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

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

1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

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

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

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

$$\begin{aligned}
p_0(z)&=z^{18}+z^{15}+z^{14}+z^{13}+z^{12}+z^{10}+z^9+z^7+z^6+z^4+z^3+z+1,\\
p_1(z)&=z^{22}+z^{17}+z^{13}+z^{11}+z^7+z^5+z^4+z,\\
p_2(z)&=z^{24}+z^{20}+z^{16}+z^{12}+z^{10}+z^4+z^2+1,\\
p_3(z)&=z^{22}+z^{17}+z^{13}+z^{11}+z^7+z^5+z^4+z,\\
p_4(z)&=z^{20}+z^{18}+z^{16}+z^{15}+z^{14}+z^{13}+z^{12}+z^9+z^7+z^6+z^3+z^2+z+1,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z)&=z^{18}+z^{16}+z^{15}+z^{14}+z^{13}+z^{12}+z^{10}+z^9+z^8+z^7+z^6+z^3+z+1,\\
p_1(z)&=z^{22}+z^{17}+z^{13}+z^{11}+z^7+z^5+z^4+z,\\
p_2(z)&=z^{24}+z^{20}+z^{16}+z^{12}+z^{10}+z^4+z^2+1,\\
p_3(z)&=z^{22}+z^{17}+z^{13}+z^{11}+z^7+z^5+z^4+z,\\
p_4(z)&=z^{20}+z^{18}+z^{15}+z^{14}+z^{13}+z^{12}+z^9+z^8+z^7+z^6+z^4+z^3+z^2+z\\
&\quad+1.
\end{aligned}$$

2. Proof

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

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

By the basic properties of continued fractions, we have

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

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

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

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. ☐

Define

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

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

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

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

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

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

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 $u = 2^{2k}$,

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

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

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

$$\begin{aligned}
x^{1}0u &= x^{10u}T[:u] + x^{9u}T[u:2u] + x^{8u}T[2u:3u] + x^{7u}T[3u:4u]\\
&\quad + x^{5u}T[5u:6u] + T[10u:11u],\\
x^{1}1u &= x^{11u}T[:u] + x^{9u}T[2u:3u] + T[11u:12u],
\end{aligned}$$

which can be rewritten as

$$0 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2], \tag{2.7}$$

$$0 = T[[w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2] + T[[111w]_2], \tag{2.8}$$

$$0 = T[[100w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.9}$$

$$0 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1001w]_2], \tag{2.10}$$

$$\begin{aligned}0 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2]\\ &\quad + T[[1010w]_2],\end{aligned} \tag{2.11}$$

$$0 = T[[w]_2] + T[[10w]_2] + T[[1011w]_2], \tag{2.12}$$

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

$$1 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2], \tag{2.13}$$

$$0 = T[[w]_2] + T[[10w]_2] + T[[100w]_2] + T[[101w]_2] + T[[111w]_2], \tag{2.14}$$

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

$$1 = T[[1w]_2] + T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1001w]_2], \tag{2.16}$$

$$\begin{aligned}1 &= T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2]\\ &\quad + T[[1010w]_2],\end{aligned} \tag{2.17}$$

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

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 3090 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

$$0 = \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,110)), \tag{2.19}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,100)) + \tau(A(s,101))\\ &\quad + \tau(A(s,111)),\end{aligned} \tag{2.20}$$

$$0 = \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1000)), \tag{2.21}$$

$$\begin{aligned}0 &= \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101))\\ &\quad + \tau(A(s,1001)),\end{aligned} \tag{2.22}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101))\\ &\quad + \tau(A(s,1010)),\end{aligned} \tag{2.23}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,1011)), \tag{2.24}$$

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

$$1 = \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,110)), \tag{2.25}$$

$$\begin{aligned}0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,100)) + \tau(A(s,101)) \\ &\quad + \tau(A(s,111)), \end{aligned} \tag{2.26}$$

$$1 = \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1000)), \tag{2.27}$$

$$\begin{aligned}1 &= \tau(A(s,1)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) \\ &\quad + \tau(A(s,1001)), \end{aligned} \tag{2.28}$$

$$\begin{aligned}1 &= \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101)) \\ &\quad + \tau(A(s,1010)), \end{aligned} \tag{2.29}$$

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

for $s = A(i, 0^{2k})$. We find that $(A(i,0^{44}), E_{44}) = (A(i,0^{20}), E_{20})$, so that we only have to verify that identities (2.19) through (2.30) hold for $2 \le k \le 22$, which turns out to be true. □

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

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

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

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

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

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

$$\begin{aligned}W_{2k}M_{2k} &= \big(W^e[:6v] + x^{2v}W^e[:4v] + x^{3v}W^e[:3v] + x^{5v}W^e[:v] + x^{6u}R^e\big) \times \big(\\ &\quad M^e[:6v] + x^{2v}M^e[:4v] + x^{3v}M^e[:3v] + x^{5v}M^e[:v] + x^{6u}R^e\big);\end{aligned} \tag{2.31}$$

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

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

For all $n \leq 12$, 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 $0 \leq j, k \leq 1$,

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

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

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

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

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

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

Define

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

where

$$\begin{aligned} q_0(x) &= x^{24} + x^{23} + x^{21} + x^{20} + x^{18} + x^{17} + x^{15} + x^{14} + x^{12} + x^{11} + x^{10} + x^9 \\ &\quad + x^6, \\ q_1(x) &= x^{23} + x^{20} + x^{19} + x^{17} + x^{13} + x^{11} + x^7 + x^2, \\ q_2(x) &= x^{24} + x^{22} + x^{20} + x^{14} + x^{12} + x^8 + x^4 + 1, \\ q_3(x) &= x^{23} + x^{20} + x^{19} + x^{17} + x^{13} + x^{11} + x^7 + x^2, \\ q_4(x) &= x^{24} + x^{23} + x^{22} + x^{21} + x^{18} + x^{17} + x^{15} + x^{12} + x^{11} + x^{10} + x^9 + x^8 \\ &\quad + x^6 + x^4. \end{aligned}$$

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

$$\begin{aligned}
p_0(x) = {} & x^{132} + x^{130} + x^{128} + x^{126} + x^{120} + x^{118} + x^{114} + x^{98} + x^{94} + x^{88} \\
& + x^{86} + x^{82} + x^{78} + x^{76} + x^{72} + x^{62} + x^{60} + x^{58} + x^{54} + x^{52} + x^{50} \\
& + x^{46} + x^{34} + x^{32} + x^{24}, \\
p_3(x) = {} & x^{130} + x^{128} + x^{124} + x^{110} + x^{104} + x^{102} + x^{100} + x^{96} + x^{90} + x^{86} \\
& + x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{74} + x^{70} + x^{68} + x^{66} + x^{62} + x^{60} \\
& + x^{54} + x^{50} + x^{46} + x^{44} + x^{42} + x^{36} + x^{34} + x^{26} + x^{24} + x^{22} + x^{20}, \\
p_6(x) = {} & x^{130} + x^{120} + x^{118} + x^{116} + x^{102} + x^{96} + x^{92} + x^{90} + x^{82} + x^{80} + x^{78} \\
& + x^{74} + x^{72} + x^{70} + x^{66} + x^{62} + x^{60} + x^{56} + x^{54} + x^{50} + x^{48} + x^{44} \\
& + x^{42} + x^{38} + x^{36} + x^{34} + x^{32} + x^{26} + x^{24} + x^{22} + x^{20} + x^{14} + x^{12} + 1 \\
& , \\
p_9(x) = {} & x^{130} + x^{128} + x^{126} + x^{124} + x^{120} + x^{118} + x^{116} + x^{112} + x^{110} + x^{108} \\
& + x^{102} + x^{100} + x^{96} + x^{84} + x^{82} + x^{80} + x^{76} + x^{72} + x^{70} + x^{68} + x^{66} \\
& + x^{64} + x^{62} + x^{54} + x^{52} + x^{42} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{22} \\
& + x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{4}, \\
p_{12}(x) = {} & x^{132} + x^{128} + x^{124} + x^{120} + x^{100} + x^{96} + x^{84} + x^{80} + x^{76} + x^{72} + x^{52} \\
& + x^{48} + x^{36} + x^{32} + x^{28} + x^{24} + x^{4} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{126} + x^{125} + x^{124} + x^{121} + x^{120} + x^{117} + x^{113} + x^{112} + x^{111} + x^{110} \\
& + x^{109} + x^{107} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{97} + x^{96} + x^{95} \\
& + x^{94} + x^{93} + x^{92} + x^{85} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{74} + x^{72} \\
& + x^{70} + x^{69} + x^{66} + x^{65} + x^{63} + x^{60} + x^{57} + x^{56} + x^{55} + x^{53} + x^{51} \\
& + x^{50} + x^{48} + x^{45} + x^{44} + x^{42} + x^{41} + x^{36} + x^{34} + x^{30}, \\
p_3(x) = {} & x^{117} + x^{116} + x^{115} + x^{113} + x^{110} + x^{109} + x^{108} + x^{106} + x^{101} + x^{100} \\
& + x^{99} + x^{96} + x^{89} + x^{88} + x^{86} + x^{83} + x^{82} + x^{81} + x^{78} + x^{75} + x^{74}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{73} + x^{70} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{62} + x^{59} + x^{58} + x^{57}\\
&+ x^{54} + x^{51} + x^{50} + x^{49} + x^{46} + x^{43} + x^{42} + x^{40} + x^{37} + x^{36} + x^{35}\\
&+ x^{33} + x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{120} + x^{119} + x^{118} + x^{117} + x^{115} + x^{114} + x^{112} + x^{106} + x^{105} + x^{104}\\
&+ x^{103} + x^{102} + x^{99} + x^{96} + x^{90} + x^{89} + x^{86} + x^{82} + x^{81} + x^{80} + x^{79}\\
&+ x^{77} + x^{75} + x^{74} + x^{71} + x^{68} + x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{56}\\
&+ x^{55} + x^{53} + x^{51} + x^{50} + x^{48} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39}\\
&+ x^{36} + x^{30} + x^{29} + x^{26} + x^{24} + x^{23} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15}\\
&+ x^{14} + x^{12},\\
p_9(x) &= x^{123} + x^{122} + x^{121} + x^{119} + x^{117} + x^{114} + x^{113} + x^{112} + x^{111} + x^{109}\\
&+ x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{94} + x^{93}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{83} + x^{80} + x^{79} + x^{78} + x^{76}\\
&+ x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41}\\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{26} + x^{21}\\
&+ x^{20} + x^{19} + x^{17} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) &= x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111}\\
&+ x^{109} + x^{107} + x^{106} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{71} + x^{69} + x^{67} + x^{65} + x^{63} + x^{61}\\
&+ x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29}\\
&+ x^{28} + x^{27} + x^{25} + x^{23} + x^{21} + x^{19} + x^{17} + x^{15} + x^{13} + x^{11} + x^{10}\\
&+ x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1].
For $\phi(M^e, 1, 0)$:

$$
\begin{aligned}
p_0(x) &= x^{126} + x^{125} + x^{124} + x^{121} + x^{120} + x^{117} + x^{113} + x^{112} + x^{111} + x^{110}\\
&+ x^{109} + x^{107} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{97} + x^{96} + x^{95}\\
&+ x^{94} + x^{93} + x^{92} + x^{85} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{74} + x^{72}\\
&+ x^{70} + x^{69} + x^{66} + x^{65} + x^{63} + x^{60} + x^{57} + x^{56} + x^{55} + x^{53} + x^{51}\\
&+ x^{50} + x^{48} + x^{45} + x^{44} + x^{42} + x^{41} + x^{36} + x^{34} + x^{30},\\
p_3(x) &= x^{117} + x^{116} + x^{115} + x^{113} + x^{110} + x^{109} + x^{108} + x^{106} + x^{101} + x^{100}\\
&+ x^{99} + x^{96} + x^{89} + x^{88} + x^{86} + x^{83} + x^{82} + x^{81} + x^{78} + x^{75} + x^{74}\\
&+ x^{73} + x^{70} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{62} + x^{59} + x^{58} + x^{57}\\
&+ x^{54} + x^{51} + x^{50} + x^{49} + x^{46} + x^{43} + x^{42} + x^{40} + x^{37} + x^{36} + x^{35}\\
&+ x^{33} + x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) &= x^{120} + x^{119} + x^{118} + x^{117} + x^{115} + x^{114} + x^{112} + x^{106} + x^{105} + x^{104}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{103} + x^{102} + x^{99} + x^{96} + x^{90} + x^{89} + x^{86} + x^{82} + x^{81} + x^{80} + x^{79}\\
&+ x^{77} + x^{75} + x^{74} + x^{71} + x^{68} + x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{56}\\
&+ x^{55} + x^{53} + x^{51} + x^{50} + x^{48} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39}\\
&+ x^{36} + x^{30} + x^{29} + x^{26} + x^{24} + x^{23} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15}\\
&+ x^{14} + x^{12},\\
p_9(x) = {}& x^{123} + x^{122} + x^{121} + x^{119} + x^{117} + x^{114} + x^{113} + x^{112} + x^{111} + x^{109}\\
&+ x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{94} + x^{93}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{83} + x^{80} + x^{79} + x^{78} + x^{76}\\
&+ x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41}\\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{26} + x^{21}\\
&+ x^{20} + x^{19} + x^{17} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = {}& x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111}\\
&+ x^{109} + x^{107} + x^{106} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{71} + x^{69} + x^{67} + x^{65} + x^{63} + x^{61}\\
&+ x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29}\\
&+ x^{28} + x^{27} + x^{25} + x^{23} + x^{21} + x^{19} + x^{17} + x^{15} + x^{13} + x^{11} + x^{10}\\
&+ x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{120} + x^{114} + x^{112} + x^{110} + x^{108} + x^{96} + x^{92} + x^{86} + x^{74} + x^{70} + x^{68}\\
&+ x^{66} + x^{64} + x^{60} + x^{58} + x^{54} + x^{48} + x^{46} + x^{36},\\
p_3(x) = {}& x^{118} + x^{114} + x^{110} + x^{108} + x^{100} + x^{98} + x^{96} + x^{92} + x^{90} + x^{86} + x^{80}\\
&+ x^{78} + x^{72} + x^{68} + x^{62} + x^{60} + x^{56} + x^{54} + x^{48} + x^{46} + x^{44} + x^{42}\\
&+ x^{32} + x^{30} + x^{28} + x^{26} + x^{18} + x^{12},\\
p_6(x) = {}& x^{118} + x^{114} + x^{112} + x^{108} + x^{106} + x^{102} + x^{100} + x^{96} + x^{94} + x^{92}\\
&+ x^{88} + x^{84} + x^{82} + x^{80} + x^{78} + x^{76} + x^{70} + x^{68} + x^{64} + x^{62} + x^{60}\\
&+ x^{48} + x^{44} + x^{42} + x^{38} + x^{34} + x^{30} + x^{28} + x^{14} + x^{10} + x^{8} + x^{6} + x^{4}\\
&+ 1,\\
p_9(x) = {}& x^{118} + x^{114} + x^{106} + x^{104} + x^{100} + x^{96} + x^{90} + x^{78} + x^{72} + x^{70} + x^{66}\\
&+ x^{60} + x^{58} + x^{56} + x^{54} + x^{52} + x^{48} + x^{36} + x^{30} + x^{22} + x^{12} + x^{10}\\
&+ x^{8} + x^{4},\\
p_{12}(x) = {}& x^{120} + x^{118} + x^{112} + x^{104} + x^{102} + x^{96} + x^{72} + x^{70} + x^{64} + x^{56} + x^{54}\\
&+ x^{48} + x^{24} + x^{22} + x^{16} + x^{8} + x^{6} + 1,
\end{aligned}
$$

