# PROOF OF THE CONTINUED FRACTION CONJECTURE FOR $(a,b)=(z^5+z^4+z+1, z^2+z+1)$

GUO-NIU HAN* AND YINING HU*

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 $(a,b)=(z^5+z^4+z+1, z^2+z+1)$.

## 1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

*Date*: runone at : 30/04/2020 17:28:40 .

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

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

* This paper was automatically generated from a computer program developed by the authors, with 37.0 minutes CPU time used.

**Theorem 1.1.** *When* $(a, b) = (z^5 + z^4 + z + 1, z^2 + z + 1)$*, the two power series* $\mathrm{CF}(a, b)$ *and* $\mathrm{CF}(b, a)$ *are algebraic over* $\mathbb{F}_2(z)$*, with minimal polynomials of the form*

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

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

$$\begin{aligned}
p_0(z) &= z^{21} + z^{18} + z^{14} + z^{11} + z^9 + z^8 + z^4 + z^3 + 1,\\
p_1(z) &= z^{26} + z^{25} + z^{22} + z^{20} + z^{16} + z^{15} + z^{14} + z^{13} + z^{12} + z^7 + z^4 + z^2,\\
p_2(z) &= z^{28} + z^{24} + z^{22} + z^{16} + z^{14} + z^8 + z^4 + 1,\\
p_3(z) &= z^{26} + z^{25} + z^{22} + z^{20} + z^{16} + z^{15} + z^{14} + z^{13} + z^{12} + z^7 + z^4 + z^2,\\
p_4(z) &= z^{24} + z^{22} + z^{21} + z^{20} + z^{18} + z^{16} + z^{12} + z^{11} + z^9 + z^8 + z^3 + 1,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z) &= z^{21} + z^{20} + z^{18} + z^{16} + z^{14} + z^{11} + z^9 + z^4 + z^3 + 1,\\
p_1(z) &= z^{26} + z^{25} + z^{22} + z^{20} + z^{16} + z^{15} + z^{14} + z^{13} + z^{12} + z^7 + z^4 + z^2,\\
p_2(z) &= z^{28} + z^{24} + z^{22} + z^{16} + z^{14} + z^8 + z^4 + 1,\\
p_3(z) &= z^{26} + z^{25} + z^{22} + z^{20} + z^{16} + z^{15} + z^{14} + z^{13} + z^{12} + z^7 + z^4 + z^2,\\
p_4(z) &= z^{24} + z^{22} + z^{21} + z^{18} + z^{12} + z^{11} + z^9 + z^3 + 1.
\end{aligned}$$

## 2. Proof

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

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

By the basic properties of continued fractions, we have

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

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

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

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

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

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

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

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

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

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

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

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

of the vector

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

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

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

**Lemma 2.1.** *We have*

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

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

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

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

*Proof.* We give the proof of the identity

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

the proofs of the others being similar.

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

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

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

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

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

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

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

Define

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

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

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

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

$$M^o[:14u] = M^o[:7u] + x^{3u}M^o[:4u] + x^{6u}M^o[:u] + x^{3u}M^o[:7u] + x^{6u}M^o[:4u]$$

$$+ x^{9u}M^o[:u] + x^{10u}M^o[:4u] + (x^{7u} + x^{10u})R^o,$$

$$W^o[:14u] = W^o[:7u] + x^{3u}W^o[:4u] + x^{6u}W^o[:u] + x^{3u}W^o[:7u] + x^{6u}W^o[:4u] + x^{9u}W^o[:u] + x^{10u}W^o[:4u] + (x^{7u} + x^{10u})R^o.$$

*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 $u = 2^{2k}$,

$$T[:14u] = T[:7u] + x^{3u}T[:4u] + x^{6u}T[:u] + x^{3u}T[:7u] + x^{6u}T[:4u] + x^{9u}T[:u] + x^{10u}T[:4u] + (x^{7u} + x^{10u}).$$

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

$$\begin{aligned}
x^7u &= x^{6u}T[u:2u] + x^{3u}T[4u:5u] + T[7u:8u],\\
0 &= x^{6u}T[2u:3u] + x^{3u}T[5u:6u] + T[8u:9u],\\
0 &= x^{9u}T[:u] + x^{6u}T[3u:4u] + x^{3u}T[6u:7u] + T[9u:10u],\\
x^1 0u &= x^{10u}T[:u] + T[10u:11u],\\
0 &= x^{10u}T[u:2u] + T[11u:12u],\\
0 &= x^{10u}T[2u:3u] + T[12u:13u],\\
0 &= x^{10u}T[3u:4u] + T[13u:14u],
\end{aligned}$$

which can be rewritten as

$$0 = T[[1w]_2] + T[[100w]_2] + T[[111w]_2], \tag{2.7}$$

$$0 = T[[10w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.8}$$

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

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

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

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

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

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

$$1 = T[[1w]_2] + T[[100w]_2] + T[[111w]_2], \tag{2.14}$$

$$0 = T[[10w]_2] + T[[101w]_2] + T[[1000w]_2], \tag{2.15}$$

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

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

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

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

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

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

First we calculate an 2-automaton that generates $T$ from its minimal polynomial and its first terms. This automaton has 1514 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 $\tau$ the output function. Define

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

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

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

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

$$1 = \tau(A(s,1)) + \tau(A(s,100)) + \tau(A(s,111)), \tag{2.28}$$
$$0 = \tau(A(s,10)) + \tau(A(s,101)) + \tau(A(s,1000)), \tag{2.29}$$
$$0 = \tau(A(s,\epsilon)) + \tau(A(s,11)) + \tau(A(s,110)) + \tau(A(s,1001)), \tag{2.30}$$
$$1 = \tau(A(s,\epsilon)) + \tau(A(s,1010)), \tag{2.31}$$
$$0 = \tau(A(s,1)) + \tau(A(s,1011)), \tag{2.32}$$
$$0 = \tau(A(s,10)) + \tau(A(s,1100)), \tag{2.33}$$
$$0 = \tau(A(s,11)) + \tau(A(s,1101)), \tag{2.34}$$

for $s = A(i, 0^{2k})$. We find that $(A(i,0^{28}), E_{28}) = (A(i,0^{16}), E_{16})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 14$, which turns out to be true. $\square$

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

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

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

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

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

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

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

We give the proof of

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

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

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

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

$$W^e[:14v]M^e[:14v] + x^{6v}W^e[:8v]M^e[:8v] + x^{12v}W^e[:2v]M^e[:2v].$$

For all $n \leq 14$, replace the occurrences of $W^e[:n \cdot v]$ and $M^e[:n \cdot v]$ in the above expression by the reduction modulo $x^{n \cdot v}$ of the right side of the corresponding identity in Lemma 2.2 and get a new expression, which we call $rhs$. Define

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

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

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

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

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

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

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

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

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

Define

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

where

$$q_0(x) = x^{28} + x^{25} + x^{24} + x^{20} + x^{19} + x^{17} + x^{14} + x^{10} + x^7,$$

$$
\begin{aligned}
q_1(x) &= x^{26}+x^{24}+x^{21}+x^{16}+x^{15}+x^{14}+x^{13}+x^{12}+x^{8}+x^{6}+x^{3}+x^{2},\\
q_2(x) &= x^{28}+x^{24}+x^{20}+x^{14}+x^{12}+x^{6}+x^{4}+1,\\
q_3(x) &= x^{26}+x^{24}+x^{21}+x^{16}+x^{15}+x^{14}+x^{13}+x^{12}+x^{8}+x^{6}+x^{3}+x^{2},\\
q_4(x) &= x^{28}+x^{25}+x^{20}+x^{19}+x^{17}+x^{16}+x^{12}+x^{10}+x^{8}+x^{7}+x^{6}+x^{4}.
\end{aligned}
$$

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 216, and substitute it for $y$ in $R(z,y)$, we get a series with valuation smaller than 216, which proves that $R(z,y)$ is not an annihilating polynomial of $f(x)$. Finally, $z^{12}Q(1/z,y)$ is the minimal polynomial of $\mathrm{CF}(a,b)=f(1/z)$. □

## 3. Annexe

All 16 polynomials are of the form

$$p_0(x)+p_3(x)y^3+p_6(x)y^6+p_9(x)y^9+p_{12}(x)y^{12}.$$

The coefficients $p_j(x)$ and the 16 initial terms to determine the solutions uniquely are given below.

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

$$
\begin{aligned}
p_0(x) &= x^{138}+x^{136}+x^{132}+x^{130}+x^{126}+x^{124}+x^{122}+x^{120}+x^{116}+x^{112}\\
&\quad +x^{110}+x^{100}+x^{98}+x^{96}+x^{90}+x^{88}+x^{84}+x^{78}+x^{72}+x^{70}+x^{66}\\
&\quad +x^{60}+x^{58}+x^{54}+x^{42}+x^{40}+x^{36}+x^{32}+x^{28}+x^{26}+x^{24},\\
p_3(x) &= x^{134}+x^{132}+x^{130}+x^{126}+x^{122}+x^{116}+x^{114}+x^{112}+x^{110}+x^{106}\\
&\quad +x^{104}+x^{102}+x^{96}+x^{94}+x^{90}+x^{86}+x^{74}+x^{62}+x^{56}+x^{46}+x^{44}\\
&\quad +x^{40}+x^{38}+x^{36}+x^{34}+x^{32}+x^{28}+x^{26}+x^{24}+x^{22}+x^{20}+x^{16},\\
p_6(x) &= x^{132}+x^{130}+x^{128}+x^{120}+x^{116}+x^{98}+x^{92}+x^{84}+x^{82}+x^{80}+x^{78}\\
&\quad +x^{76}+x^{74}+x^{70}+x^{68}+x^{66}+x^{64}+x^{62}+x^{50}+x^{46}+x^{40}+x^{38}\\
&\quad +x^{36}+x^{32}+x^{30}+x^{28}+x^{26}+x^{22}+x^{18}+x^{16}+x^{14}+x^{12}+x^{10}\\
&\quad +x^{4}+x^{2}+1,\\
p_9(x) &= x^{134}+x^{132}+x^{124}+x^{122}+x^{118}+x^{116}+x^{112}+x^{110}+x^{96}+x^{94}\\
&\quad +x^{92}+x^{86}+x^{78}+x^{70}+x^{68}+x^{66}+x^{64}+x^{62}+x^{56}+x^{50}+x^{48}\\
&\quad +x^{46}+x^{42}+x^{36}+x^{34}+x^{32}+x^{30}+x^{20}+x^{10}+x^{4},\\
p_{12}(x) &= x^{138}+x^{136}+x^{114}+x^{112}+x^{106}+x^{104}+x^{90}+x^{88}+x^{82}+x^{80}\\
&\quad +x^{66}+x^{64}+x^{58}+x^{56}+x^{34}+x^{32}+x^{26}+x^{24}+x^{2}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147}+x^{144}+x^{141}+x^{140}+x^{138}+x^{136}+x^{132}+x^{130}+x^{128}+x^{126}\\
&\quad +x^{124}+x^{121}+x^{120}+x^{115}+x^{113}+x^{112}+x^{109}+x^{108}+x^{107}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{105} + x^{103} + x^{101} + x^{100} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92}\\
&+ x^{90} + x^{89} + x^{88} + x^{87} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{72} + x^{69}\\
&+ x^{68} + x^{65} + x^{64} + x^{59} + x^{57} + x^{56} + x^{54} + x^{53} + x^{52} + x^{46} + x^{44}\\
&+ x^{43} + x^{40} + x^{37} + x^{36} + x^{35} + x^{33},\\
p_3(x) = {}& x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115}\\
&+ x^{112} + x^{111} + x^{110} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98}\\
&+ x^{97} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{85} + x^{82} + x^{80} + x^{79} + x^{78}\\
&+ x^{77} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{67} + x^{66} + x^{65} + x^{63}\\
&+ x^{62} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{19} + x^{18},\\
p_6(x) = {}& x^{135} + x^{132} + x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{118} + x^{117} + x^{114}\\
&+ x^{113} + x^{111} + x^{110} + x^{108} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100}\\
&+ x^{98} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} + x^{81} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{74} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60}\\
&+ x^{59} + x^{58} + x^{56} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{26} + x^{25} + x^{22} + x^{17} + x^{15} + x^{14}\\
&+ x^{12},\\
p_9(x) = {}& x^{141} + x^{139} + x^{138} + x^{131} + x^{128} + x^{127} + x^{126} + x^{117} + x^{114} + x^{113}\\
&+ x^{112} + x^{109} + x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{99} + x^{97}\\
&+ x^{96} + x^{95} + x^{92} + x^{90} + x^{89} + x^{88} + x^{85} + x^{82} + x^{80} + x^{78} + x^{77}\\
&+ x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{65} + x^{62} + x^{61} + x^{60} + x^{53} + x^{50}\\
&+ x^{48} + x^{47} + x^{46} + x^{43} + x^{41} + x^{40} + x^{35} + x^{33} + x^{32} + x^{31} + x^{29}\\
&+ x^{28} + x^{25} + x^{22} + x^{20} + x^{19} + x^{18} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) = {}& x^{147} + x^{144} + x^{143} + x^{140} + x^{135} + x^{132} + x^{127} + x^{124} + x^{119} + x^{116}\\
&+ x^{111} + x^{108} + x^{103} + x^{100} + x^{99} + x^{96} + x^{83} + x^{80} + x^{79} + x^{76}\\
&+ x^{71} + x^{68} + x^{63} + x^{60} + x^{55} + x^{52} + x^{47} + x^{44} + x^{39} + x^{36} + x^{31}\\
&+ x^{28} + x^{23} + x^{20} + x^{15} + x^{12} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{144} + x^{141} + x^{140} + x^{138} + x^{136} + x^{132} + x^{130} + x^{128} + x^{126}\\
&+ x^{124} + x^{121} + x^{120} + x^{115} + x^{113} + x^{112} + x^{109} + x^{108} + x^{107}\\
&+ x^{105} + x^{103} + x^{101} + x^{100} + x^{98} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92}\\
&+ x^{90} + x^{89} + x^{88} + x^{87} + x^{83} + x^{82} + x^{81} + x^{80} + x^{78} + x^{72} + x^{69}\\
&+ x^{68} + x^{65} + x^{64} + x^{59} + x^{57} + x^{56} + x^{54} + x^{53} + x^{52} + x^{46} + x^{44}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{43} + x^{40} + x^{37} + x^{36} + x^{35} + x^{33},\\
p_3(x) = {}& x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115}\\
&+ x^{112} + x^{111} + x^{110} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98}\\
&+ x^{97} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{85} + x^{82} + x^{80} + x^{79} + x^{78}\\
&+ x^{77} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{67} + x^{66} + x^{65} + x^{63}\\
&+ x^{62} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{19} + x^{18},\\
p_6(x) = {}& x^{135} + x^{132} + x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{118} + x^{117} + x^{114}\\
&+ x^{113} + x^{111} + x^{110} + x^{108} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100}\\
&+ x^{98} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} + x^{81} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{74} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60}\\
&+ x^{59} + x^{58} + x^{56} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{26} + x^{25} + x^{22} + x^{17} + x^{15} + x^{14}\\
&+ x^{12},\\
p_9(x) = {}& x^{141} + x^{139} + x^{138} + x^{131} + x^{128} + x^{127} + x^{126} + x^{117} + x^{114} + x^{113}\\
&+ x^{112} + x^{109} + x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{99} + x^{97}\\
&+ x^{96} + x^{95} + x^{92} + x^{90} + x^{89} + x^{88} + x^{85} + x^{82} + x^{80} + x^{78} + x^{77}\\
&+ x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{65} + x^{62} + x^{61} + x^{60} + x^{53} + x^{50}\\
&+ x^{48} + x^{47} + x^{46} + x^{43} + x^{41} + x^{40} + x^{35} + x^{33} + x^{32} + x^{31} + x^{29}\\
&+ x^{28} + x^{25} + x^{22} + x^{20} + x^{19} + x^{18} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) = {}& x^{147} + x^{144} + x^{143} + x^{140} + x^{135} + x^{132} + x^{127} + x^{124} + x^{119} + x^{116}\\
&+ x^{111} + x^{108} + x^{103} + x^{100} + x^{99} + x^{96} + x^{83} + x^{80} + x^{79} + x^{76}\\
&+ x^{71} + x^{68} + x^{63} + x^{60} + x^{55} + x^{52} + x^{47} + x^{44} + x^{39} + x^{36} + x^{31}\\
&+ x^{28} + x^{23} + x^{20} + x^{15} + x^{12} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{156} + x^{154} + x^{152} + x^{150} + x^{148} + x^{146} + x^{144} + x^{140} + x^{136} + x^{128}\\
&+ x^{126} + x^{122} + x^{118} + x^{114} + x^{110} + x^{108} + x^{104} + x^{98} + x^{94} + x^{92}\\
&+ x^{88} + x^{86} + x^{82} + x^{80} + x^{78} + x^{70} + x^{66} + x^{62} + x^{60} + x^{58} + x^{56}\\
&+ x^{48} + x^{46} + x^{44} + x^{42},\\
p_3(x) = {}& x^{152} + x^{150} + x^{142} + x^{140} + x^{138} + x^{128} + x^{122} + x^{116} + x^{114} + x^{112}\\
&+ x^{108} + x^{106} + x^{104} + x^{102} + x^{96} + x^{94} + x^{86} + x^{84} + x^{80} + x^{74}\\
&+ x^{72} + x^{70} + x^{68} + x^{66} + x^{60} + x^{58} + x^{54} + x^{52} + x^{50} + x^{48} + x^{40}\\
&+ x^{38} + x^{32} + x^{26} + x^{18} + x^{12},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) &= x^{150} + x^{146} + x^{142} + x^{140} + x^{136} + x^{134} + x^{126} + x^{124} + x^{114} + x^{110}\\
&\quad + x^{106} + x^{104} + x^{98} + x^{96} + x^{94} + x^{90} + x^{86} + x^{84} + x^{82} + x^{78} + x^{74}\\
&\quad + x^{70} + x^{64} + x^{60} + x^{44} + x^{42} + x^{38} + x^{36} + x^{34} + x^{30} + x^{28} + x^{24}\\
&\quad + x^{22} + x^{16} + x^{12} + x^{8} + x^{2} + 1,\\
p_9(x) &= x^{152} + x^{150} + x^{148} + x^{144} + x^{138} + x^{136} + x^{128} + x^{126} + x^{122} + x^{120}\\
&\quad + x^{116} + x^{112} + x^{106} + x^{104} + x^{94} + x^{92} + x^{88} + x^{86} + x^{82} + x^{80}\\
&\quad + x^{78} + x^{76} + x^{74} + x^{68} + x^{64} + x^{50} + x^{46} + x^{44} + x^{42} + x^{40} + x^{28}\\
&\quad + x^{26} + x^{24} + x^{16} + x^{8} + x^{4},\\
p_{12}(x) &= x^{156} + x^{154} + x^{152} + x^{148} + x^{146} + x^{144} + x^{108} + x^{106} + x^{104} + x^{100}\\
&\quad + x^{98} + x^{96} + x^{92} + x^{90} + x^{88} + x^{84} + x^{82} + x^{80} + x^{12} + x^{10} + x^{8}\\
&\quad + x^{4} + x^{2} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{156} + x^{154} + x^{152} + x^{150} + x^{138} + x^{136} + x^{130} + x^{126} + x^{124} + x^{120}\\
&\quad + x^{118} + x^{114} + x^{112} + x^{106} + x^{102} + x^{98} + x^{96} + x^{94} + x^{92} + x^{90}\\
&\quad + x^{78} + x^{76} + x^{74} + x^{72} + x^{70} + x^{68} + x^{66} + x^{62} + x^{60} + x^{58} + x^{44}\\
&\quad + x^{42} + x^{34} + x^{26} + x^{24},\\
p_3(x) &= x^{152} + x^{150} + x^{144} + x^{140} + x^{132} + x^{128} + x^{124} + x^{118} + x^{112} + x^{106}\\
&\quad + x^{104} + x^{102} + x^{100} + x^{98} + x^{94} + x^{92} + x^{88} + x^{84} + x^{82} + x^{78} + x^{76}\\
&\quad + x^{68} + x^{66} + x^{64} + x^{56} + x^{54} + x^{52} + x^{44} + x^{34} + x^{32} + x^{28} + x^{26}\\
&\quad + x^{20} + x^{16},\\
p_6(x) &= x^{150} + x^{148} + x^{140} + x^{138} + x^{136} + x^{134} + x^{130} + x^{124} + x^{122} + x^{120}\\
&\quad + x^{116} + x^{114} + x^{112} + x^{110} + x^{104} + x^{102} + x^{100} + x^{98} + x^{90} + x^{88}\\
&\quad + x^{82} + x^{76} + x^{70} + x^{68} + x^{60} + x^{50} + x^{46} + x^{44} + x^{42} + x^{40} + x^{36}\\
&\quad + x^{30} + x^{28} + x^{26} + x^{24} + x^{20} + x^{14} + x^{10} + x^{2} + 1,\\
p_9(x) &= x^{152} + x^{150} + x^{148} + x^{144} + x^{138} + x^{136} + x^{128} + x^{126} + x^{122} + x^{120}\\
&\quad + x^{116} + x^{112} + x^{106} + x^{104} + x^{94} + x^{92} + x^{88} + x^{86} + x^{82} + x^{80}\\
&\quad + x^{78} + x^{76} + x^{74} + x^{68} + x^{64} + x^{50} + x^{46} + x^{44} + x^{42} + x^{40} + x^{28}\\
&\quad + x^{26} + x^{24} + x^{16} + x^{8} + x^{4},\\
p_{12}(x) &= x^{156} + x^{154} + x^{152} + x^{148} + x^{146} + x^{144} + x^{108} + x^{106} + x^{104} + x^{100}\\
&\quad + x^{98} + x^{96} + x^{92} + x^{90} + x^{88} + x^{84} + x^{82} + x^{80} + x^{12} + x^{10} + x^{8}\\
&\quad + x^{4} + x^{2} + 1,
\end{aligned}$$

