	[1050, 316]	2747	[1164, 88]	3756	[907, 3589]
730	[1007, 1193]	1739	[2439, 2440]	2748	[1237, 2061]	3757	[307, 421]
731	[809, 334]	1740	[2441, 332]	2749	[3449, 2536]	3758	[2432, 69]
732	[1194, 372]	1741	[939, 891]	2750	[3493, 2289]	3759	[2588, 1212]
733	[416, 1195]	1742	[2329, 2442]	2751	[3456, 1228]	3760	[2546, 2477]
734	[984, 1196]	1743	[2061, 1244]	2752	[2344, 2099]	3761	[2453, 3578]
735	[1197, 1198]	1744	[2443, 297]	2753	[3502, 2186]	3762	[2454, 3558]
736	[333, 1199]	1745	[959, 812]	2754	[2376, 273]	3763	[3601, 3615]
737	[834, 76]	1746	[2444, 2445]	2755	[1225, 421]	3764	[2386, 68]
738	[65, 893]	1747	[994, 893]	2756	[2433, 2215]	3765	[3439, 292]
739	[901, 319]	1748	[327, 1078]	2757	[3479, 297]	3766	[3995, 868]
740	[1200, 1201]	1749	[17, 1055]	2758	[1180, 2550]	3767	[883, 2145]
741	[1186, 1183]	1750	[106, 1113]	2759	[249, 893]	3768	[3620, 1144]
742	[1202, 1203]	1751	[2446, 2447]	2760	[2541, 67]	3769	[1053, 78]

743	[1204, 1205]	1752	[2448, 1052]	2761	[1213, 840]	3770	[2559, 889]
744	[1206, 103]	1753	[2449, 349]	2762	[2559, 2434]	3771	[3524, 2419]
745	[1127, 1207]	1754	[260, 1153]	2763	[3503, 2267]	3772	[3471, 265]
746	[428, 438]	1755	[2450, 2451]	2764	[1246, 1087]	3773	[304, 3594]
747	[1208, 1209]	1756	[810, 1192]	2765	[77, 1027]	3774	[2339, 1077]
748	[999, 1128]	1757	[2452, 2453]	2766	[835, 971]	3775	[2449, 2304]
749	[1210, 1211]	1758	[2335, 993]	2767	[803, 2135]	3776	[2286, 3476]
750	[1212, 989]	1759	[1119, 852]	2768	[1023, 78]	3777	[269, 364]
751	[1213, 853]	1760	[25, 815]	2769	[2597, 315]	3778	[2334, 2065]
752	[1214, 1215]	1761	[1049, 2237]	2770	[1045, 318]	3779	[873, 2200]
753	[1216, 1190]	1762	[2454, 889]	2771	[1014, 265]	3780	[349, 3525]
754	[251, 1217]	1763	[824, 1237]	2772	[3504, 3505]	3781	[2284, 2227]
755	[1218, 100]	1764	[937, 855]	2773	[2560, 879]	3782	[288, 2280]
756	[16, 318]	1765	[2455, 1135]	2774	[2507, 968]	3783	[862, 858]
757	[1219, 1220]	1766	[333, 253]	2775	[3506, 2317]	3784	[1104, 340]
758	[1221, 1222]	1767	[2456, 1233]	2776	[2226, 99]	3785	[76, 3493]
759	[1223, 1224]	1768	[2457, 2458]	2777	[2209, 3507]	3786	[4003, 829]
760	[1225, 862]	1769	[2303, 1177]	2778	[393, 415]	3787	[382, 2168]
761	[1226, 1227]	1770	[2247, 2287]	2779	[2121, 310]	3788	[2310, 263]
762	[1228, 1229]	1771	[2345, 280]	2780	[827, 239]	3789	[2461, 4004]
763	[1230, 1231]	1772	[842, 2164]	2781	[1040, 87]	3790	[2397, 344]
764	[1232, 294]	1773	[2459, 2274]	2782	[2341, 939]	3791	[246, 2437]
765	[1233, 1234]	1774	[102, 357]	2783	[2453, 3508]	3792	[275, 4005]
766	[821, 877]	1775	[2460, 2461]	2784	[119, 431]	3793	[2111, 972]
767	[1235, 371]	1776	[2462, 2349]	2785	[2468, 3509]	3794	[3444, 1115]
768	[1236, 1237]	1777	[2463, 2262]	2786	[2499, 2301]	3795	[3522, 3997]
769	[1238, 1239]	1778	[74, 2193]	2787	[416, 294]	3796	[2346, 351]
770	[1240, 953]	1779	[2079, 2464]	2788	[100, 2422]	3797	[3484, 2508]
771	[1241, 1242]	1780	[998, 2326]	2789	[318, 1042]	3798	[375, 4006]
772	[322, 1243]	1781	[966, 837]	2790	[2410, 2238]	3799	[372, 881]
773	[1204, 1244]	1782	[2221, 2217]	2791	[1237, 2104]	3800	[3543, 3645]
774	[1245, 832]	1783	[2184, 916]	2792	[987, 2318]	3801	[2318, 929]
775	[1246, 1247]	1784	[884, 2465]	2793	[2364, 3510]	3802	[815, 3597]
776	[1248, 1184]	1785	[2264, 322]	2794	[1135, 1237]	3803	[2216, 73]
777	[1249, 1134]	1786	[2331, 2466]	2795	[1157, 2503]	3804	[3502, 376]
778	[1056, 886]	1787	[1042, 1243]	2796	[2088, 2113]	3805	[2071, 2416]
779	[1250, 1251]	1788	[359, 1124]	2797	[2556, 908]	3806	[3994, 978]
780	[1252, 1253]	1789	[311, 108]	2798	[2469, 955]	3807	[1082, 3580]
781	[1254, 1255]	1790	[2129, 2467]	2799	[379, 879]	3808	[364, 925]
782	[1217, 1187]	1791	[2468, 976]	2800	[3447, 962]	3809	[3658, 1061]
783	[433, 114]	1792	[407, 245]	2801	[3511, 2256]	3810	[2521, 277]
784	[429, 1256]	1793	[403, 377]	2802	[2225, 1062]	3811	[2315, 2392]
785	[438, 434]	1794	[2469, 1216]	2803	[3512, 421]	3812	[1219, 2433]