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

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

$$\begin{aligned}
p_0(x) &= x^{120}+x^{116}+x^{112}+x^{108}+x^{106}+x^{102}+x^{100}+x^{98}+x^{96}+x^{92}\\
&\quad +x^{88}+x^{86}+x^{80}+x^{78}+x^{76}+x^{74}+x^{70}+x^{68}+x^{66}+x^{62}+x^{56}\\
&\quad +x^{54}+x^{48}+x^{44}+x^{40}+x^{36}+x^{30}+x^{28}+x^{24},\\
p_3(x) &= x^{118}+x^{112}+x^{108}+x^{106}+x^{98}+x^{96}+x^{92}+x^{88}+x^{86}+x^{84}+x^{82}\\
&\quad +x^{74}+x^{72}+x^{70}+x^{68}+x^{64}+x^{62}+x^{60}+x^{58}+x^{50}+x^{48}+x^{44}\\
&\quad +x^{38}+x^{22},\\
p_6(x) &= x^{118}+x^{116}+x^{114}+x^{110}+x^{104}+x^{94}+x^{88}+x^{86}+x^{82}+x^{80}+x^{74}\\
&\quad +x^{66}+x^{62}+x^{60}+x^{56}+x^{54}+x^{52}+x^{50}+x^{48}+x^{46}+x^{44}+x^{36}\\
&\quad +x^{30}+x^{28}+x^{26}+x^{24}+x^{22}+x^{18}+x^{16}+x^{12}+x^{10}+x^{6}+x^{4}+1,\\
p_9(x) &= x^{118}+x^{114}+x^{106}+x^{104}+x^{100}+x^{96}+x^{90}+x^{78}+x^{72}+x^{70}+x^{66}\\
&\quad +x^{60}+x^{58}+x^{56}+x^{54}+x^{52}+x^{48}+x^{36}+x^{30}+x^{22}+x^{12}+x^{10}\\
&\quad +x^{8}+x^{4},\\
p_{12}(x) &= x^{120}+x^{118}+x^{112}+x^{104}+x^{102}+x^{96}+x^{72}+x^{70}+x^{64}+x^{56}+x^{54}\\
&\quad +x^{48}+x^{24}+x^{22}+x^{16}+x^{8}+x^{6}+1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{126}+x^{125}+x^{124}+x^{121}+x^{119}+x^{118}+x^{116}+x^{112}+x^{109}+x^{107}\\
&\quad +x^{106}+x^{103}+x^{99}+x^{98}+x^{95}+x^{93}+x^{92}+x^{91}+x^{90}+x^{89}+x^{85}\\
&\quad +x^{83}+x^{82}+x^{80}+x^{79}+x^{77}+x^{76}+x^{75}+x^{74}+x^{73}+x^{71}+x^{69}\\
&\quad +x^{65}+x^{62}+x^{58}+x^{49}+x^{46}+x^{44}+x^{43}+x^{40}+x^{37}+x^{35}+x^{34}\\
&\quad +x^{32}+x^{30},\\
p_3(x) &= x^{117}+x^{116}+x^{115}+x^{113}+x^{110}+x^{109}+x^{108}+x^{106}+x^{101}+x^{100}\\
&\quad +x^{99}+x^{96}+x^{89}+x^{88}+x^{86}+x^{83}+x^{82}+x^{81}+x^{78}+x^{75}+x^{74}\\
&\quad +x^{73}+x^{70}+x^{69}+x^{68}+x^{66}+x^{65}+x^{64}+x^{62}+x^{59}+x^{58}+x^{57}\\
&\quad +x^{54}+x^{51}+x^{50}+x^{49}+x^{46}+x^{43}+x^{42}+x^{40}+x^{37}+x^{36}+x^{35}\\
&\quad +x^{33}+x^{30}+x^{29}+x^{28}+x^{26}+x^{25}+x^{24}+x^{22}+x^{21}+x^{20}+x^{18},\\
p_6(x) &= x^{120}+x^{119}+x^{118}+x^{117}+x^{115}+x^{114}+x^{112}+x^{106}+x^{105}+x^{104}\\
&\quad +x^{103}+x^{102}+x^{99}+x^{96}+x^{90}+x^{89}+x^{86}+x^{82}+x^{81}+x^{80}+x^{79}\\
&\quad +x^{77}+x^{75}+x^{74}+x^{71}+x^{68}+x^{64}+x^{63}+x^{60}+x^{58}+x^{57}+x^{56}\\
&\quad +x^{55}+x^{53}+x^{51}+x^{50}+x^{48}+x^{46}+x^{45}+x^{44}+x^{43}+x^{42}+x^{39}\\
&\quad +x^{36}+x^{30}+x^{29}+x^{26}+x^{24}+x^{23}+x^{20}+x^{18}+x^{17}+x^{16}+x^{15}\\
&\quad +x^{14}+x^{12},\\
p_9(x) &= x^{123}+x^{122}+x^{121}+x^{119}+x^{117}+x^{114}+x^{113}+x^{112}+x^{111}+x^{109}\\
&\quad +x^{107}+x^{104}+x^{103}+x^{102}+x^{101}+x^{98}+x^{97}+x^{96}+x^{94}+x^{93}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{83} + x^{80} + x^{79} + x^{78} + x^{76}\\
&+ x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41}\\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{26} + x^{21}\\
&+ x^{20} + x^{19} + x^{17} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) = &\, x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111}\\
&+ x^{109} + x^{107} + x^{106} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{71} + x^{69} + x^{67} + x^{65} + x^{63} + x^{61}\\
&+ x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29}\\
&+ x^{28} + x^{27} + x^{25} + x^{23} + x^{21} + x^{19} + x^{17} + x^{15} + x^{13} + x^{11} + x^{10}\\
&+ x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = &\, x^{126} + x^{125} + x^{124} + x^{121} + x^{119} + x^{118} + x^{116} + x^{112} + x^{109} + x^{107}\\
&+ x^{106} + x^{103} + x^{99} + x^{98} + x^{95} + x^{93} + x^{92} + x^{91} + x^{90} + x^{89} + x^{85}\\
&+ x^{83} + x^{82} + x^{80} + x^{79} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{69}\\
&+ x^{65} + x^{62} + x^{58} + x^{49} + x^{46} + x^{44} + x^{43} + x^{40} + x^{37} + x^{35} + x^{34}\\
&+ x^{32} + x^{30},\\
p_3(x) = &\, x^{117} + x^{116} + x^{115} + x^{113} + x^{110} + x^{109} + x^{108} + x^{106} + x^{101} + x^{100}\\
&+ x^{99} + x^{96} + x^{89} + x^{88} + x^{86} + x^{83} + x^{82} + x^{81} + x^{78} + x^{75} + x^{74}\\
&+ x^{73} + x^{70} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{62} + x^{59} + x^{58} + x^{57}\\
&+ x^{54} + x^{51} + x^{50} + x^{49} + x^{46} + x^{43} + x^{42} + x^{40} + x^{37} + x^{36} + x^{35}\\
&+ x^{33} + x^{30} + x^{29} + x^{28} + x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{18},\\
p_6(x) = &\, x^{120} + x^{119} + x^{118} + x^{117} + x^{115} + x^{114} + x^{112} + x^{106} + x^{105} + x^{104}\\
&+ x^{103} + x^{102} + x^{99} + x^{96} + x^{90} + x^{89} + x^{86} + x^{82} + x^{81} + x^{80} + x^{79}\\
&+ x^{77} + x^{75} + x^{74} + x^{71} + x^{68} + x^{64} + x^{63} + x^{60} + x^{58} + x^{57} + x^{56}\\
&+ x^{55} + x^{53} + x^{51} + x^{50} + x^{48} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{39}\\
&+ x^{36} + x^{30} + x^{29} + x^{26} + x^{24} + x^{23} + x^{20} + x^{18} + x^{17} + x^{16} + x^{15}\\
&+ x^{14} + x^{12},\\
p_9(x) = &\, x^{123} + x^{122} + x^{121} + x^{119} + x^{117} + x^{114} + x^{113} + x^{112} + x^{111} + x^{109}\\
&+ x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{94} + x^{93}\\
&+ x^{92} + x^{90} + x^{89} + x^{88} + x^{87} + x^{85} + x^{83} + x^{80} + x^{79} + x^{78} + x^{76}\\
&+ x^{73} + x^{72} + x^{70} + x^{67} + x^{66} + x^{64} + x^{63} + x^{62} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43} + x^{41}\\
&+ x^{38} + x^{37} + x^{36} + x^{34} + x^{33} + x^{32} + x^{30} + x^{29} + x^{28} + x^{26} + x^{21}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{20} + x^{19} + x^{17} + x^{14} + x^{13} + x^{12} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_{12}(x) &= x^{126} + x^{125} + x^{124} + x^{123} + x^{121} + x^{119} + x^{117} + x^{115} + x^{113} + x^{111}\\
&+ x^{109} + x^{107} + x^{106} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{71} + x^{69} + x^{67} + x^{65} + x^{63} + x^{61}\\
&+ x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29}\\
&+ x^{28} + x^{27} + x^{25} + x^{23} + x^{21} + x^{19} + x^{17} + x^{15} + x^{13} + x^{11} + x^{10}\\
&+ x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{126} + x^{124} + x^{122} + x^{118} + x^{116} + x^{110} + x^{108} + x^{106}\\
&+ x^{102} + x^{100} + x^{96} + x^{92} + x^{88} + x^{86} + x^{84} + x^{82} + x^{80} + x^{76} + x^{74}\\
&+ x^{70} + x^{68} + x^{58} + x^{56} + x^{48} + x^{44} + x^{42} + x^{36},\\
p_3(x) &= x^{130} + x^{128} + x^{126} + x^{124} + x^{120} + x^{118} + x^{114} + x^{110} + x^{104} + x^{102}\\
&+ x^{98} + x^{94} + x^{86} + x^{78} + x^{74} + x^{70} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56}\\
&+ x^{52} + x^{50} + x^{48} + x^{42} + x^{40} + x^{36} + x^{32} + x^{16} + x^{12},\\
p_6(x) &= x^{130} + x^{128} + x^{126} + x^{124} + x^{120} + x^{116} + x^{114} + x^{104} + x^{102} + x^{100}\\
&+ x^{98} + x^{94} + x^{92} + x^{88} + x^{84} + x^{78} + x^{74} + x^{72} + x^{70} + x^{68} + x^{62}\\
&+ x^{58} + x^{52} + x^{50} + x^{48} + x^{46} + x^{42} + x^{38} + x^{28} + x^{16} + x^{14} + x^{12}\\
&+ x^{8} + 1,\\
p_9(x) &= x^{130} + x^{128} + x^{126} + x^{124} + x^{120} + x^{118} + x^{116} + x^{112} + x^{110} + x^{108}\\
&+ x^{102} + x^{100} + x^{96} + x^{84} + x^{82} + x^{80} + x^{76} + x^{72} + x^{70} + x^{68} + x^{66}\\
&+ x^{64} + x^{62} + x^{54} + x^{52} + x^{42} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{22}\\
&+ x^{20} + x^{18} + x^{16} + x^{14} + x^{12} + x^{4},\\
p_{12}(x) &= x^{132} + x^{128} + x^{124} + x^{120} + x^{100} + x^{96} + x^{84} + x^{80} + x^{76} + x^{72} + x^{52}\\
&+ x^{48} + x^{36} + x^{32} + x^{28} + x^{24} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{126} + x^{125} + x^{120} + x^{118} + x^{117} + x^{115} + x^{114} + x^{110} + x^{108} + x^{104}\\
&+ x^{101} + x^{99} + x^{98} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84}\\
&+ x^{80} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{61}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{46} + x^{45} + x^{44} + x^{41} + x^{38} + x^{37} + x^{29}\\
&+ x^{28} + x^{27} + x^{26} + x^{24},\\
p_3(x) &= x^{122} + x^{121} + x^{118} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} + x^{111} + x^{107}\\
&+ x^{103} + x^{101} + x^{100} + x^{99} + x^{97} + x^{96} + x^{94} + x^{89} + x^{85} + x^{84} + x^{78}\\
&+ x^{77} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{61} + x^{60} + x^{54} + x^{53} + x^{52} + x^{43} + x^{39} + x^{37} + x^{36} + x^{35} + x^{31} \\
&+ x^{30} + x^{27} + x^{26} + x^{24} + x^{21} + x^{20} + x^{19} + x^{18} + x^{16}, \\
p_6(x) &= x^{124} + x^{123} + x^{121} + x^{120} + x^{119} + x^{118} + x^{114} + x^{111} + x^{109} + x^{106} \\
&+ x^{105} + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} \\
&+ x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{84} + x^{83} + x^{80} + x^{79} + x^{78} + x^{77} \\
&+ x^{76} + x^{75} + x^{71} + x^{69} + x^{68} + x^{66} + x^{64} + x^{59} + x^{56} + x^{55} + x^{52} \\
&+ x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{40} + x^{39} + x^{37} + x^{35} + x^{34} \\
&+ x^{33} + x^{31} + x^{30} + x^{29} + x^{25} + x^{22} + x^{20} + x^{19} + x^{17} + x^{15} + x^{12} \\
&+ x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1, \\
p_9(x) &= x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109} \\
&+ x^{108} + x^{107} + x^{106} + x^{104} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} \\
&+ x^{66} + x^{64} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{26} + x^{25} + x^{24} \\
&+ x^{23} + x^{21} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{8}, \\
p_{12}(x) &= x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} \\
&+ x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{78} + x^{77} \\
&+ x^{76} + x^{75} + x^{74} + x^{72} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{54} \\
&+ x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{24} \\
&+ x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{128} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{118} + x^{117} + x^{116} + x^{107} \\
&+ x^{106} + x^{105} + x^{104} + x^{103} + x^{101} + x^{99} + x^{96} + x^{95} + x^{91} + x^{90} \\
&+ x^{88} + x^{87} + x^{83} + x^{82} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{72} \\
&+ x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{53} \\
&+ x^{49} + x^{48} + x^{47} + x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33} \\
&+ x^{32} + x^{30}, \\
p_3(x) &= x^{119} + x^{117} + x^{116} + x^{114} + x^{112} + x^{109} + x^{106} + x^{102} + x^{101} + x^{100} \\
&+ x^{96} + x^{93} + x^{90} + x^{86} + x^{85} + x^{84} + x^{80} + x^{79} + x^{76} + x^{72} + x^{71} \\
&+ x^{70} + x^{69} + x^{62} + x^{61} + x^{60} + x^{56} + x^{55} + x^{52} + x^{48} + x^{46} + x^{44} \\
&+ x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{30} + x^{29} + x^{23} + x^{22} \\
&+ x^{18}, \\
p_6(x) &= x^{122} + x^{118} + x^{116} + x^{112} + x^{108} + x^{102} + x^{98} + x^{96} + x^{92} + x^{90} \\
&+ x^{88} + x^{86} + x^{84} + x^{80} + x^{76} + x^{74} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} \\
&+ x^{56} + x^{52} + x^{42} + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{24} + x^{22} + x^{12}, \\
p_9(x) &= x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{117} + x^{113} + x^{112} + x^{110} + x^{107}
\end{aligned}
$$

