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

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Abstract. The continued fraction conjecture claims that the continued fraction defined by the (a,b)-Thue-Morse sequence is algebraic over $\mathbb{F}_2(x)$ for all pairs of distinct elements (a,b) in $\mathbb{F}_2[x] \setminus \mathbb{F}_2$. In this paper we prove the conjecture for $(a,b) = (z^6 + z^5 + z^3 + z, z + 1)$.

1. Introduction

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

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

as the limit of the finite continued fractions

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

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

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

admits a continued fraction expansion of form (1.1).

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

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

that we shall denote

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

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Theorem 1.1. *When* $(a,b)=(z^6+z^5+z^3+z, z+1)$*, the two power series* $\mathrm{CF}(a,b)$ *and* $\mathrm{CF}(b,a)$ *are algebraic over* $\mathbb{F}_2(z)$*, with minimal polynomials of the form*

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

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

$$\begin{aligned}
p_0(z)&=z^{15}+z^{13}+z^{12}+z^{10}+z^9+z^6+z^5+z^3+z^2+z+1,\\
p_1(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{17}+z^{13}+z^{10}+z^9+z^7+z^3+z^2+z,\\
p_2(z)&=z^{22}+z^6+z^4+z^2,\\
p_3(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{17}+z^{13}+z^{10}+z^9+z^7+z^3+z^2+z,\\
p_4(z)&=z^{20}+z^{18}+z^{16}+z^{15}+z^{14}+z^{13}+z^{10}+z^9+z^6+z^5+z^3+z^2+z,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z)&=z^{18}+z^{16}+z^{15}+z^{14}+z^{13}+z^9+z^8+z^6+z^5+z^3+z,\\
p_1(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{17}+z^{13}+z^{10}+z^9+z^7+z^3+z^2+z,\\
p_2(z)&=z^{22}+z^6+z^4+z^2,\\
p_3(z)&=z^{21}+z^{20}+z^{19}+z^{18}+z^{17}+z^{13}+z^{10}+z^9+z^7+z^3+z^2+z,\\
p_4(z)&=z^{20}+z^{15}+z^{13}+z^{12}+z^9+z^8+z^6+z^5+z^3+z+1.
\end{aligned}$$

2. Proof

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

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

By the basic properties of continued fractions, we have

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

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

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

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

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

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

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

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

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

for some positive integer d_n. Hence,

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

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

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

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

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

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

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

Define

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

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

$$\begin{aligned}
M^e[:14u] &= M^e[:7u] + x^{3u}M^e[:4u] + x^{3u}M^e[:7u] + x^{6u}M^e[:4u] + x^{6u}M^e[:7u] \\
&\quad + x^{9u}M^e[:4u] + x^{7u}M^e[:7u] + x^{10u}M^e[:4u] + x^{9u}M^e[:5u] \\
&\quad + x^{12u}M^e[:2u] + x^{11u}M^e[:3u] + x^{13u}M^e[:u] \\
&\quad + (x^{7u} + x^{10u} + x^{13u})R^e, \\
W^e[:14u] &= W^e[:7u] + x^{3u}W^e[:4u] + x^{3u}W^e[:7u] + x^{6u}W^e[:4u] + x^{6u}W^e[:7u] \\
&\quad + x^{9u}W^e[:4u] + x^{7u}W^e[:7u] + x^{10u}W^e[:4u] + x^{9u}W^e[:5u]
\end{aligned}$$

$$+ x^{12u}W^e[:2u] + x^{11u}W^e[:3u] + x^{13u}W^e[:u] + (x^{7u} + x^{10u} + x^{13u})R^e.$$