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

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

$$p_0(x) = x^{147} + x^{144} + x^{141} + x^{140} + x^{138} + x^{136} + x^{135} + x^{130} + x^{128} + x^{126}$$

$$
\begin{aligned}
&+ x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{116} + x^{112} + x^{111} + x^{110}\\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{102} + x^{101} + x^{96} + x^{95} + x^{94} + x^{93}\\
&+ x^{90} + x^{84} + x^{82} + x^{79} + x^{78} + x^{76} + x^{72} + x^{68} + x^{67} + x^{65} + x^{63}\\
&+ x^{62} + x^{59} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{48}\\
&+ x^{45} + x^{44} + x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{33},\\
p_3(x) &= x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115}\\
&+ x^{112} + x^{111} + x^{110} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98}\\
&+ x^{97} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{85} + x^{82} + x^{80} + x^{79} + x^{78}\\
&+ x^{77} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{67} + x^{66} + x^{65} + x^{63}\\
&+ x^{62} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{19} + x^{18},\\
p_6(x) &= x^{135} + x^{132} + x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{118} + x^{117} + x^{114}\\
&+ x^{113} + x^{111} + x^{110} + x^{108} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100}\\
&+ x^{98} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} + x^{81} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{74} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60}\\
&+ x^{59} + x^{58} + x^{56} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{26} + x^{25} + x^{22} + x^{17} + x^{15} + x^{14}\\
&+ x^{12},\\
p_9(x) &= x^{141} + x^{139} + x^{138} + x^{131} + x^{128} + x^{127} + x^{126} + x^{117} + x^{114} + x^{113}\\
&+ x^{112} + x^{109} + x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{99} + x^{97}\\
&+ x^{96} + x^{95} + x^{92} + x^{90} + x^{89} + x^{88} + x^{85} + x^{82} + x^{80} + x^{78} + x^{77}\\
&+ x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{65} + x^{62} + x^{61} + x^{60} + x^{53} + x^{50}\\
&+ x^{48} + x^{47} + x^{46} + x^{43} + x^{41} + x^{40} + x^{35} + x^{33} + x^{32} + x^{31} + x^{29}\\
&+ x^{28} + x^{25} + x^{22} + x^{20} + x^{19} + x^{18} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) &= x^{147} + x^{144} + x^{143} + x^{140} + x^{135} + x^{132} + x^{127} + x^{124} + x^{119} + x^{116}\\
&+ x^{111} + x^{108} + x^{103} + x^{100} + x^{99} + x^{96} + x^{83} + x^{80} + x^{79} + x^{76}\\
&+ x^{71} + x^{68} + x^{63} + x^{60} + x^{55} + x^{52} + x^{47} + x^{44} + x^{39} + x^{36} + x^{31}\\
&+ x^{28} + x^{23} + x^{20} + x^{15} + x^{12} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{141} + x^{140} + x^{138} + x^{136} + x^{135} + x^{130} + x^{128} + x^{126}\\
&+ x^{125} + x^{124} + x^{123} + x^{122} + x^{121} + x^{116} + x^{112} + x^{111} + x^{110}\\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{102} + x^{101} + x^{96} + x^{95} + x^{94} + x^{93}\\
&+ x^{90} + x^{84} + x^{82} + x^{79} + x^{78} + x^{76} + x^{72} + x^{68} + x^{67} + x^{65} + x^{63}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{62} + x^{59} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{49} + x^{48}\\
&+ x^{45} + x^{44} + x^{43} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{33},\\
p_3(x) &= x^{129} + x^{127} + x^{126} + x^{125} + x^{123} + x^{122} + x^{121} + x^{119} + x^{118} + x^{115}\\
&+ x^{112} + x^{111} + x^{110} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98}\\
&+ x^{97} + x^{95} + x^{94} + x^{93} + x^{91} + x^{90} + x^{85} + x^{82} + x^{80} + x^{79} + x^{78}\\
&+ x^{77} + x^{75} + x^{74} + x^{73} + x^{71} + x^{70} + x^{69} + x^{67} + x^{66} + x^{65} + x^{63}\\
&+ x^{62} + x^{59} + x^{56} + x^{55} + x^{54} + x^{51} + x^{48} + x^{47} + x^{46} + x^{45} + x^{43}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{35} + x^{34} + x^{29} + x^{26} + x^{24} + x^{23}\\
&+ x^{22} + x^{21} + x^{19} + x^{18},\\
p_6(x) &= x^{135} + x^{132} + x^{125} + x^{123} + x^{122} + x^{121} + x^{120} + x^{118} + x^{117} + x^{114}\\
&+ x^{113} + x^{111} + x^{110} + x^{108} + x^{105} + x^{103} + x^{102} + x^{101} + x^{100}\\
&+ x^{98} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} + x^{81} + x^{80} + x^{79}\\
&+ x^{78} + x^{77} + x^{76} + x^{74} + x^{67} + x^{65} + x^{64} + x^{63} + x^{62} + x^{61} + x^{60}\\
&+ x^{59} + x^{58} + x^{56} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{32} + x^{31} + x^{29} + x^{28} + x^{26} + x^{25} + x^{22} + x^{17} + x^{15} + x^{14}\\
&+ x^{12},\\
p_9(x) &= x^{141} + x^{139} + x^{138} + x^{131} + x^{128} + x^{127} + x^{126} + x^{117} + x^{114} + x^{113}\\
&+ x^{112} + x^{109} + x^{107} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{99} + x^{97}\\
&+ x^{96} + x^{95} + x^{92} + x^{90} + x^{89} + x^{88} + x^{85} + x^{82} + x^{80} + x^{78} + x^{77}\\
&+ x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{65} + x^{62} + x^{61} + x^{60} + x^{53} + x^{50}\\
&+ x^{48} + x^{47} + x^{46} + x^{43} + x^{41} + x^{40} + x^{35} + x^{33} + x^{32} + x^{31} + x^{29}\\
&+ x^{28} + x^{25} + x^{22} + x^{20} + x^{19} + x^{18} + x^{13} + x^{10} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) &= x^{147} + x^{144} + x^{143} + x^{140} + x^{135} + x^{132} + x^{127} + x^{124} + x^{119} + x^{116}\\
&+ x^{111} + x^{108} + x^{103} + x^{100} + x^{99} + x^{96} + x^{83} + x^{80} + x^{79} + x^{76}\\
&+ x^{71} + x^{68} + x^{63} + x^{60} + x^{55} + x^{52} + x^{47} + x^{44} + x^{39} + x^{36} + x^{31}\\
&+ x^{28} + x^{23} + x^{20} + x^{15} + x^{12} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{138} + x^{136} + x^{132} + x^{128} + x^{126} + x^{124} + x^{122} + x^{120} + x^{118} + x^{116}\\
&+ x^{114} + x^{112} + x^{110} + x^{106} + x^{98} + x^{96} + x^{94} + x^{92} + x^{90} + x^{86}\\
&+ x^{82} + x^{80} + x^{78} + x^{58} + x^{54} + x^{48} + x^{42},\\
p_3(x) &= x^{134} + x^{132} + x^{130} + x^{124} + x^{120} + x^{112} + x^{108} + x^{104} + x^{98} + x^{96}\\
&+ x^{94} + x^{92} + x^{90} + x^{88} + x^{84} + x^{78} + x^{72} + x^{70} + x^{64} + x^{56} + x^{54}\\
&+ x^{50} + x^{48} + x^{46} + x^{42} + x^{40} + x^{32} + x^{26} + x^{16} + x^{12},\\
p_6(x) &= x^{132} + x^{126} + x^{124} + x^{120} + x^{114} + x^{104} + x^{102} + x^{98} + x^{96} + x^{90}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{86} + x^{78} + x^{74} + x^{68} + x^{64} + x^{62} + x^{60} + x^{52} + x^{48} + x^{46} + x^{44} \\
&+ x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{30} + x^{20} + x^{18} + x^{16} + x^{12} \\
&+ x^{8} + x^{4} + x^{2} + 1, \\
p_9(x) &= x^{134} + x^{132} + x^{124} + x^{122} + x^{118} + x^{116} + x^{112} + x^{110} + x^{96} + x^{94} \\
&+ x^{92} + x^{86} + x^{78} + x^{70} + x^{68} + x^{66} + x^{64} + x^{62} + x^{56} + x^{50} + x^{48} \\
&+ x^{46} + x^{42} + x^{36} + x^{34} + x^{32} + x^{30} + x^{20} + x^{10} + x^{4}, \\
p_{12}(x) &= x^{138} + x^{136} + x^{114} + x^{112} + x^{106} + x^{104} + x^{90} + x^{88} + x^{82} + x^{80} \\
&+ x^{66} + x^{64} + x^{58} + x^{56} + x^{34} + x^{32} + x^{26} + x^{24} + x^{2} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{137} + x^{135} + x^{134} \\
&+ x^{133} + x^{131} + x^{130} + x^{128} + x^{125} + x^{120} + x^{119} + x^{117} + x^{115} \\
&+ x^{112} + x^{111} + x^{107} + x^{106} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} \\
&+ x^{93} + x^{92} + x^{91} + x^{90} + x^{86} + x^{82} + x^{81} + x^{77} + x^{75} + x^{74} + x^{73} \\
&+ x^{72} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{60} + x^{57} + x^{56} + x^{53} + x^{48} \\
&+ x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{36} + x^{35} + x^{34} + x^{32} + x^{28} + x^{27} \\
&+ x^{24}, \\
p_3(x) &= x^{139} + x^{136} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{128} + x^{127} + x^{126} \\
&+ x^{123} + x^{117} + x^{113} + x^{112} + x^{110} + x^{109} + x^{104} + x^{103} + x^{101} \\
&+ x^{98} + x^{96} + x^{95} + x^{93} + x^{91} + x^{90} + x^{88} + x^{87} + x^{85} + x^{83} + x^{81} \\
&+ x^{79} + x^{78} + x^{73} + x^{72} + x^{71} + x^{70} + x^{65} + x^{64} + x^{62} + x^{61} + x^{56} \\
&+ x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{42} + x^{40} + x^{36} + x^{35} + x^{32} \\
&+ x^{31} + x^{26} + x^{24} + x^{23} + x^{19} + x^{16}, \\
p_6(x) &= x^{141} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132} + x^{131} + x^{125} + x^{123} + x^{119} \\
&+ x^{114} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} + x^{96} \\
&+ x^{95} + x^{92} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{73} + x^{71} + x^{70} \\
&+ x^{69} + x^{68} + x^{67} + x^{66} + x^{62} + x^{60} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} \\
&+ x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} \\
&+ x^{31} + x^{30} + x^{23} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{15} + x^{11} + x^{8} \\
&+ x^{7} + x^{4} + x^{3} + 1, \\
p_9(x) &= x^{139} + x^{136} + x^{135} + x^{132} + x^{131} + x^{128} + x^{123} + x^{120} + x^{107} + x^{104} \\
&+ x^{103} + x^{100} + x^{99} + x^{96} + x^{87} + x^{84} + x^{83} + x^{80} + x^{75} + x^{72} + x^{59} \\
&+ x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{43} + x^{40} + x^{27} + x^{24} + x^{23} + x^{20} \\
&+ x^{19} + x^{16} + x^{11} + x^{8}, \\
p_{12}(x) &= x^{147} + x^{144} + x^{143} + x^{140} + x^{139} + x^{136} + x^{131} + x^{128} + x^{127} + x^{124}
\end{aligned}
$$

$$+ x^{123} + x^{120} + x^{119} + x^{116} + x^{111} + x^{108} + x^{107} + x^{104} + x^{87} + x^{84}$$
$$+ x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{68} + x^{63} + x^{60} + x^{59} + x^{56} + x^{51}$$
$$+ x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{31} + x^{28} + x^{27} + x^{24}$$
$$+ x^{19} + x^{16} + x^{15} + x^{12} + x^{11} + x^{8} + x^{7} + x^{4} + x^{3} + 1,$$

