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

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

1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

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

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

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

$$\begin{aligned}
p_0(z) &= z^{18}+z^{17}+z^{16}+z^{15}+z^{11}+z^{10}+z^9+z^5+z^2+1,\\
p_1(z) &= z^{22}+z^{20}+z^{19}+z^{17}+z^{14}+z^{13}+z^{12}+z^{11}+z^7+z^6+z^4+z^2,\\
p_2(z) &= z^{24}+z^{16}+z^{14}+z^4,\\
p_3(z) &= z^{22}+z^{20}+z^{19}+z^{17}+z^{14}+z^{13}+z^{12}+z^{11}+z^7+z^6+z^4+z^2,\\
p_4(z) &= z^{20}+z^{18}+z^{17}+z^{15}+z^{14}+z^{12}+z^{11}+z^{10}+z^9+z^8+z^5+z^4+z^2,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z) &= z^{18}+z^{17}+z^{15}+z^{12}+z^{11}+z^{10}+z^9+z^5+z^2,\\
p_1(z) &= z^{22}+z^{20}+z^{19}+z^{17}+z^{14}+z^{13}+z^{12}+z^{11}+z^7+z^6+z^4+z^2,\\
p_2(z) &= z^{24}+z^{16}+z^{14}+z^4,\\
p_3(z) &= z^{22}+z^{20}+z^{19}+z^{17}+z^{14}+z^{13}+z^{12}+z^{11}+z^7+z^6+z^4+z^2,\\
p_4(z) &= z^{20}+z^{18}+z^{17}+z^{16}+z^{15}+z^{14}+z^{11}+z^{10}+z^9+z^8+z^5+z^4+z^2\\
&\quad +1.
\end{aligned}$$

2. Proof

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

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

By the basic properties of continued fractions, we have

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

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

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

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

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

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

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

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

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

for some positive integer d_n. Hence,

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

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

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

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

$$(150, 150, 150, 150, 150)$$

of the vector

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

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

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

Lemma 2.1. *We have*

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

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

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

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

Proof. We give the proof of the identity

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

the proofs of the others being similar.

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

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

is an annihilating polynomial of $W^o_{0,0}M^o_{0,0}$. We use Padé-Hermite approximation to find a candidate for the minimal polynomial of $W^o_{0,0}M^o_{0,0}$, that will be called $\phi_0(x,y)$. To prove that $\phi_0(x,y)$ is indeed the minimal polynomial, it suffices to prove that it is an irreducible factor of $P(x,y)$ of multiplicity m and that $Q(x,y) := P(x,y)/\phi_0(x,y)^m$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0}$. We verify the first point directly. For the second point, we truncate $W^o_{0,0}M^o_{0,0}$ to order 540 and substitute it for y in $Q(x,y)$. We get a series of valuation less than 540, 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 660 and substitute it for y in $Q(x,y)$. We get a series of valuation less than 660, and therefore $Q(x,y)$ is not an annihilating polynomial of $W^o_{0,0}M^o_{0,0} + W^o_{0,1}M^o_{1,0}$.

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

Define

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

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

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

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

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

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

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 $u = 2^{2k}$,

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

The proof of the other 15 cases are similar. We break down the above identity into 6 parts:

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

$$0 = x^{10u}T[u\!:\!2u] + x^{9u}T[2u\!:\!3u] + T[11u\!:\!12u],$$

which can be rewritten as

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

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

$$0 = T[[w]_2] + T[[1w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2], \tag{2.13}$$
$$0 = T[[w]_2] + T[[10w]_2] + T[[100w]_2] + T[[111w]_2], \tag{2.14}$$
$$0 = T[[w]_2] + T[[1w]_2] + T[[11w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.15}$$
$$0 = T[[10w]_2] + T[[101w]_2] + T[[1001w]_2], \tag{2.16}$$
$$0 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1010w]_2], \tag{2.17}$$
$$0 = T[[1w]_2] + T[[10w]_2] + T[[1011w]_2], \tag{2.18}$$

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 2404 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 (2.18) can be written as

$$\begin{aligned} 0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,100)) + \tau(A(s,101)) \\ + \tau(A(s,110)), \end{aligned} \tag{2.19}$$
$$0 = \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,100)) + \tau(A(s,111)), \tag{2.20}$$
$$\begin{aligned} 0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,101)) \\ + \tau(A(s,1000)), \end{aligned} \tag{2.21}$$
$$0 = \tau(A(s,10)) + \tau(A(s,101)) + \tau(A(s,1001)), \tag{2.22}$$
$$\begin{aligned} 0 = \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) \\ + \tau(A(s,1010)), \end{aligned} \tag{2.23}$$
$$0 = \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,1011)), \tag{2.24}$$

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

$$\begin{aligned} 0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,100)) + \tau(A(s,101)) \\ + \tau(A(s,110)), \end{aligned} \tag{2.25}$$
$$0 = \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,100)) + \tau(A(s,111)), \tag{2.26}$$
$$\begin{aligned} 0 = \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,101)) \\ + \tau(A(s,1000)), \end{aligned} \tag{2.27}$$

$$0 = \tau(A(s,10)) + \tau(A(s,101)) + \tau(A(s,1001)), \tag{2.28}$$

$$\begin{aligned} 0 = {} & \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) \\ & + \tau(A(s,1010)), \end{aligned} \tag{2.29}$$

$$0 = \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,1011)), \tag{2.30}$$

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{34}), E_{34}) = (A(i, 0^{20}), E_{20})$, so that we only have to verify that identities (2.19) through (2.30) hold for $2 \le k \le 17$, which turns out to be true. $\square$

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

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

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

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

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

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

$$\begin{aligned} W_{2k} M_{2k} = {} & \big(W^e[:6v] + x^v W^e[:5v] + x^{2v} W^e[:4v] + x^{5v} W^e[:v] + x^{6u} R^e\big) \times \big(\\ & M^e[:6v] + x^v M^e[:5v] + x^{2v} M^e[:4v] + x^{5v} M^e[:v] + x^{6u} R^e\big); \end{aligned} \tag{2.31}$$

Call this expression lhs. Note that both sides of identity M_{2k+1} have the same term of highest degree $x^{12v} R^o$. Therefore we only need to prove that their difference is $O(x^{12v})$. Using Lemma 2.1 it can be seen that the right side of identity M_{2k+1} is congruent, modulo x^{12v}, to

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

For all $n \le 12$, 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 (2.31) and rhs as polynomials in $\mathbb{F}_2[a_1, ..., a_{12}, b_1, ..., b_{12}, c][X]$. 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 $O(X^{12})$, which completes the proof. $\square$

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

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

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

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

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

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

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

Define

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

where

$$\begin{aligned}
q_0(x) &= x^{24} + x^{22} + x^{19} + x^{15} + x^{14} + x^{13} + x^9 + x^8 + x^7 + x^6,\\
q_1(x) &= x^{22} + x^{20} + x^{18} + x^{17} + x^{13} + x^{12} + x^{11} + x^{10} + x^7 + x^5 + x^4 + x^2,\\
q_2(x) &= x^{20} + x^{10} + x^8 + 1,\\
q_3(x) &= x^{22} + x^{20} + x^{18} + x^{17} + x^{13} + x^{12} + x^{11} + x^{10} + x^7 + x^5 + x^4 + x^2,\\
q_4(x) &= x^{22} + x^{20} + x^{19} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{10} + x^9 + x^7 + x^6\\
&\quad + x^4.
\end{aligned}$$

The polynomial $Q(x, y)$ is the candidate for the minimal polynomial of $f(x)$ found by Padé-Hermite approximation. To prove that it is indeed the minimal polynomial of $f(x)$, we only need to prove that it is an irreducible factor of $P(x, y)$ of multiplicity m and $R(x, y) := P(x, y)/Q(x, y)^m$ is not an annihilating polynomial of $f(x)$. We verify the first point directly. For the second point, we find that when we truncate $f(x)$ to order 186, and substitute it for y in $R(z, y)$, we get a series with valuation smaller than 186, 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 $\mathrm{CF}(a, b) = f(1/z)$. $\square$

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

$$\begin{aligned}
p_0(x) = {} & x^{132} + x^{128} + x^{126} + x^{124} + x^{120} + x^{110} + x^{106} + x^{102} + x^{100} + x^{96} \\
& + x^{92} + x^{86} + x^{82} + x^{78} + x^{76} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{56} \\
& + x^{54} + x^{52} + x^{48} + x^{44} + x^{42} + x^{38} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} \\
& + x^{24}, \\
p_3(x) = {} & x^{124} + x^{122} + x^{120} + x^{110} + x^{106} + x^{102} + x^{100} + x^{94} + x^{92} + x^{82} \\
& + x^{78} + x^{76} + x^{74} + x^{72} + x^{64} + x^{60} + x^{58} + x^{56} + x^{52} + x^{50} + x^{46} \\
& + x^{44} + x^{32} + x^{30} + x^{28} + x^{22} + x^{20} + x^{18}, \\
p_6(x) = {} & x^{122} + x^{118} + x^{116} + x^{112} + x^{106} + x^{104} + x^{102} + x^{100} + x^{94} + x^{92} \\
& + x^{90} + x^{88} + x^{82} + x^{76} + x^{74} + x^{72} + x^{68} + x^{64} + x^{62} + x^{60} + x^{58} \\
& + x^{52} + x^{48} + x^{46} + x^{44} + x^{42} + x^{40} + x^{38} + x^{32} + x^{28} + x^{24} + x^{22} \\
& + x^{20} + x^{18} + x^{10} + x^{8} + x^{4} + 1, \\
p_9(x) = {} & x^{128} + x^{124} + x^{116} + x^{114} + x^{112} + x^{106} + x^{102} + x^{96} + x^{94} + x^{90} \\
& + x^{88} + x^{80} + x^{74} + x^{72} + x^{68} + x^{64} + x^{62} + x^{58} + x^{56} + x^{50} + x^{46} \\
& + x^{42} + x^{34} + x^{32} + x^{26} + x^{22} + x^{16} + x^{14} + x^{10} + x^{4}, \\
p_{12}(x) = {} & x^{128} + x^{112} + x^{104} + x^{72} + x^{56} + x^{24} + x^{8} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{126} + x^{124} + x^{121} + x^{116} + x^{115} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106} \\
& + x^{103} + x^{101} + x^{99} + x^{90} + x^{83} + x^{82} + x^{80} + x^{79} + x^{78} + x^{75} + x^{74} \\
& + x^{73} + x^{72} + x^{68} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{58} + x^{56} \\
& + x^{55} + x^{52} + x^{48} + x^{45} + x^{43} + x^{40} + x^{37} + x^{35} + x^{34} + x^{32} + x^{30}, \\
p_3(x) = {} & x^{122} + x^{119} + x^{118} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{103} + x^{99} \\
& + x^{98} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{87} + x^{83} + x^{82} + x^{80} + x^{78} \\
& + x^{77} + x^{76} + x^{75} + x^{71} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{56} \\
& + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} + x^{42} + x^{39} + x^{35} + x^{34} \\
& + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{22} + x^{19} + x^{18}, \\
p_6(x) = {} & x^{120} + x^{118} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} + x^{107} + x^{105} + x^{101} \\
& + x^{99} + x^{98} + x^{86} + x^{83} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{75} \\
& + x^{74} + x^{68} + x^{65} + x^{64} + x^{63} + x^{61} + x^{57} + x^{56} + x^{55} + x^{53} + x^{50} \\
& + x^{49} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{33} + x^{32}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{31} + x^{29} + x^{28} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12},\\
p_9(x) &= x^{118} + x^{115} + x^{111} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98}\\
&+ x^{95} + x^{94} + x^{88} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{75} + x^{71} + x^{68}\\
&+ x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{51} + x^{48} + x^{47}\\
&+ x^{46} + x^{45} + x^{41} + x^{40} + x^{36} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28}\\
&+ x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11}\\
&+ x^{7} + x^{6},\\
p_{12}(x) &= x^{116} + x^{114} + x^{113} + x^{112} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{98}\\
&+ x^{97} + x^{96} + x^{84} + x^{82} + x^{81} + x^{80} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69}\\
&+ x^{68} + x^{60} + x^{58} + x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{36} + x^{34}\\
&+ x^{33} + x^{32} + x^{28} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} + x^{12} + x^{10} + x^{9}\\
&+ x^{6} + x^{5} + x^{2} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{126} + x^{124} + x^{121} + x^{116} + x^{115} + x^{114} + x^{112} + x^{109} + x^{108} + x^{106}\\
&+ x^{103} + x^{101} + x^{99} + x^{90} + x^{83} + x^{82} + x^{80} + x^{79} + x^{78} + x^{75} + x^{74}\\
&+ x^{73} + x^{72} + x^{68} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{58} + x^{56}\\
&+ x^{55} + x^{52} + x^{48} + x^{45} + x^{43} + x^{40} + x^{37} + x^{35} + x^{34} + x^{32} + x^{30},\\
p_3(x) &= x^{122} + x^{119} + x^{118} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{103} + x^{99}\\
&+ x^{98} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{87} + x^{83} + x^{82} + x^{80} + x^{78}\\
&+ x^{77} + x^{76} + x^{75} + x^{71} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{56}\\
&+ x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} + x^{42} + x^{39} + x^{35} + x^{34}\\
&+ x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{22} + x^{19} + x^{18},\\
p_6(x) &= x^{120} + x^{118} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} + x^{107} + x^{105} + x^{101}\\
&+ x^{99} + x^{98} + x^{86} + x^{83} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{75}\\
&+ x^{74} + x^{68} + x^{65} + x^{64} + x^{63} + x^{61} + x^{57} + x^{56} + x^{55} + x^{53} + x^{50}\\
&+ x^{49} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{33} + x^{32}\\
&+ x^{31} + x^{29} + x^{28} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12},\\
p_9(x) &= x^{118} + x^{115} + x^{111} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98}\\
&+ x^{95} + x^{94} + x^{88} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{75} + x^{71} + x^{68}\\
&+ x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{51} + x^{48} + x^{47}\\
&+ x^{46} + x^{45} + x^{41} + x^{40} + x^{36} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28}\\
&+ x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11}\\
&+ x^{7} + x^{6},\\
p_{12}(x) &= x^{116} + x^{114} + x^{113} + x^{112} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{98}
\end{aligned}
$$

$$+ x^{97} + x^{96} + x^{84} + x^{82} + x^{81} + x^{80} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{60} + x^{58} + x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{36} + x^{34} + x^{33} + x^{32} + x^{28} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} + x^{12} + x^{10} + x^{9} + x^{6} + x^{5} + x^{2} + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) &= x^{120} + x^{114} + x^{112} + x^{108} + x^{100} + x^{96} + x^{90} + x^{84} + x^{78} + x^{76} + x^{72} \\
&\quad + x^{64} + x^{62} + x^{54} + x^{46} + x^{42} + x^{36}, \\
p_3(x) &= x^{108} + x^{102} + x^{100} + x^{98} + x^{94} + x^{88} + x^{86} + x^{82} + x^{70} + x^{66} + x^{64} \\
&\quad + x^{60} + x^{56} + x^{50} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{24} + x^{22} \\
&\quad + x^{20} + x^{18} + x^{14} + x^{12}, \\
p_6(x) &= x^{108} + x^{104} + x^{102} + x^{100} + x^{94} + x^{90} + x^{84} + x^{82} + x^{78} + x^{76} + x^{70} \\
&\quad + x^{68} + x^{66} + x^{62} + x^{60} + x^{58} + x^{56} + x^{54} + x^{52} + x^{46} + x^{44} + x^{40} \\
&\quad + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{26} + x^{24} + x^{22} + x^{20} + x^{16} + x^{14} \\
&\quad + x^{12} + x^{8} + x^{6} + x^{2} + 1, \\
p_9(x) &= x^{104} + x^{98} + x^{94} + x^{90} + x^{88} + x^{84} + x^{78} + x^{76} + x^{70} + x^{66} + x^{58} \\
&\quad + x^{56} + x^{52} + x^{50} + x^{46} + x^{38} + x^{36} + x^{30} + x^{28} + x^{26} + x^{20} + x^{16} \\
&\quad + x^{14} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4}, \\
p_{12}(x) &= x^{104} + x^{100} + x^{98} + x^{96} + x^{72} + x^{68} + x^{66} + x^{64} + x^{56} + x^{52} + x^{50} \\
&\quad + x^{48} + x^{24} + x^{20} + x^{18} + x^{16} + x^{8} + x^{4} + x^{2} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{120} + x^{114} + x^{106} + x^{100} + x^{98} + x^{90} + x^{80} + x^{76} + x^{74} + x^{68} + x^{64} \\
&\quad + x^{62} + x^{60} + x^{54} + x^{52} + x^{50} + x^{44} + x^{36} + x^{34} + x^{26} + x^{24}, \\
p_3(x) &= x^{108} + x^{102} + x^{98} + x^{88} + x^{82} + x^{80} + x^{78} + x^{76} + x^{74} + x^{72} + x^{70} \\
&\quad + x^{66} + x^{58} + x^{56} + x^{54} + x^{48} + x^{46} + x^{44} + x^{42} + x^{38} + x^{36} + x^{32} \\
&\quad + x^{28} + x^{26} + x^{20} + x^{18}, \\
p_6(x) &= x^{108} + x^{104} + x^{102} + x^{96} + x^{92} + x^{86} + x^{80} + x^{72} + x^{66} + x^{64} + x^{62} \\
&\quad + x^{60} + x^{56} + x^{54} + x^{46} + x^{42} + x^{40} + x^{38} + x^{34} + x^{22} + x^{20} + x^{18} \\
&\quad + x^{16} + x^{12} + x^{10} + x^{6} + x^{2} + 1, \\
p_9(x) &= x^{104} + x^{98} + x^{94} + x^{90} + x^{88} + x^{84} + x^{78} + x^{76} + x^{70} + x^{66} + x^{58} \\
&\quad + x^{56} + x^{52} + x^{50} + x^{46} + x^{38} + x^{36} + x^{30} + x^{28} + x^{26} + x^{20} + x^{16} \\
&\quad + x^{14} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4}, \\
p_{12}(x) &= x^{104} + x^{100} + x^{98} + x^{96} + x^{72} + x^{68} + x^{66} + x^{64} + x^{56} + x^{52} + x^{50} \\
&\quad + x^{48} + x^{24} + x^{20} + x^{18} + x^{16} + x^{8} + x^{4} + x^{2} + 1,
\end{aligned}$$