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

$$\begin{aligned} M^o[:14u] &= M^o[:7u] + x^{3u}M^o[:4u] + x^{3u}M^o[:7u] + x^{6u}M^o[:4u] + x^{6u}M^o[:7u] \\ &\quad + x^{9u}M^o[:4u] + x^{7u}M^o[:7u] + x^{10u}M^o[:4u] + x^{9u}M^o[:5u] \\ &\quad + x^{12u}M^o[:2u] + x^{11u}M^o[:3u] + x^{13u}M^o[:u] \\ &\quad + (x^{7u} + x^{10u} + x^{13u})R^o, \\ W^o[:14u] &= W^o[:7u] + x^{3u}W^o[:4u] + x^{3u}W^o[:7u] + x^{6u}W^o[:4u] + x^{6u}W^o[:7u] \\ &\quad + x^{9u}W^o[:4u] + x^{7u}W^o[:7u] + x^{10u}W^o[:4u] + x^{9u}W^o[:5u] \\ &\quad + x^{12u}W^o[:2u] + x^{11u}W^o[:3u] + x^{13u}W^o[:u] \\ &\quad + (x^{7u} + x^{10u} + x^{13u})R^o. \end{aligned}$$

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

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

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

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

which can be rewritten as

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

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

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

$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1010w]_2], \tag{2.10}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1011w]_2], \tag{2.11}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1100w]_2], \tag{2.12}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.13}$$

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

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

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

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

$$0 = T[[w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1010w]_2], \tag{2.17}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1011w]_2], \tag{2.18}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1100w]_2], \tag{2.19}$$

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.20}$$

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 4092 states; its transition function and output function can be found in the annex. Let $A(s, w)$ denote the state reached after reading w from right to left starting from the state s, and τ the output function. Define

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

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

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 100)) + \tau(A(s, 111)), \tag{2.21}$$

$$0 = \tau(A(s, 1)) + \tau(A(s, 101)) + \tau(A(s, 1000)), \tag{2.22}$$

$$0 = \tau(A(s, 10)) + \tau(A(s, 110)) + \tau(A(s, 1001)), \tag{2.23}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 1010)), \tag{2.24}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 100)) + \tau(A(s, 101)) + \tau(A(s, 1011)), \tag{2.25}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 10)) + \tau(A(s, 101)) + \tau(A(s, 110)) + \tau(A(s, 1100)), \tag{2.26}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 10)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 110)) + \tau(A(s, 1101)), \tag{2.27}$$

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

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 100)) + \tau(A(s, 111)), \tag{2.28}$$

$$0 = \tau(A(s, 1)) + \tau(A(s, 101)) + \tau(A(s, 1000)), \tag{2.29}$$

$$0 = \tau(A(s, 10)) + \tau(A(s, 110)) + \tau(A(s, 1001)), \tag{2.30}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 11)) + \tau(A(s, 100)) + \tau(A(s, 1010)), \tag{2.31}$$

$$0 = \tau(A(s, \epsilon)) + \tau(A(s, 1)) + \tau(A(s, 100)) + \tau(A(s, 101))$$

$$\begin{aligned}&+\tau(A(s,1011)), &(2.32)\\ 0&=\tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,101))\\ &+\tau(A(s,110))+\tau(A(s,1100)), &(2.33)\\ 0&=\tau(A(s,\epsilon))+\tau(A(s,1))+\tau(A(s,10))+\tau(A(s,11))+\tau(A(s,100))\\ &+\tau(A(s,110))+\tau(A(s,1101)), &(2.34)\end{aligned}$$

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{42}), E_{42}) = (A(i, 0^{22}), E_{22})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 21$, which turns out to be true. □

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Define

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

where

$$\begin{aligned}
q_0(x) &= x^{22} + x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{13} + x^{12} + x^{10} + x^9 + x^7,\\
q_1(x) &= x^{21} + x^{20} + x^{19} + x^{15} + x^{13} + x^{12} + x^9 + x^5 + x^4 + x^3 + x^2 + x,\\
q_2(x) &= x^{20} + x^{18} + x^{16} + 1,\\
q_3(x) &= x^{21} + x^{20} + x^{19} + x^{15} + x^{13} + x^{12} + x^9 + x^5 + x^4 + x^3 + x^2 + x,\\
q_4(x) &= x^{21} + x^{20} + x^{19} + x^{17} + x^{16} + x^{13} + x^{12} + x^9 + x^8 + x^7 + x^6 + x^4 + x^2.
\end{aligned}$$