$$\begin{aligned}
&+ x^{106} + x^{102} + x^{77} + x^{75} + x^{74} + x^{73} + x^{72} + x^{69} + x^{65} + x^{64} + x^{62}\\
&+ x^{59} + x^{58} + x^{54} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24} + x^{21} + x^{17} + x^{16}\\
&+ x^{14} + x^{11} + x^{10} + x^{6},\\
p_{12}(x) &= x^{128} + x^{120} + x^{116} + x^{108} + x^{104} + x^{96} + x^{80} + x^{72} + x^{68} + x^{60} + x^{56}\\
&+ x^{48} + x^{32} + x^{24} + x^{20} + x^{12} + x^{8} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{136} + x^{133} + x^{131} + x^{128} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{117}\\
&+ x^{110} + x^{108} + x^{107} + x^{103} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{96}\\
&+ x^{93} + x^{89} + x^{88} + x^{85} + x^{84} + x^{82} + x^{80} + x^{79} + x^{78} + x^{73} + x^{72}\\
&+ x^{70} + x^{69} + x^{68} + x^{67} + x^{63} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{51}\\
&+ x^{50} + x^{46} + x^{45} + x^{44} + x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30},\\
p_3(x) &= x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115} + x^{110}\\
&+ x^{107} + x^{105} + x^{104} + x^{102} + x^{100} + x^{99} + x^{96} + x^{92} + x^{91} + x^{90}\\
&+ x^{89} + x^{87} + x^{85} + x^{84} + x^{81} + x^{77} + x^{76} + x^{75} + x^{74} + x^{72} + x^{71}\\
&+ x^{70} + x^{68} + x^{67} + x^{65} + x^{63} + x^{61} + x^{60} + x^{57} + x^{55} + x^{49} + x^{48}\\
&+ x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{32} + x^{30} + x^{29} + x^{26}\\
&+ x^{23} + x^{22} + x^{18},\\
p_6(x) &= x^{130} + x^{124} + x^{116} + x^{114} + x^{112} + x^{106} + x^{104} + x^{102} + x^{100} + x^{96}\\
&+ x^{92} + x^{78} + x^{72} + x^{70} + x^{60} + x^{58} + x^{54} + x^{52} + x^{48} + x^{46} + x^{44}\\
&+ x^{42} + x^{40} + x^{36} + x^{34} + x^{32} + x^{28} + x^{22} + x^{20} + x^{12},\\
p_9(x) &= x^{133} + x^{131} + x^{130} + x^{128} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{122}\\
&+ x^{119} + x^{117} + x^{115} + x^{113} + x^{112} + x^{107} + x^{106} + x^{102} + x^{85} + x^{83}\\
&+ x^{82} + x^{80} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{71} + x^{69} + x^{67}\\
&+ x^{65} + x^{64} + x^{59} + x^{58} + x^{54} + x^{37} + x^{35} + x^{34} + x^{32} + x^{31} + x^{30}\\
&+ x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{21} + x^{19} + x^{17} + x^{16} + x^{11} + x^{10}\\
&+ x^{6},\\
p_{12}(x) &= x^{136} + x^{132} + x^{124} + x^{112} + x^{96} + x^{88} + x^{84} + x^{76} + x^{64} + x^{48} + x^{40}\\
&+ x^{36} + x^{28} + x^{16} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{126} + x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{116} + x^{112} + x^{111} + x^{110}\\
&+ x^{107} + x^{106} + x^{105} + x^{104} + x^{103} + x^{101} + x^{98} + x^{96} + x^{94} + x^{92}\\
&+ x^{84} + x^{83} + x^{82} + x^{81} + x^{78} + x^{77} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71}\\
&+ x^{70} + x^{68} + x^{67} + x^{66} + x^{64} + x^{62} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40}\\
&+ x^{39} + x^{36},\\
p_3(x) &= x^{122} + x^{121} + x^{116} + x^{113} + x^{110} + x^{109} + x^{106} + x^{104} + x^{103} + x^{102}\\
&+ x^{100} + x^{99} + x^{96} + x^{90} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{83} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{68} + x^{66} + x^{64} + x^{63}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{47} + x^{42}\\
&+ x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{34} + x^{32} + x^{29} + x^{26} + x^{25} + x^{24}\\
&+ x^{23} + x^{20},\\
p_6(x) &= x^{124} + x^{123} + x^{122} + x^{120} + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{112}\\
&+ x^{111} + x^{109} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{96}\\
&+ x^{94} + x^{90} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} + x^{81} + x^{78} + x^{76} + x^{74}\\
&+ x^{70} + x^{68} + x^{67} + x^{64} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{53} + x^{52}\\
&+ x^{50} + x^{47} + x^{45} + x^{38} + x^{34} + x^{30} + x^{28} + x^{20} + x^{19} + x^{18} + x^{16}\\
&+ x^{13} + x^{12} + x^{11} + x^{10} + x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,\\
p_9(x) &= x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109}\\
&+ x^{108} + x^{107} + x^{106} + x^{104} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67}\\
&+ x^{66} + x^{64} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{26} + x^{25} + x^{24}\\
&+ x^{23} + x^{21} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{8},\\
p_{12}(x) &= x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111}\\
&+ x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{78} + x^{77}\\
&+ x^{76} + x^{75} + x^{74} + x^{72} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{54}\\
&+ x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{24}\\
&+ x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{126} + x^{125} + x^{120} + x^{118} + x^{117} + x^{115} + x^{114} + x^{110} + x^{108} + x^{104}\\
&+ x^{101} + x^{99} + x^{98} + x^{93} + x^{92} + x^{91} + x^{89} + x^{88} + x^{87} + x^{85} + x^{84}\\
&+ x^{80} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{61}\\
&+ x^{57} + x^{55} + x^{52} + x^{51} + x^{46} + x^{45} + x^{44} + x^{41} + x^{38} + x^{37} + x^{29}\\
&+ x^{28} + x^{27} + x^{26} + x^{24},\\
p_3(x) &= x^{122} + x^{121} + x^{118} + x^{117} + x^{116} + x^{114} + x^{113} + x^{112} + x^{111} + x^{107}\\
&+ x^{103} + x^{101} + x^{100} + x^{99} + x^{97} + x^{96} + x^{94} + x^{89} + x^{85} + x^{84} + x^{78}\\
&+ x^{77} + x^{76} + x^{74} + x^{73} + x^{70} + x^{69} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64}\\
&+ x^{61} + x^{60} + x^{54} + x^{53} + x^{52} + x^{43} + x^{39} + x^{37} + x^{36} + x^{35} + x^{31}\\
&+ x^{30} + x^{27} + x^{26} + x^{24} + x^{21} + x^{20} + x^{19} + x^{18} + x^{16},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) = {} & x^{124} + x^{123} + x^{121} + x^{120} + x^{119} + x^{118} + x^{114} + x^{111} + x^{109} + x^{106} \\
& + x^{105} + x^{104} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} \\
& + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{84} + x^{83} + x^{80} + x^{79} + x^{78} + x^{77} \\
& + x^{76} + x^{75} + x^{71} + x^{69} + x^{68} + x^{66} + x^{64} + x^{59} + x^{56} + x^{55} + x^{52} \\
& + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{40} + x^{39} + x^{37} + x^{35} + x^{34} \\
& + x^{33} + x^{31} + x^{30} + x^{29} + x^{25} + x^{22} + x^{20} + x^{19} + x^{17} + x^{15} + x^{12} \\
& + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1, \\
p_9(x) = {} & x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109} \\
& + x^{108} + x^{107} + x^{106} + x^{104} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} \\
& + x^{66} + x^{64} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{26} + x^{25} + x^{24} \\
& + x^{23} + x^{21} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{8}, \\
p_{12}(x) = {} & x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} \\
& + x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{78} + x^{77} \\
& + x^{76} + x^{75} + x^{74} + x^{72} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{54} \\
& + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{24} \\
& + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) = {} & x^{136} + x^{133} + x^{131} + x^{128} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{117} \\
& + x^{110} + x^{108} + x^{107} + x^{103} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} + x^{96} \\
& + x^{93} + x^{89} + x^{88} + x^{85} + x^{84} + x^{82} + x^{80} + x^{79} + x^{78} + x^{73} + x^{72} \\
& + x^{70} + x^{69} + x^{68} + x^{67} + x^{63} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{51} \\
& + x^{50} + x^{46} + x^{45} + x^{44} + x^{40} + x^{36} + x^{35} + x^{34} + x^{33} + x^{30}, \\
p_3(x) = {} & x^{127} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115} + x^{110} \\
& + x^{107} + x^{105} + x^{104} + x^{102} + x^{100} + x^{99} + x^{96} + x^{92} + x^{91} + x^{90} \\
& + x^{89} + x^{87} + x^{85} + x^{84} + x^{81} + x^{77} + x^{76} + x^{75} + x^{74} + x^{72} + x^{71} \\
& + x^{70} + x^{68} + x^{67} + x^{65} + x^{63} + x^{61} + x^{60} + x^{57} + x^{55} + x^{49} + x^{48} \\
& + x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{32} + x^{30} + x^{29} + x^{26} \\
& + x^{23} + x^{22} + x^{18}, \\
p_6(x) = {} & x^{130} + x^{124} + x^{116} + x^{114} + x^{112} + x^{106} + x^{104} + x^{102} + x^{100} + x^{96} \\
& + x^{92} + x^{78} + x^{72} + x^{70} + x^{60} + x^{58} + x^{54} + x^{52} + x^{48} + x^{46} + x^{44} \\
& + x^{42} + x^{40} + x^{36} + x^{34} + x^{32} + x^{28} + x^{22} + x^{20} + x^{12}, \\
p_9(x) = {} & x^{133} + x^{131} + x^{130} + x^{128} + x^{127} + x^{126} + x^{125} + x^{124} + x^{123} + x^{122} \\
& + x^{119} + x^{117} + x^{115} + x^{113} + x^{112} + x^{107} + x^{106} + x^{102} + x^{85} + x^{83} \\
& + x^{82} + x^{80} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{71} + x^{69} + x^{67}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{65} + x^{64} + x^{59} + x^{58} + x^{54} + x^{37} + x^{35} + x^{34} + x^{32} + x^{31} + x^{30} \\
&+ x^{29} + x^{28} + x^{27} + x^{26} + x^{23} + x^{21} + x^{19} + x^{17} + x^{16} + x^{11} + x^{10} \\
&+ x^{6}, \\
p_{12}(x) &= x^{136} + x^{132} + x^{124} + x^{112} + x^{96} + x^{88} + x^{84} + x^{76} + x^{64} + x^{48} + x^{40} \\
&+ x^{36} + x^{28} + x^{16} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{128} + x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{118} + x^{117} + x^{116} + x^{107} \\
&+ x^{106} + x^{105} + x^{104} + x^{103} + x^{101} + x^{99} + x^{96} + x^{95} + x^{91} + x^{90} \\
&+ x^{88} + x^{87} + x^{83} + x^{82} + x^{79} + x^{78} + x^{77} + x^{76} + x^{75} + x^{73} + x^{72} \\
&+ x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{61} + x^{59} + x^{56} + x^{55} + x^{54} + x^{53} \\
&+ x^{49} + x^{48} + x^{47} + x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35} + x^{33} \\
&+ x^{32} + x^{30}, \\
p_3(x) &= x^{119} + x^{117} + x^{116} + x^{114} + x^{112} + x^{109} + x^{106} + x^{102} + x^{101} + x^{100} \\
&+ x^{96} + x^{93} + x^{90} + x^{86} + x^{85} + x^{84} + x^{80} + x^{79} + x^{76} + x^{72} + x^{71} \\
&+ x^{70} + x^{69} + x^{62} + x^{61} + x^{60} + x^{56} + x^{55} + x^{52} + x^{48} + x^{46} + x^{44} \\
&+ x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{31} + x^{30} + x^{29} + x^{23} + x^{22} \\
&+ x^{18}, \\
p_6(x) &= x^{122} + x^{118} + x^{116} + x^{112} + x^{108} + x^{102} + x^{98} + x^{96} + x^{92} + x^{90} \\
&+ x^{88} + x^{86} + x^{84} + x^{80} + x^{76} + x^{74} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} \\
&+ x^{56} + x^{52} + x^{42} + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{24} + x^{22} + x^{12}, \\
p_9(x) &= x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{117} + x^{113} + x^{112} + x^{110} + x^{107} \\
&+ x^{106} + x^{102} + x^{77} + x^{75} + x^{74} + x^{73} + x^{72} + x^{69} + x^{65} + x^{64} + x^{62} \\
&+ x^{59} + x^{58} + x^{54} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24} + x^{21} + x^{17} + x^{16} \\
&+ x^{14} + x^{11} + x^{10} + x^{6}, \\
p_{12}(x) &= x^{128} + x^{120} + x^{116} + x^{108} + x^{104} + x^{96} + x^{80} + x^{72} + x^{68} + x^{60} + x^{56} \\
&+ x^{48} + x^{32} + x^{24} + x^{20} + x^{12} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{126} + x^{125} + x^{122} + x^{121} + x^{120} + x^{117} + x^{116} + x^{112} + x^{111} + x^{110} \\
&+ x^{107} + x^{106} + x^{105} + x^{104} + x^{103} + x^{101} + x^{98} + x^{96} + x^{94} + x^{92} \\
&+ x^{84} + x^{83} + x^{82} + x^{81} + x^{78} + x^{77} + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} \\
&+ x^{70} + x^{68} + x^{67} + x^{66} + x^{64} + x^{62} + x^{60} + x^{59} + x^{58} + x^{56} + x^{55} \\
&+ x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40} \\
&+ x^{39} + x^{36},
\end{aligned}
$$

$$\begin{aligned}
p_3(x) &= x^{122} + x^{121} + x^{116} + x^{113} + x^{110} + x^{109} + x^{106} + x^{104} + x^{103} + x^{102} \\
&\quad + x^{100} + x^{99} + x^{96} + x^{90} + x^{88} + x^{87} + x^{86} + x^{85} + x^{84} + x^{83} + x^{79} \\
&\quad + x^{78} + x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{68} + x^{66} + x^{64} + x^{63} \\
&\quad + x^{62} + x^{61} + x^{60} + x^{59} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{47} + x^{42} \\
&\quad + x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{34} + x^{32} + x^{29} + x^{26} + x^{25} + x^{24} \\
&\quad + x^{23} + x^{20}, \\
p_6(x) &= x^{124} + x^{123} + x^{122} + x^{120} + x^{119} + x^{118} + x^{117} + x^{116} + x^{115} + x^{112} \\
&\quad + x^{111} + x^{109} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{96} \\
&\quad + x^{94} + x^{90} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} + x^{81} + x^{78} + x^{76} + x^{74} \\
&\quad + x^{70} + x^{68} + x^{67} + x^{64} + x^{63} + x^{62} + x^{61} + x^{57} + x^{56} + x^{53} + x^{52} \\
&\quad + x^{50} + x^{47} + x^{45} + x^{38} + x^{34} + x^{30} + x^{28} + x^{20} + x^{19} + x^{18} + x^{16} \\
&\quad + x^{13} + x^{12} + x^{11} + x^{10} + x^{8} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1, \\
p_9(x) &= x^{122} + x^{121} + x^{120} + x^{119} + x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109} \\
&\quad + x^{108} + x^{107} + x^{106} + x^{104} + x^{74} + x^{73} + x^{72} + x^{71} + x^{69} + x^{67} \\
&\quad + x^{66} + x^{64} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{26} + x^{25} + x^{24} \\
&\quad + x^{23} + x^{21} + x^{19} + x^{18} + x^{16} + x^{14} + x^{13} + x^{12} + x^{11} + x^{10} + x^{8}, \\
p_{12}(x) &= x^{126} + x^{125} + x^{124} + x^{123} + x^{122} + x^{120} + x^{114} + x^{113} + x^{112} + x^{111} \\
&\quad + x^{110} + x^{108} + x^{102} + x^{101} + x^{100} + x^{99} + x^{98} + x^{96} + x^{78} + x^{77} \\
&\quad + x^{76} + x^{75} + x^{74} + x^{72} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{60} + x^{54} \\
&\quad + x^{53} + x^{52} + x^{51} + x^{50} + x^{48} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{24} \\
&\quad + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{6} + x^{5} + x^{4} + x^{3} + x^{2} + 1,
\end{aligned}$$

and the initial terms are [0, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 1, 1, 0, 0, 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]	773	[254, 1078]	1546	[2191, 2192]	2319	[828, 2699]
1	[3, 4]	774	[1276, 1249]	1547	[1171, 957]	2320	[1757, 770]
2	[5, 6]	775	[1277, 1278]	1548	[2193, 2194]	2321	[1625, 2555]
3	[7, 8]	776	[1279, 1280]	1549	[2195, 330]	2322	[2693, 2767]
4	[9, 10]	777	[1069, 1281]	1550	[2196, 2197]	2323	[1559, 2768]
5	[11, 12]	778	[1282, 1283]	1551	[2198, 1091]	2324	[2769, 2612]
6	[13, 14]	779	[1284, 1285]	1552	[2199, 2200]	2325	[2770, 719]
7	[15, 16]	780	[929, 1286]	1553	[2201, 2202]	2326	[570, 594]
8	[17, 18]	781	[1157, 1287]	1554	[1261, 2089]	2327	[836, 1442]
9	[19, 20]	782	[1288, 1289]	1555	[2203, 2204]	2328	[2771, 801]
10	[21, 22]	783	[1290, 1291]	1556	[2094, 2205]	2329	[2698, 58]
11	[23, 24]	784	[1292, 1118]	1557	[104, 2206]	2330	[775, 1559]

12	[25, 26]	785	[468, 1293]	1558	[2207, 2208]	2331	[2772, 1951]
13	[27, 28]	786	[1294, 96]	1559	[915, 2209]	2332	[2749, 2773]
14	[29, 30]	787	[1295, 1296]	1560	[1278, 2210]	2333	[242, 1810]
15	[31, 32]	788	[941, 1297]	1561	[1185, 2211]	2334	[822, 564]
16	[33, 34]	789	[1147, 1298]	1562	[2212, 453]	2335	[2774, 1621]
17	[35, 36]	790	[1299, 1300]	1563	[1331, 2213]	2336	[2712, 1649]
18	[37, 38]	791	[993, 1301]	1564	[2214, 1345]	2337	[1849, 1947]
19	[39, 40]	792	[306, 1302]	1565	[2215, 1133]	2338	[191, 1732]
20	[41, 42]	793	[352, 1233]	1566	[2216, 386]	2339	[2717, 1759]
21	[43, 44]	794	[1303, 24]	1567	[1001, 2217]	2340	[1587, 570]
22	[45, 46]	795	[1304, 897]	1568	[1189, 2218]	2341	[2694, 231]
23	[47, 48]	796	[1295, 1305]	1569	[1240, 2219]	2342	[2775, 154]
24	[49, 50]	797	[1306, 1307]	1570	[2220, 425]	2343	[2776, 2633]
25	[51, 52]	798	[1308, 1309]	1571	[2221, 2222]	2344	[2777, 665]
26	[53, 54]	799	[1310, 1311]	1572	[2223, 2157]	2345	[1476, 510]
27	[55, 56]	800	[864, 1312]	1573	[2224, 868]	2346	[1521, 508]
28	[57, 58]	801	[1313, 83]	1574	[2225, 2226]	2347	[2610, 1677]
29	[59, 60]	802	[1314, 28]	1575	[855, 2227]	2348	[2670, 1710]
30	[61, 62]	803	[28, 1315]	1576	[2228, 940]	2349	[1545, 1848]
31	[63, 64]	804	[440, 1297]	1577	[2229, 2087]	2350	[1662, 2670]
32	[65, 66]	805	[68, 1316]	1578	[2155, 2230]	2351	[1778, 1508]
33	[67, 68]	806	[1317, 1074]	1579	[2231, 255]	2352	[1484, 1856]
34	[69, 70]	807	[1318, 1214]	1580	[1341, 2232]	2353	[724, 2778]
35	[71, 72]	808	[1319, 1320]	1581	[2233, 2234]	2354	[34, 805]
36	[73, 74]	809	[1321, 1322]	1582	[1074, 2235]	2355	[646, 1598]
37	[75, 76]	810	[1231, 1323]	1583	[1194, 2236]	2356	[1450, 2643]
38	[77, 78]	811	[1324, 442]	1584	[2237, 369]	2357	[1864, 45]
39	[79, 80]	812	[1325, 1326]	1585	[1203, 882]	2358	[1916, 166]
40	[81, 82]	813	[1327, 1328]	1586	[2238, 1239]	2359	[2779, 1544]
41	[83, 84]	814	[1329, 1263]	1587	[2095, 937]	2360	[2780, 1793]
42	[85, 86]	815	[1330, 1304]	1588	[1222, 1291]	2361	[769, 2774]
43	[87, 88]	816	[1331, 1332]	1589	[2239, 2240]	2362	[592, 2781]
44	[89, 90]	817	[1333, 1334]	1590	[106, 912]	2363	[1868, 149]
45	[91, 92]	818	[1335, 1336]	1591	[852, 2241]	2364	[618, 666]
46	[93, 94]	819	[955, 1337]	1592	[2242, 1266]	2365	[1718, 1552]
47	[95, 96]	820	[298, 962]	1593	[2243, 2244]	2366	[1976, 591]
48	[97, 98]	821	[1338, 1124]	1594	[1050, 2245]	2367	[1768, 1594]
49	[99, 100]	822	[1339, 884]	1595	[926, 864]	2368	[754, 1898]
50	[101, 102]	823	[1340, 1341]	1596	[2146, 2246]	2369	[2620, 711]
51	[103, 104]	824	[1342, 1343]	1597	[348, 2113]	2370	[2782, 1457]
52	[105, 106]	825	[1250, 1344]	1598	[332, 345]	2371	[1417, 2611]
53	[107, 108]	826	[419, 1014]	1599	[2247, 2248]	2372	[1768, 2783]
54	[109, 110]	827	[1345, 1346]	1600	[2249, 2250]	2373	[2784, 1863]
55	[111, 112]	828	[1347, 1348]	1601	[2215, 2251]	2374	[1377, 2785]