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^{126} + x^{118} + x^{117} + x^{113} + x^{101} + x^{99} + x^{95} + x^{94} + x^{92} + x^{91} + x^{87} \\
&\quad + x^{85} + x^{81} + x^{79} + x^{78} + x^{77} + x^{76} + x^{74} + x^{72} + x^{71} + x^{69} + x^{66} \\
&\quad + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{53} + x^{52} + x^{50} + x^{39} + x^{38} + x^{36} \\
&\quad + x^{33} + x^{30}, \\
p_3(x) &= x^{122} + x^{119} + x^{118} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{103} + x^{99} \\
&\quad + x^{98} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{87} + x^{83} + x^{82} + x^{80} + x^{78} \\
&\quad + x^{77} + x^{76} + x^{75} + x^{71} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{56} \\
&\quad + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} + x^{42} + x^{39} + x^{35} + x^{34} \\
&\quad + x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{22} + x^{19} + x^{18}, \\
p_6(x) &= x^{120} + x^{118} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} + x^{107} + x^{105} + x^{101} \\
&\quad + x^{99} + x^{98} + x^{86} + x^{83} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{75} \\
&\quad + x^{74} + x^{68} + x^{65} + x^{64} + x^{63} + x^{61} + x^{57} + x^{56} + x^{55} + x^{53} + x^{50} \\
&\quad + x^{49} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{33} + x^{32} \\
&\quad + x^{31} + x^{29} + x^{28} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12}, \\
p_9(x) &= x^{118} + x^{115} + x^{111} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98} \\
&\quad + x^{95} + x^{94} + x^{88} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{75} + x^{71} + x^{68} \\
&\quad + x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{51} + x^{48} + x^{47} \\
&\quad + x^{46} + x^{45} + x^{41} + x^{40} + x^{36} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28} \\
&\quad + x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} \\
&\quad + x^{7} + x^{6}, \\
p_{12}(x) &= x^{116} + x^{114} + x^{113} + x^{112} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{98} \\
&\quad + x^{97} + x^{96} + x^{84} + x^{82} + x^{81} + x^{80} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69} \\
&\quad + x^{68} + x^{60} + x^{58} + x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{36} + x^{34} \\
&\quad + x^{33} + x^{32} + x^{28} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} + x^{12} + x^{10} + x^{9} \\
&\quad + x^{6} + x^{5} + x^{2} + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{126} + x^{118} + x^{117} + x^{113} + x^{101} + x^{99} + x^{95} + x^{94} + x^{92} + x^{91} + x^{87} \\
&\quad + x^{85} + x^{81} + x^{79} + x^{78} + x^{77} + x^{76} + x^{74} + x^{72} + x^{71} + x^{69} + x^{66} \\
&\quad + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{53} + x^{52} + x^{50} + x^{39} + x^{38} + x^{36} \\
&\quad + x^{33} + x^{30}, \\
p_3(x) &= x^{122} + x^{119} + x^{118} + x^{112} + x^{110} + x^{109} + x^{108} + x^{107} + x^{103} + x^{99} \\
&\quad + x^{98} + x^{96} + x^{94} + x^{93} + x^{92} + x^{91} + x^{87} + x^{83} + x^{82} + x^{80} + x^{78}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{77} + x^{76} + x^{75} + x^{71} + x^{67} + x^{64} + x^{63} + x^{61} + x^{60} + x^{59} + x^{56}\\
&+ x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} + x^{42} + x^{39} + x^{35} + x^{34}\\
&+ x^{32} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{22} + x^{19} + x^{18},\\
p_6(x) &= x^{120} + x^{118} + x^{117} + x^{114} + x^{113} + x^{109} + x^{108} + x^{107} + x^{105} + x^{101}\\
&+ x^{99} + x^{98} + x^{86} + x^{83} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{77} + x^{75}\\
&+ x^{74} + x^{68} + x^{65} + x^{64} + x^{63} + x^{61} + x^{57} + x^{56} + x^{55} + x^{53} + x^{50}\\
&+ x^{49} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{33} + x^{32}\\
&+ x^{31} + x^{29} + x^{28} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12},\\
p_9(x) &= x^{118} + x^{115} + x^{111} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98}\\
&+ x^{95} + x^{94} + x^{88} + x^{85} + x^{82} + x^{81} + x^{80} + x^{79} + x^{75} + x^{71} + x^{68}\\
&+ x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{54} + x^{51} + x^{48} + x^{47}\\
&+ x^{46} + x^{45} + x^{41} + x^{40} + x^{36} + x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{28}\\
&+ x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11}\\
&+ x^{7} + x^{6},\\
p_{12}(x) &= x^{116} + x^{114} + x^{113} + x^{112} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{98}\\
&+ x^{97} + x^{96} + x^{84} + x^{82} + x^{81} + x^{80} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69}\\
&+ x^{68} + x^{60} + x^{58} + x^{57} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{36} + x^{34}\\
&+ x^{33} + x^{32} + x^{28} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} + x^{12} + x^{10} + x^{9}\\
&+ x^{6} + x^{5} + x^{2} + x + 1,
\end{aligned}
$$

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

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

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

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{126} + x^{124} + x^{122} + x^{121} + x^{115} + x^{114} + x^{112} + x^{111} + x^{110} + x^{106} \\
& + x^{105} + x^{102} + x^{101} + x^{98} + x^{96} + x^{95} + x^{90} + x^{89} + x^{85} + x^{84} + x^{83} \\
& + x^{82} + x^{80} + x^{77} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{63} + x^{62} \\
& + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{50} + x^{48} \\
& + x^{47} + x^{43} + x^{42} + x^{39} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} \\
& + x^{26} + x^{25} + x^{24}, \\
p_3(x) = {} & x^{124} + x^{121} + x^{118} + x^{117} + x^{116} + x^{112} + x^{108} + x^{107} + x^{106} + x^{103} \\
& + x^{102} + x^{101} + x^{100} + x^{98} + x^{96} + x^{95} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} \\
& + x^{87} + x^{85} + x^{83} + x^{82} + x^{78} + x^{77} + x^{75} + x^{72} + x^{70} + x^{69} + x^{68} \\
& + x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{51} \\
& + x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} \\
& + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{18} + x^{17} \\
& + x^{16}, \\
p_6(x) = {} & x^{124} + x^{121} + x^{118} + x^{117} + x^{116} + x^{114} + x^{110} + x^{109} + x^{107} + x^{104} \\
& + x^{103} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{94} + x^{93} + x^{90} \\
& + x^{89} + x^{88} + x^{87} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{76} + x^{75} + x^{72} \\
& + x^{69} + x^{68} + x^{67} + x^{62} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} \\
& + x^{47} + x^{45} + x^{40} + x^{39} + x^{38} + x^{35} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} \\
& + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{8} + x^{6} + x^{5} + x^{2} + x + 1, \\
p_9(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104} \\
& + x^{92} + x^{90} + x^{89} + x^{88} + x^{80} + x^{78} + x^{77} + x^{76} + x^{64} + x^{62} + x^{61} \\
& + x^{58} + x^{57} + x^{56} + x^{44} + x^{42} + x^{41} + x^{40} + x^{32} + x^{30} + x^{29} + x^{28} \\
& + x^{16} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8}, \\
p_{12}(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{116} + x^{114} + x^{113} + x^{110} + x^{109} + x^{108} \\
& + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
& + x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{62} \\
& + x^{61} + x^{60} + x^{56} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{44} + x^{42} + x^{41} \\
& + x^{40} + x^{36} + x^{34} + x^{33} + x^{30} + x^{29} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} \\
& + x^{16} + x^{14} + x^{13} + x^{12} + x^{8} + x^{6} + x^{5} + x^{2} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {} & x^{128} + x^{122} + x^{119} + x^{114} + x^{113} + x^{112} + x^{110} + x^{109} + x^{107} + x^{105} \\
& + x^{104} + x^{103} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{86} + x^{84} \\
& + x^{82} + x^{76} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{62} + x^{60} + x^{52} + x^{51}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{48} + x^{44} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{32} + x^{31} + x^{30},\\
p_3(x) &= x^{114} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104} + x^{103} + x^{102} + x^{101}\\
&+ x^{100} + x^{96} + x^{94} + x^{93} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84}\\
&+ x^{80} + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{64}\\
&+ x^{62} + x^{61} + x^{57} + x^{55} + x^{52} + x^{50} + x^{49} + x^{47} + x^{44} + x^{41} + x^{40}\\
&+ x^{39} + x^{38} + x^{37} + x^{36} + x^{32} + x^{30} + x^{29} + x^{26} + x^{25} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{116} + x^{112} + x^{108} + x^{106} + x^{104} + x^{100} + x^{98} + x^{82} + x^{80} + x^{78}\\
&+ x^{76} + x^{74} + x^{64} + x^{62} + x^{60} + x^{56} + x^{54} + x^{52} + x^{48} + x^{44} + x^{42}\\
&+ x^{40} + x^{38} + x^{32} + x^{30} + x^{28} + x^{18} + x^{12},\\
p_9(x) &= x^{118} + x^{116} + x^{113} + x^{112} + x^{110} + x^{108} + x^{107} + x^{105} + x^{104} + x^{102}\\
&+ x^{86} + x^{84} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{68} + x^{65}\\
&+ x^{64} + x^{62} + x^{60} + x^{59} + x^{57} + x^{56} + x^{54} + x^{38} + x^{36} + x^{33} + x^{32}\\
&+ x^{30} + x^{28} + x^{27} + x^{25} + x^{24} + x^{20} + x^{17} + x^{16} + x^{14} + x^{12} + x^{11}\\
&+ x^{9} + x^{8} + x^{6},\\
p_{12}(x) &= x^{120} + x^{112} + x^{108} + x^{100} + x^{96} + x^{88} + x^{80} + x^{76} + x^{72} + x^{68} + x^{60}\\
&+ x^{52} + x^{48} + x^{40} + x^{32} + x^{28} + x^{24} + x^{20} + x^{12} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{128} + x^{127} + x^{126} + x^{123} + x^{121} + x^{120} + x^{119} + x^{118}\\
&+ x^{117} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106}\\
&+ x^{102} + x^{100} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{86} + x^{85} + x^{84}\\
&+ x^{82} + x^{78} + x^{77} + x^{75} + x^{74} + x^{71} + x^{70} + x^{65} + x^{62} + x^{52} + x^{50}\\
&+ x^{49} + x^{48} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{38} + x^{36} + x^{34} + x^{31}\\
&+ x^{30},\\
p_3(x) &= x^{130} + x^{128} + x^{126} + x^{125} + x^{121} + x^{119} + x^{118} + x^{114} + x^{112} + x^{111}\\
&+ x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{96} + x^{95} + x^{91} + x^{90}\\
&+ x^{89} + x^{86} + x^{85} + x^{84} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{65}\\
&+ x^{64} + x^{62} + x^{59} + x^{58} + x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{45}\\
&+ x^{44} + x^{43} + x^{41} + x^{38} + x^{37} + x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{27}\\
&+ x^{26} + x^{23} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{132} + x^{128} + x^{122} + x^{120} + x^{112} + x^{110} + x^{108} + x^{102} + x^{100} + x^{96}\\
&+ x^{94} + x^{92} + x^{88} + x^{82} + x^{80} + x^{78} + x^{74} + x^{68} + x^{66} + x^{52} + x^{50}\\
&+ x^{46} + x^{44} + x^{30} + x^{26} + x^{22} + x^{20} + x^{18} + x^{16} + x^{12},\\
p_9(x) &= x^{134} + x^{132} + x^{129} + x^{128} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} + x^{116}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{115} + x^{114} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{104}\\
&+ x^{100} + x^{97} + x^{96} + x^{91} + x^{90} + x^{88} + x^{85} + x^{83} + x^{82} + x^{81} + x^{79}\\
&+ x^{77} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{64} + x^{63} + x^{61} + x^{59} + x^{58}\\
&+ x^{57} + x^{56} + x^{52} + x^{49} + x^{48} + x^{43} + x^{42} + x^{40} + x^{37} + x^{35} + x^{34}\\
&+ x^{33} + x^{31} + x^{29} + x^{25} + x^{21} + x^{20} + x^{19} + x^{18} + x^{16} + x^{15} + x^{13}\\
&+ x^{11} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = {}& x^{136} + x^{116} + x^{112} + x^{104} + x^{96} + x^{88} + x^{84} + x^{80} + x^{68} + x^{56} + x^{48}\\
&+ x^{40} + x^{36} + x^{32} + x^{20} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{126} + x^{122} + x^{120} + x^{118} + x^{114} + x^{113} + x^{110} + x^{108} + x^{106} + x^{104}\\
&+ x^{100} + x^{96} + x^{90} + x^{89} + x^{87} + x^{84} + x^{81} + x^{80} + x^{79} + x^{78} + x^{75}\\
&+ x^{69} + x^{68} + x^{66} + x^{61} + x^{59} + x^{58} + x^{56} + x^{55} + x^{54} + x^{52} + x^{51}\\
&+ x^{50} + x^{49} + x^{48} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38}\\
&+ x^{37} + x^{36},\\
p_3(x) = {}& x^{124} + x^{121} + x^{120} + x^{112} + x^{110} + x^{108} + x^{106} + x^{105} + x^{103} + x^{100}\\
&+ x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80}\\
&+ x^{77} + x^{73} + x^{72} + x^{68} + x^{67} + x^{66} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58}\\
&+ x^{55} + x^{54} + x^{48} + x^{46} + x^{44} + x^{43} + x^{36} + x^{35} + x^{32} + x^{31} + x^{30}\\
&+ x^{29} + x^{28} + x^{26} + x^{23} + x^{22} + x^{21} + x^{20},\\
p_6(x) = {}& x^{124} + x^{121} + x^{120} + x^{114} + x^{112} + x^{110} + x^{108} + x^{105} + x^{103} + x^{101}\\
&+ x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{77} + x^{73}\\
&+ x^{72} + x^{70} + x^{67} + x^{66} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} + x^{54} + x^{52}\\
&+ x^{50} + x^{49} + x^{48} + x^{47} + x^{43} + x^{40} + x^{38} + x^{37} + x^{35} + x^{33} + x^{32}\\
&+ x^{31} + x^{29} + x^{28} + x^{23} + x^{18} + x^{15} + x^{14} + x^{13} + x^{10} + x^{9} + x^{6} + x^{5}\\
&+ x^{2} + x + 1,\\
p_9(x) = {}& x^{124} + x^{122} + x^{121} + x^{120} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{80} + x^{78} + x^{77} + x^{76} + x^{64} + x^{62} + x^{61}\\
&+ x^{58} + x^{57} + x^{56} + x^{44} + x^{42} + x^{41} + x^{40} + x^{32} + x^{30} + x^{29} + x^{28}\\
&+ x^{16} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8},\\
p_{12}(x) = {}& x^{124} + x^{122} + x^{121} + x^{120} + x^{116} + x^{114} + x^{113} + x^{110} + x^{109} + x^{108}\\
&+ x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84}\\
&+ x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{62}\\
&+ x^{61} + x^{60} + x^{56} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{44} + x^{42} + x^{41}\\
&+ x^{40} + x^{36} + x^{34} + x^{33} + x^{30} + x^{29} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20}
\end{aligned}
$$