The polynomial $Q(x, y)$ is the candidate for the minimal polynomial of $f(x)$ found by Padé-Hermite approximation. To prove that it is indeed the minimal polynomial of $f(x)$, we only need to prove that it is an irreducible factor of $P(x, y)$ of multiplicity m and $R(x, y) := P(x, y)/Q(x, y)^m$ is not an annihilating polynomial of $f(x)$. We verify the first point directly. For the second point, we find that when we truncate $f(x)$ to order 216, and substitute it for y in $R(z, y)$, we get a series with valuation smaller than 216, which proves that $R(z, y)$ is not an annihilating polynomial of $f(x)$. Finally, $z^{12}Q(1/z, y)$ is the minimal polynomial of $\mathrm{CF}(a, b) = f(1/z)$. $\square$

3. Annexe

All 16 polynomials are of the form

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

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

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

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

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{116} + x^{115} + x^{113} + x^{112} + x^{107} + x^{106} + x^{104} + x^{103} + x^{101} \\
&\quad + x^{95} + x^{94} + x^{91} + x^{89} + x^{88} + x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{76} \\
&\quad + x^{75} + x^{73} + x^{65} + x^{62} + x^{60} + x^{59} + x^{55} + x^{53} + x^{51} + x^{49} + x^{48} \\
&\quad + x^{46} + x^{44} + x^{43} + x^{40} + x^{34} + x^{33} + x^{32} + x^{31} + x^{27}, \\
p_3(x) &= x^{115} + x^{113} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{95} + x^{92} \\
&\quad + x^{90} + x^{89} + x^{67} + x^{65} + x^{64} + x^{63} + x^{61} + x^{58} + x^{56} + x^{55} + x^{53} \\
&\quad + x^{50} + x^{48} + x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{36} + x^{33} + x^{32} + x^{29} \\
&\quad + x^{28} + x^{27} + x^{23} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{10} + x^{9}, \\
p_6(x) &= x^{114} + x^{113} + x^{112} + x^{111} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{101} \\
&\quad + x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84} \\
&\quad + x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{73} + x^{70} + x^{68} + x^{67} + x^{64} \\
&\quad + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{49} + x^{48} + x^{47} \\
&\quad + x^{46} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{28} + x^{27} + x^{26} + x^{25} \\
&\quad + x^{23} + x^{22} + x^{20} + x^{18} + x^{17} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{6}, \\
p_9(x) &= x^{113} + x^{110} + x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95} \\
&\quad + x^{87} + x^{85} + x^{84} + x^{81} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{67} \\
&\quad + x^{66} + x^{64} + x^{61} + x^{60} + x^{57} + x^{56} + x^{52} + x^{50} + x^{46} + x^{45} + x^{44} \\