56	[113, 114]	829	[1207, 1349]	1602	[2248, 2252]	2375	[182, 2786]
57	[115, 116]	830	[1255, 1350]	1603	[2253, 2254]	2376	[1608, 787]
58	[117, 118]	831	[1351, 1352]	1604	[2255, 2256]	2377	[705, 2787]
59	[119, 120]	832	[1353, 1354]	1605	[2257, 2258]	2378	[2788, 1497]
60	[121, 122]	833	[1355, 892]	1606	[118, 2259]	2379	[2789, 739]
61	[123, 124]	834	[24, 373]	1607	[2260, 2038]	2380	[2790, 2590]
62	[125, 126]	835	[1264, 1356]	1608	[2116, 2261]	2381	[1432, 131]
63	[127, 128]	836	[1357, 1101]	1609	[100, 2262]	2382	[1592, 193]
64	[129, 130]	837	[1358, 1359]	1610	[1083, 1309]	2383	[1502, 1947]
65	[131, 132]	838	[1353, 1360]	1611	[2123, 2263]	2384	[1421, 2721]
66	[133, 134]	839	[1340, 321]	1612	[2264, 1144]	2385	[1934, 1983]
67	[135, 136]	840	[1361, 1362]	1613	[931, 2265]	2386	[1750, 2791]
68	[137, 138]	841	[1363, 1364]	1614	[1236, 74]	2387	[2747, 1448]
69	[139, 140]	842	[1365, 1366]	1615	[1230, 2128]	2388	[1891, 164]
70	[141, 142]	843	[228, 1367]	1616	[2266, 1000]	2389	[594, 1367]
71	[143, 130]	844	[1368, 188]	1617	[2267, 2268]	2390	[1860, 1924]
72	[144, 145]	845	[1369, 1370]	1618	[2269, 2270]	2391	[782, 2792]
73	[146, 147]	846	[1371, 1372]	1619	[1247, 403]	2392	[1444, 1827]
74	[148, 149]	847	[1373, 52]	1620	[2271, 995]	2393	[778, 1749]
75	[150, 151]	848	[1374, 1375]	1621	[975, 1321]	2394	[2691, 2793]
76	[152, 153]	849	[1376, 779]	1622	[1337, 351]	2395	[2663, 668]
77	[154, 155]	850	[1377, 1378]	1623	[2272, 456]	2396	[2586, 1628]
78	[156, 157]	851	[1379, 682]	1624	[90, 276]	2397	[1674, 2794]
79	[158, 159]	852	[1380, 1381]	1625	[2273, 2274]	2398	[698, 1957]
80	[160, 161]	853	[746, 1382]	1626	[2275, 2276]	2399	[2560, 2795]
81	[162, 163]	854	[1383, 810]	1627	[876, 1149]	2400	[2796, 1526]
82	[164, 165]	855	[1384, 748]	1628	[2277, 1181]	2401	[2797, 2798]
83	[166, 167]	856	[669, 775]	1629	[2278, 895]	2402	[2570, 1419]
84	[168, 169]	857	[1385, 1386]	1630	[959, 400]	2403	[2651, 1778]
85	[170, 171]	858	[1387, 1388]	1631	[2279, 2280]	2404	[2676, 2799]
86	[172, 173]	859	[1389, 1390]	1632	[917, 2254]	2405	[660, 133]
87	[174, 175]	860	[1391, 1392]	1633	[2281, 350]	2406	[1416, 2717]
88	[176, 177]	861	[727, 1393]	1634	[2117, 971]	2407	[581, 821]
89	[178, 179]	862	[1394, 1395]	1635	[1144, 2112]	2408	[1431, 1912]
90	[180, 181]	863	[1396, 36]	1636	[260, 2176]	2409	[1572, 1481]
91	[182, 183]	864	[1397, 1398]	1637	[2282, 1235]	2410	[2800, 586]
92	[184, 185]	865	[1399, 1400]	1638	[2283, 1026]	2411	[2801, 512]
93	[186, 187]	866	[1401, 1402]	1639	[2284, 1320]	2412	[2558, 139]
94	[188, 189]	867	[1403, 635]	1640	[2285, 449]	2413	[2802, 1456]
95	[190, 191]	868	[1404, 1405]	1641	[2286, 1353]	2414	[2543, 1373]
96	[192, 193]	869	[1406, 1407]	1642	[1238, 2287]	2415	[1617, 1637]
97	[194, 195]	870	[1408, 1378]	1643	[2288, 1221]	2416	[2803, 2804]
98	[196, 197]	871	[1409, 1410]	1644	[2289, 964]	2417	[2805, 1476]
99	[198, 154]	872	[1411, 1412]	1645	[2290, 2291]	2418	[2707, 2806]

100	[199, 200]	873	[1413, 1414]	1646	[2292, 1111]	2419	[1499, 831]
101	[201, 202]	874	[513, 521]	1647	[1146, 2293]	2420	[2807, 779]
102	[203, 150]	875	[552, 1415]	1648	[2294, 891]	2421	[1395, 2808]
103	[204, 205]	876	[1416, 1417]	1649	[2295, 2296]	2422	[1458, 741]
104	[206, 207]	877	[1418, 1419]	1650	[1333, 1218]	2423	[144, 2557]
105	[208, 209]	878	[510, 1420]	1651	[2297, 2298]	2424	[2647, 1883]
106	[210, 211]	879	[37, 1421]	1652	[920, 254]	2425	[1578, 1963]
107	[212, 213]	880	[1422, 1423]	1653	[2299, 914]	2426	[1747, 2601]
108	[214, 215]	881	[779, 1424]	1654	[2300, 2271]	2427	[2809, 2545]
109	[216, 217]	882	[1425, 1426]	1655	[2301, 99]	2428	[1698, 1494]
110	[218, 219]	883	[1427, 1428]	1656	[1036, 126]	2429	[1852, 587]
111	[220, 221]	884	[1429, 1430]	1657	[1088, 2302]	2430	[1763, 2810]
112	[222, 223]	885	[1431, 618]	1658	[1033, 2303]	2431	[2811, 752]
113	[224, 225]	886	[1432, 140]	1659	[313, 2304]	2432	[1844, 2769]
114	[11, 226]	887	[1433, 1434]	1660	[2305, 2306]	2433	[1697, 809]
115	[227, 228]	888	[1435, 741]	1661	[2192, 343]	2434	[1920, 1603]
116	[229, 230]	889	[32, 1436]	1662	[2307, 2308]	2435	[807, 566]
117	[231, 232]	890	[1437, 1438]	1663	[2309, 272]	2436	[2812, 1837]
118	[233, 234]	891	[1439, 1440]	1664	[331, 2266]	2437	[688, 2580]
119	[235, 236]	892	[1441, 1442]	1665	[305, 2310]	2438	[2709, 1817]
120	[237, 238]	893	[1443, 1444]	1666	[2311, 298]	2439	[1924, 2766]
121	[239, 240]	894	[1445, 597]	1667	[842, 2312]	2440	[1445, 1921]
122	[241, 242]	895	[1446, 640]	1668	[2216, 2313]	2441	[1381, 2813]
123	[243, 244]	896	[1447, 1448]	1669	[2305, 364]	2442	[1650, 610]
124	[191, 245]	897	[663, 482]	1670	[2314, 2315]	2443	[2814, 1468]
125	[246, 247]	898	[718, 1449]	1671	[2316, 320]	2444	[1464, 1515]
126	[248, 249]	899	[805, 181]	1672	[2317, 2270]	2445	[248, 142]
127	[250, 251]	900	[1450, 1451]	1673	[2316, 2318]	2446	[1461, 1905]
128	[252, 253]	901	[1438, 1452]	1674	[2319, 2320]	2447	[1864, 759]
129	[254, 255]	902	[1453, 1454]	1675	[2298, 2136]	2448	[2815, 1643]
130	[256, 257]	903	[1455, 1456]	1676	[902, 1090]	2449	[2668, 234]
131	[258, 259]	904	[804, 656]	1677	[2321, 2322]	2450	[1513, 1883]
132	[260, 261]	905	[607, 1457]	1678	[2275, 2323]	2451	[2576, 1903]
133	[253, 262]	906	[1458, 1459]	1679	[2011, 292]	2452	[1754, 2682]
134	[263, 264]	907	[1460, 1461]	1680	[2324, 2325]	2453	[715, 1502]
135	[265, 266]	908	[1462, 1463]	1681	[2092, 2166]	2454	[2690, 2672]
136	[267, 268]	909	[1464, 541]	1682	[1184, 2205]	2455	[824, 2816]
137	[269, 270]	910	[1465, 1466]	1683	[2178, 2326]	2456	[690, 1949]
138	[271, 272]	911	[1467, 1468]	1684	[1989, 2170]	2457	[2801, 1553]
139	[273, 274]	912	[1469, 677]	1685	[2327, 2328]	2458	[613, 2720]
140	[275, 276]	913	[1470, 1471]	1686	[350, 2296]	2459	[543, 622]
141	[277, 278]	914	[551, 1472]	1687	[2329, 871]	2460	[508, 1561]
142	[279, 280]	915	[1473, 1474]	1688	[423, 1997]	2461	[158, 2817]
143	[281, 282]	916	[1475, 1476]	1689	[857, 2330]	2462	[831, 491]

144	[283, 71]	917	[1477, 1478]	1690	[2245, 457]	2463	[2792, 1427]
145	[284, 285]	918	[1479, 791]	1691	[2247, 1304]	2464	[2818, 1882]
146	[286, 287]	919	[1480, 1481]	1692	[2331, 2332]	2465	[2819, 788]
147	[288, 27]	920	[1482, 1483]	1693	[1247, 2300]	2466	[1870, 519]
148	[289, 290]	921	[641, 1484]	1694	[2333, 2142]	2467	[2820, 725]
149	[291, 292]	922	[1485, 736]	1695	[2334, 1176]	2468	[190, 1731]
150	[293, 294]	923	[541, 1486]	1696	[2335, 2336]	2469	[833, 500]
151	[295, 65]	924	[1487, 1488]	1697	[2337, 1231]	2470	[666, 598]
152	[296, 297]	925	[1489, 152]	1698	[2338, 2339]	2471	[2821, 1704]
153	[298, 299]	926	[1490, 1491]	1699	[2340, 2178]	2472	[1761, 1855]
154	[300, 301]	927	[1492, 758]	1700	[2051, 960]	2473	[2822, 2730]
155	[302, 303]	928	[1493, 470]	1701	[2341, 1280]	2474	[780, 1463]
156	[304, 305]	929	[1494, 578]	1702	[2342, 1286]	2475	[1556, 2823]
157	[306, 307]	930	[1495, 128]	1703	[2343, 1187]	2476	[1373, 1556]
158	[308, 72]	931	[1496, 572]	1704	[2306, 2137]	2477	[2615, 686]
159	[309, 310]	932	[1497, 201]	1705	[2344, 888]	2478	[753, 1897]
160	[311, 312]	933	[181, 1498]	1706	[2345, 2189]	2479	[2824, 1652]
161	[313, 314]	934	[1499, 1500]	1707	[2346, 2347]	2480	[778, 2825]
162	[315, 316]	935	[1501, 1502]	1708	[2348, 2128]	2481	[2584, 1529]
163	[317, 318]	936	[763, 1503]	1709	[2349, 1170]	2482	[1769, 2727]
164	[319, 320]	937	[1504, 1505]	1710	[939, 2350]	2483	[474, 215]
165	[321, 322]	938	[1506, 1507]	1711	[2351, 1057]	2484	[629, 2826]
166	[323, 324]	939	[1508, 1509]	1712	[2096, 2347]	2485	[1567, 1891]
167	[325, 326]	940	[1510, 174]	1713	[2165, 2301]	2486	[1751, 1471]
168	[327, 328]	941	[1511, 1512]	1714	[1177, 2111]	2487	[1725, 2827]
169	[329, 330]	942	[1513, 1514]	1715	[2352, 368]	2488	[2828, 2578]
170	[331, 332]	943	[1515, 542]	1716	[867, 2353]	2489	[811, 2829]
171	[333, 334]	944	[649, 1516]	1717	[889, 2354]	2490	[798, 2777]
172	[335, 336]	945	[783, 1427]	1718	[1214, 2355]	2491	[194, 694]
173	[337, 338]	946	[1517, 1518]	1719	[2356, 376]	2492	[1775, 2830]
174	[339, 340]	947	[487, 576]	1720	[2357, 2358]	2493	[476, 159]
175	[341, 296]	948	[1519, 158]	1721	[2022, 2303]	2494	[2831, 48]
176	[342, 343]	949	[1520, 699]	1722	[2359, 2163]	2495	[2600, 1425]
177	[344, 73]	950	[1521, 1522]	1723	[2014, 379]	2496	[196, 1789]
178	[345, 346]	951	[1523, 789]	1724	[1003, 2360]	2497	[8, 498]
179	[347, 348]	952	[1524, 139]	1725	[1082, 2361]	2498	[1750, 2678]
180	[349, 350]	953	[1525, 1526]	1726	[2280, 2362]	2499	[201, 2832]
181	[70, 351]	954	[1527, 630]	1727	[93, 1100]	2500	[2833, 2575]
182	[352, 283]	955	[1528, 1529]	1728	[2363, 2070]	2501	[1602, 2834]
183	[353, 354]	956	[1530, 1531]	1729	[2174, 2072]	2502	[2835, 2836]
184	[355, 356]	957	[1532, 775]	1730	[2086, 2364]	2503	[2788, 739]
185	[357, 358]	958	[1533, 1534]	1731	[1024, 2006]	2504	[1965, 2837]
186	[359, 312]	959	[1535, 239]	1732	[2365, 2366]	2505	[2596, 1430]
187	[360, 361]	960	[1536, 772]	1733	[2367, 2368]	2506	[2838, 1953]

188	[362, 363]	961	[1537, 1538]	1734	[2369, 2370]	2507	[763, 2839]
189	[364, 365]	962	[1539, 1540]	1735	[2371, 2372]	2508	[2802, 2840]
190	[5, 366]	963	[1541, 1542]	1736	[1326, 2373]	2509	[2835, 1805]
191	[367, 368]	964	[632, 1543]	1737	[353, 2126]	2510	[1827, 2841]
192	[369, 370]	965	[1544, 546]	1738	[2359, 2374]	2511	[2842, 2724]
193	[371, 372]	966	[1545, 1546]	1739	[1115, 1093]	2512	[2843, 678]
194	[373, 374]	967	[1547, 1548]	1740	[2243, 2375]	2513	[2844, 1688]
195	[375, 376]	968	[1549, 1550]	1741	[2376, 1996]	2514	[2748, 1945]
196	[74, 377]	969	[1551, 1552]	1742	[2049, 918]	2515	[2845, 2829]
197	[378, 379]	970	[1553, 633]	1743	[945, 2377]	2516	[169, 2782]
198	[380, 381]	971	[1554, 1555]	1744	[2134, 1166]	2517	[2702, 1829]
199	[382, 383]	972	[1556, 1557]	1745	[1994, 2378]	2518	[45, 760]
200	[384, 69]	973	[492, 1558]	1746	[2379, 888]	2519	[2846, 803]
201	[385, 386]	974	[1559, 1560]	1747	[121, 426]	2520	[1891, 651]
202	[71, 387]	975	[1522, 1561]	1748	[2380, 2230]	2521	[1859, 499]
203	[388, 389]	976	[1562, 1563]	1749	[2044, 2381]	2522	[135, 1465]
204	[390, 336]	977	[1564, 1565]	1750	[2382, 2166]	2523	[1932, 1748]
205	[391, 392]	978	[1566, 1567]	1751	[2029, 66]	2524	[2750, 2847]
206	[393, 394]	979	[496, 1543]	1752	[1140, 2322]	2525	[1543, 1895]
207	[395, 85]	980	[1568, 1569]	1753	[2383, 1311]	2526	[1584, 2848]
208	[396, 397]	981	[1570, 1571]	1754	[2384, 2256]	2527	[1931, 192]
209	[398, 399]	982	[1572, 1573]	1755	[2385, 2202]	2528	[2705, 1806]
210	[400, 401]	983	[1574, 56]	1756	[2373, 2386]	2529	[1603, 2760]
211	[402, 75]	984	[1575, 1576]	1757	[2387, 975]	2530	[625, 2834]
212	[403, 404]	985	[1577, 641]	1758	[2388, 81]	2531	[2822, 2849]
213	[405, 406]	986	[1578, 1579]	1759	[2389, 2390]	2532	[1640, 2850]
214	[407, 408]	987	[1580, 1388]	1760	[305, 2391]	2533	[1558, 2851]
215	[409, 410]	988	[785, 1581]	1761	[2392, 932]	2534	[2852, 2580]
216	[411, 412]	989	[619, 598]	1762	[324, 1160]	2535	[2853, 2340]
217	[413, 414]	990	[621, 1582]	1763	[78, 1053]	2536	[979, 2066]
218	[415, 93]	991	[709, 1583]	1764	[2329, 925]	2537	[976, 2192]
219	[416, 417]	992	[1584, 44]	1765	[2393, 268]	2538	[2161, 2854]
220	[418, 419]	993	[1585, 1586]	1766	[411, 2394]	2539	[2494, 2855]
221	[420, 421]	994	[1587, 227]	1767	[1130, 1076]	2540	[2334, 115]
222	[422, 423]	995	[1588, 1589]	1768	[2395, 959]	2541	[257, 2056]
223	[424, 425]	996	[1590, 1591]	1769	[2396, 2397]	2542	[2856, 340]
224	[426, 427]	997	[1592, 1593]	1770	[2183, 275]	2543	[857, 2054]
225	[428, 429]	998	[771, 687]	1771	[281, 2398]	2544	[428, 1348]
226	[430, 431]	999	[134, 1594]	1772	[2214, 416]	2545	[2857, 1241]
227	[432, 433]	1000	[1595, 1596]	1773	[2290, 1113]	2546	[2858, 2859]
228	[434, 81]	1001	[1430, 1597]	1774	[1164, 2399]	2547	[2114, 953]
229	[435, 436]	1002	[128, 612]	1775	[975, 2061]	2548	[294, 2299]
230	[437, 438]	1003	[1598, 1599]	1776	[2400, 2401]	2549	[2860, 2154]
231	[120, 283]	1004	[1466, 1531]	1777	[2402, 2010]	2550	[2861, 2862]