$$+ x^{16} + x^{14} + x^{13} + x^{12} + x^{8} + x^{6} + x^{5} + x^{2} + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{126} + x^{124} + x^{122} + x^{121} + x^{115} + x^{114} + x^{112} + x^{111} + x^{110} + x^{106} \\
& + x^{105} + x^{102} + x^{101} + x^{98} + x^{96} + x^{95} + x^{90} + x^{89} + x^{85} + x^{84} + x^{83} \\
& + x^{82} + x^{80} + x^{77} + x^{75} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{63} + x^{62} \\
& + x^{61} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{50} + x^{48} \\
& + x^{47} + x^{43} + x^{42} + x^{39} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} \\
& + x^{26} + x^{25} + x^{24}, \\
p_3(x) = {} & x^{124} + x^{121} + x^{118} + x^{117} + x^{116} + x^{112} + x^{108} + x^{107} + x^{106} + x^{103} \\
& + x^{102} + x^{101} + x^{100} + x^{98} + x^{96} + x^{95} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} \\
& + x^{87} + x^{85} + x^{83} + x^{82} + x^{78} + x^{77} + x^{75} + x^{72} + x^{70} + x^{69} + x^{68} \\
& + x^{67} + x^{65} + x^{63} + x^{62} + x^{61} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{51} \\
& + x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{31} \\
& + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{18} + x^{17} \\
& + x^{16}, \\
p_6(x) = {} & x^{124} + x^{121} + x^{118} + x^{117} + x^{116} + x^{114} + x^{110} + x^{109} + x^{107} + x^{104} \\
& + x^{103} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{94} + x^{93} + x^{90} \\
& + x^{89} + x^{88} + x^{87} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{76} + x^{75} + x^{72} \\
& + x^{69} + x^{68} + x^{67} + x^{62} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} \\
& + x^{47} + x^{45} + x^{40} + x^{39} + x^{38} + x^{35} + x^{24} + x^{23} + x^{21} + x^{20} + x^{19} \\
& + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{13} + x^{12} + x^{8} + x^{6} + x^{5} + x^{2} + x + 1, \\
p_9(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104} \\
& + x^{92} + x^{90} + x^{89} + x^{88} + x^{80} + x^{78} + x^{77} + x^{76} + x^{64} + x^{62} + x^{61} \\
& + x^{58} + x^{57} + x^{56} + x^{44} + x^{42} + x^{41} + x^{40} + x^{32} + x^{30} + x^{29} + x^{28} \\
& + x^{16} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8}, \\
p_{12}(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{116} + x^{114} + x^{113} + x^{110} + x^{109} + x^{108} \\
& + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
& + x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{62} \\
& + x^{61} + x^{60} + x^{56} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{44} + x^{42} + x^{41} \\
& + x^{40} + x^{36} + x^{34} + x^{33} + x^{30} + x^{29} + x^{26} + x^{25} + x^{22} + x^{21} + x^{20} \\
& + x^{16} + x^{14} + x^{13} + x^{12} + x^{8} + x^{6} + x^{5} + x^{2} + x + 1,
\end{aligned}$$

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

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

$$p_0(x) = x^{132} + x^{130} + x^{128} + x^{127} + x^{126} + x^{123} + x^{121} + x^{120} + x^{119} + x^{118}$$

$$
\begin{aligned}
&+ x^{117} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109} + x^{108} + x^{107} + x^{106}\\
&+ x^{102} + x^{100} + x^{99} + x^{98} + x^{94} + x^{93} + x^{92} + x^{91} + x^{86} + x^{85} + x^{84}\\
&+ x^{82} + x^{78} + x^{77} + x^{75} + x^{74} + x^{71} + x^{70} + x^{65} + x^{62} + x^{52} + x^{50}\\
&+ x^{49} + x^{48} + x^{46} + x^{45} + x^{43} + x^{42} + x^{41} + x^{38} + x^{36} + x^{34} + x^{31}\\
&+ x^{30},\\
p_3(x) = {}& x^{130} + x^{128} + x^{126} + x^{125} + x^{121} + x^{119} + x^{118} + x^{114} + x^{112} + x^{111}\\
&+ x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{96} + x^{95} + x^{91} + x^{90}\\
&+ x^{89} + x^{86} + x^{85} + x^{84} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{65}\\
&+ x^{64} + x^{62} + x^{59} + x^{58} + x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{45}\\
&+ x^{44} + x^{43} + x^{41} + x^{38} + x^{37} + x^{36} + x^{34} + x^{31} + x^{30} + x^{29} + x^{27}\\
&+ x^{26} + x^{23} + x^{21} + x^{20} + x^{18},\\
p_6(x) = {}& x^{132} + x^{128} + x^{122} + x^{120} + x^{112} + x^{110} + x^{108} + x^{102} + x^{100} + x^{96}\\
&+ x^{94} + x^{92} + x^{88} + x^{82} + x^{80} + x^{78} + x^{74} + x^{68} + x^{66} + x^{52} + x^{50}\\
&+ x^{46} + x^{44} + x^{30} + x^{26} + x^{22} + x^{20} + x^{18} + x^{16} + x^{12},\\
p_9(x) = {}& x^{134} + x^{132} + x^{129} + x^{128} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} + x^{116}\\
&+ x^{115} + x^{114} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{104}\\
&+ x^{100} + x^{97} + x^{96} + x^{91} + x^{90} + x^{88} + x^{85} + x^{83} + x^{82} + x^{81} + x^{79}\\
&+ x^{77} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{64} + x^{63} + x^{61} + x^{59} + x^{58}\\
&+ x^{57} + x^{56} + x^{52} + x^{49} + x^{48} + x^{43} + x^{42} + x^{40} + x^{37} + x^{35} + x^{34}\\
&+ x^{33} + x^{31} + x^{29} + x^{25} + x^{21} + x^{20} + x^{19} + x^{18} + x^{16} + x^{15} + x^{13}\\
&+ x^{11} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = {}& x^{136} + x^{116} + x^{112} + x^{104} + x^{96} + x^{88} + x^{84} + x^{80} + x^{68} + x^{56} + x^{48}\\
&+ x^{40} + x^{36} + x^{32} + x^{20} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{128} + x^{122} + x^{119} + x^{114} + x^{113} + x^{112} + x^{110} + x^{109} + x^{107} + x^{105}\\
&+ x^{104} + x^{103} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{86} + x^{84}\\
&+ x^{82} + x^{76} + x^{74} + x^{73} + x^{70} + x^{68} + x^{66} + x^{62} + x^{60} + x^{52} + x^{51}\\
&+ x^{48} + x^{44} + x^{42} + x^{39} + x^{38} + x^{37} + x^{36} + x^{32} + x^{31} + x^{30},\\
p_3(x) = {}& x^{114} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104} + x^{103} + x^{102} + x^{101}\\
&+ x^{100} + x^{96} + x^{94} + x^{93} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84}\\
&+ x^{80} + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{64}\\
&+ x^{62} + x^{61} + x^{57} + x^{55} + x^{52} + x^{50} + x^{49} + x^{47} + x^{44} + x^{41} + x^{40}\\
&+ x^{39} + x^{38} + x^{37} + x^{36} + x^{32} + x^{30} + x^{29} + x^{26} + x^{25} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{20} + x^{18},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) = {} & x^{116} + x^{112} + x^{108} + x^{106} + x^{104} + x^{100} + x^{98} + x^{82} + x^{80} + x^{78} \\
& + x^{76} + x^{74} + x^{64} + x^{62} + x^{60} + x^{56} + x^{54} + x^{52} + x^{48} + x^{44} + x^{42} \\
& + x^{40} + x^{38} + x^{32} + x^{30} + x^{28} + x^{18} + x^{12}, \\
p_9(x) = {} & x^{118} + x^{116} + x^{113} + x^{112} + x^{110} + x^{108} + x^{107} + x^{105} + x^{104} + x^{102} \\
& + x^{86} + x^{84} + x^{81} + x^{80} + x^{78} + x^{76} + x^{75} + x^{73} + x^{72} + x^{68} + x^{65} \\
& + x^{64} + x^{62} + x^{60} + x^{59} + x^{57} + x^{56} + x^{54} + x^{38} + x^{36} + x^{33} + x^{32} \\
& + x^{30} + x^{28} + x^{27} + x^{25} + x^{24} + x^{20} + x^{17} + x^{16} + x^{14} + x^{12} + x^{11} \\
& + x^{9} + x^{8} + x^{6}, \\
p_{12}(x) = {} & x^{120} + x^{112} + x^{108} + x^{100} + x^{96} + x^{88} + x^{80} + x^{76} + x^{72} + x^{68} + x^{60} \\
& + x^{52} + x^{48} + x^{40} + x^{32} + x^{28} + x^{24} + x^{20} + x^{12} + x^{4} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{126} + x^{122} + x^{120} + x^{118} + x^{114} + x^{113} + x^{110} + x^{108} + x^{106} + x^{104} \\
& + x^{100} + x^{96} + x^{90} + x^{89} + x^{87} + x^{84} + x^{81} + x^{80} + x^{79} + x^{78} + x^{75} \\
& + x^{69} + x^{68} + x^{66} + x^{61} + x^{59} + x^{58} + x^{56} + x^{55} + x^{54} + x^{52} + x^{51} \\
& + x^{50} + x^{49} + x^{48} + x^{46} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} \\
& + x^{37} + x^{36}, \\
p_3(x) = {} & x^{124} + x^{121} + x^{120} + x^{112} + x^{110} + x^{108} + x^{106} + x^{105} + x^{103} + x^{100} \\
& + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{88} + x^{87} + x^{86} + x^{83} + x^{81} + x^{80} \\
& + x^{77} + x^{73} + x^{72} + x^{68} + x^{67} + x^{66} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58} \\
& + x^{55} + x^{54} + x^{48} + x^{46} + x^{44} + x^{43} + x^{36} + x^{35} + x^{32} + x^{31} + x^{30} \\
& + x^{29} + x^{28} + x^{26} + x^{23} + x^{22} + x^{21} + x^{20}, \\
p_6(x) = {} & x^{124} + x^{121} + x^{120} + x^{114} + x^{112} + x^{110} + x^{108} + x^{105} + x^{103} + x^{101} \\
& + x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{87} + x^{85} + x^{84} + x^{83} + x^{77} + x^{73} \\
& + x^{72} + x^{70} + x^{67} + x^{66} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} + x^{54} + x^{52} \\
& + x^{50} + x^{49} + x^{48} + x^{47} + x^{43} + x^{40} + x^{38} + x^{37} + x^{35} + x^{33} + x^{32} \\
& + x^{31} + x^{29} + x^{28} + x^{23} + x^{18} + x^{15} + x^{14} + x^{13} + x^{10} + x^{9} + x^{6} + x^{5} \\
& + x^{2} + x + 1, \\
p_9(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{112} + x^{110} + x^{109} + x^{106} + x^{105} + x^{104} \\
& + x^{92} + x^{90} + x^{89} + x^{88} + x^{80} + x^{78} + x^{77} + x^{76} + x^{64} + x^{62} + x^{61} \\
& + x^{58} + x^{57} + x^{56} + x^{44} + x^{42} + x^{41} + x^{40} + x^{32} + x^{30} + x^{29} + x^{28} \\
& + x^{16} + x^{14} + x^{13} + x^{10} + x^{9} + x^{8}, \\
p_{12}(x) = {} & x^{124} + x^{122} + x^{121} + x^{120} + x^{116} + x^{114} + x^{113} + x^{110} + x^{109} + x^{108} \\
& + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{90} + x^{89} + x^{88} + x^{84} \\
& + x^{82} + x^{81} + x^{78} + x^{77} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{64} + x^{62}
\end{aligned}$$

$$+x^{61}+x^{60}+x^{56}+x^{54}+x^{53}+x^{50}+x^{49}+x^{48}+x^{44}+x^{42}+x^{41}$$
$$+x^{40}+x^{36}+x^{34}+x^{33}+x^{30}+x^{29}+x^{26}+x^{25}+x^{22}+x^{21}+x^{20}$$
$$+x^{16}+x^{14}+x^{13}+x^{12}+x^{8}+x^{6}+x^{5}+x^{2}+x+1,$$

and the initial terms are [0, 0, 0, 0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 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]	602	[975, 258]	1204	[1614, 1010]	1806	[512, 630]
1	[3, 4]	603	[976, 260]	1205	[1615, 1616]	1807	[225, 472]
2	[5, 6]	604	[977, 70]	1206	[1617, 283]	1808	[588, 629]
3	[7, 8]	605	[334, 978]	1207	[1618, 1619]	1809	[1386, 1238]
4	[9, 10]	606	[979, 980]	1208	[276, 397]	1810	[1889, 213]
5	[11, 12]	607	[981, 982]	1209	[1620, 1621]	1811	[1388, 1107]
6	[13, 14]	608	[983, 737]	1210	[1622, 1623]	1812	[2083, 568]
7	[15, 16]	609	[984, 985]	1211	[1038, 1616]	1813	[2084, 1912]
8	[17, 18]	610	[986, 357]	1212	[1624, 384]	1814	[1222, 1368]
9	[19, 20]	611	[987, 988]	1213	[1625, 1626]	1815	[1874, 1115]
10	[21, 22]	612	[989, 990]	1214	[1627, 762]	1816	[2085, 1433]
11	[23, 24]	613	[329, 991]	1215	[1030, 1628]	1817	[2008, 1987]
12	[25, 26]	614	[992, 820]	1216	[1629, 932]	1818	[1244, 451]
13	[15, 27]	615	[993, 994]	1217	[396, 308]	1819	[1884, 453]
14	[28, 29]	616	[995, 763]	1218	[1630, 1631]	1820	[620, 1906]
15	[30, 31]	617	[996, 997]	1219	[780, 1632]	1821	[1190, 2086]
16	[32, 33]	618	[998, 283]	1220	[1541, 1084]	1822	[2087, 2088]
17	[34, 35]	619	[999, 1000]	1221	[1580, 1527]	1823	[539, 537]
18	[36, 37]	620	[1001, 889]	1222	[970, 339]	1824	[2089, 2090]
19	[38, 39]	621	[338, 1002]	1223	[69, 715]	1825	[2091, 1465]
20	[40, 41]	622	[1003, 713]	1224	[1032, 399]	1826	[2092, 1204]
21	[42, 43]	623	[1004, 1005]	1225	[1633, 1085]	1827	[608, 2093]
22	[44, 45]	624	[1006, 327]	1226	[1634, 82]	1828	[2094, 2095]
23	[46, 47]	625	[983, 1007]	1227	[72, 240]	1829	[1974, 2096]
24	[48, 49]	626	[1008, 361]	1228	[301, 1054]	1830	[1184, 1311]
25	[50, 51]	627	[323, 1009]	1229	[1496, 1635]	1831	[495, 1164]
26	[52, 53]	628	[777, 1010]	1230	[1636, 412]	1832	[659, 674]
27	[54, 55]	629	[956, 1011]	1231	[273, 1637]	1833	[2097, 2098]
28	[56, 57]	630	[1012, 1013]	1232	[1638, 924]	1834	[1963, 2]
29	[58, 59]	631	[1014, 1015]	1233	[415, 1639]	1835	[1318, 542]
30	[60, 61]	632	[1016, 777]	1234	[1640, 1641]	1836	[2099, 1395]
31	[62, 63]	633	[1015, 1017]	1235	[1642, 1643]	1837	[700, 642]
32	[64, 65]	634	[305, 382]	1236	[1644, 374]	1838	[2100, 531]
33	[66, 67]	635	[1018, 1019]	1237	[1071, 1593]	1839	[1144, 2101]
34	[68, 69]	636	[1020, 1021]	1238	[1645, 1646]	1840	[1485, 1211]