&\quad + x^{42} + x^{38} + x^{36} + x^{33} + x^{32} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{21}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{5} + x^{4}\\
&+ x^{3},\\
p_{12}(x) &= x^{112} + x^{111} + x^{108} + x^{96} + x^{95} + x^{91} + x^{87} + x^{83} + x^{80} + x^{76} + x^{75}\\
&+ x^{71} + x^{67} + x^{63} + x^{60} + x^{48} + x^{47} + x^{43} + x^{39} + x^{35} + x^{31} + x^{27}\\
&+ x^{23} + x^{19} + x^{16} + x^{12} + x^{11} + x^{7} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{117} + x^{116} + x^{115} + x^{113} + x^{112} + x^{107} + x^{106} + x^{104} + x^{103} + x^{101}\\
&+ x^{95} + x^{94} + x^{91} + x^{89} + x^{88} + x^{84} + x^{83} + x^{80} + x^{78} + x^{77} + x^{76}\\
&+ x^{75} + x^{73} + x^{65} + x^{62} + x^{60} + x^{59} + x^{55} + x^{53} + x^{51} + x^{49} + x^{48}\\
&+ x^{46} + x^{44} + x^{43} + x^{40} + x^{34} + x^{33} + x^{32} + x^{31} + x^{27},\\
p_3(x) &= x^{115} + x^{113} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{95} + x^{92}\\
&+ x^{90} + x^{89} + x^{67} + x^{65} + x^{64} + x^{63} + x^{61} + x^{58} + x^{56} + x^{55} + x^{53}\\
&+ x^{50} + x^{48} + x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{36} + x^{33} + x^{32} + x^{29}\\
&+ x^{28} + x^{27} + x^{23} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{10} + x^{9},\\
p_6(x) &= x^{114} + x^{113} + x^{112} + x^{111} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{101}\\
&+ x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{73} + x^{70} + x^{68} + x^{67} + x^{64}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{49} + x^{48} + x^{47}\\
&+ x^{46} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{28} + x^{27} + x^{26} + x^{25}\\
&+ x^{23} + x^{22} + x^{20} + x^{18} + x^{17} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_9(x) &= x^{113} + x^{110} + x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95}\\
&+ x^{87} + x^{85} + x^{84} + x^{81} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{67}\\
&+ x^{66} + x^{64} + x^{61} + x^{60} + x^{57} + x^{56} + x^{52} + x^{50} + x^{46} + x^{45} + x^{44}\\
&+ x^{42} + x^{38} + x^{36} + x^{33} + x^{32} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{21}\\
&+ x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{5} + x^{4}\\
&+ x^{3},\\
p_{12}(x) &= x^{112} + x^{111} + x^{108} + x^{96} + x^{95} + x^{91} + x^{87} + x^{83} + x^{80} + x^{76} + x^{75}\\
&+ x^{71} + x^{67} + x^{63} + x^{60} + x^{48} + x^{47} + x^{43} + x^{39} + x^{35} + x^{31} + x^{27}\\
&+ x^{23} + x^{19} + x^{16} + x^{12} + x^{11} + x^{7} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{122} + x^{120} + x^{118} + x^{114} + x^{112} + x^{110} + x^{108} + x^{104}\\
&+ x^{102} + x^{100} + x^{98} + x^{96} + x^{92} + x^{88} + x^{86} + x^{84} + x^{80} + x^{74} + x^{70}\\
&+ x^{68} + x^{64} + x^{62} + x^{60} + x^{58} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{46}
\end{aligned}
$$