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

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

$$\begin{aligned}
p_0(x) &= x^{160} + x^{154} + x^{153} + x^{152} + x^{150} + x^{147} + x^{146} + x^{144} + x^{143} + x^{142} \\
&\quad + x^{141} + x^{139} + x^{138} + x^{137} + x^{135} + x^{127} + x^{126} + x^{124} + x^{119} \\
&\quad + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} \\
&\quad + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98} + x^{94} + x^{92} + x^{90} + x^{89} \\
&\quad + x^{87} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} + x^{77} + x^{76} + x^{74} \\
&\quad + x^{73} + x^{71} + x^{69} + x^{68} + x^{67} + x^{65} + x^{62} + x^{61} + x^{60} + x^{57} + x^{54} \\
&\quad + x^{50} + x^{49} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38} + x^{35} + x^{33}, \\
p_3(x) &= x^{142} + x^{140} + x^{137} + x^{134} + x^{131} + x^{130} + x^{102} + x^{100} + x^{97} + x^{92} \\
&\quad + x^{91} + x^{90} + x^{89} + x^{86} + x^{83} + x^{82} + x^{46} + x^{44} + x^{41} + x^{36} + x^{35} \\
&\quad + x^{34} + x^{33} + x^{28} + x^{27} + x^{26} + x^{25} + x^{22} + x^{19} + x^{18}, \\
p_6(x) &= x^{148} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124} + x^{122} + x^{120} \\
&\quad + x^{116} + x^{106} + x^{102} + x^{100} + x^{98} + x^{96} + x^{72} + x^{64} + x^{62} + x^{58} \\
&\quad + x^{52} + x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{30} + x^{26} \\
&\quad + x^{22} + x^{14} + x^{12}, \\
p_9(x) &= x^{154} + x^{152} + x^{150} + x^{149} + x^{148} + x^{145} + x^{143} + x^{141} + x^{140} + x^{137} \\
&\quad + x^{135} + x^{133} + x^{132} + x^{129} + x^{127} + x^{125} + x^{124} + x^{121} + x^{119} \\
&\quad + x^{117} + x^{116} + x^{113} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104} \\
&\quad + x^{103} + x^{102} + x^{90} + x^{88} + x^{86} + x^{85} + x^{84} + x^{81} + x^{79} + x^{77} + x^{76} \\
&\quad + x^{73} + x^{71} + x^{69} + x^{68} + x^{65} + x^{63} + x^{61} + x^{60} + x^{57} + x^{55} + x^{53} \\
&\quad + x^{52} + x^{49} + x^{47} + x^{45} + x^{44} + x^{41} + x^{39} + x^{37} + x^{36} + x^{33} + x^{31} \\
&\quad + x^{29} + x^{28} + x^{25} + x^{23} + x^{21} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12} + x^{10} \\
&\quad + x^{9} + x^{8} + x^{7} + x^{6}, \\
p_{12}(x) &= x^{160} + x^{156} + x^{152} + x^{132} + x^{128} + x^{116} + x^{108} + x^{104} + x^{100} + x^{92} \\
&\quad + x^{88} + x^{68} + x^{64} + x^{52} + x^{48} + x^{36} + x^{32} + x^{20} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{148} + x^{142} + x^{141} + x^{138} + x^{135} + x^{133} + x^{132} + x^{131} + x^{130} + x^{125} \\
&\quad + x^{124} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} + x^{113} + x^{111} + x^{108} \\
&\quad + x^{106} + x^{104} + x^{100} + x^{98} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{84} + x^{78}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{67} + x^{66} + x^{65} + x^{63} + x^{62} \\
&+ x^{59} + x^{58} + x^{57} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{43} + x^{40} + x^{37} \\
&+ x^{34} + x^{33}, \\
p_3(x) = {}& x^{130} + x^{128} + x^{125} + x^{120} + x^{119} + x^{117} + x^{116} + x^{114} + x^{113} + x^{111} \\
&+ x^{110} + x^{108} + x^{107} + x^{106} + x^{105} + x^{102} + x^{99} + x^{96} + x^{93} + x^{90} \\
&+ x^{87} + x^{84} + x^{81} + x^{78} + x^{75} + x^{72} + x^{69} + x^{64} + x^{63} + x^{61} + x^{60} \\
&+ x^{58} + x^{57} + x^{55} + x^{54} + x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{43} + x^{40} \\
&+ x^{37} + x^{34} + x^{31} + x^{28} + x^{25} + x^{22} + x^{19} + x^{18}, \\
p_6(x) = {}& x^{136} + x^{128} + x^{126} + x^{122} + x^{120} + x^{114} + x^{112} + x^{110} + x^{106} + x^{102} \\
&+ x^{100} + x^{96} + x^{94} + x^{90} + x^{88} + x^{82} + x^{78} + x^{74} + x^{72} + x^{66} + x^{62} \\
&+ x^{60} + x^{58} + x^{56} + x^{48} + x^{44} + x^{38} + x^{36} + x^{24} + x^{20} + x^{14} + x^{12}, \\
p_9(x) = {}& x^{142} + x^{140} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133} + x^{132} + x^{131} + x^{128} \\
&+ x^{126} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{110} \\
&+ x^{108} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{96} + x^{93} \\
&+ x^{87} + x^{85} + x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} \\
&+ x^{71} + x^{70} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} \\
&+ x^{48} + x^{46} + x^{45} + x^{44} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{30} + x^{28} \\
&+ x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{19} + x^{16} + x^{14} + x^{13} + x^{12} \\
&+ x^{10} + x^{9} + x^{8} + x^{7} + x^{6}, \\
p_{12}(x) = {}& x^{148} + x^{144} + x^{124} + x^{100} + x^{96} + x^{92} + x^{84} + x^{80} + x^{76} + x^{44} + x^{12} \\
&+ x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{147} + x^{144} + x^{143} + x^{141} + x^{140} + x^{138} + x^{137} + x^{136} + x^{135} + x^{134} \\
&+ x^{133} + x^{131} + x^{130} + x^{128} + x^{127} + x^{125} + x^{124} + x^{114} + x^{113} \\
&+ x^{112} + x^{111} + x^{110} + x^{109} + x^{106} + x^{105} + x^{103} + x^{101} + x^{100} \\
&+ x^{99} + x^{97} + x^{92} + x^{88} + x^{85} + x^{84} + x^{80} + x^{79} + x^{77} + x^{75} + x^{74} \\
&+ x^{70} + x^{68} + x^{67} + x^{66} + x^{61} + x^{57} + x^{52} + x^{51} + x^{50} + x^{47} + x^{46} \\
&+ x^{44} + x^{43} + x^{42}, \\
p_3(x) = {}& x^{139} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{130} + x^{129} + x^{127} + x^{126} \\
&+ x^{123} + x^{119} + x^{116} + x^{115} + x^{114} + x^{111} + x^{108} + x^{107} + x^{106} \\
&+ x^{105} + x^{103} + x^{102} + x^{101} + x^{98} + x^{96} + x^{95} + x^{93} + x^{90} + x^{84} \\
&+ x^{83} + x^{82} + x^{79} + x^{73} + x^{72} + x^{71} + x^{70} + x^{65} + x^{64} + x^{63} + x^{62} \\
&+ x^{60} + x^{59} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} \\
&+ x^{42} + x^{40} + x^{36} + x^{29} + x^{28} + x^{25} + x^{24} + x^{23} + x^{22},
\end{aligned}
$$

$$\begin{aligned}
p_6(x) &= x^{141} + x^{139} + x^{138} + x^{137} + x^{134} + x^{132} + x^{131} + x^{127} + x^{124} + x^{122} \\
&\quad + x^{121} + x^{120} + x^{119} + x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} \\
&\quad + x^{107} + x^{105} + x^{104} + x^{100} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} \\
&\quad + x^{78} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{61} + x^{60} \\
&\quad + x^{58} + x^{57} + x^{56} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} \\
&\quad + x^{44} + x^{43} + x^{42} + x^{34} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} \\
&\quad + x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{14} + x^{12} + x^{7} + x^{4} + x^{3} + 1, \\
p_9(x) &= x^{139} + x^{136} + x^{135} + x^{132} + x^{131} + x^{128} + x^{123} + x^{120} + x^{107} + x^{104} \\
&\quad + x^{103} + x^{100} + x^{99} + x^{96} + x^{87} + x^{84} + x^{83} + x^{80} + x^{75} + x^{72} + x^{59} \\
&\quad + x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{43} + x^{40} + x^{27} + x^{24} + x^{23} + x^{20} \\
&\quad + x^{19} + x^{16} + x^{11} + x^{8}, \\
p_{12}(x) &= x^{147} + x^{144} + x^{143} + x^{140} + x^{139} + x^{136} + x^{131} + x^{128} + x^{127} + x^{124} \\
&\quad + x^{123} + x^{120} + x^{119} + x^{116} + x^{111} + x^{108} + x^{107} + x^{104} + x^{87} + x^{84} \\
&\quad + x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{68} + x^{63} + x^{60} + x^{59} + x^{56} + x^{51} \\
&\quad + x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{31} + x^{28} + x^{27} + x^{24} \\
&\quad + x^{19} + x^{16} + x^{15} + x^{12} + x^{11} + x^{8} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{143} + x^{141} + x^{140} + x^{139} + x^{138} + x^{137} + x^{135} + x^{134} \\
&\quad + x^{133} + x^{131} + x^{130} + x^{128} + x^{125} + x^{120} + x^{119} + x^{117} + x^{115} \\
&\quad + x^{112} + x^{111} + x^{107} + x^{106} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} \\
&\quad + x^{93} + x^{92} + x^{91} + x^{90} + x^{86} + x^{82} + x^{81} + x^{77} + x^{75} + x^{74} + x^{73} \\
&\quad + x^{72} + x^{71} + x^{69} + x^{66} + x^{64} + x^{62} + x^{60} + x^{57} + x^{56} + x^{53} + x^{48} \\
&\quad + x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{36} + x^{35} + x^{34} + x^{32} + x^{28} + x^{27} \\
&\quad + x^{24}, \\
p_3(x) &= x^{139} + x^{136} + x^{135} + x^{133} + x^{132} + x^{130} + x^{129} + x^{128} + x^{127} + x^{126} \\
&\quad + x^{123} + x^{117} + x^{113} + x^{112} + x^{110} + x^{109} + x^{104} + x^{103} + x^{101} \\
&\quad + x^{98} + x^{96} + x^{95} + x^{93} + x^{91} + x^{90} + x^{88} + x^{87} + x^{85} + x^{83} + x^{81} \\
&\quad + x^{79} + x^{78} + x^{73} + x^{72} + x^{71} + x^{70} + x^{65} + x^{64} + x^{62} + x^{61} + x^{56} \\
&\quad + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{42} + x^{40} + x^{36} + x^{35} + x^{32} \\
&\quad + x^{31} + x^{26} + x^{24} + x^{23} + x^{19} + x^{16}, \\
p_6(x) &= x^{141} + x^{138} + x^{137} + x^{136} + x^{134} + x^{132} + x^{131} + x^{125} + x^{123} + x^{119} \\
&\quad + x^{114} + x^{107} + x^{104} + x^{103} + x^{102} + x^{101} + x^{99} + x^{98} + x^{97} + x^{96} \\
&\quad + x^{95} + x^{92} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{74} + x^{73} + x^{71} + x^{70} \\
&\quad + x^{69} + x^{68} + x^{67} + x^{66} + x^{62} + x^{60} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{42} + x^{40} + x^{39} + x^{37} + x^{36} \\
&+ x^{31} + x^{30} + x^{23} + x^{22} + x^{20} + x^{19} + x^{18} + x^{16} + x^{15} + x^{11} + x^{8} \\
&+ x^{7} + x^{4} + x^{3} + 1, \\
p_9(x) &= x^{139} + x^{136} + x^{135} + x^{132} + x^{131} + x^{128} + x^{123} + x^{120} + x^{107} + x^{104} \\
&+ x^{103} + x^{100} + x^{99} + x^{96} + x^{87} + x^{84} + x^{83} + x^{80} + x^{75} + x^{72} + x^{59} \\
&+ x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{43} + x^{40} + x^{27} + x^{24} + x^{23} + x^{20} \\
&+ x^{19} + x^{16} + x^{11} + x^{8}, \\
p_{12}(x) &= x^{147} + x^{144} + x^{143} + x^{140} + x^{139} + x^{136} + x^{131} + x^{128} + x^{127} + x^{124} \\
&+ x^{123} + x^{120} + x^{119} + x^{116} + x^{111} + x^{108} + x^{107} + x^{104} + x^{87} + x^{84} \\
&+ x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{68} + x^{63} + x^{60} + x^{59} + x^{56} + x^{51} \\
&+ x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{31} + x^{28} + x^{27} + x^{24} \\
&+ x^{19} + x^{16} + x^{15} + x^{12} + x^{11} + x^{8} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{148} + x^{142} + x^{141} + x^{138} + x^{135} + x^{133} + x^{132} + x^{131} + x^{130} + x^{125} \\
&+ x^{124} + x^{123} + x^{122} + x^{120} + x^{118} + x^{117} + x^{113} + x^{111} + x^{108} \\
&+ x^{106} + x^{104} + x^{100} + x^{98} + x^{92} + x^{91} + x^{89} + x^{88} + x^{86} + x^{84} + x^{78} \\
&+ x^{77} + x^{76} + x^{75} + x^{74} + x^{73} + x^{72} + x^{67} + x^{66} + x^{65} + x^{63} + x^{62} \\
&+ x^{59} + x^{58} + x^{57} + x^{51} + x^{50} + x^{48} + x^{47} + x^{46} + x^{43} + x^{40} + x^{37} \\
&+ x^{34} + x^{33}, \\
p_3(x) &= x^{130} + x^{128} + x^{125} + x^{120} + x^{119} + x^{117} + x^{116} + x^{114} + x^{113} + x^{111} \\
&+ x^{110} + x^{108} + x^{107} + x^{106} + x^{105} + x^{102} + x^{99} + x^{96} + x^{93} + x^{90} \\
&+ x^{87} + x^{84} + x^{81} + x^{78} + x^{75} + x^{72} + x^{69} + x^{64} + x^{63} + x^{61} + x^{60} \\
&+ x^{58} + x^{57} + x^{55} + x^{54} + x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{43} + x^{40} \\
&+ x^{37} + x^{34} + x^{31} + x^{28} + x^{25} + x^{22} + x^{19} + x^{18}, \\
p_6(x) &= x^{136} + x^{128} + x^{126} + x^{122} + x^{120} + x^{114} + x^{112} + x^{110} + x^{106} + x^{102} \\
&+ x^{100} + x^{96} + x^{94} + x^{90} + x^{88} + x^{82} + x^{78} + x^{74} + x^{72} + x^{66} + x^{62} \\
&+ x^{60} + x^{58} + x^{56} + x^{48} + x^{44} + x^{38} + x^{36} + x^{24} + x^{20} + x^{14} + x^{12}, \\
p_9(x) &= x^{142} + x^{140} + x^{138} + x^{137} + x^{136} + x^{134} + x^{133} + x^{132} + x^{131} + x^{128} \\
&+ x^{126} + x^{125} + x^{124} + x^{122} + x^{121} + x^{120} + x^{119} + x^{118} + x^{110} \\
&+ x^{108} + x^{106} + x^{105} + x^{104} + x^{102} + x^{101} + x^{100} + x^{99} + x^{96} + x^{93} \\
&+ x^{87} + x^{85} + x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{76} + x^{74} + x^{73} + x^{72} \\
&+ x^{71} + x^{70} + x^{62} + x^{60} + x^{58} + x^{57} + x^{56} + x^{54} + x^{53} + x^{52} + x^{51} \\
&+ x^{48} + x^{46} + x^{45} + x^{44} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{30} + x^{28} \\
&+ x^{26} + x^{25} + x^{24} + x^{22} + x^{21} + x^{20} + x^{19} + x^{16} + x^{14} + x^{13} + x^{12}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{10} + x^{9} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) &= x^{148} + x^{144} + x^{124} + x^{100} + x^{96} + x^{92} + x^{84} + x^{80} + x^{76} + x^{44} + x^{12}\\
&\quad + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{160} + x^{154} + x^{153} + x^{152} + x^{150} + x^{147} + x^{146} + x^{144} + x^{143} + x^{142}\\
&\quad + x^{141} + x^{139} + x^{138} + x^{137} + x^{135} + x^{127} + x^{126} + x^{124} + x^{119}\\
&\quad + x^{116} + x^{115} + x^{114} + x^{113} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105}\\
&\quad + x^{104} + x^{103} + x^{102} + x^{101} + x^{100} + x^{98} + x^{94} + x^{92} + x^{90} + x^{89}\\
&\quad + x^{87} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} + x^{77} + x^{76} + x^{74}\\
&\quad + x^{73} + x^{71} + x^{69} + x^{68} + x^{67} + x^{65} + x^{62} + x^{61} + x^{60} + x^{57} + x^{54}\\
&\quad + x^{50} + x^{49} + x^{46} + x^{45} + x^{41} + x^{40} + x^{38} + x^{35} + x^{33},\\
p_3(x) &= x^{142} + x^{140} + x^{137} + x^{134} + x^{131} + x^{130} + x^{102} + x^{100} + x^{97} + x^{92}\\
&\quad + x^{91} + x^{90} + x^{89} + x^{86} + x^{83} + x^{82} + x^{46} + x^{44} + x^{41} + x^{36} + x^{35}\\
&\quad + x^{34} + x^{33} + x^{28} + x^{27} + x^{26} + x^{25} + x^{22} + x^{19} + x^{18},\\
p_6(x) &= x^{148} + x^{138} + x^{136} + x^{134} + x^{132} + x^{130} + x^{126} + x^{124} + x^{122} + x^{120}\\
&\quad + x^{116} + x^{106} + x^{102} + x^{100} + x^{98} + x^{96} + x^{72} + x^{64} + x^{62} + x^{58}\\
&\quad + x^{52} + x^{50} + x^{48} + x^{42} + x^{40} + x^{38} + x^{36} + x^{34} + x^{32} + x^{30} + x^{26}\\
&\quad + x^{22} + x^{14} + x^{12},\\
p_9(x) &= x^{154} + x^{152} + x^{150} + x^{149} + x^{148} + x^{145} + x^{143} + x^{141} + x^{140} + x^{137}\\
&\quad + x^{135} + x^{133} + x^{132} + x^{129} + x^{127} + x^{125} + x^{124} + x^{121} + x^{119}\\
&\quad + x^{117} + x^{116} + x^{113} + x^{111} + x^{109} + x^{108} + x^{106} + x^{105} + x^{104}\\
&\quad + x^{103} + x^{102} + x^{90} + x^{88} + x^{86} + x^{85} + x^{84} + x^{81} + x^{79} + x^{77} + x^{76}\\
&\quad + x^{73} + x^{71} + x^{69} + x^{68} + x^{65} + x^{63} + x^{61} + x^{60} + x^{57} + x^{55} + x^{53}\\
&\quad + x^{52} + x^{49} + x^{47} + x^{45} + x^{44} + x^{41} + x^{39} + x^{37} + x^{36} + x^{33} + x^{31}\\
&\quad + x^{29} + x^{28} + x^{25} + x^{23} + x^{21} + x^{20} + x^{17} + x^{15} + x^{13} + x^{12} + x^{10}\\
&\quad + x^{9} + x^{8} + x^{7} + x^{6},\\
p_{12}(x) &= x^{160} + x^{156} + x^{152} + x^{132} + x^{128} + x^{116} + x^{108} + x^{104} + x^{100} + x^{92}\\
&\quad + x^{88} + x^{68} + x^{64} + x^{52} + x^{48} + x^{36} + x^{32} + x^{20} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{147} + x^{144} + x^{143} + x^{141} + x^{140} + x^{138} + x^{137} + x^{136} + x^{135} + x^{134}\\
&\quad + x^{133} + x^{131} + x^{130} + x^{128} + x^{127} + x^{125} + x^{124} + x^{114} + x^{113}\\
&\quad + x^{112} + x^{111} + x^{110} + x^{109} + x^{106} + x^{105} + x^{103} + x^{101} + x^{100}\\
&\quad + x^{99} + x^{97} + x^{92} + x^{88} + x^{85} + x^{84} + x^{80} + x^{79} + x^{77} + x^{75} + x^{74}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{70} + x^{68} + x^{67} + x^{66} + x^{61} + x^{57} + x^{52} + x^{51} + x^{50} + x^{47} + x^{46} \\
&+ x^{44} + x^{43} + x^{42}, \\
p_3(x) = &\, x^{139} + x^{136} + x^{135} + x^{133} + x^{132} + x^{131} + x^{130} + x^{129} + x^{127} + x^{126} \\
&+ x^{123} + x^{119} + x^{116} + x^{115} + x^{114} + x^{111} + x^{108} + x^{107} + x^{106} \\
&+ x^{105} + x^{103} + x^{102} + x^{101} + x^{98} + x^{96} + x^{95} + x^{93} + x^{90} + x^{84} \\
&+ x^{83} + x^{82} + x^{79} + x^{73} + x^{72} + x^{71} + x^{70} + x^{65} + x^{64} + x^{63} + x^{62} \\
&+ x^{60} + x^{59} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} + x^{52} + x^{48} + x^{45} + x^{44} \\
&+ x^{42} + x^{40} + x^{36} + x^{29} + x^{28} + x^{25} + x^{24} + x^{23} + x^{22}, \\
p_6(x) = &\, x^{141} + x^{139} + x^{138} + x^{137} + x^{134} + x^{132} + x^{131} + x^{127} + x^{124} + x^{122} \\
&+ x^{121} + x^{120} + x^{119} + x^{118} + x^{117} + x^{115} + x^{113} + x^{112} + x^{110} \\
&+ x^{107} + x^{105} + x^{104} + x^{100} + x^{95} + x^{94} + x^{93} + x^{92} + x^{90} + x^{83} \\
&+ x^{78} + x^{73} + x^{71} + x^{70} + x^{69} + x^{68} + x^{66} + x^{65} + x^{64} + x^{61} + x^{60} \\
&+ x^{58} + x^{57} + x^{56} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} + x^{47} + x^{46} + x^{45} \\
&+ x^{44} + x^{43} + x^{42} + x^{34} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} + x^{24} \\
&+ x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{14} + x^{12} + x^{7} + x^{4} + x^{3} + 1, \\
p_9(x) = &\, x^{139} + x^{136} + x^{135} + x^{132} + x^{131} + x^{128} + x^{123} + x^{120} + x^{107} + x^{104} \\
&+ x^{103} + x^{100} + x^{99} + x^{96} + x^{87} + x^{84} + x^{83} + x^{80} + x^{75} + x^{72} + x^{59} \\
&+ x^{56} + x^{55} + x^{52} + x^{51} + x^{48} + x^{43} + x^{40} + x^{27} + x^{24} + x^{23} + x^{20} \\
&+ x^{19} + x^{16} + x^{11} + x^{8}, \\
p_{12}(x) = &\, x^{147} + x^{144} + x^{143} + x^{140} + x^{139} + x^{136} + x^{131} + x^{128} + x^{127} + x^{124} \\
&+ x^{123} + x^{120} + x^{119} + x^{116} + x^{111} + x^{108} + x^{107} + x^{104} + x^{87} + x^{84} \\
&+ x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{68} + x^{63} + x^{60} + x^{59} + x^{56} + x^{51} \\
&+ x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{31} + x^{28} + x^{27} + x^{24} \\
&+ x^{19} + x^{16} + x^{15} + x^{12} + x^{11} + x^{8} + x^{7} + x^{4} + x^{3} + 1,
\end{aligned}
$$