35	[70, 71]	637	[26, 921]	1239	[1647, 1535]	1841	[2102, 2027]
36	[72, 73]	638	[16, 233]	1240	[841, 1648]	1842	[2011, 1182]
37	[74, 75]	639	[1022, 1023]	1241	[1649, 1650]	1843	[1446, 1426]
38	[19, 76]	640	[1024, 274]	1242	[1651, 1086]	1844	[611, 1150]
39	[77, 78]	641	[1025, 1026]	1243	[872, 344]	1845	[599, 2021]
40	[79, 80]	642	[1027, 980]	1244	[1652, 934]	1846	[2103, 1904]
41	[81, 82]	643	[1028, 1029]	1245	[1653, 1654]	1847	[2091, 214]
42	[83, 84]	644	[1030, 783]	1246	[999, 1019]	1848	[2104, 1900]
43	[78, 85]	645	[411, 1031]	1247	[723, 802]	1849	[2078, 2105]
44	[86, 87]	646	[1032, 1033]	1248	[830, 365]	1850	[463, 611]
45	[88, 89]	647	[912, 259]	1249	[1655, 1656]	1851	[2106, 664]
46	[90, 91]	648	[1034, 1035]	1250	[24, 732]	1852	[2107, 1467]
47	[92, 93]	649	[307, 951]	1251	[1005, 1026]	1853	[165, 1335]
48	[94, 95]	650	[1036, 383]	1252	[1657, 956]	1854	[1962, 465]
49	[96, 97]	651	[398, 1033]	1253	[1658, 1659]	1855	[2108, 1897]
50	[98, 99]	652	[93, 367]	1254	[1494, 74]	1856	[1208, 2109]
51	[100, 101]	653	[1037, 1027]	1255	[1660, 1661]	1857	[2110, 2111]
52	[102, 103]	654	[754, 257]	1256	[1662, 1663]	1858	[690, 2054]
53	[104, 105]	655	[1038, 1039]	1257	[1664, 317]	1859	[621, 1125]
54	[106, 107]	656	[1040, 1041]	1258	[1665, 1556]	1860	[1105, 2006]
55	[108, 109]	657	[796, 1042]	1259	[94, 1666]	1861	[2044, 1439]
56	[110, 111]	658	[1043, 342]	1260	[73, 241]	1862	[2112, 1348]
57	[112, 113]	659	[1044, 793]	1261	[749, 80]	1863	[2113, 448]
58	[114, 115]	660	[319, 1045]	1262	[959, 870]	1864	[1972, 2114]
59	[116, 117]	661	[824, 1046]	1263	[1667, 728]	1865	[2115, 1213]
60	[118, 119]	662	[283, 1047]	1264	[1510, 1668]	1866	[1983, 47]
61	[120, 121]	663	[1048, 753]	1265	[968, 1558]	1867	[2116, 1471]
62	[122, 123]	664	[1049, 1050]	1266	[1669, 1555]	1868	[2117, 280]
63	[124, 125]	665	[795, 897]	1267	[967, 1557]	1869	[1665, 1598]
64	[126, 8]	666	[793, 1051]	1268	[975, 912]	1870	[2118, 1504]
65	[127, 128]	667	[258, 94]	1269	[753, 256]	1871	[1843, 895]
66	[12, 129]	668	[1052, 1053]	1270	[1670, 924]	1872	[709, 2119]
67	[130, 131]	669	[819, 1054]	1271	[831, 1671]	1873	[2120, 2121]
68	[132, 133]	670	[1055, 1056]	1272	[1672, 1673]	1874	[1690, 2122]
69	[134, 135]	671	[1057, 1058]	1273	[1674, 1675]	1875	[977, 1518]
70	[136, 137]	672	[1059, 1060]	1274	[363, 1676]	1876	[847, 1795]
71	[138, 139]	673	[813, 1061]	1275	[1677, 1678]	1877	[880, 2123]
72	[140, 141]	674	[342, 1062]	1276	[1679, 260]	1878	[2124, 852]
73	[142, 57]	675	[1063, 723]	1277	[1680, 367]	1879	[259, 95]
74	[143, 144]	676	[79, 750]	1278	[312, 371]	1880	[1739, 227]
75	[145, 146]	677	[764, 882]	1279	[1681, 1011]	1881	[2125, 15]
76	[147, 148]	678	[931, 1064]	1280	[1636, 1031]	1882	[897, 1042]
77	[149, 150]	679	[1065, 1066]	1281	[943, 1562]	1883	[2126, 2127]
78	[151, 152]	680	[1067, 792]	1282	[1682, 1551]	1884	[1089, 2128]

79	[153, 154]	681	[978, 417]	1283	[913, 1673]	1885	[2129, 2130]
80	[155, 156]	682	[1068, 1069]	1284	[1683, 382]	1886	[950, 748]
81	[37, 157]	683	[1070, 370]	1285	[1684, 299]	1887	[1603, 1680]
82	[158, 159]	684	[1071, 1072]	1286	[811, 1685]	1888	[1008, 967]
83	[160, 161]	685	[1073, 1074]	1287	[1686, 1687]	1889	[833, 2131]
84	[162, 163]	686	[1075, 252]	1288	[987, 1623]	1890	[1018, 1000]
85	[150, 164]	687	[1025, 1076]	1289	[1688, 1505]	1891	[1088, 855]
86	[165, 166]	688	[1077, 887]	1290	[321, 779]	1892	[2132, 330]
87	[167, 168]	689	[97, 1078]	1291	[1689, 1565]	1893	[365, 371]
88	[169, 170]	690	[922, 88]	1292	[1690, 1668]	1894	[2133, 115]
89	[171, 172]	691	[1079, 1080]	1293	[744, 99]	1895	[2134, 1743]
90	[173, 174]	692	[1081, 1082]	1294	[1055, 1691]	1896	[2135, 2136]
91	[175, 176]	693	[1083, 966]	1295	[106, 1692]	1897	[2137, 2138]
92	[177, 178]	694	[242, 1084]	1296	[1058, 1651]	1898	[2139, 1752]
93	[179, 180]	695	[1085, 1086]	1297	[1693, 1694]	1899	[1561, 944]
94	[181, 182]	696	[826, 1087]	1298	[1600, 1695]	1900	[2140, 353]
95	[183, 184]	697	[929, 1088]	1299	[1696, 276]	1901	[1516, 1537]
96	[185, 186]	698	[1089, 1090]	1300	[1697, 1698]	1902	[2141, 2142]
97	[174, 187]	699	[1091, 1027]	1301	[1014, 1564]	1903	[2143, 2144]
98	[188, 189]	700	[111, 1028]	1302	[1699, 1700]	1904	[2145, 27]
99	[190, 191]	701	[177, 225]	1303	[1675, 1701]	1905	[1711, 20]
100	[192, 193]	702	[1092, 679]	1304	[1587, 1006]	1906	[1000, 1790]
101	[194, 195]	703	[1093, 224]	1305	[1702, 1045]	1907	[1189, 2146]
102	[196, 197]	704	[1094, 484]	1306	[1703, 1704]	1908	[2129, 917]
103	[198, 199]	705	[439, 463]	1307	[1705, 859]	1909	[873, 345]
104	[200, 201]	706	[462, 1095]	1308	[1706, 1707]	1910	[1742, 1582]
105	[202, 203]	707	[617, 119]	1309	[1708, 1709]	1911	[926, 270]
106	[204, 205]	708	[1096, 669]	1310	[1710, 287]	1912	[2147, 2148]
107	[206, 207]	709	[1097, 1098]	1311	[1711, 76]	1913	[2126, 2138]
108	[208, 209]	710	[1099, 1100]	1312	[1614, 1712]	1914	[254, 2139]
109	[210, 211]	711	[1101, 1102]	1313	[1713, 1714]	1915	[2146, 1189]
110	[212, 213]	712	[212, 1103]	1314	[839, 1715]	1916	[1716, 88]
111	[214, 215]	713	[1104, 597]	1315	[1716, 923]	1917	[1827, 2149]
112	[216, 217]	714	[1105, 1106]	1316	[313, 372]	1918	[915, 1804]
113	[218, 219]	715	[1107, 12]	1317	[1717, 861]	1919	[2150, 840]
114	[220, 221]	716	[119, 1108]	1318	[1043, 1718]	1920	[295, 1636]
115	[222, 31]	717	[1109, 124]	1319	[818, 301]	1921	[806, 1626]
116	[223, 224]	718	[1110, 1111]	1320	[1719, 1720]	1922	[2151, 1766]
117	[225, 226]	719	[1112, 1113]	1321	[1721, 1016]	1923	[2152, 978]
118	[227, 228]	720	[1114, 1115]	1322	[1722, 1047]	1924	[758, 862]
119	[229, 230]	721	[560, 1116]	1323	[369, 908]	1925	[2153, 1538]
120	[231, 232]	722	[140, 1117]	1324	[1520, 1723]	1926	[928, 1776]
121	[27, 233]	723	[1118, 1119]	1325	[1068, 1723]	1927	[1509, 1690]
122	[234, 235]	724	[1120, 467]	1326	[1724, 854]	1928	[928, 1802]

123	[236, 237]	725	[1121, 1122]	1327	[1725, 334]	1929	[1555, 1598]
124	[238, 239]	726	[442, 1123]	1328	[1726, 891]	1930	[96, 741]
125	[240, 241]	727	[1124, 1125]	1329	[87, 1727]	1931	[1091, 979]
126	[242, 243]	728	[1126, 1127]	1330	[1639, 1728]	1932	[1835, 847]
127	[244, 245]	729	[618, 1108]	1331	[319, 1729]	1933	[1633, 1651]
128	[246, 247]	730	[1128, 1129]	1332	[1730, 1731]	1934	[1820, 303]
129	[248, 249]	731	[1130, 1131]	1333	[957, 1732]	1935	[918, 1735]
130	[250, 251]	732	[47, 528]	1334	[1733, 1632]	1936	[933, 1828]
131	[252, 253]	733	[1132, 1096]	1335	[1734, 976]	1937	[2154, 2155]
132	[254, 255]	734	[157, 1133]	1336	[1735, 17]	1938	[404, 235]
133	[256, 257]	735	[1134, 659]	1337	[1642, 1736]	1939	[2156, 1074]
134	[258, 259]	736	[662, 34]	1338	[1611, 363]	1940	[1523, 62]
135	[260, 261]	737	[1135, 1136]	1339	[938, 318]	1941	[1655, 2157]
136	[262, 263]	738	[645, 1137]	1340	[1737, 1738]	1942	[1085, 2158]
137	[264, 265]	739	[32, 1138]	1341	[1739, 1740]	1943	[2159, 385]
138	[266, 267]	740	[423, 1139]	1342	[1741, 1742]	1944	[371, 2160]
139	[268, 269]	741	[1140, 693]	1343	[773, 873]	1945	[2161, 1643]
140	[23, 270]	742	[199, 538]	1344	[1708, 724]	1946	[331, 1727]
141	[271, 272]	743	[1141, 1142]	1345	[1048, 1499]	1947	[961, 1518]
142	[273, 274]	744	[1143, 1144]	1346	[1743, 1087]	1948	[1052, 1654]
143	[275, 276]	745	[33, 1145]	1347	[305, 278]	1949	[916, 2130]
144	[277, 269]	746	[1146, 1147]	1348	[1023, 1744]	1950	[2162, 752]
145	[278, 279]	747	[1148, 1149]	1349	[98, 745]	1951	[1651, 2158]
146	[280, 281]	748	[457, 1150]	1350	[99, 1745]	1952	[2163, 705]
147	[282, 232]	749	[1151, 1152]	1351	[1746, 1747]	1953	[2164, 1755]
148	[283, 284]	750	[1153, 1154]	1352	[1567, 234]	1954	[289, 2165]
149	[285, 286]	751	[1155, 218]	1353	[1573, 776]	1955	[2151, 1813]
150	[287, 288]	752	[1156, 13]	1354	[1748, 1749]	1956	[2166, 1663]
151	[289, 290]	753	[1157, 1158]	1355	[1009, 797]	1957	[1506, 718]
152	[67, 291]	754	[1159, 146]	1356	[1750, 1751]	1958	[102, 1774]
153	[292, 293]	755	[679, 1160]	1357	[255, 1752]	1959	[327, 2167]
154	[294, 295]	756	[1161, 595]	1358	[825, 1743]	1960	[364, 312]
155	[296, 297]	757	[1162, 423]	1359	[1753, 1754]	1961	[1755, 2168]
156	[298, 299]	758	[1163, 1164]	1360	[1622, 988]	1962	[395, 277]
157	[300, 301]	759	[1115, 1165]	1361	[299, 729]	1963	[376, 1060]
158	[302, 261]	760	[1116, 1166]	1362	[1755, 108]	1964	[2169, 2170]
159	[303, 304]	761	[1167, 643]	1363	[1756, 67]	1965	[2171, 823]
160	[103, 305]	762	[1125, 1168]	1364	[741, 1078]	1966	[2172, 1808]
161	[306, 307]	763	[1169, 1170]	1365	[1757, 879]	1967	[385, 2173]
162	[276, 308]	764	[479, 1171]	1366	[1627, 387]	1968	[2174, 2175]
163	[309, 310]	765	[1172, 150]	1367	[1758, 252]	1969	[2176, 1061]
164	[286, 311]	766	[1100, 1173]	1368	[1759, 1760]	1970	[2177, 111]
165	[312, 313]	767	[1174, 1117]	1369	[1761, 1762]	1971	[1558, 2128]
166	[314, 315]	768	[1175, 1176]	1370	[1763, 703]	1972	[1803, 1695]