786	[431, 118]	1795	[1023, 2470]	2804	[380, 1056]	3813	[428, 1256]

787	[437, 1257]	1796	[2471, 338]	2805	[871, 3513]	3814	[3482, 366]
788	[1258, 120]	1797	[2472, 963]	2806	[3514, 817]	3815	[2058, 3662]
789	[1259, 429]	1798	[842, 2175]	2807	[3515, 2089]	3816	[3655, 3656]
790	[402, 117]	1799	[2086, 87]	2808	[419, 298]	3817	[2510, 2297]
791	[1257, 436]	1800	[375, 2473]	2809	[3516, 2333]	3818	[3544, 3646]
792	[115, 430]	1801	[2346, 69]	2810	[1198, 113]	3819	[1125, 2214]
793	[425, 438]	1802	[889, 2474]	2811	[1183, 2164]	3820	[975, 3627]
794	[1256, 402]	1803	[30, 429]	2812	[830, 64]	3821	[1208, 1192]
795	[433, 1256]	1804	[2475, 2186]	2813	[2366, 998]	3822	[2095, 266]
796	[29, 1259]	1805	[2476, 2357]	2814	[288, 77]	3823	[74, 1140]
797	[402, 119]	1806	[1104, 2107]	2815	[997, 835]	3824	[2584, 2483]
798	[115, 1258]	1807	[1109, 2477]	2816	[3517, 935]	3825	[2164, 2411]
799	[427, 433]	1808	[376, 404]	2817	[919, 1006]	3826	[2217, 4007]
800	[1260, 116]	1809	[2478, 2479]	2818	[3476, 68]	3827	[4003, 2217]
801	[29, 427]	1810	[379, 2134]	2819	[98, 360]	3828	[2295, 320]
802	[114, 116]	1811	[1020, 1155]	2820	[2249, 3518]	3829	[93, 311]
803	[1261, 165]	1812	[2257, 2119]	2821	[2247, 816]	3830	[2180, 325]
804	[1262, 1263]	1813	[2394, 2480]	2822	[881, 321]	3831	[2310, 2074]
805	[1264, 1265]	1814	[2461, 2222]	2823	[1120, 853]	3832	[3658, 1001]
806	[1266, 1267]	1815	[83, 2481]	2824	[3464, 297]	3833	[2242, 1211]
807	[1268, 1269]	1816	[967, 842]	2825	[1086, 1247]	3834	[3478, 876]
808	[1270, 467]	1817	[1005, 2482]	2826	[3467, 920]	3835	[322, 3628]
809	[1271, 1272]	1818	[1084, 2483]	2827	[1064, 3519]	3836	[3565, 262]
810	[1273, 1274]	1819	[975, 2260]	2828	[394, 96]	3837	[2501, 3616]
811	[1275, 1276]	1820	[864, 997]	2829	[3520, 2518]	3838	[3511, 2338]
812	[751, 1277]	1821	[260, 2484]	2830	[2402, 18]	3839	[3998, 4008]
813	[1278, 1279]	1822	[2129, 2485]	2831	[2186, 3521]	3840	[1187, 2564]
814	[1280, 1281]	1823	[2090, 2103]	2832	[2224, 1007]	3841	[2195, 379]
815	[1282, 1283]	1824	[2486, 2487]	2833	[1158, 967]	3842	[2572, 392]
816	[1284, 1285]	1825	[2362, 1172]	2834	[3522, 3523]	3843	[3664, 1247]
817	[1286, 623]	1826	[2480, 840]	2835	[2595, 107]	3844	[3573, 3550]
818	[588, 1287]	1827	[2166, 944]	2836	[281, 2502]	3845	[1202, 876]
819	[1288, 1289]	1828	[2085, 1040]	2837	[2146, 2326]	3846	[2123, 863]
820	[1290, 1291]	1829	[405, 2130]	2838	[2552, 2318]	3847	[807, 302]
821	[1287, 1292]	1830	[251, 99]	2839	[2113, 2107]	3848	[116, 430]
822	[1293, 1294]	1831	[312, 1118]	2840	[843, 2087]	3849	[2557, 2440]
823	[1295, 1296]	1832	[2488, 2146]	2841	[1226, 3524]	3850	[365, 2491]
824	[1297, 1298]	1833	[1220, 70]	2842	[2067, 3525]	3851	[2126, 387]
825	[1299, 1300]	1834	[2489, 2100]	2843	[115, 117]	3852	[1189, 1079]
826	[694, 1301]	1835	[2490, 1175]	2844	[883, 3526]	3853	[3612, 1161]
827	[1302, 1303]	1836	[392, 2491]	2845	[72, 2344]	3854	[370, 4009]
828	[549, 1304]	1837	[970, 1217]	2846	[3527, 1230]	3855	[964, 939]
829	[1305, 1306]	1838	[2303, 2492]	2847	[2377, 1087]	3856	[2220, 917]
830	[1307, 1308]	1839	[2493, 2268]	2848	[2207, 3528]	3857	[2298, 2336]

831	[1281, 207]	1840	[2358, 2494]	2849	[828, 1074]	3858	[2315, 833]
832	[1309, 1310]	1841	[968, 1037]	2850	[2157, 2458]	3859	[2567, 77]
833	[1311, 1312]	1842	[2495, 2496]	2851	[247, 2295]	3860	[1206, 2362]
834	[1313, 1314]	1843	[1066, 298]	2852	[2423, 908]	3861	[26, 2551]
835	[1315, 1316]	1844	[281, 407]	2853	[3529, 1152]	3862	[846, 366]
836	[1317, 1318]	1845	[2497, 2226]	2854	[2592, 3530]	3863	[4010, 69]
837	[1319, 1320]	1846	[422, 2188]	2855	[1036, 1094]	3864	[873, 3493]
838	[1321, 1322]	1847	[1178, 2498]	2856	[857, 3446]	3865	[837, 1183]
839	[1323, 1324]	1848	[2499, 2500]	2857	[2535, 2135]	3866	[954, 1216]
840	[1325, 1326]	1849	[2501, 2447]	2858	[2486, 1143]	3867	[3540, 3632]
841	[1327, 1328]	1850	[2502, 408]	2859	[3531, 3532]	3868	[2073, 2139]