232	[439, 440]	1005	[1600, 153]	1778	[2403, 1106]	2551	[2233, 102]
233	[441, 442]	1006	[1601, 1602]	1779	[1159, 964]	2552	[2863, 2864]
234	[443, 444]	1007	[1603, 240]	1780	[2007, 1098]	2553	[2453, 1353]
235	[445, 328]	1008	[1604, 1605]	1781	[2309, 2404]	2554	[1234, 2865]
236	[446, 447]	1009	[807, 1606]	1782	[1027, 2258]	2555	[276, 933]
237	[448, 449]	1010	[1607, 1608]	1783	[1028, 1335]	2556	[2866, 2149]
238	[450, 451]	1011	[52, 1557]	1784	[2405, 65]	2557	[2431, 1104]
239	[452, 453]	1012	[50, 1609]	1785	[2210, 2386]	2558	[2867, 1275]
240	[454, 455]	1013	[1610, 1611]	1786	[1312, 2406]	2559	[2868, 1305]
241	[456, 457]	1014	[1612, 808]	1787	[1358, 973]	2560	[2869, 2081]
242	[458, 459]	1015	[41, 1613]	1788	[2407, 1246]	2561	[1162, 2870]
243	[460, 461]	1016	[197, 799]	1789	[2408, 864]	2562	[1126, 2390]
244	[462, 463]	1017	[1614, 1386]	1790	[993, 2001]	2563	[314, 1128]
245	[366, 464]	1018	[1615, 1616]	1791	[2409, 966]	2564	[464, 445]
246	[465, 466]	1019	[1617, 1618]	1792	[869, 1046]	2565	[2489, 2105]
247	[292, 467]	1020	[1619, 1620]	1793	[2410, 2411]	2566	[2196, 2397]
248	[310, 100]	1021	[770, 1621]	1794	[2412, 1081]	2567	[2871, 948]
249	[468, 468]	1022	[835, 813]	1795	[2413, 857]	2568	[960, 401]
250	[469, 470]	1023	[1622, 1623]	1796	[2012, 467]	2569	[1312, 991]
251	[471, 472]	1024	[1624, 1625]	1797	[2414, 2415]	2570	[2872, 2487]
252	[473, 474]	1025	[1626, 766]	1798	[892, 2416]	2571	[1213, 2471]
253	[475, 476]	1026	[1627, 222]	1799	[2417, 2418]	2572	[2873, 2874]
254	[477, 478]	1027	[1628, 1520]	1800	[2124, 1260]	2573	[405, 1070]
255	[479, 480]	1028	[1629, 1630]	1801	[2419, 2420]	2574	[2006, 2321]
256	[481, 482]	1029	[34, 180]	1802	[1349, 2088]	2575	[2875, 2368]
257	[483, 484]	1030	[706, 188]	1803	[1217, 2061]	2576	[2876, 1032]
258	[485, 486]	1031	[164, 652]	1804	[413, 1042]	2577	[1116, 2209]
259	[487, 488]	1032	[1523, 1631]	1805	[2080, 1211]	2578	[265, 395]
260	[489, 490]	1033	[1632, 1563]	1806	[935, 2421]	2579	[2877, 2454]
261	[491, 492]	1034	[1633, 1634]	1807	[464, 327]	2580	[2424, 2502]
262	[474, 493]	1035	[235, 1635]	1808	[2422, 412]	2581	[2320, 2304]
263	[494, 495]	1036	[1636, 517]	1809	[100, 2058]	2582	[992, 2000]
264	[496, 497]	1037	[1637, 1458]	1810	[2423, 2424]	2583	[880, 2109]
265	[498, 499]	1038	[1638, 204]	1811	[2425, 1049]	2584	[2072, 2293]
266	[500, 501]	1039	[1639, 606]	1812	[2179, 2426]	2585	[334, 2878]
267	[502, 503]	1040	[1640, 1426]	1813	[318, 2427]	2586	[1208, 2235]
268	[504, 505]	1041	[740, 202]	1814	[2425, 2428]	2587	[2485, 2879]
269	[506, 507]	1042	[1641, 1642]	1815	[2088, 844]	2588	[2266, 345]
270	[508, 509]	1043	[1643, 40]	1816	[1135, 431]	2589	[384, 955]
271	[510, 511]	1044	[1644, 1645]	1817	[1200, 306]	2590	[2210, 2880]
272	[512, 513]	1045	[1646, 731]	1818	[2429, 2430]	2591	[2881, 374]
273	[514, 515]	1046	[1647, 1607]	1819	[2431, 405]	2592	[2882, 2883]
274	[516, 517]	1047	[1614, 1648]	1820	[2131, 2432]	2593	[1164, 1092]
275	[518, 519]	1048	[1649, 1630]	1821	[1183, 2094]	2594	[2352, 2884]

276	[179, 520]	1049	[1650, 1651]	1822	[108, 463]	2595	[118, 114]
277	[521, 522]	1050	[1652, 1423]	1823	[415, 1099]	2596	[1144, 348]
278	[523, 524]	1051	[1653, 1654]	1824	[1198, 2077]	2597	[2885, 1357]
279	[525, 526]	1052	[1655, 783]	1825	[333, 2370]	2598	[2206, 1082]
280	[527, 528]	1053	[1656, 1657]	1826	[2433, 1186]	2599	[1283, 988]
281	[529, 530]	1054	[1658, 645]	1827	[1004, 2434]	2600	[2886, 1343]
282	[531, 532]	1055	[1471, 1607]	1828	[2435, 880]	2601	[2452, 2310]
283	[36, 533]	1056	[1659, 1660]	1829	[342, 353]	2602	[2887, 98]
284	[534, 535]	1057	[1661, 1662]	1830	[346, 316]	2603	[2281, 2295]
285	[536, 537]	1058	[1663, 14]	1831	[2436, 2090]	2604	[2252, 898]
286	[538, 539]	1059	[1487, 1664]	1832	[2437, 2147]	2605	[2258, 949]
287	[540, 490]	1060	[1665, 1666]	1833	[2438, 1259]	2606	[1211, 2190]
288	[541, 542]	1061	[470, 1667]	1834	[2239, 2144]	2607	[324, 2888]
289	[62, 223]	1062	[1619, 1668]	1835	[2439, 392]	2608	[2481, 887]
290	[543, 544]	1063	[1669, 1670]	1836	[2405, 2029]	2609	[896, 2480]
291	[545, 546]	1064	[1671, 136]	1837	[870, 1047]	2610	[1010, 370]
292	[547, 548]	1065	[1672, 1673]	1838	[1221, 2152]	2611	[1011, 117]
293	[492, 549]	1066	[1674, 495]	1839	[2331, 2440]	2612	[978, 2889]
294	[550, 551]	1067	[1675, 1676]	1840	[2435, 2108]	2613	[2873, 848]
295	[552, 553]	1068	[1677, 1678]	1841	[2441, 359]	2614	[67, 2024]
296	[554, 555]	1069	[1679, 1680]	1842	[895, 332]	2615	[2890, 2426]
297	[556, 557]	1070	[1681, 1628]	1843	[2442, 1152]	2616	[1325, 1278]
298	[558, 559]	1071	[1682, 1438]	1844	[998, 978]	2617	[2185, 335]
299	[560, 561]	1072	[242, 1683]	1845	[2443, 2276]	2618	[983, 2103]
300	[507, 562]	1073	[1684, 813]	1846	[1239, 2075]	2619	[2872, 2891]
301	[563, 564]	1074	[1424, 1685]	1847	[1278, 2373]	2620	[1119, 1130]
302	[149, 163]	1075	[1686, 503]	1848	[2041, 861]	2621	[2007, 2892]
303	[565, 566]	1076	[1376, 708]	1849	[1201, 1302]	2622	[1349, 843]
304	[567, 568]	1077	[1407, 1687]	1850	[1042, 1069]	2623	[916, 2253]
305	[569, 570]	1078	[223, 1688]	1851	[1216, 963]	2624	[2357, 1191]
306	[571, 572]	1079	[478, 1689]	1852	[1107, 1139]	2625	[2460, 1039]
307	[573, 574]	1080	[1690, 1534]	1853	[865, 2444]	2626	[2878, 2893]
308	[238, 575]	1081	[1691, 1692]	1854	[877, 2371]	2627	[2314, 2894]
309	[530, 576]	1082	[750, 1693]	1855	[2445, 2344]	2628	[2008, 2895]
310	[577, 578]	1083	[1694, 1613]	1856	[1103, 2317]	2629	[2896, 1250]
311	[579, 580]	1084	[1695, 1696]	1857	[2014, 2446]	2630	[1348, 896]
312	[581, 582]	1085	[1697, 1383]	1858	[74, 2447]	2631	[1276, 2897]
313	[583, 584]	1086	[1698, 577]	1859	[2194, 2140]	2632	[2195, 2898]
314	[585, 586]	1087	[1699, 1700]	1860	[2448, 1332]	2633	[122, 427]
315	[587, 588]	1088	[1701, 1445]	1861	[2449, 1192]	2634	[123, 2899]
316	[208, 589]	1089	[1444, 1644]	1862	[2120, 1201]	2635	[2488, 373]
317	[590, 43]	1090	[821, 737]	1863	[2450, 1259]	2636	[910, 2218]
318	[591, 45]	1091	[1702, 814]	1864	[2451, 2440]	2637	[2900, 1024]
319	[592, 593]	1092	[1703, 32]	1865	[958, 384]	2638	[873, 88]

320	[594, 595]	1093	[1704, 1705]	1866	[335, 1269]	2639	[2901, 2902]
321	[596, 597]	1094	[1706, 1707]	1867	[304, 2452]	2640	[2903, 2526]
322	[598, 599]	1095	[1708, 1480]	1868	[964, 324]	2641	[2904, 2905]
323	[600, 601]	1096	[1393, 1709]	1869	[2453, 2018]	2642	[2906, 2907]
324	[602, 603]	1097	[1710, 1480]	1870	[2118, 2454]	2643	[925, 2908]
325	[604, 605]	1098	[1711, 1661]	1871	[2225, 2455]	2644	[2909, 2344]
326	[606, 607]	1099	[1712, 1713]	1872	[2251, 1134]	2645	[2861, 2905]
327	[608, 530]	1100	[1714, 1577]	1873	[899, 2456]	2646	[2910, 2911]
328	[609, 610]	1101	[1715, 1716]	1874	[2457, 969]	2647	[2912, 2227]
329	[611, 612]	1102	[499, 1717]	1875	[2458, 1203]	2648	[83, 2493]
330	[613, 614]	1103	[723, 1718]	1876	[2459, 2185]	2649	[1225, 1251]
331	[615, 616]	1104	[1719, 1720]	1877	[2460, 2461]	2650	[2913, 397]
332	[597, 617]	1105	[1633, 1392]	1878	[2420, 2462]	2651	[1096, 919]
333	[618, 619]	1106	[1721, 1508]	1879	[2463, 882]	2652	[2050, 959]
334	[620, 621]	1107	[1722, 1548]	1880	[2464, 994]	2653	[1053, 2914]
335	[622, 623]	1108	[1723, 1724]	1881	[1103, 2269]	2654	[2915, 2916]
336	[624, 625]	1109	[1601, 625]	1882	[2465, 2081]	2655	[2113, 2917]
337	[513, 626]	1110	[1725, 795]	1883	[2466, 900]	2656	[2459, 859]
338	[627, 628]	1111	[1726, 698]	1884	[393, 2059]	2657	[2918, 1289]
339	[629, 630]	1112	[1727, 1555]	1885	[1244, 2083]	2658	[2525, 2919]
340	[631, 632]	1113	[1728, 1729]	1886	[1361, 2101]	2659	[2866, 2920]
341	[512, 633]	1114	[1597, 1730]	1887	[938, 2467]	2660	[952, 2921]
342	[634, 635]	1115	[1731, 1732]	1888	[1176, 2468]	2661	[321, 2232]
343	[636, 637]	1116	[515, 1464]	1889	[2297, 970]	2662	[2458, 2463]
344	[638, 639]	1117	[1703, 649]	1890	[2469, 1063]	2663	[2922, 2253]
345	[640, 641]	1118	[1733, 535]	1891	[2470, 321]	2664	[2923, 2500]
346	[642, 43]	1119	[1734, 1735]	1892	[2471, 2355]	2665	[2371, 2182]
347	[643, 175]	1120	[1736, 588]	1893	[2363, 2472]	2666	[108, 2924]
348	[644, 645]	1121	[1737, 1738]	1894	[2473, 2017]	2667	[1304, 2252]
349	[646, 647]	1122	[745, 179]	1895	[2474, 2475]	2668	[2158, 1140]
350	[648, 649]	1123	[1739, 786]	1896	[1198, 2476]	2669	[289, 2925]
351	[140, 650]	1124	[1740, 685]	1897	[2370, 989]	2670	[343, 2126]
352	[651, 652]	1125	[1741, 1742]	1898	[2255, 2477]	2671	[2304, 1128]
353	[653, 217]	1126	[1743, 1493]	1899	[2478, 2194]	2672	[2926, 2022]
354	[654, 655]	1127	[1744, 1745]	1900	[2479, 2448]	2673	[1058, 2208]
355	[176, 557]	1128	[1746, 496]	1901	[2258, 1335]	2674	[2020, 944]
356	[656, 657]	1129	[1747, 507]	1902	[2129, 2257]	2675	[1156, 257]
357	[658, 659]	1130	[1748, 1749]	1903	[2368, 2226]	2676	[2423, 1194]
358	[660, 661]	1131	[621, 1750]	1904	[2221, 2480]	2677	[2927, 344]
359	[662, 663]	1132	[1751, 1647]	1905	[1121, 21]	2678	[2340, 1284]
360	[664, 665]	1133	[1752, 1652]	1906	[2481, 2482]	2679	[287, 423]
361	[666, 667]	1134	[1753, 1754]	1907	[2483, 2420]	2680	[1337, 2928]
362	[234, 668]	1135	[1755, 1398]	1908	[2402, 2484]	2681	[2467, 2929]
363	[669, 670]	1136	[1756, 1757]	1909	[1145, 2072]	2682	[947, 2930]

364	[671, 672]	1137	[1758, 1643]	1910	[2485, 459]	2683	[1067, 2864]
365	[673, 10]	1138	[1759, 1760]	1911	[2427, 1085]	2684	[2478, 2139]
366	[674, 675]	1139	[1577, 1761]	1912	[2486, 2487]	2685	[2921, 955]
367	[676, 677]	1140	[1762, 1461]	1913	[23, 2488]	2686	[2271, 1234]
368	[678, 679]	1141	[611, 660]	1914	[2489, 2490]	2687	[2931, 2534]
369	[680, 681]	1142	[1680, 247]	1915	[2376, 2491]	2688	[2016, 2932]
370	[682, 683]	1143	[1763, 1550]	1916	[2199, 2492]	2689	[995, 2865]
371	[684, 685]	1144	[1764, 1414]	1917	[1007, 259]	2690	[2127, 2894]
372	[686, 646]	1145	[1765, 1766]	1918	[2493, 1083]	2691	[276, 253]
373	[48, 687]	1146	[505, 500]	1919	[2494, 444]	2692	[2417, 2361]
374	[688, 689]	1147	[1767, 605]	1920	[2495, 2375]	2693	[1229, 1999]
375	[690, 671]	1148	[709, 1685]	1921	[2209, 2444]	2694	[2933, 2499]
376	[691, 673]	1149	[661, 1768]	1922	[2496, 2497]	2695	[354, 2314]
377	[692, 693]	1150	[1639, 169]	1923	[2328, 443]	2696	[1205, 20]
378	[694, 695]	1151	[1707, 1769]	1924	[2498, 935]	2697	[327, 2165]
379	[696, 697]	1152	[1770, 1771]	1925	[2483, 2063]	2698	[2934, 394]
380	[698, 699]	1153	[677, 1772]	1926	[859, 335]	2699	[2325, 2935]
381	[700, 701]	1154	[1773, 1774]	1927	[2335, 2499]	2700	[2001, 2936]
382	[702, 147]	1155	[1723, 1596]	1928	[2463, 1064]	2701	[2896, 1225]
383	[529, 487]	1156	[1775, 1776]	1929	[1302, 2027]	2702	[416, 1346]
384	[703, 704]	1157	[1777, 1660]	1930	[851, 369]	2703	[981, 2937]
385	[705, 501]	1158	[1778, 1404]	1931	[2500, 2243]	2704	[1292, 117]
386	[706, 615]	1159	[1779, 1544]	1932	[2496, 2091]	2705	[2938, 2089]
387	[195, 707]	1160	[1780, 1781]	1933	[2501, 1145]	2706	[1055, 2237]
388	[708, 709]	1161	[1782, 1783]	1934	[1194, 2502]	2707	[2939, 1061]
389	[710, 711]	1162	[633, 626]	1935	[2503, 2504]	2708	[2084, 2940]
390	[712, 713]	1163	[1784, 1703]	1936	[2467, 2350]	2709	[257, 26]
391	[714, 715]	1164	[1785, 1786]	1937	[1017, 2337]	2710	[2941, 2942]
392	[716, 717]	1165	[1787, 669]	1938	[92, 2451]	2711	[1328, 2288]
393	[718, 719]	1166	[1759, 1788]	1939	[2505, 1052]	2712	[2008, 264]
394	[720, 721]	1167	[1789, 799]	1940	[112, 2231]	2713	[409, 104]
395	[722, 723]	1168	[1790, 593]	1941	[2441, 311]	2714	[2139, 2943]
396	[724, 725]	1169	[527, 655]	1942	[2506, 1132]	2715	[2170, 2940]
397	[726, 727]	1170	[1791, 1791]	1943	[419, 2507]	2716	[86, 2269]
398	[728, 221]	1171	[1792, 1793]	1944	[1045, 2508]	2717	[2944, 305]
399	[729, 730]	1172	[1794, 1795]	1945	[356, 2106]	2718	[884, 2945]
400	[731, 732]	1173	[1796, 1533]	1946	[2212, 420]	2719	[1053, 2217]
401	[733, 486]	1174	[1714, 640]	1947	[2509, 2032]	2720	[2946, 313]
402	[734, 152]	1175	[1530, 1797]	1948	[1302, 2510]	2721	[2947, 2948]
403	[735, 736]	1176	[1798, 1799]	1949	[2023, 2511]	2722	[2107, 2041]
404	[737, 738]	1177	[1800, 1801]	1950	[288, 1314]	2723	[2360, 2949]
405	[739, 740]	1178	[534, 1802]	1951	[1073, 1208]	2724	[2950, 1991]
406	[741, 742]	1179	[801, 138]	1952	[356, 1327]	2725	[1990, 2951]
407	[743, 744]	1180	[1803, 510]	1953	[1010, 2512]	2726	[2952, 2122]