167	[316, 317]	769	[1177, 570]	1371	[1764, 1748]	1973	[2178, 1581]
168	[318, 319]	770	[1178, 1179]	1372	[1740, 28]	1974	[1667, 2179]
169	[320, 321]	771	[1180, 1181]	1373	[1765, 1766]	1975	[2180, 2181]
170	[292, 322]	772	[1182, 1183]	1374	[1582, 1767]	1976	[28, 338]
171	[323, 324]	773	[1184, 601]	1375	[278, 1768]	1977	[1676, 2182]
172	[325, 326]	774	[1124, 622]	1376	[982, 1769]	1978	[2183, 2184]
173	[327, 328]	775	[1185, 1111]	1377	[886, 1770]	1979	[2185, 929]
174	[329, 330]	776	[1186, 1187]	1378	[705, 1709]	1980	[1657, 1681]
175	[86, 331]	777	[1188, 1189]	1379	[1660, 1771]	1981	[779, 992]
176	[332, 333]	778	[1190, 1191]	1380	[733, 1772]	1982	[1758, 2186]
177	[334, 335]	779	[561, 1166]	1381	[1650, 1773]	1983	[860, 2187]
178	[336, 337]	780	[465, 1192]	1382	[1774, 305]	1984	[2145, 16]
179	[338, 250]	781	[1193, 442]	1383	[1775, 1776]	1985	[2188, 268]
180	[115, 339]	782	[1112, 459]	1384	[1777, 1778]	1986	[1750, 2189]
181	[336, 340]	783	[1194, 1195]	1385	[1779, 1636]	1987	[1596, 2190]
182	[341, 342]	784	[1196, 1197]	1386	[1780, 15]	1988	[1811, 69]
183	[343, 234]	785	[1101, 482]	1387	[1781, 1782]	1989	[782, 1628]
184	[344, 345]	786	[1198, 1199]	1388	[1003, 25]	1990	[2191, 2192]
185	[346, 265]	787	[1200, 1201]	1389	[1783, 959]	1991	[2193, 1015]
186	[347, 348]	788	[1202, 1203]	1390	[290, 1784]	1992	[2194, 831]
187	[328, 349]	789	[1204, 456]	1391	[1785, 747]	1993	[923, 89]
188	[350, 351]	790	[1156, 694]	1392	[1786, 1787]	1994	[2195, 2196]
189	[352, 353]	791	[1205, 1180]	1393	[1788, 1568]	1995	[811, 63]
190	[354, 355]	792	[1206, 1119]	1394	[114, 970]	1996	[978, 803]
191	[356, 357]	793	[1207, 59]	1395	[1789, 963]	1997	[1525, 2197]
192	[358, 359]	794	[1192, 1208]	1396	[1019, 1790]	1998	[2198, 1523]
193	[360, 361]	795	[185, 1209]	1397	[1741, 1581]	1999	[2199, 1656]
194	[362, 363]	796	[1210, 574]	1398	[416, 1728]	2000	[888, 1781]
195	[364, 365]	797	[1211, 133]	1399	[1699, 1791]	2001	[1531, 1522]
196	[366, 4]	798	[568, 588]	1400	[1792, 1534]	2002	[2200, 2181]
197	[367, 368]	799	[421, 1212]	1401	[266, 982]	2003	[2165, 1784]
198	[369, 370]	800	[1213, 1214]	1402	[889, 1782]	2004	[2201, 929]
199	[371, 372]	801	[1215, 1216]	1403	[320, 778]	2005	[913, 2202]
200	[373, 374]	802	[1117, 438]	1404	[1793, 892]	2006	[965, 2203]
201	[4, 375]	803	[1217, 1218]	1405	[1794, 74]	2007	[2204, 255]
202	[376, 377]	804	[1219, 512]	1406	[785, 1795]	2008	[1591, 2205]
203	[378, 68]	805	[1220, 1221]	1407	[1796, 866]	2009	[2206, 2207]
204	[379, 297]	806	[1222, 1223]	1408	[719, 1797]	2010	[751, 112]
205	[380, 381]	807	[1224, 38]	1409	[1798, 1799]	2011	[801, 2208]
206	[382, 279]	808	[1225, 1226]	1410	[1800, 1801]	2012	[856, 1641]
207	[383, 384]	809	[694, 14]	1411	[1775, 1802]	2013	[1521, 390]
208	[385, 386]	810	[1227, 124]	1412	[1803, 1601]	2014	[61, 1648]
209	[387, 388]	811	[1228, 624]	1413	[267, 1769]	2015	[2209, 394]
210	[389, 290]	812	[507, 469]	1414	[1804, 1619]	2016	[2210, 103]

211	[390, 391]	813	[1229, 1137]	1415	[986, 1805]	2017	[2211, 1639]
212	[373, 392]	814	[1230, 1112]	1416	[1806, 65]	2018	[736, 1007]
213	[393, 394]	815	[1231, 1232]	1417	[1807, 1808]	2019	[1726, 2212]
214	[395, 268]	816	[49, 647]	1418	[1809, 1740]	2020	[2207, 1555]
215	[396, 397]	817	[490, 1096]	1419	[1001, 1781]	2021	[2213, 2150]
216	[398, 399]	818	[1233, 502]	1420	[1810, 800]	2022	[1793, 798]
217	[400, 401]	819	[1234, 58]	1421	[1811, 714]	2023	[2214, 2215]
218	[402, 403]	820	[1235, 584]	1422	[921, 843]	2024	[1780, 2145]
219	[404, 405]	821	[1236, 1100]	1423	[3, 1812]	2025	[1620, 940]
220	[287, 406]	822	[1237, 1238]	1424	[1765, 1813]	2026	[299, 263]
221	[407, 408]	823	[1239, 427]	1425	[1814, 410]	2027	[2216, 2175]
222	[409, 410]	824	[1240, 462]	1426	[1815, 1816]	2028	[883, 2217]
223	[411, 412]	825	[494, 1241]	1427	[1800, 104]	2029	[2218, 2219]
224	[413, 414]	826	[125, 1242]	1428	[1817, 1818]	2030	[2220, 322]
225	[415, 416]	827	[1243, 541]	1429	[1080, 710]	2031	[260, 2221]
226	[335, 417]	828	[1244, 1245]	1430	[1819, 1051]	2032	[904, 1767]
227	[418, 58]	829	[1246, 1247]	1431	[1820, 1586]	2033	[1082, 68]
228	[419, 420]	830	[631, 633]	1432	[1821, 1822]	2034	[346, 1081]
229	[421, 52]	831	[498, 1248]	1433	[361, 968]	2035	[117, 2213]
230	[422, 423]	832	[161, 634]	1434	[1823, 1529]	2036	[1718, 871]
231	[424, 425]	833	[1249, 1250]	1435	[1824, 1610]	2037	[2222, 806]
232	[426, 427]	834	[1251, 654]	1436	[1825, 1826]	2038	[103, 1683]
233	[31, 428]	835	[1252, 1253]	1437	[1827, 1720]	2039	[1569, 1565]
234	[429, 186]	836	[1254, 36]	1438	[701, 18]	2040	[1570, 1566]
235	[1, 200]	837	[1255, 1256]	1439	[1722, 284]	2041	[1785, 950]
236	[430, 431]	838	[1257, 1258]	1440	[989, 946]	2042	[763, 881]
237	[432, 433]	839	[1259, 515]	1441	[1652, 1828]	2043	[253, 747]
238	[434, 174]	840	[1260, 1133]	1442	[1829, 821]	2044	[1640, 857]
239	[435, 436]	841	[1261, 494]	1443	[1830, 764]	2045	[2118, 789]
240	[437, 420]	842	[1248, 1262]	1444	[1831, 1597]	2046	[2223, 383]
241	[141, 438]	843	[1263, 164]	1445	[745, 1745]	2047	[302, 2221]
242	[439, 440]	844	[1264, 1265]	1446	[391, 1832]	2048	[2224, 1008]
243	[441, 442]	845	[1266, 1143]	1447	[1653, 1053]	2049	[82, 734]
244	[132, 443]	846	[1267, 33]	1448	[1693, 1833]	2050	[2225, 2226]
245	[444, 217]	847	[1268, 49]	1449	[1612, 1676]	2051	[1840, 324]
246	[445, 446]	848	[1269, 1270]	1450	[265, 378]	2052	[2141, 1607]
247	[447, 448]	849	[1271, 173]	1451	[354, 1609]	2053	[721, 759]
248	[36, 449]	850	[1272, 1201]	1452	[1834, 1035]	2054	[2227, 2228]
249	[450, 451]	851	[1273, 154]	1453	[1835, 785]	2055	[2229, 2230]
250	[420, 452]	852	[195, 1274]	1454	[62, 1685]	2056	[1806, 1530]
251	[453, 454]	853	[1118, 1275]	1455	[937, 347]	2057	[1556, 1599]
252	[455, 456]	854	[1276, 1277]	1456	[1836, 1837]	2058	[2231, 237]
253	[440, 457]	855	[1278, 55]	1457	[1027, 1838]	2059	[2232, 920]
254	[458, 459]	856	[660, 1241]	1458	[1839, 1547]	2060	[1016, 1614]

255	[460, 180]	857	[1279, 1280]	1459	[1732, 5]	2061	[2233, 757]
256	[461, 462]	858	[1281, 54]	1460	[1840, 1009]	2062	[907, 331]
257	[463, 457]	859	[1282, 151]	1461	[1624, 1841]	2063	[761, 387]
258	[464, 183]	860	[1283, 1284]	1462	[1731, 860]	2064	[1702, 1729]
259	[424, 452]	861	[1285, 1214]	1463	[362, 1612]	2065	[2124, 1604]
260	[465, 144]	862	[1286, 1287]	1464	[275, 396]	2066	[721, 1610]
261	[466, 467]	863	[1288, 1289]	1465	[1842, 1631]	2067	[409, 2234]
262	[468, 469]	864	[170, 1290]	1466	[1843, 731]	2068	[866, 2217]
263	[470, 471]	865	[1291, 1153]	1467	[1011, 73]	2069	[851, 1604]
264	[472, 473]	866	[1292, 210]	1468	[1609, 1844]	2070	[1718, 1062]
265	[474, 475]	867	[1293, 1294]	1469	[1845, 1846]	2071	[2235, 1778]
266	[476, 477]	868	[1295, 166]	1470	[1608, 355]	2072	[301, 2236]
267	[478, 479]	869	[1227, 1296]	1471	[1847, 1714]	2073	[2226, 2237]
268	[14, 121]	870	[1297, 628]	1472	[1534, 1848]	2074	[1650, 1675]
269	[480, 48]	871	[1298, 1299]	1473	[1849, 998]	2075	[1669, 1665]
270	[481, 482]	872	[1169, 1300]	1474	[1850, 1056]	2076	[896, 796]
271	[483, 484]	873	[641, 700]	1475	[1851, 1852]	2077	[1783, 350]
272	[485, 486]	874	[1301, 1199]	1476	[1853, 906]	2078	[1824, 759]
273	[487, 488]	875	[1302, 1303]	1477	[1854, 976]	2079	[2238, 778]
274	[489, 436]	876	[125, 1304]	1478	[822, 1855]	2080	[1513, 61]
275	[490, 491]	877	[1305, 695]	1479	[1856, 1857]	2081	[2239, 1606]
276	[492, 475]	878	[142, 1306]	1480	[1858, 1006]	2082	[2220, 293]
277	[493, 494]	879	[1307, 1277]	1481	[1859, 761]	2083	[2191, 272]
278	[495, 496]	880	[1255, 1308]	1482	[402, 1797]	2084	[2240, 1584]
279	[497, 498]	881	[1309, 1310]	1483	[1860, 1861]	2085	[1059, 377]
280	[499, 201]	882	[1311, 158]	1484	[869, 296]	2086	[2241, 784]
281	[500, 501]	883	[1312, 1313]	1485	[1499, 256]	2087	[366, 1812]
282	[181, 502]	884	[1314, 1099]	1486	[1579, 1526]	2088	[291, 1532]
283	[503, 504]	885	[1315, 1316]	1487	[1862, 1863]	2089	[2223, 1624]
284	[505, 506]	886	[1234, 1207]	1488	[1864, 1694]	2090	[2242, 2177]
285	[507, 508]	887	[1317, 1176]	1489	[1773, 1701]	2091	[774, 2243]
286	[509, 510]	888	[1318, 1129]	1490	[356, 1805]	2092	[2244, 1700]
287	[511, 159]	889	[1319, 1242]	1491	[1865, 799]	2093	[715, 2245]
288	[512, 513]	890	[498, 1320]	1492	[1866, 1832]	2094	[1733, 781]
289	[7, 514]	891	[1321, 207]	1493	[858, 1867]	2095	[2246, 2247]
290	[515, 134]	892	[1322, 593]	1494	[1868, 145]	2096	[2248, 1505]
291	[516, 48]	893	[1323, 1324]	1495	[1202, 534]	2097	[2249, 286]
292	[517, 518]	894	[1325, 45]	1496	[1490, 1392]	2098	[2250, 1852]
293	[519, 520]	895	[1326, 1280]	1497	[1869, 673]	2099	[1618, 2251]
294	[521, 522]	896	[175, 1327]	1498	[1868, 1159]	2100	[1830, 881]
295	[173, 523]	897	[1328, 1329]	1499	[1481, 463]	2101	[2252, 2253]
296	[524, 525]	898	[182, 1330]	1500	[1870, 1871]	2102	[835, 1735]
297	[526, 527]	899	[1331, 1332]	1501	[1872, 1873]	2103	[2254, 1580]
298	[528, 529]	900	[1333, 1334]	1502	[433, 1247]	2104	[2255, 2168]

299	[530, 131]	901	[674, 666]	1503	[1377, 480]	2105	[2256, 2257]
300	[420, 425]	902	[450, 1245]	1504	[1874, 1379]	2106	[1829, 2258]
301	[531, 532]	903	[1219, 629]	1505	[1875, 1110]	2107	[2259, 1635]
302	[533, 534]	904	[1295, 1335]	1506	[1229, 1876]	2108	[1615, 1039]
303	[535, 135]	905	[137, 1336]	1507	[1877, 1226]	2109	[269, 926]
304	[536, 219]	906	[1337, 1338]	1508	[1878, 1879]	2110	[2260, 706]
305	[537, 497]	907	[597, 1122]	1509	[1880, 1881]	2111	[2261, 281]
306	[537, 538]	908	[1339, 1340]	1510	[666, 1882]	2112	[1034, 2262]
307	[539, 199]	909	[1341, 1342]	1511	[149, 1263]	2113	[2263, 1744]
308	[540, 541]	910	[1343, 1344]	1512	[13, 120]	2114	[1704, 2264]
309	[542, 543]	911	[56, 1306]	1513	[528, 652]	2115	[1859, 1627]
310	[544, 545]	912	[1345, 1346]	1514	[1883, 178]	2116	[1672, 2202]
311	[508, 546]	913	[1152, 1144]	1515	[669, 1195]	2117	[1214, 500]
312	[547, 548]	914	[1347, 1348]	1516	[1884, 1385]	2118	[143, 1192]
313	[204, 549]	915	[1349, 1350]	1517	[1885, 426]	2119	[2265, 2266]
314	[550, 551]	916	[123, 1300]	1518	[583, 1886]	2120	[2267, 2268]
315	[552, 553]	917	[1108, 148]	1519	[1211, 443]	2121	[1439, 2269]
316	[158, 554]	918	[604, 34]	1520	[504, 573]	2122	[2270, 1937]
317	[555, 556]	919	[623, 1351]	1521	[493, 660]	2123	[2271, 1979]
318	[557, 558]	920	[1352, 479]	1522	[1887, 510]	2124	[1266, 1152]
319	[559, 35]	921	[597, 1264]	1523	[645, 1876]	2125	[1362, 54]
320	[560, 561]	922	[1353, 1354]	1524	[1888, 1098]	2126	[1348, 1159]
321	[562, 563]	923	[156, 1355]	1525	[1889, 1103]	2127	[2272, 2273]
322	[564, 565]	924	[1356, 1357]	1526	[1890, 1310]	2128	[2274, 2095]
323	[474, 566]	925	[1358, 1332]	1527	[1333, 1891]	2129	[1493, 601]
324	[567, 568]	926	[494, 661]	1528	[1286, 197]	2130	[2275, 41]
325	[569, 36]	927	[195, 1359]	1529	[1892, 1893]	2131	[2276, 2277]
326	[570, 571]	928	[1360, 1361]	1530	[1894, 179]	2132	[1434, 1297]
327	[572, 573]	929	[1362, 1278]	1531	[14, 639]	2133	[43, 590]
328	[574, 209]	930	[1174, 141]	1532	[469, 546]	2134	[46, 1492]
329	[575, 576]	931	[1235, 590]	1533	[1895, 1345]	2135	[481, 1102]
330	[577, 539]	932	[1363, 151]	1534	[1440, 505]	2136	[2278, 695]
331	[578, 579]	933	[38, 1364]	1535	[193, 1258]	2137	[1967, 1456]
332	[580, 581]	934	[1365, 544]	1536	[1207, 1896]	2138	[2279, 486]
333	[582, 583]	935	[1366, 574]	1537	[1897, 1898]	2139	[1986, 2009]
334	[43, 584]	936	[1296, 125]	1538	[434, 523]	2140	[2280, 465]
335	[153, 585]	937	[1367, 1368]	1539	[1899, 1900]	2141	[1917, 2281]
336	[586, 536]	938	[1252, 637]	1540	[1901, 37]	2142	[2282, 1945]
337	[587, 588]	939	[530, 1369]	1541	[1902, 1903]	2143	[2283, 1151]
338	[589, 453]	940	[1370, 1371]	1542	[449, 157]	2144	[1324, 553]
339	[590, 591]	941	[1342, 1372]	1543	[1904, 1221]	2145	[1435, 1400]
340	[592, 593]	942	[633, 631]	1544	[1905, 1175]	2146	[1929, 1964]
341	[594, 595]	943	[1373, 625]	1545	[430, 1906]	2147	[2284, 2053]
342	[596, 597]	944	[1374, 44]	1546	[1907, 446]	2148	[2285, 1449]