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

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

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

| $n$ | $\Lambda(n)$ | $n$ | $\Lambda(n)$ | $n$ | $\Lambda(n)$ | $n$ | $\Lambda(n)$ |
|---|---|---|---|---|---|---|---|
| 0 | [1, 2] | 379 | [587, 588] | 758 | [936, 999] | 1137 | [496, 935] |
| 1 | [3, 4] | 380 | [589, 590] | 759 | [416, 53] | 1138 | [994, 474] |
| 2 | [5, 6] | 381 | [591, 592] | 760 | [942, 928] | 1139 | [441, 1100] |
| 3 | [7, 8] | 382 | [593, 594] | 761 | [566, 570] | 1140 | [1051, 188] |
| 4 | [9, 10] | 383 | [595, 596] | 762 | [50, 1024] | 1141 | [1398, 1399] |
| 5 | [8, 11] | 384 | [597, 201] | 763 | [1025, 1026] | 1142 | [516, 1091] |
| 6 | [12, 13] | 385 | [598, 599] | 764 | [1027, 478] | 1143 | [390, 1017] |
| 7 | [14, 15] | 386 | [600, 601] | 765 | [412, 147] | 1144 | [380, 1400] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | [16, 17] | 387 | [602, 603] | 766 | [1028, 465] | 1145 | [161, 159] |
| 9 | [18, 19] | 388 | [604, 605] | 767 | [1029, 1030] | 1146 | [479, 443] |
| 10 | [20, 21] | 389 | [606, 607] | 768 | [920, 501] | 1147 | [1097, 480] |
| 11 | [22, 23] | 390 | [608, 609] | 769 | [512, 166] | 1148 | [1401, 398] |
| 12 | [24, 25] | 391 | [610, 611] | 770 | [394, 950] | 1149 | [186, 411] |
| 13 | [26, 27] | 392 | [612, 613] | 771 | [1031, 994] | 1150 | [543, 1063] |
| 14 | [28, 29] | 393 | [614, 615] | 772 | [478, 1013] | 1151 | [31, 189] |
| 15 | [30, 31] | 394 | [616, 617] | 773 | [1012, 433] | 1152 | [1402, 1000] |
| 16 | [32, 33] | 395 | [210, 618] | 774 | [467, 1032] | 1153 | [374, 135] |
| 17 | [34, 35] | 396 | [74, 619] | 775 | [152, 1033] | 1154 | [137, 406] |
| 18 | [36, 37] | 397 | [620, 621] | 776 | [929, 158] | 1155 | [1403, 526] |
| 19 | [38, 39] | 398 | [622, 623] | 777 | [504, 918] | 1156 | [122, 975] |
| 20 | [40, 41] | 399 | [624, 625] | 778 | [463, 1034] | 1157 | [492, 136] |
| 21 | [42, 43] | 400 | [626, 627] | 779 | [1035, 1036] | 1158 | [198, 1056] |
| 22 | [44, 45] | 401 | [628, 629] | 780 | [1037, 117] | 1159 | [1391, 140] |
| 23 | [46, 47] | 402 | [630, 631] | 781 | [929, 402] | 1160 | [1404, 1017] |
| 24 | [48, 49] | 403 | [632, 633] | 782 | [403, 533] | 1161 | [524, 977] |
| 25 | [50, 51] | 404 | [634, 635] | 783 | [1038, 12] | 1162 | [432, 1405] |
| 26 | [46, 52] | 405 | [636, 637] | 784 | [953, 1039] | 1163 | [1406, 1399] |
| 27 | [53, 54] | 406 | [638, 639] | 785 | [502, 163] | 1164 | [935, 930] |
| 28 | [55, 56] | 407 | [640, 641] | 786 | [971, 115] | 1165 | [126, 47] |
| 29 | [57, 58] | 408 | [642, 367] | 787 | [1040, 378] | 1166 | [33, 154] |
| 30 | [59, 60] | 409 | [643, 269] | 788 | [1041, 32] | 1167 | [1407, 957] |
| 31 | [61, 62] | 410 | [644, 645] | 789 | [168, 985] | 1168 | [995, 160] |
| 32 | [63, 64] | 411 | [289, 646] | 790 | [1042, 522] | 1169 | [1068, 1032] |
| 33 | [65, 66] | 412 | [647, 648] | 791 | [541, 129] | 1170 | [192, 962] |
| 34 | [67, 68] | 413 | [649, 650] | 792 | [1043, 1044] | 1171 | [512, 1075] |
| 35 | [69, 70] | 414 | [651, 652] | 793 | [404, 196] | 1172 | [1408, 1044] |
| 36 | [71, 72] | 415 | [653, 654] | 794 | [987, 981] | 1173 | [1088, 944] |
| 37 | [73, 74] | 416 | [655, 65] | 795 | [1045, 1046] | 1174 | [38, 123] |
| 38 | [75, 76] | 417 | [656, 657] | 796 | [1011, 1007] | 1175 | [448, 1024] |
| 39 | [77, 78] | 418 | [658, 335] | 797 | [398, 406] | 1176 | [405, 560] |
| 40 | [79, 80] | 419 | [659, 660] | 798 | [1047, 1048] | 1177 | [402, 50] |
| 41 | [81, 82] | 420 | [661, 662] | 799 | [1049, 1050] | 1178 | [1061, 393] |
| 42 | [83, 84] | 421 | [663, 664] | 800 | [559, 399] | 1179 | [175, 573] |
| 43 | [85, 86] | 422 | [665, 666] | 801 | [126, 529] | 1180 | [32, 153] |
| 44 | [87, 88] | 423 | [667, 668] | 802 | [172, 517] | 1181 | [1409, 993] |
| 45 | [89, 90] | 424 | [578, 669] | 803 | [119, 492] | 1182 | [436, 546] |
| 46 | [91, 92] | 425 | [670, 671] | 804 | [1041, 171] | 1183 | [1035, 1022] |
| 47 | [93, 94] | 426 | [260, 672] | 805 | [1051, 447] | 1184 | [1410, 152] |
| 48 | [95, 96] | 427 | [673, 674] | 806 | [51, 534] | 1185 | [448, 533] |
| 49 | [97, 98] | 428 | [675, 676] | 807 | [380, 1048] | 1186 | [1411, 1412] |
| 50 | [99, 100] | 429 | [677, 678] | 808 | [508, 1052] | 1187 | [1413, 192] |
| 51 | [101, 102] | 430 | [678, 679] | 809 | [1053, 1021] | 1188 | [555, 950] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 52 | [103, 104] | 431 | [680, 681] | 810 | [496, 51] | 1189 | [1414, 919] |
| 53 | [105, 106] | 432 | [682, 683] | 811 | [465, 1054] | 1190 | [949, 1039] |
| 54 | [107, 108] | 433 | [684, 685] | 812 | [445, 484] | 1191 | [1041, 194] |
| 55 | [109, 110] | 434 | [686, 687] | 813 | [954, 468] | 1192 | [918, 945] |
| 56 | [111, 112] | 435 | [688, 638] | 814 | [538, 1055] | 1193 | [415, 1005] |
| 57 | [113, 114] | 436 | [689, 690] | 815 | [554, 158] | 1194 | [462, 561] |
| 58 | [111, 115] | 437 | [691, 692] | 816 | [168, 1056] | 1195 | [1051, 567] |
| 59 | [116, 117] | 438 | [693, 694] | 817 | [1057, 385] | 1196 | [386, 1415] |
| 60 | [118, 45] | 439 | [695, 696] | 818 | [955, 1058] | 1197 | [1004, 192] |
| 61 | [45, 119] | 440 | [697, 698] | 819 | [375, 136] | 1198 | [1416, 1072] |
| 62 | [34, 49] | 441 | [699, 219] | 820 | [553, 188] | 1199 | [430, 429] |
| 63 | [120, 121] | 442 | [700, 701] | 821 | [1059, 1048] | 1200 | [433, 1417] |
| 64 | [122, 123] | 443 | [702, 703] | 822 | [1060, 41] | 1201 | [1067, 482] |
| 65 | [124, 125] | 444 | [704, 705] | 823 | [1061, 192] | 1202 | [426, 160] |
| 66 | [126, 52] | 445 | [706, 707] | 824 | [177, 451] | 1203 | [445, 435] |
| 67 | [127, 128] | 446 | [708, 709] | 825 | [1062, 408] | 1204 | [993, 437] |
| 68 | [129, 130] | 447 | [56, 642] | 826 | [470, 145] | 1205 | [1418, 475] |
| 69 | [131, 132] | 448 | [710, 711] | 827 | [1063, 132] | 1206 | [190, 945] |
| 70 | [133, 134] | 449 | [712, 713] | 828 | [1064, 433] | 1207 | [1087, 1046] |
| 71 | [135, 136] | 450 | [714, 715] | 829 | [1008, 47] | 1208 | [1049, 1394] |
| 72 | [137, 138] | 451 | [716, 717] | 830 | [1065, 128] | 1209 | [996, 156] |
| 73 | [139, 140] | 452 | [718, 719] | 831 | [431, 471] | 1210 | [124, 120] |
| 74 | [141, 142] | 453 | [720, 721] | 832 | [134, 148] | 1211 | [923, 962] |
| 75 | [143, 144] | 454 | [722, 723] | 833 | [1066, 523] | 1212 | [428, 1419] |
| 76 | [145, 146] | 455 | [637, 724] | 834 | [435, 1054] | 1213 | [54, 528] |
| 77 | [147, 148] | 456 | [725, 726] | 835 | [178, 427] | 1214 | [125, 374] |
| 78 | [149, 150] | 457 | [727, 628] | 836 | [1067, 523] | 1215 | [163, 1397] |
| 79 | [151, 152] | 458 | [728, 729] | 837 | [493, 159] | 1216 | [503, 1397] |
| 80 | [153, 154] | 459 | [730, 731] | 838 | [485, 186] | 1217 | [1420, 1000] |
| 81 | [155, 156] | 460 | [732, 733] | 839 | [1068, 454] | 1218 | [33, 528] |
| 82 | [157, 158] | 461 | [734, 735] | 840 | [505, 561] | 1219 | [998, 937] |
| 83 | [159, 160] | 462 | [314, 736] | 841 | [1069, 140] | 1220 | [492, 1007] |
| 84 | [161, 162] | 463 | [737, 738] | 842 | [1070, 383] | 1221 | [1051, 1090] |
| 85 | [163, 164] | 464 | [739, 740] | 843 | [1071, 1072] | 1222 | [530, 932] |
| 86 | [165, 166] | 465 | [741, 587] | 844 | [146, 991] | 1223 | [1404, 391] |
| 87 | [167, 168] | 466 | [707, 742] | 845 | [484, 1054] | 1224 | [1053, 152] |
| 88 | [169, 170] | 467 | [743, 744] | 846 | [1068, 1073] | 1225 | [518, 190] |
| 89 | [171, 33] | 468 | [745, 231] | 847 | [1074, 459] | 1226 | [996, 1001] |
| 90 | [172, 173] | 469 | [746, 747] | 848 | [174, 1075] | 1227 | [943, 402] |
| 91 | [174, 166] | 470 | [681, 643] | 849 | [1076, 463] | 1228 | [428, 396] |
| 92 | [175, 176] | 471 | [96, 748] | 850 | [119, 1011] | 1229 | [513, 1421] |
| 93 | [177, 115] | 472 | [749, 750] | 851 | [570, 504] | 1230 | [548, 545] |
| 94 | [178, 13] | 473 | [751, 56] | 852 | [191, 921] | 1231 | [438, 966] |
| 95 | [179, 180] | 474 | [582, 752] | 853 | [1074, 453] | 1232 | [183, 1422] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 96 | [181, 182] | 475 | [753, 285] | 854 | [511, 1074] | 1233 | [524, 1423] |
| 97 | [183, 184] | 476 | [754, 755] | 855 | [177, 972] | 1234 | [436, 1013] |
| 98 | [185, 186] | 477 | [756, 757] | 856 | [1077, 990] | 1235 | [442, 1098] |
| 99 | [187, 45] | 478 | [758, 759] | 857 | [1049, 391] | 1236 | [131, 1424] |
| 100 | [29, 188] | 479 | [760, 761] | 858 | [1078, 1079] | 1237 | [1420, 998] |
| 101 | [48, 35] | 480 | [762, 763] | 859 | [145, 471] | 1238 | [119, 375] |
| 102 | [189, 190] | 481 | [764, 339] | 860 | [1080, 441] | 1239 | [461, 1425] |
| 103 | [191, 176] | 482 | [765, 766] | 861 | [548, 439] | 1240 | [187, 125] |
| 104 | [192, 193] | 483 | [767, 768] | 862 | [1081, 1074] | 1241 | [1024, 930] |
| 105 | [194, 195] | 484 | [769, 770] | 863 | [403, 51] | 1242 | [400, 1056] |
| 106 | [48, 196] | 485 | [771, 772] | 864 | [1000, 1082] | 1243 | [120, 119] |
| 107 | [157, 197] | 486 | [773, 774] | 865 | [54, 154] | 1244 | [428, 940] |
| 108 | [198, 199] | 487 | [775, 776] | 866 | [998, 1083] | 1245 | [394, 1039] |
| 109 | [200, 201] | 488 | [777, 778] | 867 | [1084, 1000] | 1246 | [968, 1389] |
| 110 | [202, 203] | 489 | [696, 223] | 868 | [1025, 1033] | 1247 | [493, 995] |
| 111 | [204, 205] | 490 | [250, 779] | 869 | [118, 120] | 1248 | [1025, 1022] |
| 112 | [206, 207] | 491 | [780, 781] | 870 | [1085, 12] | 1249 | [554, 402] |
| 113 | [208, 101] | 492 | [222, 782] | 871 | [970, 922] | 1250 | [562, 375] |
| 114 | [209, 210] | 493 | [783, 784] | 872 | [450, 972] | 1251 | [1426, 475] |
| 115 | [211, 212] | 494 | [785, 786] | 873 | [1015, 1074] | 1252 | [964, 1427] |
| 116 | [213, 214] | 495 | [787, 788] | 874 | [513, 922] | 1253 | [416, 171] |
| 117 | [215, 216] | 496 | [292, 789] | 875 | [939, 396] | 1254 | [398, 560] |
| 118 | [217, 218] | 497 | [790, 791] | 876 | [191, 501] | 1255 | [1428, 152] |
| 119 | [219, 220] | 498 | [792, 793] | 877 | [1086, 415] | 1256 | [121, 375] |
| 120 | [221, 222] | 499 | [794, 795] | 878 | [30, 570] | 1257 | [152, 1022] |
| 121 | [223, 224] | 500 | [796, 797] | 879 | [154, 984] | 1258 | [457, 536] |
| 122 | [225, 226] | 501 | [798, 799] | 880 | [1087, 389] | 1259 | [961, 454] |
| 123 | [227, 228] | 502 | [800, 801] | 881 | [40, 933] | 1260 | [118, 125] |
| 124 | [229, 230] | 503 | [802, 803] | 882 | [1088, 520] | 1261 | [372, 1090] |
| 125 | [231, 232] | 504 | [804, 805] | 883 | [153, 528] | 1262 | [1097, 443] |
| 126 | [233, 234] | 505 | [62, 691] | 884 | [553, 447] | 1263 | [475, 545] |