842	[1318, 1329]	1851	[2503, 109]	2860	[2326, 1207]	3869	[3581, 1095]
843	[1330, 1331]	1852	[2504, 2128]	2861	[353, 370]	3870	[2225, 1193]
844	[1332, 1333]	1853	[289, 2491]	2862	[2114, 937]	3871	[3516, 3532]
845	[1334, 1335]	1854	[80, 333]	2863	[322, 397]	3872	[1009, 260]
846	[1336, 703]	1855	[2505, 346]	2864	[2472, 2310]	3873	[313, 908]
847	[1337, 1338]	1856	[2506, 266]	2865	[3533, 1071]	3874	[2119, 3546]
848	[1339, 50]	1857	[2367, 1169]	2866	[3534, 1228]	3875	[430, 120]
849	[1340, 1341]	1858	[1234, 98]	2867	[1017, 2051]	3876	[2286, 300]
850	[1342, 1343]	1859	[2507, 1093]	2868	[3535, 3536]	3877	[2461, 3663]
851	[1344, 773]	1860	[2327, 2508]	2869	[2414, 1016]	3878	[2184, 4001]
852	[1345, 1346]	1861	[1121, 886]	2870	[3537, 2224]	3879	[932, 857]
853	[1347, 1348]	1862	[2424, 324]	2871	[2181, 2145]	3880	[105, 244]
854	[1349, 1350]	1863	[2509, 2494]	2872	[3538, 3539]	3881	[2076, 1064]
855	[1333, 1351]	1864	[2326, 1128]	2873	[857, 414]	3882	[808, 333]
856	[1352, 1353]	1865	[2437, 2210]	2874	[344, 112]	3883	[1245, 2283]
857	[1354, 1355]	1866	[2510, 2511]	2875	[2095, 315]	3884	[2275, 1111]
858	[1356, 1357]	1867	[319, 388]	2876	[3540, 3541]	3885	[2364, 1133]
859	[1358, 1359]	1868	[999, 1207]	2877	[3542, 2206]	3886	[3561, 3613]
860	[1360, 1361]	1869	[2512, 1136]	2878	[389, 23]	3887	[2259, 3509]
861	[1362, 507]	1870	[2375, 1243]	2879	[1175, 406]	3888	[247, 319]
862	[1363, 1364]	1871	[2386, 2513]	2880	[3543, 2570]	3889	[2049, 271]
863	[1365, 1366]	1872	[105, 2502]	2881	[3544, 1242]	3890	[1065, 419]
864	[1367, 149]	1873	[2514, 822]	2882	[3545, 2254]	3891	[1198, 2099]
865	[1368, 1369]	1874	[2515, 248]	2883	[2283, 1022]	3892	[1063, 1139]
866	[1370, 1371]	1875	[292, 2088]	2884	[2268, 3546]	3893	[409, 896]
867	[1372, 1373]	1876	[2516, 2517]	2885	[2452, 992]	3894	[2210, 388]
868	[1374, 1375]	1877	[400, 2143]	2886	[1081, 920]	3895	[3620, 1015]
869	[1376, 1377]	1878	[2518, 816]	2887	[2543, 1094]	3896	[3570, 806]
870	[1378, 1379]	1879	[862, 2090]	2888	[3465, 3547]	3897	[389, 2253]
871	[1380, 1381]	1880	[2312, 2519]	2889	[955, 1190]	3898	[4010, 2433]
872	[1382, 1383]	1881	[1117, 357]	2890	[1132, 932]	3899	[2444, 316]
873	[1384, 1385]	1882	[2434, 890]	2891	[2430, 2324]	3900	[382, 3639]
874	[1369, 1386]	1883	[2520, 2467]	2892	[3548, 2564]	3901	[2205, 3582]

875	[1387, 1388]	1884	[928, 2319]	2893	[3506, 2125]	3902	[3647, 2149]
876	[1389, 1390]	1885	[2521, 2522]	2894	[956, 334]	3903	[2579, 934]
877	[1291, 1391]	1886	[1015, 1145]	2895	[2433, 3549]	3904	[3661, 2269]
878	[1392, 1393]	1887	[1049, 2523]	2896	[2436, 366]	3905	[955, 1171]
879	[680, 1394]	1888	[238, 2224]	2897	[2369, 1038]	3906	[322, 3993]
880	[1395, 1396]	1889	[2154, 2235]	2898	[3524, 2323]	3907	[831, 65]
881	[1397, 1398]	1890	[873, 971]	2899	[2490, 2105]	3908	[1092, 877]
882	[1388, 1399]	1891	[2524, 2525]	2900	[1175, 959]	3909	[1046, 272]
883	[1400, 1401]	1892	[977, 2500]	2901	[2258, 2120]	3910	[309, 3992]
884	[1402, 1403]	1893	[2526, 2527]	2902	[2509, 870]	3911	[2462, 2250]
885	[1404, 1405]	1894	[96, 2528]	2903	[67, 2513]	3912	[351, 2215]
886	[1406, 1407]	1895	[2078, 2283]	2904	[2152, 370]	3913	[3991, 2185]
887	[9, 1408]	1896	[2529, 2357]	2905	[415, 2052]	3914	[2569, 2498]
888	[1409, 1410]	1897	[271, 2145]	2906	[3491, 84]	3915	[1046, 395]
889	[1411, 1412]	1898	[914, 1196]	2907	[1091, 269]	3916	[2515, 930]
890	[1413, 1414]	1899	[2530, 392]	2908	[3484, 3550]	3917	[2489, 987]
891	[122, 1415]	1900	[2207, 1244]	2909	[2461, 989]	3918	[2116, 2326]
892	[124, 1416]	1901	[1206, 111]	2910	[2089, 3551]	3919	[3495, 3558]
893	[126, 1417]	1902	[2531, 2532]	2911	[2488, 2325]	3920	[2227, 849]
894	[1418, 1419]	1903	[994, 2426]	2912	[72, 1198]	3921	[2131, 2414]
895	[1420, 1342]	1904	[2352, 968]	2913	[2125, 901]	3922	[1105, 2405]
896	[1421, 1422]	1905	[2533, 2534]	2914	[1024, 2518]	3923	[2384, 341]