343	[598, 488]	945	[1375, 1354]	1547	[1294, 1350]	2149	[2286, 1417]
344	[599, 600]	946	[1218, 1376]	1548	[1901, 449]	2150	[226, 1398]
345	[601, 158]	947	[1377, 516]	1549	[1908, 1222]	2151	[1228, 1351]
346	[602, 603]	948	[1378, 620]	1550	[1344, 1909]	2152	[220, 2096]
347	[604, 559]	949	[602, 515]	1551	[1372, 1910]	2153	[2287, 1290]
348	[605, 606]	950	[1379, 1165]	1552	[524, 477]	2154	[2288, 1324]
349	[573, 172]	951	[538, 498]	1553	[1911, 1912]	2155	[2289, 1946]
350	[607, 163]	952	[1380, 1213]	1554	[178, 472]	2156	[1948, 653]
351	[608, 548]	953	[1381, 1382]	1555	[675, 1882]	2157	[2290, 615]
352	[191, 609]	954	[1383, 1384]	1556	[1913, 606]	2158	[2291, 1299]
353	[610, 583]	955	[589, 1385]	1557	[1914, 656]	2159	[1195, 653]
354	[440, 611]	956	[1386, 1387]	1558	[123, 1170]	2160	[2292, 2002]
355	[612, 563]	957	[1388, 11]	1559	[446, 1915]	2161	[1312, 1925]
356	[613, 614]	958	[1339, 576]	1560	[1916, 44]	2162	[620, 431]
357	[615, 616]	959	[1389, 1248]	1561	[1917, 1918]	2163	[1403, 1120]
358	[617, 618]	960	[152, 1390]	1562	[1919, 1123]	2164	[1366, 208]
359	[619, 620]	961	[1391, 1392]	1563	[1920, 1279]	2165	[2293, 1487]
360	[621, 622]	962	[1171, 1393]	1564	[575, 1340]	2166	[644, 1229]
361	[623, 624]	963	[1160, 677]	1565	[1921, 1355]	2167	[2294, 2295]
362	[151, 625]	964	[1394, 1395]	1566	[1922, 211]	2168	[2296, 2295]
363	[626, 168]	965	[1171, 1372]	1567	[1422, 683]	2169	[698, 1334]
364	[627, 549]	966	[1247, 1396]	1568	[1923, 1898]	2170	[1280, 1467]
365	[160, 628]	967	[1397, 123]	1569	[1924, 1925]	2171	[1441, 56]
366	[629, 630]	968	[622, 1168]	1570	[1926, 170]	2172	[2297, 1873]
367	[178, 226]	969	[472, 1398]	1571	[1927, 581]	2173	[2298, 2277]
368	[180, 130]	970	[1399, 1400]	1572	[1928, 466]	2174	[2299, 2300]
369	[631, 631]	971	[1401, 1218]	1573	[1929, 2]	2175	[1195, 1251]
370	[632, 160]	972	[1242, 623]	1574	[1930, 38]	2176	[1109, 1296]
371	[633, 633]	973	[219, 1402]	1575	[1931, 605]	2177	[1427, 1212]
372	[628, 634]	974	[1155, 536]	1576	[1932, 645]	2178	[50, 671]
373	[635, 636]	975	[419, 424]	1577	[1304, 1228]	2179	[2301, 1112]
374	[545, 637]	976	[1403, 466]	1578	[1933, 1483]	2180	[2302, 2300]
375	[8, 638]	977	[214, 138]	1579	[1934, 1364]	2181	[681, 474]
376	[120, 639]	978	[1151, 1143]	1580	[1341, 1171]	2182	[579, 2303]
377	[640, 641]	979	[1404, 183]	1581	[1935, 137]	2183	[1960, 2281]
378	[603, 134]	980	[1405, 1406]	1582	[1121, 1264]	2184	[2304, 1338]
379	[642, 643]	981	[1167, 1407]	1583	[1936, 1937]	2185	[2034, 1266]
380	[644, 645]	982	[1408, 1409]	1584	[1938, 1939]	2186	[1114, 1379]
381	[646, 647]	983	[545, 1253]	1585	[1940, 1308]	2187	[2305, 1384]
382	[199, 497]	984	[1410, 1411]	1586	[1941, 1106]	2188	[12, 1250]
383	[648, 649]	985	[1412, 1413]	1587	[522, 572]	2189	[2306, 615]
384	[650, 206]	986	[1152, 202]	1588	[1942, 1943]	2190	[1947, 2269]
385	[651, 652]	987	[492, 566]	1589	[1944, 43]	2191	[1928, 1120]
386	[653, 654]	988	[1414, 179]	1590	[1945, 1946]	2192	[2307, 2273]

387	[655, 656]	989	[504, 171]	1591	[1391, 1491]	2193	[607, 2035]
388	[525, 657]	990	[1415, 447]	1592	[1319, 1304]	2194	[547, 2093]
389	[629, 513]	991	[1416, 1417]	1593	[581, 1292]	2195	[1263, 2308]
390	[658, 659]	992	[563, 551]	1594	[453, 1469]	2196	[428, 2309]
391	[660, 661]	993	[651, 529]	1595	[1438, 1947]	2197	[2310, 2311]
392	[662, 559]	994	[1418, 1396]	1596	[1948, 1251]	2198	[2312, 2313]
393	[663, 664]	995	[1419, 1409]	1597	[1262, 1893]	2199	[429, 1209]
394	[665, 666]	996	[1404, 1420]	1598	[1949, 558]	2200	[1107, 1249]
395	[667, 480]	997	[1421, 426]	1599	[1950, 571]	2201	[44, 2314]
396	[668, 132]	998	[1422, 505]	1600	[1951, 570]	2202	[2315, 1200]
397	[491, 669]	999	[30, 1423]	1601	[1952, 1430]	2203	[1891, 1459]
398	[670, 671]	1000	[1424, 1425]	1602	[464, 1420]	2204	[1092, 1443]
399	[672, 673]	1001	[1196, 1426]	1603	[34, 1953]	2205	[1172, 1263]
400	[674, 675]	1002	[1233, 182]	1604	[1954, 1425]	2206	[665, 675]
401	[676, 677]	1003	[1427, 52]	1605	[1955, 1956]	2207	[1367, 1223]
402	[678, 679]	1004	[1345, 1428]	1606	[1373, 152]	2208	[2316, 1175]
403	[680, 681]	1005	[1237, 1387]	1607	[1957, 1336]	2209	[1343, 635]
404	[682, 176]	1006	[553, 1329]	1608	[1958, 1462]	2210	[198, 537]
405	[683, 506]	1007	[1429, 1430]	1609	[673, 1191]	2211	[1934, 39]
406	[126, 514]	1008	[1180, 1357]	1610	[1959, 1149]	2212	[2317, 2015]
407	[684, 685]	1009	[1431, 10]	1611	[1960, 1918]	2213	[37, 1260]
408	[686, 130]	1010	[649, 206]	1612	[1961, 579]	2214	[2318, 1232]
409	[687, 605]	1011	[1385, 454]	1613	[1962, 143]	2215	[1242, 1228]
410	[688, 689]	1012	[145, 1432]	1614	[1963, 1964]	2216	[11, 1249]
411	[690, 691]	1013	[1258, 1433]	1615	[1128, 542]	2217	[2319, 2033]
412	[692, 693]	1014	[1389, 1320]	1616	[1965, 674]	2218	[2296, 2110]
413	[694, 120]	1015	[1434, 160]	1617	[598, 1966]	2219	[1433, 2057]
414	[695, 696]	1016	[634, 649]	1618	[1967, 1968]	2220	[436, 561]
415	[697, 698]	1017	[1320, 1262]	1619	[1969, 1292]	2221	[2320, 167]
416	[699, 700]	1018	[1435, 1436]	1620	[468, 508]	2222	[1342, 1393]
417	[584, 591]	1019	[1437, 1274]	1621	[1970, 641]	2223	[1186, 2114]
418	[701, 116]	1020	[1183, 694]	1622	[668, 1211]	2224	[1304, 623]
419	[702, 703]	1021	[1438, 1439]	1623	[1971, 128]	2225	[33, 2321]
420	[704, 705]	1022	[1159, 1432]	1624	[1972, 1187]	2226	[139, 1413]
421	[257, 706]	1023	[436, 1116]	1625	[687, 1913]	2227	[2280, 143]
422	[707, 386]	1024	[1440, 683]	1626	[1393, 1910]	2228	[2322, 1915]
423	[406, 708]	1025	[1441, 142]	1627	[476, 525]	2229	[1408, 2323]
424	[709, 710]	1026	[1420, 184]	1628	[1973, 1939]	2230	[2324, 2325]
425	[711, 380]	1027	[1442, 1346]	1629	[1974, 221]	2231	[586, 218]
426	[712, 713]	1028	[1212, 53]	1630	[1344, 636]	2232	[1397, 1169]
427	[714, 715]	1029	[215, 139]	1631	[647, 689]	2233	[1283, 1452]
428	[61, 716]	1030	[678, 1443]	1632	[1382, 1489]	2234	[2326, 2327]
429	[717, 718]	1031	[523, 187]	1633	[594, 1975]	2235	[1302, 2105]
430	[719, 403]	1032	[596, 1121]	1634	[1976, 1977]	2236	[2328, 1307]

431	[720, 721]	1033	[1444, 1445]	1635	[1915, 1445]	2237	[2041, 2329]
432	[722, 723]	1034	[1188, 1188]	1636	[522, 504]	2238	[2089, 518]
433	[705, 724]	1035	[207, 632]	1637	[1978, 1979]	2239	[2046, 2050]
434	[725, 726]	1036	[634, 650]	1638	[1980, 1981]	2240	[559, 1953]
435	[727, 728]	1037	[1206, 1275]	1639	[1982, 600]	2241	[1358, 2330]
436	[262, 729]	1038	[1446, 1197]	1640	[1983, 1492]	2242	[1338, 2029]
437	[730, 731]	1039	[1447, 1270]	1641	[1984, 1131]	2243	[2331, 2332]
438	[270, 732]	1040	[1448, 1283]	1642	[1292, 1922]	2244	[1360, 500]
439	[733, 734]	1041	[520, 1449]	1643	[1985, 1376]	2245	[135, 1879]
440	[285, 735]	1042	[1209, 1450]	1644	[1880, 1182]	2246	[148, 1185]
441	[736, 737]	1043	[1451, 1452]	1645	[1986, 1987]	2247	[2333, 1402]
442	[738, 379]	1044	[1453, 1216]	1646	[1988, 1222]	2248	[2334, 1998]
443	[739, 740]	1045	[606, 681]	1647	[487, 1966]	2249	[130, 1369]
444	[91, 741]	1046	[144, 1208]	1648	[1989, 471]	2250	[2022, 635]
445	[742, 743]	1047	[1454, 200]	1649	[1267, 1138]	2251	[2335, 1477]
446	[744, 745]	1048	[1455, 1456]	1650	[1214, 1361]	2252	[1125, 1365]
447	[746, 280]	1049	[1457, 1458]	1651	[1465, 215]	2253	[2327, 2325]
448	[747, 748]	1050	[1334, 1459]	1652	[1990, 1333]	2254	[697, 1333]
449	[749, 750]	1051	[1216, 1406]	1653	[1399, 1436]	2255	[1924, 1313]
450	[751, 752]	1052	[222, 1423]	1654	[1991, 1154]	2256	[1959, 2336]
451	[753, 754]	1053	[1460, 156]	1655	[682, 1327]	2257	[1995, 2088]
452	[703, 755]	1054	[502, 1330]	1656	[1992, 1993]	2258	[2337, 2266]
453	[756, 757]	1055	[1461, 1462]	1657	[58, 1896]	2259	[1465, 138]
454	[245, 5]	1056	[1463, 520]	1658	[174, 1994]	2260	[1461, 2071]
455	[758, 307]	1057	[1464, 1465]	1659	[486, 1995]	2261	[2338, 2079]
456	[759, 760]	1058	[1451, 1284]	1660	[226, 473]	2262	[2339, 2098]
457	[761, 762]	1059	[1261, 660]	1661	[1996, 1871]	2263	[517, 2090]
458	[763, 764]	1060	[1466, 1371]	1662	[1997, 1998]	2264	[2340, 642]
459	[765, 766]	1061	[1467, 1127]	1663	[1999, 545]	2265	[2260, 2341]
460	[767, 768]	1062	[1452, 1468]	1664	[1132, 491]	2266	[2342, 998]
461	[769, 770]	1063	[1385, 1469]	1665	[1177, 1950]	2267	[853, 2343]
462	[771, 761]	1064	[1470, 1471]	1666	[2000, 1386]	2268	[2344, 787]
463	[392, 772]	1065	[1472, 11]	1667	[1356, 1181]	2269	[18, 117]
464	[773, 344]	1066	[1430, 433]	1668	[1881, 1183]	2270	[2162, 112]
465	[774, 775]	1067	[418, 1207]	1669	[1931, 1913]	2271	[2161, 1736]
466	[776, 777]	1068	[1375, 1473]	1670	[1875, 1185]	2272	[868, 1560]
467	[778, 779]	1069	[1474, 1294]	1671	[2001, 2002]	2273	[2345, 2346]
468	[780, 781]	1070	[627, 205]	1672	[613, 189]	2274	[1088, 846]
469	[782, 783]	1071	[483, 1475]	1673	[1425, 2003]	2275	[1495, 824]
470	[784, 785]	1072	[1476, 1477]	1674	[1146, 2004]	2276	[115, 971]
471	[786, 787]	1073	[1478, 1479]	1675	[2005, 191]	2277	[2240, 1515]
472	[788, 789]	1074	[1480, 696]	1676	[625, 1390]	2278	[2134, 826]
473	[790, 791]	1075	[1481, 440]	1677	[1941, 2006]	2279	[2347, 1771]
474	[792, 793]	1076	[1482, 1386]	1678	[2007, 1180]	2280	[1842, 2348]