| 127 | [235, 236] | 506 | [806, 26] | 885 | [1089, 378] | 1264 | [1096, 490] |
| 128 | [237, 238] | 507 | [807, 808] | 886 | [949, 556] | 1265 | [549, 439] |
| 129 | [239, 240] | 508 | [809, 810] | 887 | [1030, 938] | 1266 | [486, 1429] |
| 130 | [240, 241] | 509 | [811, 812] | 888 | [171, 195] | 1267 | [1028, 446] |
| 131 | [242, 243] | 510 | [813, 814] | 889 | [553, 1090] | 1268 | [374, 1011] |
| 132 | [244, 245] | 511 | [815, 816] | 890 | [125, 121] | 1269 | [478, 437] |
| 133 | [246, 247] | 512 | [817, 818] | 891 | [527, 1091] | 1270 | [478, 1427] |
| 134 | [248, 249] | 513 | [819, 820] | 892 | [1092, 144] | 1271 | [1405, 1417] |
| 135 | [90, 250] | 514 | [821, 822] | 893 | [130, 540] | 1272 | [1402, 998] |
| 136 | [251, 252] | 515 | [823, 824] | 894 | [1093, 1094] | 1273 | [11, 452] |
| 137 | [253, 254] | 516 | [825, 826] | 895 | [963, 1093] | 1274 | [574, 1421] |
| 138 | [255, 256] | 517 | [827, 828] | 896 | [1095, 126] | 1275 | [491, 171] |
| 139 | [257, 258] | 518 | [776, 829] | 897 | [157, 563] | 1276 | [1008, 1005] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 140 | [259, 260] | 519 | [830, 831] | 898 | [500, 921] | 1277 | [564, 517] |
| 141 | [261, 262] | 520 | [832, 833] | 899 | [1096, 474] | 1278 | [54, 983] |
| 142 | [263, 264] | 521 | [834, 739] | 900 | [1097, 1098] | 1279 | [1430, 926] |
| 143 | [265, 266] | 522 | [835, 653] | 901 | [1099, 994] | 1280 | [496, 1024] |
| 144 | [267, 268] | 523 | [836, 837] | 902 | [1096, 1100] | 1281 | [958, 396] |
| 145 | [269, 270] | 524 | [838, 839] | 903 | [197, 403] | 1282 | [456, 551] |
| 146 | [271, 272] | 525 | [840, 745] | 904 | [1088, 1058] | 1283 | [472, 454] |
| 147 | [273, 274] | 526 | [841, 842] | 905 | [413, 1094] | 1284 | [549, 545] |
| 148 | [275, 276] | 527 | [843, 844] | 906 | [1101, 507] | 1285 | [479, 488] |
| 149 | [277, 278] | 528 | [321, 762] | 907 | [519, 419] | 1286 | [1093, 1431] |
| 150 | [279, 280] | 529 | [652, 332] | 908 | [1102, 981] | 1287 | [1038, 1030] |
| 151 | [281, 282] | 530 | [845, 846] | 909 | [51, 930] | 1288 | [422, 1421] |
| 152 | [283, 284] | 531 | [847, 848] | 910 | [405, 138] | 1289 | [566, 31] |
| 153 | [285, 286] | 532 | [849, 850] | 911 | [955, 520] | 1290 | [117, 985] |
| 154 | [64, 287] | 533 | [631, 695] | 912 | [121, 135] | 1291 | [1078, 932] |
| 155 | [288, 289] | 534 | [715, 851] | 913 | [168, 199] | 1292 | [1070, 1432] |
| 156 | [290, 77] | 535 | [86, 369] | 914 | [1103, 587] | 1293 | [1413, 393] |
| 157 | [291, 292] | 536 | [852, 853] | 915 | [1104, 1105] | 1294 | [574, 514] |
| 158 | [293, 294] | 537 | [854, 855] | 916 | [1106, 1107] | 1295 | [1433, 372] |
| 159 | [295, 296] | 538 | [856, 351] | 917 | [60, 1108] | 1296 | [454, 1396] |
| 160 | [58, 259] | 539 | [857, 858] | 918 | [1109, 1110] | 1297 | [493, 162] |
| 161 | [297, 298] | 540 | [844, 859] | 919 | [1111, 1112] | 1298 | [1011, 136] |
| 162 | [299, 93] | 541 | [541, 541] | 920 | [1113, 1114] | 1299 | [415, 47] |
| 163 | [300, 301] | 542 | [68, 677] | 921 | [1115, 1116] | 1300 | [388, 1048] |
| 164 | [302, 105] | 543 | [860, 861] | 922 | [619, 1117] | 1301 | [1102, 988] |
| 165 | [303, 304] | 544 | [862, 852] | 923 | [1118, 1119] | 1302 | [1073, 1396] |
| 166 | [305, 306] | 545 | [863, 864] | 924 | [72, 313] | 1303 | [472, 1032] |
| 167 | [307, 308] | 546 | [865, 866] | 925 | [1120, 1121] | 1304 | [192, 924] |
| 168 | [309, 310] | 547 | [867, 863] | 926 | [1122, 1123] | 1305 | [948, 1390] |
| 169 | [311, 312] | 548 | [868, 869] | 927 | [1124, 1125] | 1306 | [1032, 455] |
| 170 | [313, 314] | 549 | [752, 107] | 928 | [1126, 827] | 1307 | [537, 426] |
| 171 | [315, 316] | 550 | [870, 871] | 929 | [1127, 1128] | 1308 | [12, 938] |
| 172 | [317, 239] | 551 | [607, 872] | 930 | [327, 1129] | 1309 | [1414, 539] |
| 173 | [318, 319] | 552 | [873, 874] | 931 | [1130, 1131] | 1310 | [1430, 155] |
| 174 | [320, 321] | 553 | [875, 876] | 932 | [1132, 741] | 1311 | [518, 918] |
| 175 | [322, 323] | 554 | [877, 878] | 933 | [1133, 1134] | 1312 | [1411, 1001] |
| 176 | [324, 325] | 555 | [879, 251] | 934 | [1135, 1136] | 1313 | [1414, 499] |
| 177 | [326, 327] | 556 | [880, 881] | 935 | [294, 1137] | 1314 | [970, 1421] |
| 178 | [328, 329] | 557 | [882, 883] | 936 | [1138, 1139] | 1315 | [1020, 999] |
| 179 | [330, 331] | 558 | [884, 63] | 937 | [641, 363] | 1316 | [1393, 1010] |
| 180 | [332, 333] | 559 | [885, 349] | 938 | [1140, 293] | 1317 | [393, 1434] |
| 181 | [76, 334] | 560 | [886, 887] | 939 | [1141, 1142] | 1318 | [462, 945] |
| 182 | [335, 336] | 561 | [805, 888] | 940 | [1143, 1144] | 1319 | [198, 985] |
| 183 | [337, 338] | 562 | [346, 889] | 941 | [98, 1145] | 1320 | [485, 410] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 184 | [339, 340] | 563 | [890, 891] | 942 | [1146, 1147] | 1321 | [446, 466] |
| 185 | [341, 342] | 564 | [892, 893] | 943 | [1148, 632] | 1322 | [550, 968] |
| 186 | [343, 344] | 565 | [894, 895] | 944 | [1149, 1150] | 1323 | [1084, 998] |
| 187 | [345, 346] | 566 | [896, 897] | 945 | [350, 1151] | 1324 | [504, 190] |
| 188 | [347, 348] | 567 | [898, 237] | 946 | [1152, 1153] | 1325 | [495, 194] |
| 189 | [349, 350] | 568 | [899, 900] | 947 | [596, 1154] | 1326 | [553, 567] |
| 190 | [351, 352] | 569 | [901, 902] | 948 | [1155, 1156] | 1327 | [484, 466] |
| 191 | [353, 354] | 570 | [903, 904] | 949 | [1157, 1158] | 1328 | [434, 446] |
| 192 | [355, 356] | 571 | [905, 732] | 950 | [1159, 1160] | 1329 | [1066, 482] |
| 193 | [357, 358] | 572 | [906, 907] | 951 | [1161, 1162] | 1330 | [961, 1073] |
| 194 | [359, 360] | 573 | [795, 908] | 952 | [1163, 1109] | 1331 | [1435, 487] |
| 195 | [361, 362] | 574 | [909, 910] | 953 | [1164, 1165] | 1332 | [1097, 488] |
| 196 | [363, 364] | 575 | [911, 912] | 954 | [17, 1166] | 1333 | [968, 536] |
| 197 | [365, 366] | 576 | [913, 365] | 955 | [1167, 680] | 1334 | [456, 968] |
| 198 | [367, 368] | 577 | [914, 137] | 956 | [1168, 1169] | 1335 | [1436, 548] |
| 199 | [369, 370] | 578 | [555, 395] | 957 | [1170, 1171] | 1336 | [487, 1098] |
| 200 | [371, 32] | 579 | [915, 916] | 958 | [1172, 1173] | 1337 | [1437, 479] |
| 201 | [372, 188] | 580 | [182, 542] | 959 | [1174, 1175] | 1338 | [1438, 1030] |
| 202 | [373, 35] | 581 | [415, 529] | 960 | [1176, 1177] | 1339 | [971, 112] |
| 203 | [374, 375] | 582 | [917, 918] | 961 | [1178, 1179] | 1340 | [435, 466] |
| 204 | [376, 377] | 583 | [518, 505] | 962 | [201, 1180] | 1341 | [425, 159] |
| 205 | [378, 379] | 584 | [197, 496] | 963 | [1181, 1182] | 1342 | [1410, 1021] |
| 206 | [380, 381] | 585 | [538, 919] | 964 | [1183, 710] | 1343 | [917, 505] |
| 207 | [382, 383] | 586 | [920, 921] | 965 | [1184, 1185] | 1344 | [1032, 1396] |
| 208 | [384, 385] | 587 | [422, 922] | 966 | [102, 1186] | 1345 | [967, 535] |
| 209 | [386, 387] | 588 | [923, 924] | 967 | [1187, 1188] | 1346 | [557, 164] |
| 210 | [388, 381] | 589 | [426, 424] | 968 | [1189, 1190] | 1347 | [191, 573] |
| 211 | [42, 389] | 590 | [467, 473] | 969 | [1191, 302] | 1348 | [418, 944] |
| 212 | [390, 391] | 591 | [110, 924] | 970 | [1192, 1193] | 1349 | [917, 190] |
| 213 | [392, 393] | 592 | [449, 469] | 971 | [1194, 1195] | 1350 | [532, 41] |
| 214 | [394, 395] | 593 | [925, 926] | 972 | [747, 1196] | 1351 | [963, 147] |
| 215 | [9, 396] | 594 | [562, 492] | 973 | [1197, 103] | 1352 | [967, 457] |
| 216 | [177, 112] | 595 | [927, 928] | 974 | [1198, 1199] | 1353 | [154, 377] |
| 217 | [397, 398] | 596 | [929, 197] | 975 | [1200, 1201] | 1354 | [162, 160] |
| 218 | [187, 120] | 597 | [533, 930] | 976 | [1202, 1203] | 1355 | [544, 535] |
| 219 | [30, 399] | 598 | [931, 932] | 977 | [1204, 1146] | 1356 | [1030, 427] |
| 220 | [400, 401] | 599 | [386, 933] | 978 | [1205, 275] | 1357 | [1428, 1021] |
| 221 | [402, 403] | 600 | [934, 155] | 979 | [1206, 884] | 1358 | [195, 528] |
| 222 | [404, 35] | 601 | [448, 935] | 980 | [1207, 1208] | 1359 | [483, 435] |
| 223 | [44, 125] | 602 | [936, 937] | 981 | [1209, 1210] | 1360 | [550, 535] |
| 224 | [405, 406] | 603 | [559, 570] | 982 | [1211, 1212] | 1361 | [433, 1439] |
| 225 | [407, 408] | 604 | [551, 536] | 983 | [304, 1213] | 1362 | [133, 413] |
| 226 | [409, 181] | 605 | [483, 446] | 984 | [66, 1214] | 1363 | [11, 1074] |
| 227 | [410, 411] | 606 | [178, 938] | 985 | [786, 1215] | 1364 | [555, 1039] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 228 | [412, 413] | 607 | [939, 940] | 986 | [1216, 4] | 1365 | [535, 1389] |
| 229 | [414, 415] | 608 | [941, 463] | 987 | [1217, 1218] | 1366 | [967, 551] |
| 230 | [416, 194] | 609 | [54, 376] | 988 | [1219, 1191] | 1367 | [1440, 180] |
| 231 | [417, 119] | 610 | [942, 464] | 989 | [1220, 1221] | 1368 | [471, 430] |
| 232 | [418, 419] | 611 | [495, 53] | 990 | [1222, 1223] | 1369 | [1085, 1030] |
| 233 | [420, 421] | 612 | [943, 197] | 991 | [226, 271] | 1370 | [1074, 1441] |
| 234 | [422, 423] | 613 | [415, 52] | 992 | [1224, 1225] | 1371 | [486, 568] |
| 235 | [162, 424] | 614 | [519, 944] | 993 | [703, 99] | 1372 | [444, 486] |
| 236 | [425, 426] | 615 | [496, 533] | 994 | [1226, 1227] | 1373 | [1073, 455] |
| 237 | [12, 427] | 616 | [505, 945] | 995 | [1228, 1229] | 1374 | [483, 465] |
| 238 | [428, 10] | 617 | [137, 560] | 996 | [1230, 1231] | 1375 | [1064, 131] |
| 239 | [429, 409] | 618 | [946, 142] | 997 | [1203, 1232] | 1376 | [161, 426] |
| 240 | [430, 431] | 619 | [931, 531] | 998 | [276, 244] | 1377 | [441, 1003] |
| 241 | [409, 430] | 620 | [947, 163] | 999 | [236, 1233] | 1378 | [1029, 12] |
| 242 | [432, 433] | 621 | [920, 573] | 1000 | [1234, 1235] | 1379 | [111, 972] |
| 243 | [434, 435] | 622 | [948, 421] | 1001 | [1121, 1236] | 1380 | [495, 32] |
| 244 | [436, 437] | 623 | [949, 950] | 1002 | [1237, 1238] | 1381 | [1411, 156] |
| 245 | [438, 439] | 624 | [53, 33] | 1003 | [698, 1239] | 1382 | [1442, 1000] |
| 246 | [440, 441] | 625 | [38, 951] | 1004 | [1240, 357] | 1383 | [189, 505] |
| 247 | [442, 443] | 626 | [952, 499] | 1005 | [672, 267] | 1384 | [918, 561] |
| 248 | [444, 186] | 627 | [953, 556] | 1006 | [1241, 1242] | 1385 | [398, 379] |
| 249 | [445, 446] | 628 | [920, 176] | 1007 | [617, 1243] | 1386 | [1443, 461] |
| 250 | [33, 376] | 629 | [954, 459] | 1008 | [1244, 1245] | 1387 | [403, 1024] |
| 251 | [372, 447] | 630 | [32, 195] | 1009 | [1246, 1247] | 1388 | [1444, 72] |
| 252 | [402, 448] | 631 | [955, 944] | 1010 | [1248, 1249] | 1389 | [871, 1308] |
| 253 | [449, 166] | 632 | [943, 158] | 1011 | [1173, 1250] | 1390 | [1223, 880] |