897	[758, 1423]	1906	[874, 2201]	2915	[327, 2492]	3924	[2315, 3592]
898	[220, 732]	1907	[2535, 804]	2916	[120, 432]	3925	[1136, 317]
899	[1424, 1425]	1908	[1139, 2193]	2917	[2090, 3552]	3926	[101, 356]
900	[1426, 695]	1909	[1221, 814]	2918	[865, 835]	3927	[894, 2574]
901	[1427, 596]	1910	[1002, 2536]	2919	[2196, 2142]	3928	[1165, 2349]
902	[1428, 1429]	1911	[1167, 1021]	2920	[1010, 1153]	3929	[3630, 2534]
903	[1430, 1431]	1912	[2325, 871]	2921	[3553, 2067]	3930	[2244, 1126]
904	[1432, 1433]	1913	[2520, 2485]	2922	[3554, 3555]	3931	[2568, 304]
905	[1434, 1435]	1914	[2537, 2538]	2923	[2388, 841]	3932	[2258, 2159]
906	[1436, 1437]	1915	[2539, 951]	2924	[2224, 2235]	3933	[2208, 1001]
907	[1438, 1439]	1916	[1232, 1195]	2925	[3556, 3486]	3934	[3535, 1123]
908	[1440, 1441]	1917	[2540, 2541]	2926	[2503, 1118]	3935	[1217, 3548]
909	[1442, 1443]	1918	[2073, 263]	2927	[3557, 976]	3936	[3609, 3473]
910	[1444, 1445]	1919	[2277, 100]	2928	[1051, 2347]	3937	[303, 1152]
911	[1446, 1447]	1920	[2542, 2328]	2929	[3553, 935]	3938	[349, 936]
912	[1448, 1449]	1921	[341, 944]	2930	[3558, 890]	3939	[94, 884]
913	[1450, 1451]	1922	[855, 2113]	2931	[2335, 3508]	3940	[2182, 2591]
914	[1452, 1453]	1923	[2505, 93]	2932	[869, 3559]	3941	[1230, 985]
915	[1454, 1455]	1924	[2543, 1037]	2933	[1159, 1133]	3942	[2253, 4006]
916	[1456, 1457]	1925	[344, 2344]	2934	[1175, 2130]	3943	[839, 94]
917	[1458, 1459]	1926	[2302, 1176]	2935	[3560, 2135]	3944	[340, 3665]
918	[1460, 1461]	1927	[2544, 306]	2936	[292, 2586]	3945	[2110, 900]

919	[1462, 1463]	1928	[2545, 829]	2937	[2111, 269]	3946	[2069, 2268]
920	[1464, 1465]	1929	[2546, 1110]	2938	[3471, 280]	3947	[1256, 116]
921	[1466, 1467]	1930	[1117, 2084]	2939	[2529, 2574]	3948	[3471, 2364]
922	[1468, 1469]	1931	[2334, 2453]	2940	[3561, 2391]	3949	[842, 1030]
923	[1470, 1471]	1932	[1005, 2547]	2941	[2560, 3562]	3950	[1150, 888]
924	[1472, 1473]	1933	[280, 1160]	2942	[2109, 891]	3951	[860, 394]
925	[724, 1474]	1934	[2345, 265]	2943	[2373, 3563]	3952	[861, 2376]
926	[1475, 1299]	1935	[2051, 416]	2944	[395, 273]	3953	[938, 2354]
927	[1476, 1477]	1936	[2152, 1235]	2945	[419, 3564]	3954	[3996, 1211]
928	[1478, 1479]	1937	[2548, 839]	2946	[2393, 1167]	3955	[3633, 914]
929	[1480, 1307]	1938	[278, 1167]	2947	[940, 892]	3956	[2306, 2258]
930	[1481, 1482]	1939	[1227, 2270]	2948	[2075, 73]	3957	[2398, 1251]
931	[1483, 1484]	1940	[317, 423]	2949	[2541, 3476]	3958	[3650, 262]
932	[1485, 1486]	1941	[2549, 2550]	2950	[2383, 824]	3959	[2224, 1074]
933	[1487, 1488]	1942	[1115, 1229]	2951	[2561, 2541]	3960	[3517, 2067]
934	[1489, 1490]	1943	[815, 2551]	2952	[3565, 2073]	3961	[400, 2150]
935	[1491, 1492]	1944	[2552, 928]	2953	[1095, 1116]	3962	[2154, 2225]
936	[1493, 1494]	1945	[2210, 2553]	2954	[2462, 3518]	3963	[3460, 804]
937	[1495, 1496]	1946	[98, 302]	2955	[3566, 2536]	3964	[988, 4004]
938	[1497, 1498]	1947	[2377, 2554]	2956	[1120, 2388]	3965	[2541, 300]
939	[1499, 1500]	1948	[2181, 326]	2957	[2426, 407]	3966	[3533, 2583]
940	[1501, 1502]	1949	[1021, 833]	2958	[3567, 836]	3967	[381, 1057]
941	[1503, 527]	1950	[2212, 988]	2959	[3568, 912]	3968	[1237, 2207]
942	[1504, 1505]	1951	[1077, 1177]	2960	[340, 3569]	3969	[3502, 403]
943	[604, 1506]	1952	[424, 433]	2961	[81, 2121]	3970	[2476, 3477]
944	[1507, 1508]	1953	[1098, 2555]	2962	[2142, 2150]	3971	[2217, 22]
945	[1509, 1510]	1954	[2519, 379]	2963	[429, 438]	3972	[1217, 2563]
946	[1511, 1512]	1955	[2094, 2111]	2964	[3570, 3571]	3973	[900, 269]
947	[1513, 1514]	1956	[2556, 314]	2965	[1061, 2395]	3974	[2493, 2070]
948	[1515, 1516]	1957	[2557, 1110]	2966	[281, 244]	3975	[2149, 2143]
949	[1517, 1518]	1958	[2264, 1042]	2967	[2456, 359]	3976	[2313, 73]
950	[1519, 1520]	1959	[2119, 2558]	2968	[927, 825]	3977	[3584, 2083]
951	[1521, 1522]	1960	[2559, 1252]	2969	[2519, 2133]	3978	[2137, 2324]
952	[1523, 1524]	1961	[2291, 2498]	2970	[3572, 3558]	3979	[2459, 1032]