408	[745, 746]	1181	[1804, 1805]	1954	[2513, 1266]	2727	[2953, 2132]
409	[747, 748]	1182	[639, 1806]	1955	[2514, 2515]	2728	[1118, 113]
410	[749, 750]	1183	[1807, 559]	1956	[1083, 2516]	2729	[2515, 2243]
411	[751, 752]	1184	[1808, 807]	1957	[2517, 2377]	2730	[2169, 2084]
412	[753, 754]	1185	[1809, 157]	1958	[2515, 2495]	2731	[1263, 1283]
413	[699, 755]	1186	[1700, 1810]	1959	[2400, 2339]	2732	[283, 308]
414	[756, 514]	1187	[1811, 1513]	1960	[310, 2057]	2733	[1357, 1022]
415	[757, 758]	1188	[1401, 1478]	1961	[2518, 2343]	2734	[381, 2954]
416	[759, 760]	1189	[1812, 1813]	1962	[437, 2308]	2735	[2161, 2354]
417	[761, 481]	1190	[692, 1738]	1963	[2519, 282]	2736	[1231, 1173]
418	[762, 763]	1191	[544, 1814]	1964	[1283, 2520]	2737	[75, 2900]
419	[764, 180]	1192	[1815, 669]	1965	[1044, 362]	2738	[2129, 1027]
420	[765, 766]	1193	[195, 695]	1966	[2521, 2522]	2739	[1150, 80]
421	[767, 472]	1194	[1816, 1817]	1967	[449, 18]	2740	[2472, 2071]
422	[130, 664]	1195	[531, 1818]	1968	[1184, 2523]	2741	[2955, 286]
423	[768, 553]	1196	[1819, 1820]	1969	[2471, 2524]	2742	[2941, 906]
424	[769, 770]	1197	[1821, 1373]	1970	[2525, 2526]	2743	[1197, 2076]
425	[771, 674]	1198	[1822, 1823]	1971	[2252, 2527]	2744	[2035, 92]
426	[772, 773]	1199	[1824, 1483]	1972	[354, 2127]	2745	[1266, 2025]
427	[774, 9]	1200	[1825, 1370]	1973	[2528, 2070]	2746	[1299, 2956]
428	[775, 776]	1201	[1826, 1827]	1974	[2284, 2529]	2747	[337, 356]
429	[777, 778]	1202	[1729, 1425]	1975	[2036, 2451]	2748	[1043, 1281]
430	[779, 709]	1203	[1828, 1829]	1976	[1016, 2416]	2749	[2957, 2448]
431	[780, 781]	1204	[818, 185]	1977	[2414, 1154]	2750	[2228, 439]
432	[782, 783]	1205	[1830, 1680]	1978	[2530, 2492]	2751	[2958, 2959]
433	[658, 784]	1206	[1831, 1832]	1979	[28, 2511]	2752	[2429, 2907]
434	[785, 548]	1207	[1833, 1799]	1980	[2292, 2531]	2753	[1056, 938]
435	[786, 787]	1208	[1834, 1417]	1981	[2137, 465]	2754	[81, 2268]
436	[788, 789]	1209	[1835, 1836]	1982	[2327, 1168]	2755	[6, 464]
437	[790, 791]	1210	[1837, 1838]	1983	[2036, 2331]	2756	[2178, 1285]
438	[792, 793]	1211	[1839, 1840]	1984	[2521, 2532]	2757	[880, 2960]
439	[794, 795]	1212	[1562, 1841]	1985	[2056, 1292]	2758	[952, 384]
440	[472, 560]	1213	[1842, 646]	1986	[1131, 2533]	2759	[2961, 2962]
441	[796, 797]	1214	[1843, 1730]	1987	[2238, 2534]	2760	[2963, 2120]
442	[129, 798]	1215	[1844, 1845]	1988	[2535, 1582]	2761	[1093, 1264]
443	[799, 800]	1216	[1846, 1589]	1989	[1627, 62]	2762	[2860, 2964]
444	[801, 802]	1217	[1847, 204]	1990	[2536, 772]	2763	[372, 2965]
445	[14, 803]	1218	[1509, 1545]	1991	[2537, 2538]	2764	[284, 2187]
446	[804, 682]	1219	[1848, 1711]	1992	[8, 1859]	2765	[107, 462]
447	[805, 806]	1220	[715, 1849]	1993	[1636, 2539]	2766	[311, 2966]
448	[58, 807]	1221	[1850, 1851]	1994	[612, 133]	2767	[2037, 2967]
449	[808, 236]	1222	[647, 1599]	1995	[1753, 1865]	2768	[2283, 2968]
450	[809, 810]	1223	[1852, 1736]	1996	[1894, 2540]	2769	[2969, 269]
451	[811, 812]	1224	[1590, 1713]	1997	[664, 2541]	2770	[2325, 2362]

452	[813, 814]	1225	[1853, 34]	1998	[2542, 1431]	2771	[2970, 1314]
453	[815, 794]	1226	[1854, 1571]	1999	[2543, 51]	2772	[999, 2889]
454	[816, 817]	1227	[203, 560]	2000	[2544, 1690]	2773	[2082, 911]
455	[818, 819]	1228	[1855, 1856]	2001	[2545, 568]	2774	[392, 1220]
456	[820, 821]	1229	[1468, 1857]	2002	[1705, 717]	2775	[1162, 2069]
457	[822, 823]	1230	[218, 1840]	2003	[2546, 190]	2776	[1117, 2020]
458	[824, 825]	1231	[1386, 1858]	2004	[1755, 2547]	2777	[2971, 2251]
459	[826, 700]	1232	[1859, 1860]	2005	[151, 2548]	2778	[1269, 2972]
460	[491, 827]	1233	[1861, 195]	2006	[1666, 1676]	2779	[2360, 2434]
461	[828, 829]	1234	[827, 549]	2007	[2549, 2550]	2780	[1045, 363]
462	[830, 831]	1235	[1862, 511]	2008	[2551, 1407]	2781	[1105, 1157]
463	[832, 833]	1236	[1863, 1864]	2009	[133, 1768]	2782	[328, 309]
464	[12, 834]	1237	[1865, 1866]	2010	[2552, 716]	2783	[1130, 2973]
465	[797, 835]	1238	[1773, 704]	2011	[2553, 603]	2784	[2503, 361]
466	[836, 837]	1239	[1428, 1867]	2012	[2554, 164]	2785	[2939, 2974]
467	[603, 838]	1240	[226, 834]	2013	[1918, 2555]	2786	[1169, 2975]
468	[839, 840]	1241	[1868, 162]	2014	[2556, 2557]	2787	[2438, 2124]
469	[841, 842]	1242	[1793, 1869]	2015	[2558, 1432]	2788	[2976, 2475]
470	[843, 844]	1243	[1870, 1871]	2016	[1726, 1520]	2789	[2300, 404]
471	[845, 846]	1244	[1605, 200]	2017	[590, 1584]	2790	[2915, 1993]
472	[847, 848]	1245	[1872, 1873]	2018	[2559, 1503]	2791	[456, 2977]
473	[849, 301]	1246	[1500, 1874]	2019	[2560, 2561]	2792	[2534, 2075]
474	[850, 851]	1247	[1875, 659]	2020	[2562, 57]	2793	[90, 252]
475	[852, 853]	1248	[1539, 1440]	2021	[2563, 2564]	2794	[849, 2003]
476	[854, 855]	1249	[1648, 1876]	2022	[1573, 636]	2795	[380, 2203]
477	[856, 857]	1250	[667, 1877]	2023	[2565, 1488]	2796	[2978, 1356]
478	[858, 859]	1251	[187, 1878]	2024	[2566, 1654]	2797	[309, 99]
479	[860, 861]	1252	[1879, 1880]	2025	[1688, 1735]	2798	[2337, 1172]
480	[862, 407]	1253	[1881, 1882]	2026	[1638, 2567]	2799	[2317, 2979]
481	[863, 120]	1254	[1883, 1884]	2027	[1787, 1532]	2800	[2947, 2859]
482	[421, 439]	1255	[1493, 551]	2028	[2568, 1513]	2801	[1163, 1091]
483	[864, 389]	1256	[1372, 1885]	2029	[2569, 1703]	2802	[2279, 2325]
484	[865, 866]	1257	[598, 1877]	2030	[2570, 2571]	2803	[2518, 1186]
485	[867, 868]	1258	[1443, 1826]	2031	[695, 1368]	2804	[396, 1333]
486	[869, 870]	1259	[1886, 1887]	2032	[1926, 2572]	2805	[372, 455]
487	[871, 872]	1260	[1883, 1888]	2033	[2573, 1431]	2806	[2909, 2379]
488	[873, 874]	1261	[136, 1466]	2034	[245, 2574]	2807	[1122, 2250]
489	[357, 875]	1262	[1889, 1580]	2035	[2575, 2576]	2808	[1236, 1182]
490	[876, 877]	1263	[1890, 1891]	2036	[2577, 1445]	2809	[2420, 2064]
491	[30, 878]	1264	[1892, 1553]	2037	[1672, 2578]	2810	[2299, 2359]
492	[879, 880]	1265	[582, 737]	2038	[1880, 1674]	2811	[2980, 366]
493	[301, 881]	1266	[1579, 1893]	2039	[1709, 1710]	2812	[1273, 1221]
494	[882, 883]	1267	[670, 776]	2040	[1711, 727]	2813	[2145, 2981]
495	[884, 885]	1268	[1396, 1894]	2041	[2579, 1778]	2814	[2061, 1322]

496	[886, 887]	1269	[1895, 213]	2042	[2580, 2581]	2815	[1267, 1035]
497	[888, 405]	1270	[713, 1896]	2043	[2582, 225]	2816	[2980, 6]
498	[16, 889]	1271	[1897, 1898]	2044	[2583, 1766]	2817	[2918, 2982]
499	[890, 311]	1272	[1899, 1900]	2045	[2584, 2585]	2818	[2983, 2411]
500	[891, 76]	1273	[1901, 1366]	2046	[536, 173]	2819	[2137, 1147]
501	[892, 893]	1274	[56, 555]	2047	[2586, 1726]	2820	[2878, 990]
502	[894, 895]	1275	[1658, 1902]	2048	[1649, 2587]	2821	[1022, 2130]
503	[429, 896]	1276	[560, 151]	2049	[792, 2550]	2822	[2067, 2902]
504	[402, 891]	1277	[1371, 1903]	2050	[2588, 731]	2823	[2385, 2984]
505	[897, 898]	1278	[1623, 1750]	2051	[2589, 2590]	2824	[2923, 2515]
506	[899, 900]	1279	[1904, 54]	2052	[1807, 1973]	2825	[1281, 1142]
507	[901, 902]	1280	[1905, 1906]	2053	[2591, 1687]	2826	[2112, 1351]
508	[903, 904]	1281	[1907, 1908]	2054	[1972, 2592]	2827	[2412, 2985]
509	[286, 422]	1282	[1909, 825]	2055	[2593, 2594]	2828	[2927, 1235]
510	[905, 906]	1283	[1910, 622]	2056	[482, 231]	2829	[927, 2986]
511	[907, 378]	1284	[1911, 1912]	2057	[2595, 1845]	2830	[2488, 2881]
512	[410, 908]	1285	[1833, 1913]	2058	[2596, 2597]	2831	[2961, 2261]
513	[909, 910]	1286	[1675, 1914]	2059	[1832, 1826]	2832	[2028, 2912]
514	[911, 912]	1287	[1659, 1915]	2060	[2598, 815]	2833	[2987, 2000]
515	[913, 914]	1288	[1916, 713]	2061	[2599, 2600]	2834	[119, 352]
516	[274, 915]	1289	[1917, 1918]	2062	[204, 1756]	2835	[2910, 1072]
517	[916, 917]	1290	[1919, 1920]	2063	[2601, 562]	2836	[2184, 2988]
518	[918, 919]	1291	[1921, 1922]	2064	[2602, 2603]	2837	[2328, 2494]
519	[111, 920]	1292	[1923, 233]	2065	[2604, 601]	2838	[2958, 1307]
520	[346, 921]	1293	[1293, 1293]	2066	[2536, 1770]	2839	[1263, 987]
521	[922, 461]	1294	[229, 1887]	2067	[2602, 1454]	2840	[2367, 2225]
522	[910, 923]	1295	[1497, 740]	2068	[2597, 1843]	2841	[1186, 450]
523	[924, 925]	1296	[1924, 1925]	2069	[1783, 2605]	2842	[2989, 383]
524	[926, 388]	1297	[1413, 1450]	2070	[2606, 209]	2843	[842, 2274]
525	[927, 928]	1298	[1789, 1926]	2071	[149, 2607]	2844	[1149, 2371]
526	[929, 930]	1299	[1927, 1928]	2072	[2608, 1668]	2845	[2006, 1140]
527	[931, 932]	1300	[244, 1725]	2073	[1842, 2609]	2846	[2990, 1350]
528	[933, 934]	1301	[1929, 782]	2074	[2610, 1955]	2847	[2031, 2991]
529	[935, 408]	1302	[1370, 1897]	2075	[2611, 1760]	2848	[2867, 2992]
530	[936, 937]	1303	[1926, 800]	2076	[1845, 2612]	2849	[2978, 2993]
531	[938, 939]	1304	[1930, 1931]	2077	[2613, 2614]	2850	[2172, 2961]
532	[940, 941]	1305	[714, 1501]	2078	[1699, 242]	2851	[2393, 2501]
533	[855, 942]	1306	[1932, 778]	2079	[2615, 1842]	2852	[2946, 2320]
534	[943, 944]	1307	[676, 1933]	2080	[2616, 526]	2853	[2994, 1911]
535	[945, 946]	1308	[1555, 1443]	2081	[2617, 1865]	2854	[2675, 2995]
536	[947, 948]	1309	[1934, 1935]	2082	[641, 1855]	2855	[1653, 2996]
537	[949, 950]	1310	[1936, 1616]	2083	[1933, 1772]	2856	[2552, 1705]
538	[951, 952]	1311	[1600, 1937]	2084	[2618, 1395]	2857	[1575, 1696]
539	[953, 954]	1312	[1912, 619]	2085	[1824, 2619]	2858	[2718, 474]