| 254 | [450, 451] | 633 | [398, 138] | 1012 | [1251, 1252] | 1391 | [1445, 1446] |
| 255 | [450, 112] | 634 | [956, 957] | 1013 | [352, 760] | 1392 | [1447, 295] |
| 256 | [452, 453] | 635 | [542, 470] | 1014 | [1125, 1234] | 1393 | [1448, 1449] |
| 257 | [454, 455] | 636 | [958, 940] | 1015 | [1253, 1254] | 1394 | [1450, 1451] |
| 258 | [456, 457] | 637 | [574, 922] | 1016 | [1255, 1256] | 1395 | [1452, 1453] |
| 259 | [458, 459] | 638 | [175, 921] | 1017 | [1257, 22] | 1396 | [586, 1211] |
| 260 | [420, 114] | 639 | [959, 960] | 1018 | [1258, 1259] | 1397 | [801, 1454] |
| 261 | [460, 461] | 640 | [473, 455] | 1019 | [1260, 1261] | 1398 | [1455, 1456] |
| 262 | [189, 462] | 641 | [961, 473] | 1020 | [1262, 1263] | 1399 | [1457, 1111] |
| 263 | [463, 464] | 642 | [110, 962] | 1021 | [1264, 1265] | 1400 | [1458, 1281] |
| 264 | [169, 399] | 643 | [431, 146] | 1022 | [282, 1266] | 1401 | [1459, 255] |
| 265 | [465, 466] | 644 | [963, 413] | 1023 | [833, 1267] | 1402 | [828, 1360] |
| 266 | [467, 454] | 645 | [537, 162] | 1024 | [662, 1268] | 1403 | [1460, 1461] |
| 267 | [458, 468] | 646 | [964, 437] | 1025 | [1269, 1270] | 1404 | [1462, 1463] |
| 268 | [165, 469] | 647 | [965, 487] | 1026 | [331, 1271] | 1405 | [1464, 1465] |
| 269 | [182, 409] | 648 | [475, 966] | 1027 | [1272, 865] | 1406 | [1466, 913] |
| 270 | [146, 470] | 649 | [569, 523] | 1028 | [1273, 1274] | 1407 | [1467, 1126] |
| 271 | [471, 181] | 650 | [967, 968] | 1029 | [1275, 1276] | 1408 | [1468, 1176] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 272 | [181, 145] | 651 | [969, 503] | 1030 | [1277, 1278] | 1409 | [1469, 1470] |
| 273 | [133, 147] | 652 | [970, 423] | 1031 | [1279, 1280] | 1410 | [1471, 1472] |
| 274 | [472, 473] | 653 | [498, 919] | 1032 | [1281, 347] | 1411 | [646, 899] |
| 275 | [441, 474] | 654 | [971, 972] | 1033 | [1282, 659] | 1412 | [1345, 227] |
| 276 | [475, 476] | 655 | [973, 126] | 1034 | [1283, 318] | 1413 | [264, 1473] |
| 277 | [477, 478] | 656 | [399, 504] | 1035 | [1284, 1285] | 1414 | [1474, 1475] |
| 278 | [479, 480] | 657 | [974, 975] | 1036 | [266, 1286] | 1415 | [1476, 1275] |
| 279 | [481, 482] | 658 | [976, 916] | 1037 | [1287, 1288] | 1416 | [1477, 1478] |
| 280 | [483, 484] | 659 | [482, 977] | 1038 | [1289, 1290] | 1417 | [1263, 1264] |
| 281 | [485, 486] | 660 | [978, 147] | 1039 | [1291, 1292] | 1418 | [1479, 754] |
| 282 | [434, 484] | 661 | [979, 980] | 1040 | [1293, 1294] | 1419 | [1480, 667] |
| 283 | [487, 488] | 662 | [564, 173] | 1041 | [1295, 361] | 1420 | [1481, 1482] |
| 284 | [489, 490] | 663 | [382, 981] | 1042 | [1296, 1297] | 1421 | [1483, 1484] |
| 285 | [491, 194] | 664 | [530, 982] | 1043 | [1298, 1299] | 1422 | [1285, 1485] |
| 286 | [137, 379] | 665 | [983, 984] | 1044 | [1300, 1301] | 1423 | [284, 1124] |
| 287 | [121, 492] | 666 | [400, 985] | 1045 | [1302, 1303] | 1424 | [683, 1486] |
| 288 | [441, 490] | 667 | [139, 986] | 1046 | [1304, 1305] | 1425 | [1145, 1487] |
| 289 | [487, 443] | 668 | [987, 988] | 1047 | [1306, 1307] | 1426 | [1488, 1489] |
| 290 | [493, 426] | 669 | [178, 576] | 1048 | [1308, 1309] | 1427 | [1225, 775] |
| 291 | [494, 168] | 670 | [392, 192] | 1049 | [1310, 1311] | 1428 | [228, 1490] |
| 292 | [495, 171] | 671 | [513, 423] | 1050 | [1312, 15] | 1429 | [772, 1491] |
| 293 | [158, 496] | 672 | [953, 395] | 1051 | [1313, 1314] | 1430 | [660, 290] |
| 294 | [497, 39] | 673 | [378, 138] | 1052 | [1315, 1240] | 1431 | [738, 1492] |
| 295 | [498, 499] | 674 | [45, 374] | 1053 | [1201, 1282] | 1432 | [1493, 1494] |
| 296 | [500, 501] | 675 | [989, 990] | 1054 | [687, 85] | 1433 | [1495, 898] |
| 297 | [502, 503] | 676 | [34, 571] | 1055 | [1316, 798] | 1434 | [613, 903] |
| 298 | [500, 176] | 677 | [542, 991] | 1056 | [214, 1317] | 1435 | [1496, 777] |
| 299 | [174, 469] | 678 | [130, 130] | 1057 | [1318, 1319] | 1436 | [1497, 1498] |
| 300 | [404, 49] | 679 | [991, 429] | 1058 | [1271, 1320] | 1437 | [1499, 702] |
| 301 | [504, 505] | 680 | [991, 431] | 1059 | [1321, 1322] | 1438 | [1500, 673] |
| 302 | [198, 401] | 681 | [470, 182] | 1060 | [1323, 1324] | 1439 | [1332, 283] |
| 303 | [506, 507] | 682 | [992, 993] | 1061 | [1325, 1326] | 1440 | [1501, 1502] |
| 304 | [373, 49] | 683 | [994, 490] | 1062 | [1327, 1328] | 1441 | [1254, 89] |
| 305 | [508, 142] | 684 | [149, 486] | 1063 | [1329, 1330] | 1442 | [1372, 1503] |
| 306 | [509, 510] | 685 | [425, 995] | 1064 | [1331, 1332] | 1443 | [1504, 1283] |
| 307 | [511, 452] | 686 | [969, 163] | 1065 | [1333, 1334] | 1444 | [1505, 170] |
| 308 | [175, 501] | 687 | [949, 395] | 1066 | [1335, 1336] | 1445 | [995, 424] |
| 309 | [512, 469] | 688 | [9, 940] | 1067 | [1337, 1204] | 1446 | [434, 465] |
| 310 | [513, 514] | 689 | [461, 464] | 1068 | [1338, 1339] | 1447 | [393, 962] |
| 311 | [515, 372] | 690 | [554, 563] | 1069 | [1340, 1341] | 1448 | [1023, 926] |
| 312 | [491, 53] | 691 | [119, 135] | 1070 | [1342, 1343] | 1449 | [195, 983] |
| 313 | [170, 504] | 692 | [996, 997] | 1071 | [1344, 1345] | 1450 | [1000, 999] |
| 314 | [516, 517] | 693 | [926, 156] | 1072 | [1346, 636] | 1451 | [943, 563] |
| 315 | [31, 518] | 694 | [559, 170] | 1073 | [592, 1347] | 1452 | [1019, 503] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 316 | [519, 520] | 695 | [195, 154] | 1074 | [1348, 1349] | 1453 | [953, 950] |
| 317 | [521, 522] | 696 | [927, 464] | 1075 | [1350, 716] | 1454 | [399, 189] |
| 318 | [523, 184] | 697 | [941, 461] | 1076 | [1351, 1352] | 1455 | [983, 377] |
| 319 | [481, 524] | 698 | [374, 492] | 1077 | [1353, 730] | 1456 | [29, 567] |
| 320 | [525, 526] | 699 | [998, 999] | 1078 | [1354, 1355] | 1457 | [42, 1046] |
| 321 | [527, 517] | 700 | [1000, 937] | 1079 | [1356, 708] | 1458 | [452, 468] |
| 322 | [528, 377] | 701 | [124, 417] | 1080 | [1357, 1358] | 1459 | [1081, 452] |
| 323 | [46, 529] | 702 | [153, 376] | 1081 | [15, 720] | 1460 | [935, 534] |
| 324 | [530, 531] | 703 | [155, 1001] | 1082 | [1359, 905] | 1461 | [378, 406] |
| 325 | [532, 387] | 704 | [1002, 479] | 1083 | [1360, 1361] | 1462 | [1442, 998] |
| 326 | [533, 534] | 705 | [489, 1003] | 1084 | [1362, 1359] | 1463 | [50, 533] |
| 327 | [117, 199] | 706 | [1004, 393] | 1085 | [82, 1140] | 1464 | [978, 413] |
| 328 | [497, 123] | 707 | [450, 115] | 1086 | [1363, 1364] | 1465 | [456, 535] |
| 329 | [518, 462] | 708 | [572, 421] | 1087 | [1365, 1366] | 1466 | [375, 1007] |
| 330 | [535, 536] | 709 | [971, 451] | 1088 | [1367, 1368] | 1467 | [457, 1389] |
| 331 | [537, 159] | 710 | [169, 31] | 1089 | [1369, 886] | 1468 | [528, 984] |
| 332 | [503, 164] | 711 | [46, 1005] | 1090 | [874, 1370] | 1469 | [460, 463] |
| 333 | [538, 539] | 712 | [1006, 980] | 1091 | [1371, 1372] | 1470 | [50, 935] |
| 334 | [540, 129] | 713 | [497, 951] | 1092 | [1373, 1374] | 1471 | [543, 433] |
| 335 | [540, 541] | 714 | [135, 1007] | 1093 | [1375, 1376] | 1472 | [425, 162] |
| 336 | [429, 542] | 715 | [1008, 52] | 1094 | [247, 1377] | 1473 | [405, 379] |
| 337 | [543, 131] | 716 | [1009, 932] | 1095 | [1378, 1379] | 1474 | [1506, 37] |
| 338 | [544, 457] | 717 | [141, 1010] | 1096 | [755, 1380] | 1475 | [172, 565] |
| 339 | [438, 545] | 718 | [974, 39] | 1097 | [1381, 804] | 1476 | [1035, 1033] |
| 340 | [478, 546] | 719 | [562, 1011] | 1098 | [287, 758] | 1477 | [446, 1054] |
| 341 | [547, 548] | 720 | [29, 447] | 1099 | [1382, 1383] | 1478 | [161, 995] |
| 342 | [549, 476] | 721 | [31, 917] | 1100 | [1280, 693] | 1479 | [151, 1021] |
| 343 | [185, 486] | 722 | [948, 114] | 1101 | [1384, 1385] | 1480 | [1070, 988] |
| 344 | [550, 551] | 723 | [970, 514] | 1102 | [1386, 1387] | 1481 | [569, 482] |
| 345 | [552, 553] | 724 | [959, 558] | 1103 | [1388, 923] | 1482 | [537, 995] |
| 346 | [554, 197] | 725 | [947, 503] | 1104 | [551, 1389] | 1483 | [509, 1046] |
| 347 | [555, 556] | 726 | [111, 451] | 1105 | [472, 1073] | 1484 | [508, 1507] |
| 348 | [557, 558] | 727 | [113, 421] | 1106 | [1074, 468] | 1485 | [549, 966] |
| 349 | [559, 31] | 728 | [516, 173] | 1107 | [113, 1390] | 1486 | [993, 1427] |
| 350 | [378, 560] | 729 | [403, 935] | 1108 | [117, 1056] | 1487 | [186, 1508] |
| 351 | [418, 520] | 730 | [117, 401] | 1109 | [974, 123] | 1488 | [1076, 461] |
| 352 | [448, 51] | 731 | [563, 448] | 1110 | [153, 983] | 1489 | [33, 983] |
| 353 | [190, 561] | 732 | [1012, 131] | 1111 | [1060, 387] | 1490 | [961, 1032] |
| 354 | [168, 401] | 733 | [445, 465] | 1112 | [1391, 1392] | 1491 | [994, 1100] |
| 355 | [122, 39] | 734 | [438, 476] | 1113 | [1024, 534] | 1492 | [442, 480] |
| 356 | [195, 376] | 735 | [994, 1003] | 1114 | [29, 1090] | 1493 | [1021, 1033] |
| 357 | [400, 199] | 736 | [504, 462] | 1115 | [1069, 986] | 1494 | [566, 170] |
| 358 | [125, 562] | 737 | [993, 1013] | 1116 | [1393, 1052] | 1495 | [1438, 12] |
| 359 | [563, 496] | 738 | [548, 476] | 1117 | [1016, 1394] | 1496 | [1443, 463] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 360 | [564, 565] | 739 | [544, 551] | 1118 | [527, 173] | 1497 | [934, 926] |
| 361 | [566, 399] | 740 | [134, 1014] | 1119 | [189, 918] | 1498 | [917, 462] |
| 362 | [372, 567] | 741 | [952, 919] | 1120 | [432, 131] | 1499 | [925, 155] |
| 363 | [150, 568] | 742 | [393, 193] | 1121 | [1068, 473] | 1500 | [124, 45] |
| 364 | [569, 183] | 743 | [1015, 452] | 1122 | [442, 488] | 1501 | [159, 424] |
| 365 | [570, 518] | 744 | [394, 556] | 1123 | [993, 546] | 1502 | [550, 457] |
| 366 | [373, 571] | 745 | [1008, 529] | 1124 | [489, 474] | 1503 | [467, 1073] |
| 367 | [572, 114] | 746 | [1016, 1017] | 1125 | [964, 1013] | 1504 | [481, 523] |
| 368 | [500, 573] | 747 | [1018, 140] | 1126 | [1028, 484] | 1505 | [1509, 804] |
| 369 | [574, 423] | 748 | [129, 540] | 1127 | [1395, 553] | 1506 | [1510, 1511] |
| 370 | [575, 576] | 749 | [1019, 163] | 1128 | [44, 417] | 1507 | [1512, 1513] |
| 371 | [577, 285] | 750 | [422, 514] | 1129 | [53, 153] | 1508 | [342, 1230] |
| 372 | [268, 578] | 751 | [538, 499] | 1130 | [473, 1396] | 1509 | [28, 1051] |
| 373 | [579, 580] | 752 | [1020, 937] | 1131 | [1028, 435] | 1510 | [376, 984] |
| 374 | [230, 581] | 753 | [463, 928] | 1132 | [557, 1397] | 1511 | [126, 1005] |
| 375 | [19, 582] | 754 | [562, 135] | 1133 | [461, 928] | 1512 | [926, 1001] |
| 376 | [316, 583] | 755 | [1021, 1022] | 1134 | [118, 417] | 1513 | [416, 32] |
| 377 | [108, 584] | 756 | [1023, 155] | 1135 | [149, 186] | | |
| 378 | [585, 586] | 757 | [121, 1011] | 1136 | [544, 968] | | |