953	[1525, 1526]	1962	[956, 253]	2971	[1075, 2118]	3980	[950, 922]
954	[1527, 1528]	1963	[2153, 2224]	2972	[3514, 80]	3981	[2175, 2087]
955	[1529, 1530]	1964	[2519, 2560]	2973	[82, 310]	3982	[3655, 3448]
956	[156, 1531]	1965	[1236, 825]	2974	[25, 2247]	3983	[2518, 2287]
957	[528, 1532]	1966	[1061, 1107]	2975	[3573, 2328]	3984	[2060, 1204]
958	[1533, 1534]	1967	[2343, 1167]	2976	[2059, 1255]	3985	[932, 2080]
959	[1535, 1536]	1968	[2561, 338]	2977	[1198, 2292]	3986	[2572, 1033]
960	[1537, 1538]	1969	[2229, 2391]	2978	[885, 942]	3987	[2560, 2594]
961	[1539, 1540]	1970	[2562, 1242]	2979	[3533, 2236]	3988	[2285, 2541]
962	[1541, 1542]	1971	[921, 2332]	2980	[3574, 2294]	3989	[901, 2295]

963	[1543, 1544]	1972	[360, 1185]	2981	[3475, 2543]	3990	[1255, 826]
964	[1545, 1501]	1973	[2563, 2564]	2982	[389, 375]	3991	[1401, 4011]
965	[1546, 1547]	1974	[269, 375]	2983	[2502, 3575]	3992	[4012, 3744]
966	[1548, 1549]	1975	[843, 2411]	2984	[902, 399]	3993	[4013, 4014]
967	[1550, 1551]	1976	[2565, 1090]	2985	[2227, 3576]	3994	[4015, 4016]
968	[1552, 1553]	1977	[2052, 1195]	2986	[1259, 433]	3995	[4017, 4018]
969	[1554, 667]	1978	[2566, 365]	2987	[1117, 3577]	3996	[3983, 4019]
970	[1555, 1556]	1979	[1001, 2395]	2988	[2116, 871]	3997	[3892, 1837]
971	[1557, 1558]	1980	[938, 2113]	2989	[2164, 2342]	3998	[1916, 4020]
972	[1559, 48]	1981	[287, 2567]	2990	[2460, 1079]	3999	[532, 3191]
973	[1560, 1561]	1982	[998, 1127]	2991	[2335, 3578]	4000	[2701, 3851]
974	[1562, 1563]	1983	[62, 939]	2992	[425, 1256]	4001	[4021, 1979]
975	[1564, 1565]	1984	[1252, 2474]	2993	[3579, 3580]	4002	[4022, 1730]
976	[1566, 1567]	1985	[2568, 1152]	2994	[1191, 811]	4003	[3863, 45]
977	[1568, 1569]	1986	[2569, 2570]	2995	[889, 2438]	4004	[4023, 4024]
978	[1570, 1571]	1987	[858, 2188]	2996	[2449, 2067]	4005	[4025, 4026]
979	[1572, 1573]	1988	[2571, 2453]	2997	[3545, 2057]	4006	[4027, 4028]
980	[1574, 1575]	1989	[2516, 946]	2998	[383, 2347]	4007	[4029, 4030]
981	[1576, 1577]	1990	[94, 2503]	2999	[3469, 2227]	4008	[3932, 4031]
982	[1578, 1579]	1991	[2572, 365]	3000	[2067, 350]	4009	[4032, 4033]
983	[1580, 1543]	1992	[1216, 1171]	3001	[2195, 2560]	4010	[4034, 137]
984	[1581, 1582]	1993	[2088, 2354]	3002	[3581, 1228]	4011	[3643, 353]
985	[1583, 1584]	1994	[2080, 2573]	3003	[3542, 3582]	4012	[3641, 410]
986	[1585, 1586]	1995	[281, 2058]	3004	[2563, 2422]	4013	[2060, 2207]
987	[1587, 1588]	1996	[2356, 2574]	3005	[3574, 2330]	4014	[1091, 972]
988	[1589, 1590]	1997	[908, 241]	3006	[413, 3446]	4015	[1084, 2527]
989	[1591, 1592]	1998	[2255, 2338]	3007	[1048, 943]	4016	[3504, 1163]
990	[1593, 1594]	1999	[2575, 2576]	3008	[2167, 2190]	4017	[959, 2359]
991	[1595, 1596]	2000	[988, 2222]	3009	[3583, 1198]	4018	[941, 353]
992	[1597, 1598]	2001	[2386, 2577]	3010	[3443, 2132]	4019	[2581, 2325]
993	[1599, 1600]	2002	[246, 901]	3011	[254, 979]	4020	[3436, 2089]
994	[1601, 1602]	2003	[2578, 346]	3012	[344, 1198]	4021	[3657, 399]
995	[1603, 1604]	2004	[2579, 2580]	3013	[3579, 1083]	4022	[3573, 3485]
996	[1346, 1605]	2005	[2335, 2066]	3014	[340, 912]	4023	[2049, 2181]
997	[1606, 1557]	2006	[2581, 998]	3015	[2362, 286]	4024	[874, 2289]
998	[1607, 1608]	2007	[2582, 2406]	3016	[1141, 1183]	4025	[3614, 3501]
999	[1609, 1610]	2008	[2058, 408]	3017	[3584, 356]	4026	[21, 1088]
1000	[1611, 1612]	2009	[903, 2583]	3018	[96, 1069]	4027	[1092, 413]
1001	[1613, 1614]	2010	[1058, 1113]	3019	[3444, 1095]	4028	[1017, 415]
1002	[1615, 1616]	2011	[339, 911]	3020	[3487, 2496]	4029	[3996, 3523]
1003	[1617, 1618]	2012	[378, 367]	3021	[2443, 1066]	4030	[2089, 886]
1004	[1619, 1620]	2013	[2539, 922]	3022	[2552, 91]	4031	[1257, 2179]
1005	[1621, 1622]	2014	[905, 2214]	3023	[2363, 75]	4032	[2073, 2311]
1006	[1623, 1624]	2015	[2584, 2585]	3024	[265, 3585]	4033	[987, 2101]

1007	[440, 1625]	2016	[2478, 1224]	3025	[2125, 2437]	4034	[861, 272]