540	[955, 70]	1313	[1519, 476]	2086	[696, 207]	2859	[2775, 2997]
541	[956, 957]	1314	[1938, 1939]	2087	[2620, 2621]	2860	[1744, 171]
542	[951, 958]	1315	[56, 1940]	2088	[2622, 1493]	2861	[1947, 1586]
543	[959, 960]	1316	[136, 1530]	2089	[2623, 1920]	2862	[796, 1364]
544	[961, 962]	1317	[1374, 1716]	2090	[2624, 1421]	2863	[1495, 611]
545	[963, 913]	1318	[1941, 817]	2091	[2625, 2626]	2864	[1365, 2685]
546	[964, 965]	1319	[1942, 1943]	2092	[2598, 244]	2865	[1801, 1938]
547	[279, 966]	1320	[485, 1944]	2093	[1548, 1538]	2866	[678, 1956]
548	[967, 968]	1321	[1448, 1945]	2094	[2627, 2628]	2867	[2842, 1783]
549	[969, 970]	1322	[747, 1946]	2095	[1612, 235]	2868	[2736, 1720]
550	[971, 84]	1323	[1947, 1948]	2096	[1963, 1893]	2869	[478, 701]
551	[972, 973]	1324	[1949, 672]	2097	[521, 2629]	2870	[2824, 1422]
552	[974, 975]	1325	[1950, 1951]	2098	[2630, 2631]	2871	[1604, 199]
553	[976, 342]	1326	[1952, 1953]	2099	[1889, 1387]	2872	[1558, 2757]
554	[977, 978]	1327	[1954, 1955]	2100	[774, 673]	2873	[2613, 484]
555	[979, 980]	1328	[628, 1956]	2101	[567, 2632]	2874	[1684, 1702]
556	[981, 982]	1329	[649, 1436]	2102	[187, 1939]	2875	[2686, 1567]
557	[983, 984]	1330	[761, 663]	2103	[226, 1698]	2876	[2740, 238]
558	[985, 986]	1331	[1957, 755]	2104	[2633, 2575]	2877	[727, 1662]
559	[987, 988]	1332	[1652, 1958]	2105	[489, 2634]	2878	[2998, 1966]
560	[989, 990]	1333	[1959, 1960]	2106	[626, 522]	2879	[1942, 2999]
561	[389, 991]	1334	[1403, 1961]	2107	[2635, 1960]	2880	[1394, 2687]
562	[992, 993]	1335	[1962, 1818]	2108	[2636, 2637]	2881	[3000, 1565]
563	[436, 994]	1336	[1963, 1964]	2109	[2638, 2639]	2882	[3001, 2563]
564	[995, 996]	1337	[1618, 1435]	2110	[2640, 738]	2883	[702, 3002]
565	[394, 997]	1338	[1900, 1859]	2111	[2641, 2642]	2884	[2665, 8]
566	[998, 999]	1339	[523, 1857]	2112	[2581, 1381]	2885	[1364, 835]
567	[1000, 346]	1340	[1965, 1966]	2113	[1414, 2643]	2886	[1707, 515]
568	[78, 1001]	1341	[1967, 1968]	2114	[2644, 1704]	2887	[1894, 533]
569	[925, 872]	1342	[160, 1908]	2115	[2597, 1597]	2888	[1543, 212]
570	[1002, 287]	1343	[684, 1969]	2116	[2645, 183]	2889	[687, 3003]
571	[1003, 1004]	1344	[1574, 554]	2117	[806, 1498]	2890	[2843, 628]
572	[95, 123]	1345	[1970, 809]	2118	[2593, 1507]	2891	[2752, 643]
573	[1005, 1006]	1346	[1795, 1971]	2119	[216, 2646]	2892	[2635, 3004]
574	[1007, 1008]	1347	[1972, 1505]	2120	[1514, 1884]	2893	[2838, 3005]
575	[449, 1009]	1348	[1973, 1974]	2121	[1706, 514]	2894	[1848, 726]
576	[851, 1010]	1349	[707, 1368]	2122	[2568, 2647]	2895	[2604, 3006]
577	[26, 1011]	1350	[1975, 1976]	2123	[138, 2648]	2896	[1801, 187]
578	[373, 1012]	1351	[1977, 671]	2124	[2649, 191]	2897	[2667, 579]
579	[1013, 1014]	1352	[1437, 1978]	2125	[1369, 753]	2898	[1729, 1640]
580	[1015, 1016]	1353	[1979, 235]	2126	[2650, 1848]	2899	[2796, 3007]
581	[1017, 1018]	1354	[1936, 1980]	2127	[637, 2651]	2900	[3008, 1666]
582	[1019, 1020]	1355	[1831, 1443]	2128	[1546, 1711]	2901	[831, 1874]
583	[1021, 263]	1356	[1705, 1981]	2129	[2652, 1629]	2902	[2679, 3009]

584	[1022, 1023]	1357	[1982, 1983]	2130	[607, 2653]	2903	[1780, 1390]
585	[76, 1024]	1358	[1984, 233]	2131	[561, 2548]	2904	[1796, 1690]
586	[448, 17]	1359	[1846, 1985]	2132	[1605, 2654]	2905	[1949, 3010]
587	[1025, 1026]	1360	[1502, 1585]	2133	[677, 2655]	2906	[1921, 617]
588	[1027, 1028]	1361	[240, 1986]	2134	[1827, 1645]	2907	[689, 1380]
589	[418, 1013]	1362	[1987, 1655]	2135	[1722, 1537]	2908	[58, 565]
590	[1029, 89]	1363	[1988, 1989]	2136	[734, 1600]	2909	[1637, 1435]
591	[1030, 93]	1364	[338, 1327]	2137	[2656, 1789]	2910	[3011, 2813]
592	[1031, 1032]	1365	[1990, 1991]	2138	[2657, 2658]	2911	[2661, 2833]
593	[1033, 1034]	1366	[1992, 1993]	2139	[2642, 2659]	2912	[2567, 205]
594	[937, 1035]	1367	[287, 1994]	2140	[1897, 2660]	2913	[1404, 1509]
595	[1036, 1037]	1368	[1995, 1996]	2141	[2661, 2633]	2914	[783, 49]
596	[1038, 1039]	1369	[1994, 1997]	2142	[1830, 246]	2915	[2625, 1851]
597	[1040, 68]	1370	[1998, 1999]	2143	[1433, 1474]	2916	[246, 828]
598	[1041, 1027]	1371	[2000, 2001]	2144	[2640, 2662]	2917	[1381, 3012]
599	[1042, 1043]	1372	[2002, 112]	2145	[1518, 1718]	2918	[544, 623]
600	[1015, 892]	1373	[2003, 2004]	2146	[50, 1867]	2919	[3013, 567]
601	[1044, 1045]	1374	[2005, 2006]	2147	[2663, 2664]	2920	[1918, 3014]
602	[1046, 1047]	1375	[1226, 2007]	2148	[2665, 1900]	2921	[1882, 1618]
603	[1048, 1049]	1376	[1161, 297]	2149	[1460, 749]	2922	[1905, 1693]
604	[1050, 456]	1377	[1281, 274]	2150	[647, 2666]	2923	[1728, 2600]
605	[1051, 29]	1378	[1021, 2008]	2151	[2667, 1795]	2924	[625, 3015]
606	[1052, 1053]	1379	[341, 1161]	2152	[1366, 818]	2925	[1387, 3016]
607	[1054, 853]	1380	[2009, 2010]	2153	[1860, 1717]	2926	[2672, 2651]
608	[1055, 851]	1381	[1168, 443]	2154	[2668, 2663]	2927	[1372, 2700]
609	[1056, 1057]	1382	[2011, 2012]	2155	[1920, 239]	2928	[1784, 648]
610	[1058, 1059]	1383	[2013, 2014]	2156	[545, 2669]	2929	[790, 3017]
611	[1060, 1006]	1384	[2001, 2015]	2157	[2670, 1708]	2930	[806, 3018]
612	[251, 1061]	1385	[2016, 2017]	2158	[2671, 611]	2931	[2797, 2658]
613	[1062, 1063]	1386	[2018, 1354]	2159	[1791, 1293]	2932	[1736, 3019]
614	[1064, 1065]	1387	[2019, 2020]	2160	[2672, 2579]	2933	[631, 496]
615	[1066, 1046]	1388	[970, 2021]	2161	[2673, 1580]	2934	[1931, 1592]
616	[1067, 1068]	1389	[1196, 2022]	2162	[2637, 190]	2935	[2612, 137]
617	[1069, 273]	1390	[27, 2023]	2163	[1471, 1739]	2936	[1690, 3020]
618	[1070, 1041]	1391	[2024, 1316]	2164	[2633, 2674]	2937	[525, 3021]
619	[1071, 1072]	1392	[2025, 2026]	2165	[834, 577]	2938	[2630, 1813]
620	[1073, 1074]	1393	[1057, 939]	2166	[2609, 647]	2939	[2715, 2711]
621	[1075, 1076]	1394	[344, 1236]	2167	[2675, 1611]	2940	[62, 2844]
622	[1077, 1018]	1395	[307, 2027]	2168	[2676, 2677]	2941	[1622, 621]
623	[960, 121]	1396	[2028, 855]	2169	[802, 2648]	2942	[751, 3022]
624	[1078, 1079]	1397	[104, 908]	2170	[1582, 2678]	2943	[762, 2559]
625	[1080, 1081]	1398	[2029, 2030]	2171	[1770, 773]	2944	[1987, 782]
626	[908, 1082]	1399	[2031, 2032]	2172	[2679, 1657]	2945	[1490, 3023]
627	[84, 1083]	1400	[2033, 884]	2173	[1950, 2680]	2946	[1879, 1400]

628	[1084, 327]	1401	[2034, 969]	2174	[503, 1842]	2947	[746, 520]
629	[21, 1085]	1402	[2035, 2036]	2175	[798, 664]	2948	[1494, 3024]
630	[1086, 1087]	1403	[2037, 2038]	2176	[1485, 2681]	2949	[2790, 3025]
631	[1088, 1089]	1404	[919, 2039]	2177	[1865, 2682]	2950	[1568, 732]
632	[1090, 403]	1405	[2040, 2041]	2178	[2683, 1491]	2951	[2844, 1734]
633	[1091, 1092]	1406	[967, 2042]	2179	[682, 657]	2952	[1837, 1642]
634	[953, 1093]	1407	[2043, 1192]	2180	[1734, 2684]	2953	[1917, 1625]
635	[303, 1094]	1408	[2044, 2045]	2181	[2685, 818]	2954	[699, 3026]
636	[1095, 1096]	1409	[2046, 2047]	2182	[2686, 1890]	2955	[2741, 575]
637	[1097, 1098]	1410	[985, 2048]	2183	[2687, 2688]	2956	[1626, 3027]
638	[862, 935]	1411	[2049, 1096]	2184	[2689, 840]	2957	[1783, 2725]
639	[1099, 1100]	1412	[2050, 2051]	2185	[497, 1895]	2958	[559, 1974]
640	[326, 1101]	1413	[2042, 2052]	2186	[2641, 232]	2959	[1484, 3028]
641	[1102, 1103]	1414	[2053, 2054]	2187	[1518, 1551]	2960	[1421, 3029]
642	[957, 904]	1415	[860, 2055]	2188	[1872, 60]	2961	[2674, 2576]
643	[1104, 1070]	1416	[2056, 1011]	2189	[471, 203]	2962	[2644, 2552]
644	[1105, 1106]	1417	[2057, 2058]	2190	[1481, 2690]	2963	[2803, 721]
645	[1107, 1108]	1418	[406, 1041]	2191	[1481, 636]	2964	[2582, 3030]
646	[1109, 108]	1419	[2059, 2060]	2192	[1405, 2650]	2965	[1701, 596]
647	[1110, 1111]	1420	[2061, 2062]	2193	[2691, 574]	2966	[1438, 3031]
648	[1112, 1113]	1421	[2063, 2064]	2194	[2692, 12]	2967	[2800, 3032]
649	[1114, 1115]	1422	[2065, 2066]	2195	[2693, 539]	2968	[802, 3033]
650	[274, 1116]	1423	[2067, 2068]	2196	[1459, 742]	2969	[3034, 508]
651	[1063, 266]	1424	[297, 2069]	2197	[1406, 2591]	2970	[2704, 57]
652	[1117, 943]	1425	[2070, 2071]	2198	[140, 132]	2971	[2722, 681]
653	[1118, 118]	1426	[2072, 2073]	2199	[832, 505]	2972	[1727, 1831]
654	[85, 1103]	1427	[2074, 278]	2200	[481, 2694]	2973	[507, 3035]
655	[1119, 1075]	1428	[2075, 2042]	2201	[169, 607]	2974	[1779, 545]
656	[1120, 1121]	1429	[446, 1243]	2202	[1904, 2695]	2975	[2689, 3036]
657	[1122, 1123]	1430	[2076, 2077]	2203	[2696, 788]	2976	[1756, 769]
658	[1124, 1125]	1431	[2078, 1071]	2204	[1758, 39]	2977	[2637, 2649]
659	[1126, 1127]	1432	[2079, 2045]	2205	[559, 2697]	2978	[1732, 2574]
660	[1128, 263]	1433	[2025, 270]	2206	[205, 769]	2979	[3001, 1409]
661	[1129, 1130]	1434	[918, 2080]	2207	[687, 675]	2980	[232, 2659]
662	[1131, 1132]	1435	[2081, 436]	2208	[2698, 1808]	2981	[1459, 3037]
663	[1133, 1134]	1436	[64, 1002]	2209	[247, 2699]	2982	[561, 3038]
664	[255, 1079]	1437	[2082, 106]	2210	[1903, 2700]	2983	[1880, 494]
665	[1135, 1136]	1438	[2083, 1198]	2211	[582, 2640]	2984	[2694, 2641]
666	[1137, 1042]	1439	[2080, 2039]	2212	[1835, 1786]	2985	[2769, 2771]
667	[1138, 1139]	1440	[2084, 2085]	2213	[2701, 2546]	2986	[3039, 3040]
668	[1140, 1141]	1441	[2086, 2087]	2214	[1648, 1858]	2987	[3013, 2545]
669	[1142, 915]	1442	[2088, 927]	2215	[1739, 1608]	2988	[1819, 3041]
670	[844, 928]	1443	[2089, 1004]	2216	[1517, 723]	2989	[1976, 1864]
671	[1143, 1144]	1444	[2090, 1210]	2217	[2702, 2703]	2990	[3039, 1542]

672	[1145, 1146]	1445	[414, 1069]	2218	[2704, 2698]	2991	[47, 771]
673	[365, 1147]	1446	[395, 1102]	2219	[2705, 2706]	2992	[1380, 3011]
674	[1148, 1149]	1447	[949, 1336]	2220	[2707, 584]	2993	[220, 1942]
675	[1150, 1151]	1448	[4, 2091]	2221	[776, 1560]	2994	[3042, 2486]
676	[1086, 1152]	1449	[2092, 1299]	2222	[502, 2615]	2995	[2034, 2297]
677	[1153, 1154]	1450	[2093, 2094]	2223	[2690, 637]	2996	[2976, 3043]
678	[1155, 986]	1451	[2095, 1267]	2224	[1509, 2650]	2997	[3044, 2945]
679	[1156, 25]	1452	[2096, 2097]	2225	[2708, 763]	2998	[3045, 1175]
680	[1157, 1158]	1453	[1328, 1273]	2226	[1567, 2554]	2999	[856, 2053]
681	[1159, 323]	1454	[2024, 2098]	2227	[2709, 2710]	3000	[2113, 1352]
682	[965, 1160]	1455	[1147, 466]	2228	[814, 2711]	3001	[2882, 2366]
683	[1161, 1162]	1456	[943, 2099]	2229	[1461, 750]	3002	[999, 3046]
684	[371, 454]	1457	[1062, 265]	2230	[2553, 210]	3003	[1273, 1338]
685	[1163, 1164]	1458	[2100, 2101]	2231	[221, 1943]	3004	[277, 3047]
686	[1165, 1166]	1459	[2102, 2103]	2232	[33, 764]	3005	[2513, 2969]
687	[96, 124]	1460	[317, 1121]	2233	[2712, 1629]	3006	[3045, 3048]
688	[1064, 883]	1461	[2104, 2105]	2234	[2713, 2714]	3007	[2341, 3049]
689	[1167, 1168]	1462	[2106, 1328]	2235	[813, 2715]	3008	[2407, 902]
690	[268, 1145]	1463	[2107, 860]	2236	[695, 706]	3009	[2379, 2431]
691	[318, 21]	1464	[912, 1229]	2237	[2716, 1869]	3010	[1342, 3050]
692	[1169, 1170]	1465	[2108, 2109]	2238	[2717, 2611]	3011	[3051, 2532]
693	[1171, 903]	1466	[2110, 2111]	2239	[1769, 1464]	3012	[2304, 1021]
694	[1172, 1173]	1467	[907, 2014]	2240	[1800, 186]	3013	[2505, 78]
695	[1174, 1175]	1468	[968, 2052]	2241	[2718, 214]	3014	[1005, 3052]
696	[1176, 116]	1469	[2112, 2113]	2242	[2537, 480]	3015	[2251, 3053]
697	[1177, 1178]	1470	[2114, 1115]	2243	[2719, 2720]	3016	[1227, 961]
698	[1179, 1180]	1471	[2115, 2116]	2244	[2575, 1371]	3017	[1031, 3054]
699	[1181, 843]	1472	[84, 1308]	2245	[1978, 1452]	3018	[894, 331]
700	[1182, 377]	1473	[2117, 83]	2246	[2588, 1568]	3019	[2989, 3055]
701	[1183, 1184]	1474	[2118, 2119]	2247	[1795, 580]	3020	[1348, 2221]
702	[1185, 433]	1475	[1258, 2120]	2248	[38, 2721]	3021	[2106, 1272]
703	[1186, 1187]	1476	[2121, 2122]	2249	[1395, 2688]	3022	[2206, 2417]
704	[1188, 1189]	1477	[2123, 878]	2250	[2722, 2723]	3023	[2220, 3056]
705	[1190, 1191]	1478	[2124, 2125]	2251	[2724, 2725]	3024	[2449, 1044]
706	[376, 364]	1479	[1051, 1180]	2252	[2726, 1776]	3025	[2439, 398]
707	[1192, 362]	1480	[2126, 2127]	2253	[2727, 541]	3026	[1180, 2123]
708	[1193, 1194]	1481	[2128, 1097]	2254	[1476, 1862]	3027	[2388, 2267]
709	[1195, 381]	1482	[325, 1357]	2255	[2638, 1931]	3028	[2983, 3057]
710	[933, 262]	1483	[406, 2129]	2256	[2583, 2728]	3029	[76, 2005]
711	[1196, 1033]	1484	[1101, 2130]	2257	[2729, 2730]	3030	[2012, 3058]
712	[1197, 1198]	1485	[2131, 2132]	2258	[2731, 1963]	3031	[106, 1228]
713	[1199, 290]	1486	[1229, 2133]	2259	[232, 2732]	3032	[2472, 3059]
714	[1200, 1201]	1487	[902, 1247]	2260	[1427, 50]	3033	[2333, 3060]
715	[1202, 1203]	1488	[2134, 2135]	2261	[1597, 2733]	3034	[64, 286]