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 | 253 | 0 | 506 | 1 | 759 | 0 | 1012 | 1 | 1265 | 1 |
| 1 | 0 | 254 | 1 | 507 | 1 | 760 | 0 | 1013 | 1 | 1266 | 1 |
| 2 | 0 | 255 | 1 | 508 | 0 | 761 | 1 | 1014 | 1 | 1267 | 1 |
| 3 | 0 | 256 | 0 | 509 | 1 | 762 | 0 | 1015 | 0 | 1268 | 0 |
| 4 | 1 | 257 | 0 | 510 | 1 | 763 | 0 | 1016 | 1 | 1269 | 0 |
| 5 | 0 | 258 | 1 | 511 | 1 | 764 | 0 | 1017 | 1 | 1270 | 0 |
| 6 | 1 | 259 | 0 | 512 | 0 | 765 | 1 | 1018 | 1 | 1271 | 0 |
| 7 | 0 | 260 | 1 | 513 | 1 | 766 | 1 | 1019 | 1 | 1272 | 0 |
| 8 | 0 | 261 | 1 | 514 | 0 | 767 | 1 | 1020 | 1 | 1273 | 1 |
| 9 | 1 | 262 | 0 | 515 | 1 | 768 | 0 | 1021 | 0 | 1274 | 1 |
| 10 | 0 | 263 | 1 | 516 | 0 | 769 | 0 | 1022 | 0 | 1275 | 1 |
| 11 | 1 | 264 | 1 | 517 | 1 | 770 | 1 | 1023 | 1 | 1276 | 0 |
| 12 | 1 | 265 | 1 | 518 | 1 | 771 | 0 | 1024 | 0 | 1277 | 0 |
| 13 | 1 | 266 | 0 | 519 | 0 | 772 | 0 | 1025 | 0 | 1278 | 0 |
| 14 | 0 | 267 | 0 | 520 | 1 | 773 | 1 | 1026 | 1 | 1279 | 0 |
| 15 | 0 | 268 | 1 | 521 | 1 | 774 | 0 | 1027 | 0 | 1280 | 1 |
| 16 | 0 | 269 | 1 | 522 | 0 | 775 | 1 | 1028 | 1 | 1281 | 1 |
| 17 | 1 | 270 | 1 | 523 | 0 | 776 | 1 | 1029 | 1 | 1282 | 1 |
| 18 | 1 | 271 | 1 | 524 | 0 | 777 | 0 | 1030 | 0 | 1283 | 1 |
| 19 | 1 | 272 | 1 | 525 | 1 | 778 | 1 | 1031 | 0 | 1284 | 1 |
| 20 | 0 | 273 | 0 | 526 | 1 | 779 | 1 | 1032 | 1 | 1285 | 0 |
| 21 | 0 | 274 | 1 | 527 | 1 | 780 | 1 | 1033 | 1 | 1286 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | 1 | 275 | 1 | 528 | 1 | 781 | 1 | 1034 | 1 | 1287 | 1 |
| 23 | 1 | 276 | 1 | 529 | 0 | 782 | 0 | 1035 | 1 | 1288 | 0 |
| 24 | 1 | 277 | 1 | 530 | 0 | 783 | 1 | 1036 | 0 | 1289 | 1 |
| 25 | 0 | 278 | 0 | 531 | 1 | 784 | 0 | 1037 | 1 | 1290 | 1 |
| 26 | 1 | 279 | 0 | 532 | 1 | 785 | 0 | 1038 | 1 | 1291 | 1 |
| 27 | 1 | 280 | 1 | 533 | 1 | 786 | 0 | 1039 | 1 | 1292 | 1 |
| 28 | 0 | 281 | 0 | 534 | 0 | 787 | 1 | 1040 | 1 | 1293 | 1 |
| 29 | 1 | 282 | 0 | 535 | 1 | 788 | 0 | 1041 | 0 | 1294 | 1 |
| 30 | 0 | 283 | 1 | 536 | 1 | 789 | 0 | 1042 | 0 | 1295 | 0 |
| 31 | 0 | 284 | 1 | 537 | 1 | 790 | 0 | 1043 | 0 | 1296 | 0 |
| 32 | 0 | 285 | 1 | 538 | 1 | 791 | 0 | 1044 | 0 | 1297 | 1 |
| 33 | 0 | 286 | 0 | 539 | 0 | 792 | 0 | 1045 | 0 | 1298 | 0 |
| 34 | 1 | 287 | 1 | 540 | 1 | 793 | 0 | 1046 | 1 | 1299 | 0 |
| 35 | 0 | 288 | 1 | 541 | 0 | 794 | 1 | 1047 | 1 | 1300 | 0 |
| 36 | 1 | 289 | 1 | 542 | 0 | 795 | 0 | 1048 | 1 | 1301 | 0 |
| 37 | 0 | 290 | 1 | 543 | 1 | 796 | 0 | 1049 | 0 | 1302 | 0 |
| 38 | 1 | 291 | 0 | 544 | 0 | 797 | 0 | 1050 | 1 | 1303 | 1 |
| 39 | 0 | 292 | 1 | 545 | 0 | 798 | 1 | 1051 | 0 | 1304 | 1 |
| 40 | 0 | 293 | 0 | 546 | 0 | 799 | 0 | 1052 | 1 | 1305 | 0 |
| 41 | 1 | 294 | 0 | 547 | 0 | 800 | 0 | 1053 | 0 | 1306 | 1 |
| 42 | 0 | 295 | 0 | 548 | 0 | 801 | 1 | 1054 | 0 | 1307 | 1 |
| 43 | 0 | 296 | 0 | 549 | 1 | 802 | 1 | 1055 | 1 | 1308 | 1 |
| 44 | 1 | 297 | 0 | 550 | 0 | 803 | 0 | 1056 | 1 | 1309 | 0 |
| 45 | 0 | 298 | 0 | 551 | 0 | 804 | 0 | 1057 | 0 | 1310 | 0 |
| 46 | 1 | 299 | 1 | 552 | 0 | 805 | 0 | 1058 | 0 | 1311 | 1 |
| 47 | 1 | 300 | 0 | 553 | 0 | 806 | 1 | 1059 | 0 | 1312 | 1 |
| 48 | 1 | 301 | 0 | 554 | 1 | 807 | 1 | 1060 | 0 | 1313 | 0 |
| 49 | 1 | 302 | 0 | 555 | 1 | 808 | 0 | 1061 | 1 | 1314 | 0 |
| 50 | 0 | 303 | 1 | 556 | 1 | 809 | 0 | 1062 | 0 | 1315 | 1 |
| 51 | 1 | 304 | 0 | 557 | 0 | 810 | 1 | 1063 | 1 | 1316 | 1 |
| 52 | 1 | 305 | 0 | 558 | 0 | 811 | 1 | 1064 | 0 | 1317 | 0 |
| 53 | 1 | 306 | 1 | 559 | 0 | 812 | 0 | 1065 | 0 | 1318 | 0 |
| 54 | 0 | 307 | 1 | 560 | 0 | 813 | 1 | 1066 | 1 | 1319 | 0 |
| 55 | 0 | 308 | 1 | 561 | 0 | 814 | 1 | 1067 | 0 | 1320 | 0 |
| 56 | 0 | 309 | 0 | 562 | 1 | 815 | 1 | 1068 | 0 | 1321 | 0 |
| 57 | 1 | 310 | 1 | 563 | 1 | 816 | 0 | 1069 | 1 | 1322 | 0 |
| 58 | 0 | 311 | 1 | 564 | 0 | 817 | 0 | 1070 | 1 | 1323 | 0 |
| 59 | 0 | 312 | 1 | 565 | 0 | 818 | 1 | 1071 | 1 | 1324 | 0 |
| 60 | 1 | 313 | 0 | 566 | 1 | 819 | 1 | 1072 | 0 | 1325 | 1 |
| 61 | 0 | 314 | 0 | 567 | 0 | 820 | 0 | 1073 | 0 | 1326 | 0 |
| 62 | 1 | 315 | 0 | 568 | 0 | 821 | 0 | 1074 | 1 | 1327 | 0 |
| 63 | 0 | 316 | 0 | 569 | 1 | 822 | 0 | 1075 | 1 | 1328 | 0 |
| 64 | 1 | 317 | 1 | 570 | 1 | 823 | 1 | 1076 | 1 | 1329 | 1 |
| 65 | 0 | 318 | 0 | 571 | 1 | 824 | 1 | 1077 | 1 | 1330 | 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 66 | 1 | 319 | 0 | 572 | 0 | 825 | 0 | 1078 | 1 | 1331 | 0 |
| 67 | 1 | 320 | 1 | 573 | 0 | 826 | 0 | 1079 | 0 | 1332 | 1 |
| 68 | 0 | 321 | 1 | 574 | 1 | 827 | 1 | 1080 | 1 | 1333 | 0 |
| 69 | 0 | 322 | 1 | 575 | 1 | 828 | 0 | 1081 | 0 | 1334 | 1 |
| 70 | 0 | 323 | 1 | 576 | 0 | 829 | 0 | 1082 | 1 | 1335 | 1 |
| 71 | 1 | 324 | 0 | 577 | 0 | 830 | 0 | 1083 | 0 | 1336 | 1 |
| 72 | 0 | 325 | 1 | 578 | 1 | 831 | 0 | 1084 | 0 | 1337 | 0 |
| 73 | 0 | 326 | 1 | 579 | 0 | 832 | 1 | 1085 | 0 | 1338 | 0 |
| 74 | 1 | 327 | 1 | 580 | 1 | 833 | 1 | 1086 | 1 | 1339 | 0 |
| 75 | 1 | 328 | 0 | 581 | 0 | 834 | 1 | 1087 | 1 | 1340 | 1 |
| 76 | 1 | 329 | 1 | 582 | 1 | 835 | 0 | 1088 | 0 | 1341 | 0 |
| 77 | 0 | 330 | 1 | 583 | 1 | 836 | 0 | 1089 | 0 | 1342 | 1 |
| 78 | 1 | 331 | 1 | 584 | 1 | 837 | 1 | 1090 | 1 | 1343 | 1 |
| 79 | 0 | 332 | 1 | 585 | 1 | 838 | 0 | 1091 | 1 | 1344 | 1 |
| 80 | 1 | 333 | 1 | 586 | 0 | 839 | 0 | 1092 | 0 | 1345 | 1 |
| 81 | 1 | 334 | 1 | 587 | 0 | 840 | 1 | 1093 | 0 | 1346 | 0 |
| 82 | 0 | 335 | 1 | 588 | 1 | 841 | 1 | 1094 | 0 | 1347 | 1 |
| 83 | 0 | 336 | 0 | 589 | 1 | 842 | 1 | 1095 | 1 | 1348 | 1 |
| 84 | 0 | 337 | 1 | 590 | 0 | 843 | 1 | 1096 | 0 | 1349 | 1 |
| 85 | 0 | 338 | 0 | 591 | 0 | 844 | 1 | 1097 | 1 | 1350 | 1 |
| 86 | 1 | 339 | 0 | 592 | 0 | 845 | 0 | 1098 | 1 | 1351 | 1 |
| 87 | 1 | 340 | 0 | 593 | 0 | 846 | 0 | 1099 | 1 | 1352 | 1 |
| 88 | 1 | 341 | 0 | 594 | 1 | 847 | 1 | 1100 | 1 | 1353 | 1 |
| 89 | 0 | 342 | 1 | 595 | 1 | 848 | 1 | 1101 | 0 | 1354 | 1 |
| 90 | 1 | 343 | 0 | 596 | 1 | 849 | 1 | 1102 | 0 | 1355 | 0 |
| 91 | 1 | 344 | 0 | 597 | 1 | 850 | 0 | 1103 | 0 | 1356 | 0 |
| 92 | 1 | 345 | 0 | 598 | 1 | 851 | 1 | 1104 | 0 | 1357 | 1 |
| 93 | 1 | 346 | 1 | 599 | 1 | 852 | 1 | 1105 | 1 | 1358 | 1 |
| 94 | 0 | 347 | 1 | 600 | 1 | 853 | 1 | 1106 | 1 | 1359 | 1 |
| 95 | 1 | 348 | 0 | 601 | 1 | 854 | 1 | 1107 | 1 | 1360 | 0 |
| 96 | 1 | 349 | 0 | 602 | 0 | 855 | 1 | 1108 | 1 | 1361 | 1 |
| 97 | 1 | 350 | 1 | 603 | 0 | 856 | 1 | 1109 | 0 | 1362 | 0 |
| 98 | 0 | 351 | 1 | 604 | 0 | 857 | 0 | 1110 | 1 | 1363 | 1 |
| 99 | 0 | 352 | 1 | 605 | 1 | 858 | 1 | 1111 | 0 | 1364 | 1 |
| 100 | 1 | 353 | 1 | 606 | 0 | 859 | 1 | 1112 | 0 | 1365 | 1 |
| 101 | 1 | 354 | 0 | 607 | 0 | 860 | 1 | 1113 | 0 | 1366 | 1 |
| 102 | 0 | 355 | 1 | 608 | 0 | 861 | 0 | 1114 | 1 | 1367 | 0 |
| 103 | 1 | 356 | 1 | 609 | 0 | 862 | 0 | 1115 | 1 | 1368 | 1 |
| 104 | 1 | 357 | 1 | 610 | 0 | 863 | 0 | 1116 | 1 | 1369 | 0 |
| 105 | 1 | 358 | 1 | 611 | 1 | 864 | 0 | 1117 | 1 | 1370 | 1 |
| 106 | 1 | 359 | 1 | 612 | 0 | 865 | 0 | 1118 | 1 | 1371 | 1 |
| 107 | 0 | 360 | 0 | 613 | 0 | 866 | 1 | 1119 | 0 | 1372 | 1 |
| 108 | 0 | 361 | 1 | 614 | 0 | 867 | 0 | 1120 | 0 | 1373 | 0 |
| 109 | 0 | 362 | 1 | 615 | 1 | 868 | 0 | 1121 | 0 | 1374 | 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 110 | 0 | 363 | 0 | 616 | 1 | 869 | 1 | 1122 | 0 | 1375 | 0 |
| 111 | 0 | 364 | 1 | 617 | 0 | 870 | 0 | 1123 | 1 | 1376 | 0 |
| 112 | 1 | 365 | 1 | 618 | 0 | 871 | 0 | 1124 | 1 | 1377 | 1 |
| 113 | 1 | 366 | 0 | 619 | 1 | 872 | 1 | 1125 | 1 | 1378 | 1 |
| 114 | 1 | 367 | 0 | 620 | 1 | 873 | 0 | 1126 | 1 | 1379 | 0 |
| 115 | 0 | 368 | 0 | 621 | 0 | 874 | 1 | 1127 | 1 | 1380 | 1 |
| 116 | 0 | 369 | 1 | 622 | 0 | 875 | 0 | 1128 | 1 | 1381 | 1 |
| 117 | 1 | 370 | 1 | 623 | 0 | 876 | 1 | 1129 | 1 | 1382 | 1 |
| 118 | 1 | 371 | 0 | 624 | 1 | 877 | 1 | 1130 | 1 | 1383 | 0 |
| 119 | 0 | 372 | 1 | 625 | 1 | 878 | 0 | 1131 | 1 | 1384 | 0 |
| 120 | 0 | 373 | 0 | 626 | 1 | 879 | 1 | 1132 | 0 | 1385 | 0 |
| 121 | 1 | 374 | 0 | 627 | 0 | 880 | 1 | 1133 | 0 | 1386 | 0 |
| 122 | 1 | 375 | 1 | 628 | 0 | 881 | 0 | 1134 | 1 | 1387 | 0 |
| 123 | 1 | 376 | 0 | 629 | 1 | 882 | 0 | 1135 | 1 | 1388 | 0 |
| 124 | 0 | 377 | 0 | 630 | 0 | 883 | 1 | 1136 | 0 | 1389 | 0 |
| 125 | 1 | 378 | 1 | 631 | 1 | 884 | 0 | 1137 | 1 | 1390 | 1 |
| 126 | 1 | 379 | 0 | 632 | 0 | 885 | 0 | 1138 | 0 | 1391 | 0 |
| 127 | 1 | 380 | 1 | 633 | 0 | 886 | 0 | 1139 | 1 | 1392 | 0 |
| 128 | 1 | 381 | 0 | 634 | 0 | 887 | 0 | 1140 | 0 | 1393 | 1 |