$$+ x^{42},$$

$$\begin{aligned}
p_3(x) &= x^{126} + x^{124} + x^{122} + x^{120} + x^{116} + x^{110} + x^{106} + x^{104} + x^{90} + x^{86} \\
&\quad + x^{78} + x^{74} + x^{68} + x^{66} + x^{64} + x^{60} + x^{56} + x^{54} + x^{48} + x^{46} + x^{44} \\
&\quad + x^{42} + x^{36} + x^{32} + x^{28} + x^{20} + x^{18} + x^{14} + x^{10} + x^{6}, \\
p_6(x) &= x^{126} + x^{114} + x^{112} + x^{110} + x^{106} + x^{104} + x^{102} + x^{98} + x^{96} + x^{94} \\
&\quad + x^{92} + x^{88} + x^{82} + x^{80} + x^{78} + x^{76} + x^{72} + x^{68} + x^{60} + x^{56} + x^{54} \\
&\quad + x^{48} + x^{46} + x^{40} + x^{36} + x^{32} + x^{26} + x^{24} + x^{22} + x^{18} + x^{14} + x^{12} \\
&\quad + x^{10} + x^{6} + x^{2} + 1, \\
p_9(x) &= x^{124} + x^{122} + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{108} + x^{100} + x^{94} \\
&\quad + x^{90} + x^{86} + x^{82} + x^{80} + x^{78} + x^{76} + x^{70} + x^{66} + x^{44} + x^{42} + x^{40} \\
&\quad + x^{38} + x^{30} + x^{26} + x^{24} + x^{20} + x^{18} + x^{16} + x^{12} + x^{10} + x^{6} + x^{2}, \\
p_{12}(x) &= x^{124} + x^{120} + x^{84} + x^{80} + x^{68} + x^{64} + x^{44} + x^{40} + x^{36} + x^{32} + x^{20} \\
&\quad + x^{16} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{132} + x^{130} + x^{128} + x^{110} + x^{108} + x^{106} + x^{102} + x^{98} + x^{88} + x^{80} \\
&\quad + x^{76} + x^{74} + x^{68} + x^{66} + x^{64} + x^{60} + x^{58} + x^{56} + x^{54} + x^{52} + x^{48} \\
&\quad + x^{44} + x^{36} + x^{34} + x^{32} + x^{28} + x^{26} + x^{22} + x^{12}, \\
p_3(x) &= x^{126} + x^{124} + x^{112} + x^{108} + x^{100} + x^{94} + x^{92} + x^{90} + x^{88} + x^{84} + x^{82} \\
&\quad + x^{80} + x^{78} + x^{76} + x^{72} + x^{70} + x^{68} + x^{66} + x^{64} + x^{60} + x^{56} + x^{54} \\
&\quad + x^{48} + x^{46} + x^{44} + x^{40} + x^{34} + x^{32} + x^{30} + x^{28} + x^{26} + x^{22} + x^{20} \\
&\quad + x^{18} + x^{12} + x^{8}, \\
p_6(x) &= x^{126} + x^{122} + x^{116} + x^{114} + x^{112} + x^{102} + x^{98} + x^{92} + x^{88} + x^{86} \\
&\quad + x^{78} + x^{76} + x^{74} + x^{70} + x^{60} + x^{56} + x^{54} + x^{48} + x^{46} + x^{42} + x^{40} \\
&\quad + x^{34} + x^{32} + x^{30} + x^{28} + x^{18} + x^{8} + x^{4} + x^{2} + 1, \\
p_9(x) &= x^{124} + x^{122} + x^{120} + x^{118} + x^{116} + x^{114} + x^{112} + x^{108} + x^{100} + x^{94} \\
&\quad + x^{90} + x^{86} + x^{82} + x^{80} + x^{78} + x^{76} + x^{70} + x^{66} + x^{44} + x^{42} + x^{40} \\
&\quad + x^{38} + x^{30} + x^{26} + x^{24} + x^{20} + x^{18} + x^{16} + x^{12} + x^{10} + x^{6} + x^{2}, \\
p_{12}(x) &= x^{124} + x^{120} + x^{84} + x^{80} + x^{68} + x^{64} + x^{44} + x^{40} + x^{36} + x^{32} + x^{20} \\
&\quad + x^{16} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109} + x^{107} + x^{106} + x^{105} + x^{101} \\
&\quad + x^{99} + x^{97} + x^{94} + x^{87} + x^{86} + x^{85} + x^{81} + x^{79} + x^{77} + x^{75} + x^{65} \\
&\quad + x^{63} + x^{61} + x^{58} + x^{57} + x^{55} + x^{53} + x^{52} + x^{50} + x^{48} + x^{44} + x^{43}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{26}\\
&+ x^{23} + x^{22} + x^{20} + x^{18},\\
p_3(x) &= x^{115} + x^{113} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{95} + x^{92}\\
&+ x^{90} + x^{89} + x^{67} + x^{65} + x^{64} + x^{63} + x^{61} + x^{58} + x^{56} + x^{55} + x^{53}\\