1008	[1626, 1627]	2017	[2454, 2434]	3026	[343, 3583]		

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	673	0	1346	0	2019	1	2692	1	3365	1
1	0	674	0	1347	0	2020	0	2693	1	3366	1
2	1	675	0	1348	1	2021	1	2694	1	3367	1
3	0	676	1	1349	0	2022	0	2695	1	3368	0
4	1	677	0	1350	1	2023	0	2696	0	3369	0
5	1	678	0	1351	1	2024	0	2697	1	3370	1
6	0	679	0	1352	1	2025	1	2698	1	3371	0
7	0	680	1	1353	1	2026	0	2699	0	3372	1
8	0	681	1	1354	0	2027	1	2700	1	3373	1
9	1	682	0	1355	0	2028	1	2701	1	3374	1
10	1	683	1	1356	1	2029	0	2702	1	3375	1
11	1	684	1	1357	1	2030	1	2703	1	3376	1
12	1	685	0	1358	0	2031	1	2704	1	3377	0
13	0	686	0	1359	1	2032	0	2705	1	3378	0
14	0	687	0	1360	1	2033	0	2706	0	3379	1
15	0	688	1	1361	1	2034	0	2707	1	3380	1
16	0	689	1	1362	0	2035	1	2708	1	3381	1
17	0	690	0	1363	1	2036	0	2709	1	3382	0
18	0	691	1	1364	1	2037	0	2710	1	3383	1
19	1	692	0	1365	0	2038	1	2711	0	3384	0
20	0	693	0	1366	1	2039	0	2712	0	3385	1
21	1	694	1	1367	0	2040	1	2713	1	3386	0
22	1	695	1	1368	0	2041	0	2714	0	3387	0
23	1	696	1	1369	1	2042	0	2715	1	3388	1
24	0	697	0	1370	1	2043	1	2716	1	3389	1
25	1	698	0	1371	1	2044	0	2717	0	3390	1
26	1	699	0	1372	1	2045	1	2718	1	3391	0
27	0	700	0	1373	1	2046	1	2719	0	3392	1
28	0	701	1	1374	0	2047	1	2720	1	3393	0
29	0	702	0	1375	0	2048	1	2721	0	3394	1
30	0	703	0	1376	1	2049	0	2722	0	3395	1
31	0	704	0	1377	0	2050	0	2723	1	3396	0
32	0	705	1	1378	1	2051	0	2724	0	3397	1
33	0	706	1	1379	0	2052	0	2725	0	3398	1
34	1	707	0	1380	0	2053	1	2726	0	3399	1
35	0	708	1	1381	0	2054	1	2727	0	3400	0
36	0	709	0	1382	1	2055	0	2728	0	3401	1
37	0	710	1	1383	1	2056	1	2729	0	3402	0
38	1	711	1	1384	0	2057	0	2730	1	3403	0

39	1	712	1	1385	1	2058	0	2731	1	3404	0
40	0	713	1	1386	1	2059	1	2732	0	3405	1
41	0	714	0	1387	0	2060	0	2733	1	3406	0
42	0	715	1	1388	0	2061	0	2734	0	3407	0
43	1	716	1	1389	1	2062	0	2735	0	3408	1
44	0	717	1	1390	1	2063	0	2736	1	3409	0
45	1	718	1	1391	0	2064	0	2737	0	3410	1
46	1	719	1	1392	1	2065	1	2738	1	3411	0
47	0	720	0	1393	0	2066	1	2739	1	3412	1
48	0	721	0	1394	0	2067	0	2740	0	3413	0
49	1	722	1	1395	0	2068	0	2741	1	3414	1
50	1	723	0	1396	1	2069	1	2742	0	3415	0
51	1	724	1	1397	1	2070	1	2743	1	3416	1
52	1	725	1	1398	0	2071	0	2744	0	3417	0
53	0	726	1	1399	0	2072	1	2745	1	3418	0
54	0	727	0	1400	0	2073	0	2746	0	3419	0
55	1	728	1	1401	1	2074	1	2747	0	3420	0
56	0	729	1	1402	1	2075	0	2748	1	3421	1
57	1	730	1	1403	1	2076	1	2749	1	3422	1
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59	1	732	1	1405	1	2078	0	2751	1	3424	1
60	0	733	1	1406	1	2079	1	2752	1	3425	1
61	0	734	1	1407	1	2080	1	2753	0	3426	0
62	0	735	0	1408	1	2081	0	2754	1	3427	0
63	0	736	0	1409	1	2082	1	2755	1	3428	0
64	0	737	1	1410	0	2083	0	2756	1	3429	1
65	0	738	0	1411	1	2084	1	2757	1	3430	1
66	0	739	0	1412	0	2085	0	2758	1	3431	0
67	1	740	0	1413	1	2086	0	2759	1	3432	1
68	1	741	1	1414	0	2087	0	2760	1	3433	0
69	0	742	0	1415	1	2088	0	2761	0	3434	1
70	1	743	1	1416	0	2089	1	2762	1	3435	1
71	0	744	1	1417	1	2090	0	2763	0	3436	0
72	0	745	0	1418	1	2091	1	2764	0	3437	1
73	0	746	0	1419	1	2092	0	2765	1	3438	1
74	0	747	1	1420	1	2093	0	2766	0	3439	0
75	1	748	1	1421	1	2094	0	2767	0	3440	0
76	1	749	1	1422	1	2095	0	2768	1	3441	0
77	1	750	0	1423	1	2096	0	2769	0	3442	0
78	1	751	0	1424	1	2097	0	2770	1	3443	0
79	0	752	0	1425	0	2098	1	2771	1	3444	1
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81	0	754	0	1427	0	2100	1	2773	1	3446	0
82	0	755	0	1428	1	2101	0	2774	1	3447	0

83	0	756	0	1429	1	2102	1	2775	1	3448	0
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85	1	758	1	1431	0	2104	1	2777	0	3450	1
86	0	759	0	1432	0	2105	0	2778	0	3451	1
87	0	760	1	1433	1	2106	0	2779	1	3452	0
88	0	761	1	1434	1	2107	0	2780	0	3453	1
89	1	762	1	1435	1	2108	0	2781	1	3454	0
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91	1	764	1	1437	1	2110	0	2783	1	3456	1
92	0	765	0	1438	1	2111	1	2784	0	3457	1
93	0	766	0	1439	1	2112	1	2785	1	3458	0
94	1	767	1	1440	0	2113	1	2786	0	3459	1