| 129 | 0 | 382 | 0 | 635 | 0 | 888 | 0 | 1141 | 0 | 1394 | 0 |
| 130 | 1 | 383 | 1 | 636 | 1 | 889 | 0 | 1142 | 0 | 1395 | 1 |
| 131 | 0 | 384 | 1 | 637 | 1 | 890 | 1 | 1143 | 0 | 1396 | 0 |
| 132 | 0 | 385 | 1 | 638 | 1 | 891 | 1 | 1144 | 1 | 1397 | 1 |
| 133 | 0 | 386 | 1 | 639 | 1 | 892 | 0 | 1145 | 0 | 1398 | 0 |
| 134 | 1 | 387 | 0 | 640 | 1 | 893 | 1 | 1146 | 0 | 1399 | 0 |
| 135 | 1 | 388 | 0 | 641 | 1 | 894 | 0 | 1147 | 1 | 1400 | 0 |
| 136 | 1 | 389 | 0 | 642 | 0 | 895 | 1 | 1148 | 0 | 1401 | 0 |
| 137 | 0 | 390 | 0 | 643 | 0 | 896 | 1 | 1149 | 0 | 1402 | 0 |
| 138 | 1 | 391 | 0 | 644 | 1 | 897 | 0 | 1150 | 1 | 1403 | 0 |
| 139 | 0 | 392 | 0 | 645 | 1 | 898 | 0 | 1151 | 0 | 1404 | 1 |
| 140 | 0 | 393 | 0 | 646 | 1 | 899 | 0 | 1152 | 0 | 1405 | 0 |
| 141 | 1 | 394 | 1 | 647 | 1 | 900 | 1 | 1153 | 0 | 1406 | 1 |
| 142 | 1 | 395 | 0 | 648 | 1 | 901 | 1 | 1154 | 0 | 1407 | 1 |
| 143 | 1 | 396 | 1 | 649 | 1 | 902 | 0 | 1155 | 0 | 1408 | 1 |
| 144 | 0 | 397 | 1 | 650 | 1 | 903 | 1 | 1156 | 1 | 1409 | 1 |
| 145 | 1 | 398 | 0 | 651 | 0 | 904 | 0 | 1157 | 0 | 1410 | 1 |
| 146 | 1 | 399 | 1 | 652 | 0 | 905 | 1 | 1158 | 0 | 1411 | 1 |
| 147 | 0 | 400 | 1 | 653 | 0 | 906 | 0 | 1159 | 0 | 1412 | 1 |
| 148 | 1 | 401 | 0 | 654 | 0 | 907 | 0 | 1160 | 1 | 1413 | 1 |
| 149 | 1 | 402 | 0 | 655 | 0 | 908 | 0 | 1161 | 0 | 1414 | 0 |
| 150 | 0 | 403 | 0 | 656 | 1 | 909 | 1 | 1162 | 0 | 1415 | 1 |
| 151 | 0 | 404 | 0 | 657 | 0 | 910 | 1 | 1163 | 1 | 1416 | 0 |
| 152 | 1 | 405 | 1 | 658 | 1 | 911 | 1 | 1164 | 0 | 1417 | 1 |
| 153 | 1 | 406 | 1 | 659 | 1 | 912 | 1 | 1165 | 1 | 1418 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 154 | 1 | 407 | 1 | 660 | 0 | 913 | 0 | 1166 | 0 | 1419 | 1 |
| 155 | 1 | 408 | 0 | 661 | 1 | 914 | 0 | 1167 | 1 | 1420 | 1 |
| 156 | 1 | 409 | 0 | 662 | 0 | 915 | 0 | 1168 | 0 | 1421 | 1 |
| 157 | 0 | 410 | 1 | 663 | 0 | 916 | 1 | 1169 | 0 | 1422 | 0 |
| 158 | 0 | 411 | 1 | 664 | 0 | 917 | 1 | 1170 | 1 | 1423 | 1 |
| 159 | 0 | 412 | 1 | 665 | 0 | 918 | 0 | 1171 | 0 | 1424 | 0 |
| 160 | 0 | 413 | 1 | 666 | 1 | 919 | 0 | 1172 | 1 | 1425 | 0 |
| 161 | 0 | 414 | 0 | 667 | 0 | 920 | 0 | 1173 | 0 | 1426 | 1 |
| 162 | 1 | 415 | 0 | 668 | 1 | 921 | 1 | 1174 | 1 | 1427 | 1 |
| 163 | 0 | 416 | 0 | 669 | 0 | 922 | 1 | 1175 | 1 | 1428 | 1 |
| 164 | 0 | 417 | 1 | 670 | 0 | 923 | 1 | 1176 | 1 | 1429 | 0 |
| 165 | 1 | 418 | 1 | 671 | 1 | 924 | 0 | 1177 | 0 | 1430 | 0 |
| 166 | 0 | 419 | 1 | 672 | 0 | 925 | 0 | 1178 | 1 | 1431 | 0 |
| 167 | 1 | 420 | 1 | 673 | 1 | 926 | 0 | 1179 | 1 | 1432 | 0 |
| 168 | 0 | 421 | 0 | 674 | 0 | 927 | 1 | 1180 | 0 | 1433 | 0 |
| 169 | 1 | 422 | 0 | 675 | 0 | 928 | 1 | 1181 | 1 | 1434 | 0 |
| 170 | 0 | 423 | 0 | 676 | 1 | 929 | 1 | 1182 | 0 | 1435 | 0 |
| 171 | 0 | 424 | 1 | 677 | 0 | 930 | 1 | 1183 | 1 | 1436 | 1 |
| 172 | 1 | 425 | 0 | 678 | 1 | 931 | 1 | 1184 | 1 | 1437 | 0 |
| 173 | 0 | 426 | 1 | 679 | 0 | 932 | 0 | 1185 | 1 | 1438 | 0 |
| 174 | 1 | 427 | 1 | 680 | 0 | 933 | 0 | 1186 | 1 | 1439 | 1 |
| 175 | 1 | 428 | 0 | 681 | 0 | 934 | 1 | 1187 | 1 | 1440 | 0 |
| 176 | 0 | 429 | 0 | 682 | 0 | 935 | 0 | 1188 | 1 | 1441 | 0 |
| 177 | 1 | 430 | 1 | 683 | 0 | 936 | 0 | 1189 | 0 | 1442 | 1 |
| 178 | 0 | 431 | 0 | 684 | 1 | 937 | 1 | 1190 | 0 | 1443 | 0 |
| 179 | 1 | 432 | 0 | 685 | 0 | 938 | 0 | 1191 | 0 | 1444 | 0 |
| 180 | 1 | 433 | 1 | 686 | 0 | 939 | 0 | 1192 | 0 | 1445 | 0 |
| 181 | 1 | 434 | 0 | 687 | 0 | 940 | 0 | 1193 | 0 | 1446 | 0 |
| 182 | 1 | 435 | 1 | 688 | 1 | 941 | 0 | 1194 | 0 | 1447 | 0 |
| 183 | 1 | 436 | 0 | 689 | 0 | 942 | 0 | 1195 | 0 | 1448 | 1 |
| 184 | 0 | 437 | 0 | 690 | 1 | 943 | 0 | 1196 | 1 | 1449 | 1 |
| 185 | 0 | 438 | 0 | 691 | 0 | 944 | 0 | 1197 | 0 | 1450 | 0 |
| 186 | 0 | 439 | 1 | 692 | 0 | 945 | 1 | 1198 | 0 | 1451 | 0 |
| 187 | 0 | 440 | 0 | 693 | 0 | 946 | 0 | 1199 | 1 | 1452 | 1 |
| 188 | 1 | 441 | 1 | 694 | 0 | 947 | 1 | 1200 | 1 | 1453 | 0 |
| 189 | 0 | 442 | 0 | 695 | 1 | 948 | 0 | 1201 | 0 | 1454 | 1 |
| 190 | 1 | 443 | 1 | 696 | 1 | 949 | 0 | 1202 | 1 | 1455 | 0 |
| 191 | 1 | 444 | 1 | 697 | 0 | 950 | 0 | 1203 | 0 | 1456 | 1 |
| 192 | 1 | 445 | 0 | 698 | 0 | 951 | 0 | 1204 | 1 | 1457 | 0 |
| 193 | 1 | 446 | 0 | 699 | 1 | 952 | 1 | 1205 | 0 | 1458 | 0 |
| 194 | 1 | 447 | 0 | 700 | 0 | 953 | 0 | 1206 | 1 | 1459 | 0 |
| 195 | 1 | 448 | 1 | 701 | 0 | 954 | 1 | 1207 | 1 | 1460 | 0 |
| 196 | 0 | 449 | 0 | 702 | 1 | 955 | 1 | 1208 | 0 | 1461 | 1 |
| 197 | 1 | 450 | 1 | 703 | 1 | 956 | 0 | 1209 | 0 | 1462 | 1 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 198 | 0 | 451 | 0 | 704 | 1 | 957 | 1 | 1210 | 0 | 1463 | 0 |
| 199 | 1 | 452 | 0 | 705 | 1 | 958 | 1 | 1211 | 1 | 1464 | 0 |
| 200 | 0 | 453 | 1 | 706 | 0 | 959 | 1 | 1212 | 0 | 1465 | 1 |
| 201 | 1 | 454 | 0 | 707 | 1 | 960 | 1 | 1213 | 0 | 1466 | 1 |
| 202 | 0 | 455 | 1 | 708 | 0 | 961 | 1 | 1214 | 1 | 1467 | 1 |
| 203 | 0 | 456 | 1 | 709 | 0 | 962 | 1 | 1215 | 0 | 1468 | 1 |
| 204 | 0 | 457 | 1 | 710 | 1 | 963 | 1 | 1216 | 1 | 1469 | 1 |
| 205 | 1 | 458 | 0 | 711 | 1 | 964 | 1 | 1217 | 1 | 1470 | 0 |
| 206 | 1 | 459 | 1 | 712 | 0 | 965 | 1 | 1218 | 0 | 1471 | 1 |
| 207 | 0 | 460 | 1 | 713 | 0 | 966 | 0 | 1219 | 1 | 1472 | 0 |
| 208 | 1 | 461 | 0 | 714 | 1 | 967 | 1 | 1220 | 0 | 1473 | 1 |
| 209 | 1 | 462 | 0 | 715 | 0 | 968 | 0 | 1221 | 0 | 1474 | 0 |
| 210 | 0 | 463 | 1 | 716 | 0 | 969 | 0 | 1222 | 0 | 1475 | 1 |
| 211 | 0 | 464 | 0 | 717 | 1 | 970 | 0 | 1223 | 1 | 1476 | 1 |
| 212 | 0 | 465 | 1 | 718 | 0 | 971 | 0 | 1224 | 0 | 1477 | 0 |
| 213 | 0 | 466 | 1 | 719 | 1 | 972 | 1 | 1225 | 1 | 1478 | 0 |
| 214 | 1 | 467 | 0 | 720 | 1 | 973 | 0 | 1226 | 0 | 1479 | 0 |
| 215 | 1 | 468 | 0 | 721 | 0 | 974 | 0 | 1227 | 0 | 1480 | 1 |
| 216 | 1 | 469 | 1 | 722 | 0 | 975 | 1 | 1228 | 0 | 1481 | 1 |
| 217 | 1 | 470 | 0 | 723 | 0 | 976 | 1 | 1229 | 1 | 1482 | 1 |
| 218 | 0 | 471 | 1 | 724 | 1 | 977 | 1 | 1230 | 0 | 1483 | 1 |
| 219 | 0 | 472 | 1 | 725 | 1 | 978 | 0 | 1231 | 0 | 1484 | 0 |
| 220 | 1 | 473 | 1 | 726 | 0 | 979 | 1 | 1232 | 1 | 1485 | 1 |
| 221 | 0 | 474 | 1 | 727 | 1 | 980 | 1 | 1233 | 0 | 1486 | 1 |
| 222 | 0 | 475 | 1 | 728 | 0 | 981 | 0 | 1234 | 0 | 1487 | 0 |
| 223 | 1 | 476 | 1 | 729 | 0 | 982 | 1 | 1235 | 0 | 1488 | 1 |
| 224 | 1 | 477 | 1 | 730 | 1 | 983 | 0 | 1236 | 0 | 1489 | 0 |
| 225 | 1 | 478 | 0 | 731 | 1 | 984 | 1 | 1237 | 1 | 1490 | 1 |
| 226 | 0 | 479 | 0 | 732 | 1 | 985 | 0 | 1238 | 0 | 1491 | 0 |
| 227 | 1 | 480 | 0 | 733 | 0 | 986 | 1 | 1239 | 0 | 1492 | 0 |
| 228 | 1 | 481 | 0 | 734 | 0 | 987 | 1 | 1240 | 0 | 1493 | 0 |
| 229 | 0 | 482 | 1 | 735 | 0 | 988 | 1 | 1241 | 0 | 1494 | 1 |
| 230 | 0 | 483 | 1 | 736 | 0 | 989 | 0 | 1242 | 1 | 1495 | 0 |
| 231 | 1 | 484 | 0 | 737 | 1 | 990 | 0 | 1243 | 0 | 1496 | 0 |
| 232 | 1 | 485 | 0 | 738 | 0 | 991 | 0 | 1244 | 0 | 1497 | 1 |
| 233 | 1 | 486 | 1 | 739 | 0 | 992 | 0 | 1245 | 1 | 1498 | 1 |
| 234 | 0 | 487 | 1 | 740 | 1 | 993 | 1 | 1246 | 0 | 1499 | 0 |
| 235 | 1 | 488 | 0 | 741 | 1 | 994 | 0 | 1247 | 1 | 1500 | 0 |
| 236 | 0 | 489 | 1 | 742 | 0 | 995 | 0 | 1248 | 0 | 1501 | 0 |
| 237 | 1 | 490 | 0 | 743 | 0 | 996 | 0 | 1249 | 1 | 1502 | 0 |
| 238 | 0 | 491 | 1 | 744 | 1 | 997 | 0 | 1250 | 1 | 1503 | 0 |
| 239 | 0 | 492 | 0 | 745 | 0 | 998 | 1 | 1251 | 1 | 1504 | 0 |
| 240 | 1 | 493 | 1 | 746 | 1 | 999 | 0 | 1252 | 1 | 1505 | 0 |
| 241 | 0 | 494 | 0 | 747 | 1 | 1000 | 0 | 1253 | 0 | 1506 | 0 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 242 | 0 | 495 | 1 | 748 | 0 | 1001 | 0 | 1254 | 0 | 1507 | 0 |
| 243 | 0 | 496 | 1 | 749 | 1 | 1002 | 1 | 1255 | 1 | 1508 | 1 |
| 244 | 0 | 497 | 0 | 750 | 0 | 1003 | 0 | 1256 | 1 | 1509 | 0 |
| 245 | 0 | 498 | 0 | 751 | 1 | 1004 | 0 | 1257 | 1 | 1510 | 0 |
| 246 | 0 | 499 | 1 | 752 | 1 | 1005 | 0 | 1258 | 1 | 1511 | 1 |
| 247 | 0 | 500 | 0 | 753 | 1 | 1006 | 0 | 1259 | 1 | 1512 | 0 |
| 248 | 1 | 501 | 1 | 754 | 1 | 1007 | 0 | 1260 | 1 | 1513 | 0 |
| 249 | 0 | 502 | 0 | 755 | 0 | 1008 | 0 | 1261 | 1 | | |
| 250 | 0 | 503 | 1 | 756 | 1 | 1009 | 0 | 1262 | 1 | | |
| 251 | 1 | 504 | 0 | 757 | 1 | 1010 | 0 | 1263 | 1 | | |
| 252 | 0 | 505 | 1 | 758 | 0 | 1011 | 0 | 1264 | 0 | | |

Université de Strasbourg, CNRS, IRMA UMR 7501, F-67000 Strasbourg, France
*Email address*: guoniu.han@unistra.fr

School of Mathematics and Statistics, Huazhong University of Science and Technology, Wuhan, PR China
*Email address*: huyining@hust.edu.cn