716	[1204, 1089]	1489	[970, 2136]	2262	[154, 2734]	3035	[426, 3061]
717	[1205, 1206]	1490	[364, 2137]	2263	[2735, 2705]	3036	[435, 2464]
718	[1207, 1181]	1491	[877, 2138]	2264	[689, 2581]	3037	[1339, 3044]
719	[1208, 1209]	1492	[2139, 2140]	2265	[2736, 2737]	3038	[2345, 3062]
720	[303, 1210]	1493	[2141, 2142]	2266	[2738, 587]	3039	[381, 2204]
721	[1211, 1212]	1494	[2143, 2144]	2267	[2739, 1837]	3040	[2383, 3063]
722	[1213, 1214]	1495	[2145, 2047]	2268	[2740, 2741]	3041	[1228, 1998]
723	[1215, 1197]	1496	[2146, 2147]	2269	[2742, 715]	3042	[3064, 1725]
724	[1216, 294]	1497	[2148, 2149]	2270	[1718, 2743]	3043	[1984, 2668]
725	[974, 1217]	1498	[350, 2150]	2271	[2744, 1801]	3044	[2997, 155]
726	[397, 1218]	1499	[1180, 30]	2272	[2701, 2637]	3045	[188, 616]
727	[1219, 982]	1500	[2151, 1345]	2273	[1677, 2745]	3046	[1663, 2846]
728	[398, 1220]	1501	[2152, 1125]	2274	[604, 2746]	3047	[2573, 1911]
729	[1221, 1124]	1502	[2153, 2154]	2275	[603, 211]	3048	[1792, 2716]
730	[1222, 1223]	1503	[2155, 2156]	2276	[2747, 2748]	3049	[1475, 1803]
731	[1224, 1225]	1504	[109, 2157]	2277	[570, 228]	3050	[2685, 184]
732	[345, 315]	1505	[6, 1084]	2278	[2749, 1968]	3051	[1741, 1670]
733	[1226, 1097]	1506	[1188, 910]	2279	[1691, 1823]	3052	[212, 3065]
734	[1227, 298]	1507	[2005, 2158]	2280	[2639, 1592]	3053	[1608, 3066]
735	[1228, 1229]	1508	[2159, 2160]	2281	[2750, 1928]	3054	[1881, 1617]
736	[1230, 1226]	1509	[1106, 1158]	2282	[1975, 1863]	3055	[2846, 3067]
737	[1018, 1231]	1510	[940, 440]	2283	[244, 794]	3056	[1564, 3068]
738	[1124, 1232]	1511	[301, 2004]	2284	[826, 478]	3057	[245, 3069]
739	[1233, 71]	1512	[1257, 2161]	2285	[1411, 2628]	3058	[2814, 523]
740	[404, 1234]	1513	[2162, 1176]	2286	[729, 744]	3059	[2812, 1641]
741	[1235, 1236]	1514	[401, 426]	2287	[833, 705]	3060	[39, 3070]
742	[436, 1237]	1515	[914, 2163]	2288	[1955, 2745]	3061	[240, 3071]
743	[1238, 1020]	1516	[1187, 2164]	2289	[470, 1472]	3062	[2715, 3072]
744	[1239, 967]	1517	[2059, 997]	2290	[713, 167]	3063	[1665, 1675]
745	[1240, 1241]	1518	[1301, 2015]	2291	[2748, 2751]	3064	[3073, 2412]
746	[1242, 1243]	1519	[2165, 309]	2292	[2752, 174]	3065	[2856, 3074]
747	[1244, 1197]	1520	[2166, 1300]	2293	[1941, 2753]	3066	[1093, 2978]
748	[917, 1245]	1521	[1187, 451]	2294	[2563, 1410]	3067	[2264, 347]
749	[1246, 1247]	1522	[2167, 89]	2295	[2754, 2561]	3068	[1078, 3075]
750	[1248, 1249]	1523	[2168, 1161]	2296	[1919, 1535]	3069	[1324, 3076]
751	[1250, 1251]	1524	[89, 275]	2297	[2755, 2563]	3070	[2869, 435]
752	[460, 1252]	1525	[2169, 2170]	2298	[2756, 2677]	3071	[453, 2228]
753	[1253, 952]	1526	[1116, 865]	2299	[549, 2757]	3072	[2887, 3077]
754	[1254, 846]	1527	[2171, 1071]	2300	[1874, 827]	3073	[3078, 2769]
755	[1255, 1256]	1528	[2172, 2116]	2301	[2758, 199]	3074	[2774, 3079]
756	[294, 913]	1529	[845, 2173]	2302	[1496, 2759]	3075	[2819, 1523]
757	[1257, 889]	1530	[266, 1102]	2303	[2651, 1721]	3076	[2741, 3080]
758	[1258, 1200]	1531	[268, 2174]	2304	[1400, 494]	3077	[9, 3081]
759	[1259, 1260]	1532	[2175, 2176]	2305	[2760, 1986]	3078	[3082, 2970]

760	[1261, 1003]	1533	[2177, 2178]	2306	[2761, 797]	3079	[2952, 3083]
761	[453, 421]	1534	[2179, 2180]	2307	[1662, 1709]	3080	[2957, 1331]
762	[1262, 1263]	1535	[2181, 454]	2308	[1708, 1572]	3081	[2171, 2910]
763	[954, 1264]	1536	[112, 254]	2309	[2735, 639]	3082	[3084, 1938]
764	[1265, 875]	1537	[2138, 2182]	2310	[1809, 2762]	3083	[1383, 3085]
765	[1266, 269]	1538	[1029, 2183]	2311	[2713, 1512]	3084	[3086, 2505]
766	[1267, 1268]	1539	[2184, 2160]	2312	[1364, 1684]	3085	[2356, 2305]
767	[334, 989]	1540	[1262, 1282]	2313	[757, 2763]	3086	[3087, 1655]
768	[1269, 1270]	1541	[302, 2090]	2314	[2764, 1820]	3087	[3088, 1290]
769	[336, 1270]	1542	[2185, 390]	2315	[1570, 2765]	3088	[3089, 1921]
770	[1271, 419]	1543	[2186, 2187]	2316	[2612, 801]	3089	[3, 2496]
771	[1272, 1273]	1544	[2188, 2189]	2317	[1717, 2766]		
772	[1274, 1275]	1545	[2039, 2190]	2318	[1743, 550]		

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	516	1	1032	1	1548	1	2064	0	2580	1
1	0	517	0	1033	0	1549	0	2065	0	2581	0
2	0	518	1	1034	1	1550	0	2066	1	2582	1
3	0	519	0	1035	1	1551	1	2067	0	2583	0
4	0	520	1	1036	0	1552	1	2068	0	2584	0
5	0	521	0	1037	0	1553	1	2069	1	2585	0
6	0	522	1	1038	1	1554	0	2070	0	2586	1
7	0	523	1	1039	1	1555	1	2071	1	2587	1
8	1	524	1	1040	1	1556	0	2072	0	2588	0
9	0	525	0	1041	1	1557	1	2073	0	2589	1
10	0	526	0	1042	1	1558	0	2074	1	2590	0
11	0	527	0	1043	1	1559	1	2075	1	2591	0
12	0	528	0	1044	1	1560	0	2076	1	2592	1
13	0	529	1	1045	1	1561	0	2077	0	2593	0
14	1	530	1	1046	1	1562	1	2078	0	2594	0
15	0	531	1	1047	0	1563	0	2079	1	2595	1
16	0	532	0	1048	0	1564	1	2080	1	2596	0
17	1	533	0	1049	0	1565	0	2081	0	2597	0
18	0	534	0	1050	1	1566	1	2082	0	2598	0
19	0	535	1	1051	1	1567	1	2083	1	2599	1
20	1	536	0	1052	0	1568	0	2084	1	2600	1
21	0	537	1	1053	0	1569	1	2085	0	2601	0
22	1	538	1	1054	0	1570	0	2086	0	2602	0
23	0	539	1	1055	0	1571	0	2087	1	2603	1
24	0	540	1	1056	1	1572	1	2088	0	2604	0
25	0	541	1	1057	0	1573	1	2089	0	2605	0
26	1	542	1	1058	1	1574	1	2090	1	2606	0
27	0	543	0	1059	1	1575	0	2091	0	2607	1

28	1	544	0	1060	1	1576	1	2092	0	2608	0
29	1	545	1	1061	1	1577	1	2093	1	2609	1
30	1	546	0	1062	1	1578	1	2094	0	2610	1
31	0	547	0	1063	1	1579	1	2095	0	2611	1
32	0	548	0	1064	1	1580	0	2096	0	2612	1
33	0	549	1	1065	0	1581	1	2097	0	2613	0
34	0	550	0	1066	1	1582	0	2098	1	2614	0
35	1	551	0	1067	0	1583	0	2099	0	2615	1
36	1	552	1	1068	0	1584	1	2100	1	2616	1
37	0	553	1	1069	0	1585	1	2101	1	2617	0
38	1	554	1	1070	0	1586	0	2102	0	2618	1
39	0	555	1	1071	1	1587	0	2103	1	2619	0
40	0	556	0	1072	0	1588	0	2104	1	2620	1
41	1	557	1	1073	0	1589	1	2105	0	2621	0
42	1	558	1	1074	0	1590	1	2106	1	2622	0
43	0	559	0	1075	1	1591	1	2107	1	2623	0
44	0	560	1	1076	0	1592	1	2108	1	2624	1
45	1	561	0	1077	1	1593	0	2109	1	2625	0
46	1	562	1	1078	1	1594	1	2110	0	2626	0
47	0	563	0	1079	1	1595	1	2111	1	2627	0
48	1	564	0	1080	0	1596	0	2112	0	2628	1
49	0	565	0	1081	1	1597	1	2113	0	2629	0
50	0	566	0	1082	0	1598	1	2114	0	2630	1
51	0	567	1	1083	0	1599	1	2115	0	2631	1
52	1	568	1	1084	1	1600	0	2116	0	2632	0
53	1	569	1	1085	0	1601	0	2117	1	2633	1
54	0	570	0	1086	1	1602	1	2118	0	2634	1
55	0	571	1	1087	0	1603	1	2119	0	2635	1
56	0	572	0	1088	1	1604	1	2120	1	2636	1
57	1	573	0	1089	1	1605	1	2121	1	2637	0
58	0	574	1	1090	0	1606	1	2122	0	2638	1
59	1	575	0	1091	1	1607	1	2123	0	2639	1
60	0	576	0	1092	0	1608	0	2124	1	2640	0
61	1	577	1	1093	0	1609	0	2125	1	2641	1
62	1	578	1	1094	1	1610	0	2126	0	2642	0
63	0	579	0	1095	0	1611	0	2127	1	2643	1
64	0	580	1	1096	0	1612	0	2128	0	2644	0
65	0	581	0	1097	1	1613	0	2129	0	2645	0
66	1	582	1	1098	0	1614	0	2130	0	2646	0
67	0	583	1	1099	0	1615	1	2131	0	2647	1
68	1	584	1	1100	1	1616	0	2132	1	2648	1
69	0	585	1	1101	0	1617	1	2133	0	2649	1
70	0	586	0	1102	0	1618	1	2134	0	2650	0
71	1	587	0	1103	0	1619	1	2135	1	2651	0

72	1	588	0	1104	1	1620	0	2136	0	2652	0
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74	1	590	0	1106	1	1622	1	2138	0	2654	0
75	0	591	0	1107	1	1623	0	2139	0	2655	0
76	1	592	0	1108	0	1624	0	2140	1	2656	0
77	1	593	0	1109	0	1625	0	2141	1	2657	0
78	1	594	0	1110	0	1626	0	2142	1	2658	1
79	0	595	0	1111	1	1627	0	2143	0	2659	0
80	0	596	1	1112	1	1628	0	2144	0	2660	0
81	0	597	1	1113	0	1629	1	2145	1	2661	1
82	0	598	1	1114	1	1630	0	2146	0	2662	1
83	1	599	1	1115	0	1631	1	2147	1	2663	1
84	0	600	1	1116	0	1632	0	2148	1	2664	0
85	1	601	1	1117	0	1633	1	2149	0	2665	1
86	1	602	1	1118	1	1634	1	2150	0	2666	0
87	0	603	0	1119	1	1635	0	2151	0	2667	0
88	1	604	1	1120	1	1636	0	2152	1	2668	0
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90	0	606	0	1122	1	1638	1	2154	0	2670	0
91	1	607	0	1123	0	1639	1	2155	1	2671	0
92	1	608	0	1124	0	1640	1	2156	1	2672	0
93	1	609	1	1125	0	1641	1	2157	0	2673	1
94	0	610	1	1126	1	1642	0	2158	0	2674	1
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96	0	612	1	1128	0	1644	1	2160	0	2676	1
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98	1	614	1	1130	0	1646	1	2162	0	2678	0
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123	1	639	0	1155	0	1671	1	2187	1	2703	0
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126	1	642	1	1158	0	1674	1	2190	0	2706	0
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129	0	645	1	1161	0	1677	0	2193	1	2709	1
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136	0	652	0	1168	1	1684	0	2200	0	2716	1
137	1	653	1	1169	0	1685	1	2201	1	2717	0
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139	0	655	1	1171	0	1687	0	2203	1	2719	0
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146	1	662	1	1178	0	1694	0	2210	0	2726	0
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148	1	664	0	1180	0	1696	0	2212	1	2728	1
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150	0	666	0	1182	0	1698	1	2214	1	2730	1
151	1	667	0	1183	0	1699	0	2215	0	2731	0
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153	1	669	0	1185	0	1701	1	2217	0	2733	1
154	1	670	1	1186	1	1702	1	2218	0	2734	0
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156	1	672	1	1188	1	1704	0	2220	0	2736	0
157	1	673	1	1189	0	1705	1	2221	0	2737	0
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159	1	675	1	1191	0	1707	1	2223	1	2739	1

160	0	676	1	1192	0	1708	0	2224	1	2740	1
161	1	677	0	1193	0	1709	1	2225	1	2741	1
162	0	678	0	1194	0	1710	1	2226	1	2742	1
163	0	679	1	1195	1	1711	0	2227	1	2743	0
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166	1	682	0	1198	0	1714	1	2230	0	2746	0
167	1	683	0	1199	0	1715	0	2231	1	2747	0
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169	1	685	0	1201	0	1717	0	2233	1	2749	1
170	1	686	1	1202	0	1718	0	2234	1	2750	1
171	0	687	0	1203	1	1719	1	2235	0	2751	0
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176	1	692	0	1208	1	1724	1	2240	1	2756	0
177	0	693	0	1209	1	1725	0	2241	1	2757	0
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184	1	700	0	1216	1	1732	0	2248	1	2764	0
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187	0	703	1	1219	1	1735	1	2251	0	2767	0
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196	1	712	0	1228	1	1744	0	2260	1	2776	0
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198	0	714	0	1230	1	1746	0	2262	1	2778	0
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200	1	716	0	1232	1	1748	0	2264	0	2780	1
201	0	717	1	1233	0	1749	0	2265	0	2781	1
202	1	718	1	1234	1	1750	1	2266	0	2782	1
203	0	719	1	1235	1	1751	1	2267	1	2783	0

204	0	720	0	1236	0	1752	1	2268	1	2784	1
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206	1	722	0	1238	0	1754	0	2270	0	2786	0
207	0	723	0	1239	1	1755	0	2271	0	2787	1
208	1	724	1	1240	1	1756	1	2272	0	2788	1
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251	1	767	0	1283	1	1799	1	2315	0	2831	1
252	0	768	0	1284	1	1800	1	2316	1	2832	0
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261	1	777	0	1293	0	1809	0	2325	0	2841	1
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266	1	782	1	1298	0	1814	1	2330	0	2846	0
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268	0	784	0	1300	1	1816	0	2332	1	2848	1
269	1	785	1	1301	1	1817	0	2333	0	2849	0
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271	0	787	1	1303	1	1819	1	2335	0	2851	1
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275	1	791	1	1307	1	1823	1	2339	0	2855	1
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279	0	795	0	1311	0	1827	0	2343	0	2859	1
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295	1	811	0	1327	0	1843	0	2359	1	2875	0
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332	1	848	1	1364	0	1880	1	2396	1	2912	1
333	0	849	0	1365	1	1881	0	2397	1	2913	0
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346	1	862	0	1378	1	1894	0	2410	0	2926	0
347	1	863	0	1379	0	1895	0	2411	0	2927	1
348	1	864	1	1380	1	1896	0	2412	1	2928	0
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350	1	866	1	1382	0	1898	1	2414	1	2930	1
351	1	867	0	1383	1	1899	0	2415	1	2931	1
352	1	868	0	1384	0	1900	0	2416	1	2932	1
353	1	869	0	1385	1	1901	0	2417	1	2933	1
354	1	870	0	1386	0	1902	0	2418	0	2934	0
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358	0	874	0	1390	0	1906	0	2422	1	2938	1
359	1	875	1	1391	0	1907	1	2423	1	2939	0
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361	0	877	1	1393	0	1909	1	2425	1	2941	1
362	0	878	0	1394	0	1910	1	2426	0	2942	0
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366	1	882	0	1398	1	1914	0	2430	1	2946	0
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368	0	884	1	1400	0	1916	1	2432	0	2948	0
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371	1	887	0	1403	0	1919	1	2435	1	2951	0
372	1	888	0	1404	0	1920	1	2436	0	2952	0
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374	1	890	0	1406	0	1922	1	2438	1	2954	1
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428	0	944	1	1460	0	1976	1	2492	1	3008	0
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430	1	946	1	1462	1	1978	0	2494	1	3010	0
431	0	947	0	1463	1	1979	1	2495	1	3011	0
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515	0	1031	0	1547	0	2063	0	2579	1		

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