475	[789, 794]	1077	[531, 1483]	1679	[1094, 1475]	2281	[2349, 2346]
476	[795, 796]	1078	[186, 1450]	1680	[2008, 2009]	2282	[1520, 1069]
477	[797, 798]	1079	[1484, 1099]	1681	[2010, 142]	2283	[717, 2350]
478	[799, 800]	1080	[1281, 1278]	1682	[2011, 1881]	2284	[1823, 2351]
479	[801, 802]	1081	[1485, 132]	1683	[1163, 496]	2285	[2352, 328]
480	[90, 96]	1082	[1486, 1487]	1684	[118, 618]	2286	[361, 1557]
481	[335, 803]	1083	[1249, 129]	1685	[2012, 527]	2287	[1674, 1773]
482	[804, 805]	1084	[1488, 1489]	1686	[1129, 543]	2288	[870, 2353]
483	[806, 807]	1085	[1490, 1491]	1687	[148, 1110]	2289	[2183, 85]
484	[808, 809]	1086	[1284, 1468]	1688	[1932, 1229]	2290	[2232, 995]
485	[810, 811]	1087	[1492, 528]	1689	[2013, 1922]	2291	[277, 925]
486	[812, 291]	1088	[1273, 585]	1690	[1951, 1950]	2292	[1510, 2122]
487	[813, 814]	1089	[1493, 1311]	1691	[1299, 565]	2293	[236, 2354]
488	[815, 816]	1090	[1168, 544]	1692	[2014, 2015]	2294	[2117, 2261]
489	[817, 288]	1091	[1453, 1405]	1693	[648, 650]	2295	[2355, 104]
490	[818, 819]	1092	[1494, 1495]	1694	[2016, 632]	2296	[1023, 2356]
491	[820, 821]	1093	[1496, 1497]	1695	[2017, 1136]	2297	[704, 1708]
492	[822, 823]	1094	[298, 262]	1696	[511, 554]	2298	[1075, 2186]
493	[74, 824]	1095	[770, 326]	1697	[1210, 208]	2299	[1779, 411]
494	[825, 826]	1096	[1498, 1499]	1698	[2018, 1995]	2300	[2357, 969]
495	[288, 827]	1097	[316, 1500]	1699	[2019, 1147]	2301	[2259, 1497]
496	[828, 829]	1098	[1501, 1502]	1700	[2020, 616]	2302	[756, 2358]
497	[370, 830]	1099	[1503, 834]	1701	[1361, 501]	2303	[2168, 109]
498	[831, 832]	1100	[296, 936]	1702	[1883, 225]	2304	[78, 2184]
499	[833, 834]	1101	[788, 1504]	1703	[1982, 2021]	2305	[2238, 321]
500	[835, 836]	1102	[1505, 1506]	1704	[2022, 1344]	2306	[406, 827]
501	[762, 388]	1103	[1507, 1508]	1705	[1097, 2023]	2307	[2352, 2167]
502	[837, 838]	1104	[1509, 1510]	1706	[2024, 685]	2308	[2359, 1763]
503	[839, 840]	1105	[25, 1511]	1707	[449, 1260]	2309	[1812, 375]
504	[841, 716]	1106	[1512, 1513]	1708	[1902, 1158]	2310	[2263, 2356]
505	[351, 842]	1107	[1514, 1515]	1709	[2025, 167]	2311	[2360, 2177]
506	[843, 844]	1108	[228, 29]	1710	[588, 512]	2312	[1063, 801]
507	[845, 846]	1109	[1516, 1517]	1711	[1990, 698]	2313	[2361, 894]
508	[784, 847]	1110	[29, 250]	1712	[2026, 2027]	2314	[2362, 2363]
509	[391, 848]	1111	[1518, 71]	1713	[2028, 2029]	2315	[2244, 1791]
510	[849, 850]	1112	[1519, 1066]	1714	[2030, 1382]	2316	[974, 1586]
511	[851, 852]	1113	[412, 1520]	1715	[2031, 1196]	2317	[2364, 770]
512	[853, 854]	1114	[1521, 1522]	1716	[572, 171]	2318	[110, 1591]
513	[855, 744]	1115	[1523, 811]	1717	[1161, 1975]	2319	[2365, 1510]
514	[856, 857]	1116	[288, 708]	1718	[670, 51]	2320	[347, 318]
515	[858, 859]	1117	[1524, 845]	1719	[1297, 161]	2321	[2366, 2367]
516	[860, 861]	1118	[1525, 230]	1720	[1893, 539]	2322	[1850, 1691]
517	[862, 863]	1119	[1526, 1527]	1721	[1189, 1188]	2323	[2368, 2369]
518	[864, 865]	1120	[1528, 1529]	1722	[2032, 691]	2324	[1558, 1090]

519	[866, 867]	1121	[64, 1530]	1723	[693, 2033]	2325	[1511, 921]
520	[868, 726]	1122	[1531, 390]	1724	[1215, 1405]	2326	[2199, 2157]
521	[60, 841]	1123	[899, 1532]	1725	[2034, 1151]	2327	[244, 1732]
522	[869, 379]	1124	[767, 1533]	1726	[162, 2035]	2328	[1866, 848]
523	[350, 870]	1125	[1534, 1535]	1727	[1122, 1265]	2329	[355, 1844]
524	[342, 871]	1126	[1536, 1537]	1728	[698, 1891]	2330	[2370, 2371]
525	[872, 873]	1127	[1031, 1520]	1729	[2036, 2037]	2331	[2372, 2189]
526	[17, 116]	1128	[1538, 1539]	1730	[2038, 1283]	2332	[2211, 416]
527	[874, 875]	1129	[702, 1540]	1731	[2039, 2040]	2333	[2178, 1742]
528	[91, 97]	1130	[1541, 243]	1732	[1183, 13]	2334	[1617, 1722]
529	[876, 877]	1131	[1542, 1543]	1733	[533, 1203]	2335	[945, 990]
530	[878, 879]	1132	[240, 1544]	1734	[2041, 609]	2336	[2255, 108]
531	[880, 239]	1133	[75, 1046]	1735	[2042, 1179]	2337	[2355, 1801]
532	[881, 882]	1134	[1538, 838]	1736	[2043, 447]	2338	[257, 2341]
533	[883, 867]	1135	[1545, 340]	1737	[2044, 1947]	2339	[374, 1583]
534	[884, 885]	1136	[1546, 1547]	1738	[2045, 474]	2340	[2372, 1751]
535	[886, 887]	1137	[1548, 1549]	1739	[2010, 56]	2341	[2373, 2039]
536	[888, 889]	1138	[1550, 1551]	1740	[1933, 532]	2342	[521, 503]
537	[83, 831]	1139	[938, 348]	1741	[1104, 1121]	2343	[2374, 1118]
538	[890, 891]	1140	[1552, 1553]	1742	[2046, 1886]	2344	[573, 2375]
539	[870, 842]	1141	[265, 1082]	1743	[2047, 2048]	2345	[2283, 1266]
540	[797, 892]	1142	[1554, 1502]	1744	[2049, 1095]	2346	[2376, 1316]
541	[893, 894]	1143	[1081, 378]	1745	[1144, 203]	2347	[1259, 603]
542	[730, 895]	1144	[1555, 1556]	1746	[583, 2050]	2348	[2377, 2327]
543	[896, 897]	1145	[1557, 1558]	1747	[2051, 1173]	2349	[1325, 2314]
544	[713, 26]	1146	[908, 364]	1748	[2052, 2040]	2350	[2378, 2332]
545	[251, 898]	1147	[1547, 1559]	1749	[2053, 1204]	2351	[2379, 1142]
546	[846, 744]	1148	[725, 1560]	1750	[2032, 2054]	2352	[1353, 1473]
547	[67, 899]	1149	[1561, 1562]	1751	[1316, 1993]	2353	[2380, 1956]
548	[900, 901]	1150	[735, 311]	1752	[1443, 1160]	2354	[2381, 1943]
549	[902, 903]	1151	[358, 994]	1753	[1921, 2055]	2355	[188, 614]
550	[904, 905]	1152	[1552, 1563]	1754	[2056, 2057]	2356	[2382, 2039]
551	[906, 844]	1153	[1564, 1017]	1755	[2013, 210]	2357	[2383, 2384]
552	[907, 87]	1154	[1565, 1566]	1756	[667, 516]	2358	[2385, 2311]
553	[908, 830]	1155	[1567, 404]	1757	[437, 424]	2359	[2042, 2386]
554	[909, 910]	1156	[996, 1568]	1758	[1157, 1903]	2360	[1464, 214]
555	[911, 912]	1157	[1569, 1570]	1759	[479, 1342]	2361	[2087, 2387]
556	[852, 913]	1158	[1571, 1572]	1760	[2058, 1904]	2362	[578, 2388]
557	[68, 714]	1159	[1573, 1016]	1761	[1437, 1359]	2363	[2389, 2309]
558	[914, 915]	1160	[1495, 75]	1762	[2059, 1139]	2364	[675, 2081]
559	[916, 917]	1161	[1550, 1574]	1763	[458, 1113]	2365	[635, 1909]
560	[918, 836]	1162	[1575, 938]	1764	[2060, 2053]	2366	[2293, 2390]
561	[919, 920]	1163	[919, 995]	1765	[122, 1169]	2367	[2277, 2391]
562	[921, 906]	1164	[1576, 1577]	1766	[2061, 1279]	2368	[2284, 2092]

563	[922, 923]	1165	[1522, 391]	1767	[2062, 1945]	2369	[2388, 2303]
564	[924, 775]	1166	[836, 17]	1768	[2063, 1289]	2370	[1198, 1291]
565	[925, 926]	1167	[1578, 792]	1769	[477, 657]	2371	[2295, 2111]
566	[927, 928]	1168	[1002, 251]	1770	[2064, 1345]	2372	[503, 572]
567	[929, 845]	1169	[1579, 1580]	1771	[1879, 556]	2373	[1689, 1570]
568	[930, 898]	1170	[1581, 1582]	1772	[2065, 1196]	2374	[2254, 1526]
569	[931, 932]	1171	[234, 405]	1773	[1138, 1145]	2375	[2392, 1038]
570	[933, 934]	1172	[392, 1583]	1774	[196, 1287]	2376	[1582, 905]
571	[935, 327]	1173	[374, 772]	1775	[2019, 2004]	2377	[713, 1511]
572	[769, 325]	1174	[1514, 1584]	1776	[2066, 1200]	2378	[111, 2205]
573	[379, 936]	1175	[1585, 96]	1777	[2067, 503]	2379	[2393, 1553]
574	[937, 938]	1176	[1586, 304]	1778	[2068, 195]	2380	[389, 2165]
575	[939, 940]	1177	[1587, 935]	1779	[1940, 1256]	2381	[1858, 935]
576	[910, 941]	1178	[1519, 1588]	1780	[1888, 2023]	2382	[1606, 2142]
577	[942, 107]	1179	[1589, 1590]	1781	[2069, 2048]	2383	[250, 930]
578	[943, 944]	1180	[1591, 1028]	1782	[1129, 2070]	2384	[2394, 2148]
579	[945, 946]	1181	[1592, 1576]	1783	[632, 1297]	2385	[746, 2261]
580	[947, 948]	1182	[1572, 1593]	1784	[514, 638]	2386	[2395, 2396]
581	[949, 389]	1183	[227, 28]	1785	[1958, 2071]	2387	[2397, 719]
582	[253, 950]	1184	[976, 302]	1786	[2067, 522]	2388	[1853, 843]
583	[862, 951]	1185	[1594, 768]	1787	[1199, 1153]	2389	[2364, 325]
584	[84, 832]	1186	[268, 925]	1788	[1442, 1428]	2390	[2398, 314]
585	[952, 953]	1187	[1595, 1596]	1789	[2072, 2073]	2391	[2186, 253]
586	[799, 954]	1188	[742, 1597]	1790	[1423, 428]	2392	[658, 1965]
587	[955, 956]	1189	[1189, 1189]	1791	[2074, 1302]	2393	[642, 1407]
588	[845, 855]	1190	[969, 389]	1792	[2075, 193]	2394	[2399, 2400]
589	[957, 245]	1191	[1598, 1599]	1793	[1472, 1107]	2395	[1907, 2322]
590	[958, 959]	1192	[1600, 1601]	1794	[1455, 1968]	2396	[191, 2329]
591	[85, 960]	1193	[812, 899]	1795	[542, 2070]	2397	[605, 680]
592	[961, 70]	1194	[1602, 1005]	1796	[523, 1994]	2398	[1323, 552]
593	[962, 963]	1195	[1499, 754]	1797	[2076, 2037]	2399	[939, 1621]
594	[66, 812]	1196	[1603, 93]	1798	[2077, 173]	2400	[2401, 2402]
595	[964, 965]	1197	[1604, 913]	1799	[2078, 1303]	2401	[2083, 587]
596	[947, 966]	1198	[1015, 1605]	1800	[1143, 202]	2402	[2403, 2391]
597	[967, 968]	1199	[1606, 1607]	1801	[1410, 2079]	2403	[926, 24]
598	[969, 289]	1200	[1608, 1609]	1802	[2080, 2003]		
599	[970, 971]	1201	[1610, 760]	1803	[666, 2081]		
600	[972, 973]	1202	[1611, 1612]	1804	[1348, 145]		
601	[974, 303]	1203	[1613, 1494]	1805	[2082, 1302]		

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	401	0	802	1	1203	0	1604	0	2005	1
1	0	402	1	803	1	1204	0	1605	0	2006	1

2	0	403	0	804	1	1205	1	1606	1	2007	0
3	0	404	0	805	0	1206	1	1607	0	2008	1
4	0	405	1	806	0	1207	0	1608	1	2009	0
5	0	406	1	807	1	1208	0	1609	0	2010	0
6	0	407	0	808	1	1209	1	1610	0	2011	1
7	0	408	0	809	1	1210	1	1611	1	2012	0
8	1	409	1	810	0	1211	0	1612	0	2013	0
9	0	410	0	811	0	1212	0	1613	0	2014	0
10	0	411	1	812	0	1213	1	1614	0	2015	0
11	0	412	0	813	0	1214	0	1615	1	2016	0
12	1	413	1	814	0	1215	1	1616	1	2017	1
13	0	414	0	815	0	1216	0	1617	1	2018	1
14	1	415	0	816	0	1217	1	1618	0	2019	0
15	0	416	0	817	0	1218	0	1619	1	2020	1
16	1	417	0	818	0	1219	1	1620	1	2021	0
17	1	418	0	819	1	1220	0	1621	0	2022	1
18	0	419	0	820	1	1221	0	1622	1	2023	1
19	0	420	1	821	0	1222	0	1623	0	2024	1
20	0	421	1	822	0	1223	0	1624	0	2025	1
21	0	422	1	823	0	1224	1	1625	1	2026	0
22	1	423	1	824	1	1225	1	1626	0	2027	0
23	0	424	0	825	1	1226	1	1627	0	2028	0
24	1	425	1	826	1	1227	0	1628	1	2029	1
25	1	426	1	827	1	1228	0	1629	0	2030	1
26	1	427	1	828	1	1229	0	1630	0	2031	1
27	0	428	0	829	0	1230	0	1631	1	2032	0
28	1	429	1	830	0	1231	0	1632	1	2033	1
29	1	430	0	831	1	1232	1	1633	1	2034	0
30	0	431	0	832	0	1233	0	1634	1	2035	0
31	1	432	0	833	0	1234	1	1635	1	2036	0
32	1	433	1	834	0	1235	1	1636	0	2037	0
33	1	434	1	835	1	1236	0	1637	1	2038	0
34	1	435	1	836	0	1237	0	1638	1	2039	1
35	1	436	1	837	0	1238	0	1639	1	2040	1
36	0	437	1	838	1	1239	0	1640	1	2041	1
37	0	438	0	839	1	1240	1	1641	1	2042	1
38	0	439	1	840	0	1241	0	1642	1	2043	0
39	0	440	0	841	1	1242	1	1643	1	2044	1
40	0	441	1	842	0	1243	1	1644	0	2045	0
41	0	442	1	843	0	1244	1	1645	0	2046	1
42	0	443	1	844	0	1245	0	1646	0	2047	0
43	0	444	1	845	0	1246	0	1647	0	2048	0
44	1	445	1	846	0	1247	0	1648	0	2049	0
45	0	446	0	847	0	1248	0	1649	0	2050	1