95	0	768	1	1441	1	2114	1	2787	1	3460	0
96	0	769	1	1442	1	2115	1	2788	0	3461	0
97	1	770	1	1443	1	2116	1	2789	0	3462	0
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104	1	777	0	1450	0	2123	0	2796	0	3469	0
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108	1	781	1	1454	1	2127	0	2800	0	3473	0
109	1	782	0	1455	0	2128	1	2801	1	3474	0
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126	1	799	1	1472	1	2145	0	2818	0	3491	1

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130	1	803	0	1476	0	2149	1	2822	1	3495	0
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132	0	805	1	1478	1	2151	0	2824	1	3497	1
133	1	806	0	1479	0	2152	1	2825	1	3498	1
134	1	807	1	1480	1	2153	1	2826	0	3499	0
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136	0	809	0	1482	1	2155	0	2828	1	3501	1
137	1	810	0	1483	0	2156	1	2829	1	3502	0
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139	0	812	0	1485	1	2158	1	2831	1	3504	1
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142	1	815	0	1488	0	2161	1	2834	1	3507	0
143	0	816	0	1489	0	2162	1	2835	0	3508	1
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145	0	818	0	1491	1	2164	1	2837	0	3510	0
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147	1	820	0	1493	0	2166	0	2839	1	3512	0
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152	0	825	0	1498	0	2171	0	2844	0	3517	0
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155	0	828	0	1501	1	2174	0	2847	0	3520	1
156	1	829	0	1502	1	2175	0	2848	0	3521	0
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158	1	831	0	1504	1	2177	0	2850	0	3523	0
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161	0	834	1	1507	1	2180	1	2853	0	3526	1
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166	0	839	1	1512	0	2185	0	2858	0	3531	0
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168	1	841	1	1514	1	2187	1	2860	1	3533	0
169	0	842	0	1515	0	2188	1	2861	0	3534	0
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171	0	844	0	1517	0	2190	0	2863	0	3536	1
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174	1	847	1	1520	1	2193	1	2866	0	3539	1
175	1	848	1	1521	1	2194	1	2867	0	3540	0
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177	1	850	0	1523	1	2196	1	2869	0	3542	0
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181	0	854	0	1527	1	2200	1	2873	0	3546	0
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184	0	857	0	1530	1	2203	1	2876	0	3549	0
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196	1	869	1	1542	0	2215	0	2888	1	3561	1
197	0	870	1	1543	0	2216	1	2889	0	3562	0
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222	1	895	1	1568	1	2241	0	2914	0	3587	0
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229	1	902	1	1575	0	2248	0	2921	1	3594	0
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321	1	994	1	1667	0	2340	1	3013	0	3686	0
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323	1	996	0	1669	0	2342	1	3015	1	3688	0
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325	0	998	0	1671	0	2344	1	3017	0	3690	1
326	1	999	1	1672	0	2345	0	3018	0	3691	1
327	1	1000	0	1673	1	2346	1	3019	1	3692	0
328	0	1001	1	1674	0	2347	0	3020	1	3693	0
329	1	1002	1	1675	0	2348	1	3021	0	3694	1
330	0	1003	0	1676	0	2349	0	3022	1	3695	1
331	0	1004	1	1677	1	2350	1	3023	1	3696	0
332	1	1005	1	1678	1	2351	0	3024	1	3697	1
333	0	1006	0	1679	1	2352	1	3025	1	3698	1
334	1	1007	1	1680	0	2353	1	3026	1	3699	0
335	0	1008	1	1681	1	2354	0	3027	0	3700	1
336	0	1009	1	1682	0	2355	0	3028	0	3701	1
337	1	1010	1	1683	0	2356	0	3029	1	3702	1
338	0	1011	0	1684	1	2357	0	3030	1	3703	0
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343	1	1016	1	1689	1	2362	1	3035	0	3708	1
344	1	1017	0	1690	1	2363	1	3036	0	3709	1
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371	0	1044	1	1717	0	2390	1	3063	1	3736	1
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375	1	1048	1	1721	1	2394	1	3067	0	3740	1