46	0	447	1	848	1	1249	0	1650	0	2051	0
47	0	448	1	849	1	1250	1	1651	1	2052	0
48	1	449	1	850	0	1251	0	1652	1	2053	0
49	0	450	0	851	1	1252	1	1653	0	2054	1
50	1	451	1	852	1	1253	0	1654	1	2055	0
51	1	452	0	853	0	1254	0	1655	0	2056	0
52	1	453	0	854	1	1255	0	1656	1	2057	1
53	1	454	1	855	1	1256	0	1657	1	2058	1
54	0	455	1	856	0	1257	1	1658	0	2059	0
55	0	456	1	857	0	1258	0	1659	0	2060	0
56	1	457	1	858	1	1259	1	1660	0	2061	1
57	0	458	1	859	1	1260	0	1661	1	2062	0
58	1	459	1	860	1	1261	1	1662	0	2063	1
59	1	460	1	861	0	1262	0	1663	1	2064	1
60	0	461	0	862	0	1263	0	1664	1	2065	0
61	0	462	1	863	0	1264	0	1665	0	2066	0
62	1	463	1	864	0	1265	0	1666	0	2067	1
63	1	464	0	865	0	1266	0	1667	0	2068	1
64	1	465	1	866	1	1267	0	1668	0	2069	1
65	1	466	1	867	0	1268	0	1669	0	2070	0
66	1	467	1	868	0	1269	1	1670	0	2071	0
67	1	468	1	869	0	1270	0	1671	1	2072	0
68	1	469	0	870	1	1271	1	1672	0	2073	1
69	0	470	1	871	1	1272	0	1673	0	2074	0
70	1	471	1	872	1	1273	1	1674	1	2075	0
71	0	472	1	873	1	1274	1	1675	1	2076	1
72	0	473	1	874	0	1275	0	1676	0	2077	0
73	0	474	1	875	0	1276	1	1677	0	2078	1
74	0	475	0	876	1	1277	1	1678	0	2079	1
75	0	476	0	877	1	1278	1	1679	1	2080	1
76	1	477	0	878	0	1279	0	1680	1	2081	1
77	0	478	1	879	0	1280	0	1681	0	2082	1
78	0	479	1	880	0	1281	1	1682	1	2083	1
79	0	480	0	881	0	1282	1	1683	1	2084	0
80	1	481	0	882	1	1283	1	1684	0	2085	1
81	0	482	1	883	0	1284	1	1685	0	2086	1
82	0	483	0	884	1	1285	0	1686	0	2087	1
83	0	484	1	885	0	1286	0	1687	1	2088	1
84	0	485	0	886	1	1287	0	1688	0	2089	1
85	1	486	0	887	0	1288	0	1689	0	2090	1
86	1	487	0	888	0	1289	0	1690	1	2091	1
87	0	488	0	889	0	1290	0	1691	1	2092	1
88	0	489	0	890	1	1291	0	1692	0	2093	1
89	1	490	0	891	0	1292	1	1693	1	2094	0

90	0	491	1	892	0	1293	0	1694	0	2095	1
91	1	492	0	893	0	1294	0	1695	1	2096	1
92	0	493	0	894	0	1295	0	1696	1	2097	1
93	0	494	1	895	1	1296	0	1697	1	2098	1
94	1	495	0	896	1	1297	1	1698	1	2099	0
95	1	496	1	897	0	1298	1	1699	0	2100	0
96	0	497	0	898	1	1299	1	1700	1	2101	1
97	0	498	1	899	0	1300	1	1701	0	2102	1
98	1	499	0	900	0	1301	0	1702	1	2103	0
99	0	500	1	901	1	1302	0	1703	1	2104	1
100	1	501	1	902	0	1303	1	1704	1	2105	0
101	0	502	0	903	1	1304	0	1705	0	2106	0
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103	0	504	1	905	1	1306	1	1707	1	2108	1
104	1	505	0	906	1	1307	0	1708	0	2109	0
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106	0	507	0	908	1	1309	0	1710	0	2111	1
107	1	508	1	909	0	1310	0	1711	1	2112	1
108	0	509	0	910	0	1311	1	1712	0	2113	0
109	1	510	1	911	1	1312	0	1713	0	2114	1
110	1	511	1	912	1	1313	0	1714	1	2115	0
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113	1	514	0	915	1	1316	0	1717	0	2118	0
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115	1	516	1	917	0	1318	0	1719	1	2120	0
116	1	517	0	918	0	1319	0	1720	0	2121	0
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118	0	519	1	920	0	1321	0	1722	0	2123	0
119	1	520	0	921	0	1322	0	1723	0	2124	0
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122	1	523	1	924	0	1325	0	1726	0	2127	0
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124	1	525	1	926	1	1327	0	1728	1	2129	1
125	1	526	1	927	1	1328	0	1729	0	2130	1
126	1	527	0	928	1	1329	0	1730	0	2131	1
127	1	528	1	929	0	1330	1	1731	1	2132	1
128	1	529	1	930	1	1331	0	1732	0	2133	0
129	0	530	0	931	1	1332	0	1733	0	2134	0
130	1	531	0	932	0	1333	0	1734	1	2135	0
131	1	532	0	933	0	1334	0	1735	1	2136	0
132	1	533	0	934	1	1335	1	1736	0	2137	0
133	0	534	1	935	0	1336	1	1737	1	2138	1

134	0	535	1	936	0	1337	1	1738	0	2139	0
135	1	536	0	937	1	1338	1	1739	0	2140	1
136	1	537	0	938	1	1339	1	1740	1	2141	0
137	1	538	1	939	0	1340	1	1741	0	2142	1
138	0	539	1	940	1	1341	0	1742	1	2143	1
139	1	540	0	941	0	1342	0	1743	0	2144	1
140	0	541	0	942	1	1343	0	1744	0	2145	1
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143	0	544	0	945	0	1346	0	1747	0	2148	1
144	0	545	0	946	0	1347	0	1748	0	2149	1
145	0	546	0	947	1	1348	1	1749	0	2150	0
146	0	547	1	948	1	1349	1	1750	0	2151	0
147	1	548	0	949	0	1350	0	1751	0	2152	1
148	1	549	0	950	0	1351	0	1752	0	2153	1
149	0	550	0	951	1	1352	0	1753	0	2154	1
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151	0	552	0	953	0	1354	0	1755	0	2156	1
152	1	553	1	954	0	1355	1	1756	0	2157	0
153	0	554	0	955	0	1356	0	1757	1	2158	0
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156	1	557	1	958	1	1359	0	1760	1	2161	0
157	1	558	0	959	0	1360	1	1761	0	2162	1
158	0	559	0	960	1	1361	0	1762	0	2163	0
159	1	560	0	961	1	1362	0	1763	1	2164	0
160	0	561	1	962	1	1363	0	1764	0	2165	0
161	0	562	0	963	1	1364	1	1765	1	2166	1
162	0	563	1	964	1	1365	1	1766	1	2167	0
163	1	564	0	965	1	1366	0	1767	0	2168	1
164	0	565	1	966	0	1367	1	1768	1	2169	1
165	1	566	1	967	0	1368	1	1769	0	2170	0
166	0	567	0	968	0	1369	0	1770	1	2171	1
167	0	568	1	969	1	1370	1	1771	0	2172	1
168	1	569	1	970	0	1371	0	1772	0	2173	0
169	0	570	0	971	0	1372	1	1773	0	2174	1
170	0	571	0	972	1	1373	1	1774	1	2175	0
171	1	572	0	973	0	1374	1	1775	0	2176	1
172	1	573	0	974	0	1375	0	1776	0	2177	0
173	0	574	1	975	0	1376	0	1777	1	2178	1
174	0	575	0	976	0	1377	1	1778	1	2179	1
175	1	576	0	977	0	1378	1	1779	1	2180	0
176	1	577	1	978	1	1379	0	1780	1	2181	1
177	0	578	1	979	1	1380	1	1781	1	2182	0

178	1	579	0	980	1	1381	0	1782	0	2183	1
179	0	580	1	981	1	1382	1	1783	0	2184	0
180	1	581	0	982	0	1383	0	1784	0	2185	0
181	1	582	0	983	0	1384	1	1785	1	2186	0
182	1	583	0	984	0	1385	1	1786	1	2187	1
183	1	584	0	985	0	1386	1	1787	1	2188	1
184	0	585	1	986	1	1387	1	1788	0	2189	1
185	0	586	1	987	0	1388	0	1789	0	2190	1
186	0	587	0	988	1	1389	0	1790	0	2191	1
187	1	588	0	989	1	1390	1	1791	0	2192	1
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189	0	590	1	991	0	1392	1	1793	1	2194	1
190	0	591	1	992	1	1393	0	1794	1	2195	0
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192	1	593	1	994	1	1395	0	1796	1	2197	0
193	0	594	1	995	1	1396	0	1797	1	2198	1
194	0	595	1	996	1	1397	0	1798	0	2199	1
195	1	596	1	997	0	1398	0	1799	1	2200	1
196	1	597	0	998	0	1399	0	1800	0	2201	1
197	1	598	1	999	0	1400	0	1801	0	2202	1
198	0	599	0	1000	1	1401	0	1802	1	2203	1
199	1	600	1	1001	1	1402	0	1803	0	2204	0
200	1	601	0	1002	0	1403	0	1804	1	2205	1
201	0	602	0	1003	0	1404	1	1805	1	2206	0
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203	0	604	0	1005	0	1406	1	1807	0	2208	0
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205	1	606	1	1007	1	1408	0	1809	1	2210	0
206	1	607	1	1008	1	1409	0	1810	0	2211	1
207	1	608	0	1009	1	1410	0	1811	0	2212	1
208	0	609	0	1010	1	1411	0	1812	1	2213	0
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210	1	611	0	1012	0	1413	1	1814	0	2215	1
211	0	612	1	1013	0	1414	1	1815	1	2216	0
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213	1	614	1	1015	1	1416	0	1817	1	2218	1
214	0	615	0	1016	0	1417	0	1818	1	2219	1
215	1	616	1	1017	1	1418	1	1819	1	2220	1
216	0	617	1	1018	1	1419	1	1820	1	2221	0
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218	1	619	0	1020	0	1421	0	1822	1	2223	1
219	0	620	1	1021	0	1422	0	1823	1	2224	0
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224	1	625	0	1026	0	1427	0	1828	0	2229	0
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226	0	627	1	1028	0	1429	1	1830	0	2231	1
227	0	628	1	1029	1	1430	1	1831	0	2232	0
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229	1	630	0	1031	1	1432	1	1833	1	2234	1
230	1	631	0	1032	1	1433	1	1834	0	2235	0
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232	1	633	1	1034	1	1435	1	1836	0	2237	1
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235	0	636	0	1037	1	1438	0	1839	1	2240	0
236	0	637	1	1038	0	1439	0	1840	0	2241	1
237	0	638	1	1039	0	1440	1	1841	1	2242	1
238	1	639	1	1040	1	1441	1	1842	1	2243	1
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240	1	641	1	1042	1	1443	0	1844	0	2245	1
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246	1	647	1	1048	1	1449	0	1850	1	2251	0
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248	0	649	1	1050	0	1451	0	1852	1	2253	1
249	0	650	0	1051	0	1452	0	1853	1	2254	0
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254	1	655	0	1056	0	1457	0	1858	1	2259	1
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257	1	658	0	1059	1	1460	0	1861	1	2262	0
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262	1	663	1	1064	1	1465	1	1866	1	2267	0
263	1	664	0	1065	1	1466	0	1867	0	2268	0
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265	1	666	0	1067	0	1468	0	1869	0	2270	1

266	0	667	0	1068	0	1469	0	1870	0	2271	0
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269	0	670	0	1071	0	1472	1	1873	0	2274	1
270	0	671	0	1072	1	1473	1	1874	1	2275	1
271	0	672	1	1073	0	1474	1	1875	0	2276	1
272	0	673	0	1074	1	1475	0	1876	0	2277	0
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275	0	676	0	1077	0	1478	0	1879	0	2280	1
276	0	677	1	1078	0	1479	0	1880	0	2281	0
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278	0	679	1	1080	1	1481	0	1882	0	2283	1
279	0	680	0	1081	0	1482	1	1883	1	2284	1
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296	1	697	0	1098	0	1499	0	1900	1	2301	1
297	1	698	1	1099	1	1500	0	1901	1	2302	0
298	1	699	0	1100	1	1501	0	1902	0	2303	1
299	0	700	0	1101	1	1502	1	1903	1	2304	0
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301	0	702	0	1103	0	1504	1	1905	1	2306	1
302	0	703	0	1104	0	1505	0	1906	1	2307	1
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310	0	711	1	1112	0	1513	1	1914	1	2315	1
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317	1	718	1	1119	1	1520	1	1921	0	2322	1
318	1	719	0	1120	0	1521	0	1922	0	2323	1
319	0	720	0	1121	1	1522	1	1923	1	2324	0
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322	0	723	0	1124	1	1525	0	1926	1	2327	1
323	1	724	0	1125	1	1526	1	1927	0	2328	1
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326	0	727	1	1128	1	1529	1	1930	0	2331	1
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328	1	729	0	1130	0	1531	1	1932	0	2333	1
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332	1	733	1	1134	1	1535	0	1936	0	2337	1
333	0	734	1	1135	0	1536	0	1937	1	2338	1
334	0	735	1	1136	0	1537	0	1938	0	2339	0
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336	1	737	0	1138	0	1539	0	1940	1	2341	0
337	0	738	1	1139	1	1540	1	1941	0	2342	0
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339	1	740	1	1141	1	1542	1	1943	0	2344	0
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341	1	742	1	1143	0	1544	1	1945	0	2346	1
342	1	743	1	1144	1	1545	0	1946	1	2347	1
343	1	744	0	1145	1	1546	0	1947	1	2348	0
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345	0	746	1	1147	0	1548	1	1949	0	2350	0
346	0	747	1	1148	1	1549	1	1950	1	2351	0
347	0	748	1	1149	0	1550	0	1951	1	2352	1
348	0	749	1	1150	1	1551	1	1952	0	2353	1
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350	1	751	0	1152	1	1553	1	1954	0	2355	1
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355	1	756	0	1157	1	1558	0	1959	0	2360	0
356	0	757	0	1158	0	1559	0	1960	1	2361	1
357	0	758	1	1159	1	1560	0	1961	0	2362	1
358	1	759	1	1160	1	1561	0	1962	0	2363	1
359	0	760	0	1161	0	1562	0	1963	0	2364	1
360	0	761	1	1162	0	1563	0	1964	1	2365	1
361	1	762	1	1163	1	1564	0	1965	1	2366	0
362	0	763	1	1164	0	1565	0	1966	1	2367	0
363	1	764	1	1165	1	1566	0	1967	0	2368	1
364	1	765	1	1166	0	1567	0	1968	1	2369	1
365	0	766	1	1167	1	1568	1	1969	1	2370	1
366	1	767	1	1168	0	1569	1	1970	0	2371	1
367	1	768	1	1169	1	1570	1	1971	0	2372	1
368	1	769	0	1170	0	1571	0	1972	0	2373	0
369	0	770	0	1171	1	1572	1	1973	1	2374	0
370	0	771	1	1172	1	1573	1	1974	0	2375	0
371	1	772	1	1173	0	1574	0	1975	0	2376	1
372	1	773	0	1174	1	1575	0	1976	1	2377	0
373	1	774	1	1175	1	1576	0	1977	0	2378	0
374	0	775	0	1176	0	1577	0	1978	1	2379	0
375	1	776	1	1177	0	1578	1	1979	0	2380	1
376	0	777	1	1178	0	1579	1	1980	1	2381	1
377	1	778	1	1179	1	1580	0	1981	1	2382	1
378	0	779	1	1180	1	1581	0	1982	1	2383	1
379	0	780	1	1181	0	1582	1	1983	1	2384	0
380	1	781	0	1182	1	1583	0	1984	1	2385	1
381	1	782	0	1183	0	1584	0	1985	1	2386	0
382	1	783	0	1184	0	1585	1	1986	0	2387	0
383	1	784	1	1185	0	1586	0	1987	1	2388	1
384	0	785	1	1186	1	1587	0	1988	0	2389	1
385	0	786	1	1187	0	1588	0	1989	0	2390	0
386	1	787	1	1188	1	1589	1	1990	1	2391	0
387	0	788	1	1189	0	1590	0	1991	1	2392	0
388	1	789	0	1190	1	1591	1	1992	1	2393	0
389	1	790	1	1191	0	1592	0	1993	1	2394	0
390	0	791	1	1192	1	1593	0	1994	0	2395	0
391	0	792	1	1193	0	1594	0	1995	0	2396	0
392	1	793	0	1194	0	1595	0	1996	1	2397	0
393	1	794	1	1195	0	1596	1	1997	0	2398	0
394	0	795	0	1196	1	1597	0	1998	1	2399	0
395	0	796	1	1197	0	1598	0	1999	1	2400	1
396	1	797	0	1198	1	1599	1	2000	0	2401	1
397	1	798	1	1199	1	1600	1	2001	1	2402	1

398	0	799	1	1200	1	1601	0	2002	1	2403	1
399	1	800	1	1201	0	1602	0	2003	0		
400	1	801	1	1202	1	1603	1	2004	1		

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