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409	0	1082	1	1755	0	2428	0	3101	1	3774	0
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416	1	1089	0	1762	0	2435	1	3108	0	3781	0
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429	1	1102	1	1775	1	2448	0	3121	0	3794	1
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435	0	1108	0	1781	0	2454	0	3127	0	3800	1
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443	0	1116	1	1789	0	2462	0	3135	1	3808	0
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445	0	1118	0	1791	1	2464	1	3137	1	3810	0
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447	0	1120	1	1793	1	2466	0	3139	0	3812	0
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450	0	1123	1	1796	0	2469	0	3142	1	3815	0
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457	0	1130	0	1803	0	2476	0	3149	1	3822	0
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595	1	1268	1	1941	0	2614	1	3287	0	3960	0
596	1	1269	0	1942	0	2615	1	3288	1	3961	0
597	1	1270	0	1943	0	2616	0	3289	0	3962	1
598	1	1271	0	1944	1	2617	1	3290	0	3963	0
599	1	1272	1	1945	0	2618	0	3291	1	3964	0
600	0	1273	0	1946	1	2619	0	3292	0	3965	1
601	1	1274	1	1947	0	2620	0	3293	0	3966	0
602	0	1275	0	1948	1	2621	1	3294	1	3967	0
603	1	1276	0	1949	0	2622	1	3295	1	3968	1
604	1	1277	1	1950	1	2623	1	3296	0	3969	0
605	0	1278	0	1951	0	2624	1	3297	1	3970	0
606	0	1279	0	1952	0	2625	1	3298	1	3971	0
607	1	1280	1	1953	1	2626	0	3299	0	3972	0
608	1	1281	0	1954	0	2627	1	3300	1	3973	0
609	1	1282	0	1955	0	2628	0	3301	1	3974	0
610	0	1283	1	1956	1	2629	1	3302	1	3975	1

611	0	1284	0	1957	1	2630	1	3303	0	3976	0
612	1	1285	1	1958	0	2631	1	3304	0	3977	0
613	1	1286	0	1959	1	2632	1	3305	1	3978	1
614	0	1287	0	1960	1	2633	1	3306	1	3979	1
615	0	1288	1	1961	0	2634	0	3307	1	3980	0
616	0	1289	0	1962	1	2635	1	3308	0	3981	0
617	0	1290	0	1963	1	2636	0	3309	1	3982	1
618	0	1291	1	1964	0	2637	1	3310	0	3983	0
619	1	1292	0	1965	1	2638	1	3311	1	3984	0
620	1	1293	0	1966	0	2639	0	3312	1	3985	1
621	0	1294	1	1967	0	2640	1	3313	1	3986	1
622	0	1295	1	1968	0	2641	1	3314	0	3987	1
623	1	1296	0	1969	0	2642	0	3315	0	3988	1
624	0	1297	1	1970	1	2643	1	3316	1	3989	0
625	0	1298	0	1971	0	2644	0	3317	0	3990	1
626	1	1299	0	1972	0	2645	1	3318	0	3991	1
627	0	1300	0	1973	1	2646	1	3319	0	3992	1
628	1	1301	0	1974	1	2647	1	3320	1	3993	0
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633	0	1306	0	1979	1	2652	0	3325	1	3998	1
634	1	1307	1	1980	1	2653	1	3326	0	3999	0
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636	1	1309	0	1982	0	2655	1	3328	0	4001	1
637	0	1310	0	1983	0	2656	0	3329	1	4002	1
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641	1	1314	0	1987	1	2660	1	3333	1	4006	0
642	1	1315	0	1988	1	2661	1	3334	1	4007	0
643	1	1316	0	1989	1	2662	0	3335	0	4008	0
644	0	1317	0	1990	1	2663	0	3336	0	4009	0
645	1	1318	0	1991	1	2664	0	3337	0	4010	0
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647	1	1320	0	1993	0	2666	0	3339	1	4012	1
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653	0	1326	1	1999	0	2672	0	3345	0	4018	0
654	0	1327	1	2000	0	2673	0	3346	1	4019	1

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657	1	1330	1	2003	0	2676	0	3349	0	4022	1
658	0	1331	0	2004	1	2677	0	3350	1	4023	0
659	0	1332	0	2005	0	2678	1	3351	1	4024	1
660	0	1333	1	2006	1	2679	0	3352	1	4025	0
661	1	1334	1	2007	1	2680	0	3353	1	4026	1
662	0	1335	0	2008	0	2681	0	3354	0	4027	0
663	0	1336	0	2009	1	2682	1	3355	0	4028	0
664	0	1337	1	2010	1	2683	0	3356	1	4029	0
665	0	1338	0	2011	1	2684	1	3357	1	4030	1
666	1	1339	1	2012	1	2685	1	3358	0	4031	0
667	1	1340	1	2013	1	2686	1	3359	1	4032	0
668	0	1341	0	2014	1	2687	1	3360	1	4033	0
669	0	1342	0	2015	0	2688	1	3361	1	4034	0
670	0	1343	0	2016	1	2689	1	3362	0		
671	0	1344	1	2017	0	2690	1	3363	1		
672	1	1345	0	2018	1	2691	1	3364	0		

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