&+ x^{50} + x^{48} + x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{36} + x^{33} + x^{32} + x^{29}\\
&+ x^{28} + x^{27} + x^{23} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{10} + x^{9},\\
p_6(x) &= x^{114} + x^{113} + x^{112} + x^{111} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{101}\\
&+ x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{73} + x^{70} + x^{68} + x^{67} + x^{64}\\
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{49} + x^{48} + x^{47}\\
&+ x^{46} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{28} + x^{27} + x^{26} + x^{25}\\
&+ x^{23} + x^{22} + x^{20} + x^{18} + x^{17} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_9(x) &= x^{113} + x^{110} + x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95}\\
&+ x^{87} + x^{85} + x^{84} + x^{81} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{67}\\
&+ x^{66} + x^{64} + x^{61} + x^{60} + x^{57} + x^{56} + x^{52} + x^{50} + x^{46} + x^{45} + x^{44}\\
&+ x^{42} + x^{38} + x^{36} + x^{33} + x^{32} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{21}\\
&+ x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{5} + x^{4}\\
&+ x^{3},\\
p_{12}(x) &= x^{112} + x^{111} + x^{108} + x^{96} + x^{95} + x^{91} + x^{87} + x^{83} + x^{80} + x^{76} + x^{75}\\
&+ x^{71} + x^{67} + x^{63} + x^{60} + x^{48} + x^{47} + x^{43} + x^{39} + x^{35} + x^{31} + x^{27}\\
&+ x^{23} + x^{19} + x^{16} + x^{12} + x^{11} + x^{7} + x^{3} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{117} + x^{115} + x^{114} + x^{112} + x^{110} + x^{109} + x^{107} + x^{106} + x^{105} + x^{101}\\
&+ x^{99} + x^{97} + x^{94} + x^{87} + x^{86} + x^{85} + x^{81} + x^{79} + x^{77} + x^{75} + x^{65}\\
&+ x^{63} + x^{61} + x^{58} + x^{57} + x^{55} + x^{53} + x^{52} + x^{50} + x^{48} + x^{44} + x^{43}\\
&+ x^{42} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{34} + x^{32} + x^{30} + x^{28} + x^{26}\\
&+ x^{23} + x^{22} + x^{20} + x^{18},\\
p_3(x) &= x^{115} + x^{113} + x^{112} + x^{111} + x^{109} + x^{107} + x^{106} + x^{105} + x^{95} + x^{92}\\
&+ x^{90} + x^{89} + x^{67} + x^{65} + x^{64} + x^{63} + x^{61} + x^{58} + x^{56} + x^{55} + x^{53}\\
&+ x^{50} + x^{48} + x^{45} + x^{44} + x^{41} + x^{40} + x^{37} + x^{36} + x^{33} + x^{32} + x^{29}\\
&+ x^{28} + x^{27} + x^{23} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{10} + x^{9},\\
p_6(x) &= x^{114} + x^{113} + x^{112} + x^{111} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{101}\\
&+ x^{99} + x^{98} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{88} + x^{87} + x^{86} + x^{84}\\
&+ x^{82} + x^{81} + x^{80} + x^{79} + x^{77} + x^{76} + x^{73} + x^{70} + x^{68} + x^{67} + x^{64}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{56} + x^{54} + x^{53} + x^{49} + x^{48} + x^{47}\\
&+ x^{46} + x^{43} + x^{42} + x^{41} + x^{39} + x^{38} + x^{36} + x^{28} + x^{27} + x^{26} + x^{25}\\
&+ x^{23} + x^{22} + x^{20} + x^{18} + x^{17} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9} + x^{8} + x^{6},\\
p_9(x) = {}& x^{113} + x^{110} + x^{108} + x^{107} + x^{105} + x^{102} + x^{100} + x^{97} + x^{96} + x^{95}\\
&+ x^{87} + x^{85} + x^{84} + x^{81} + x^{80} + x^{79} + x^{75} + x^{73} + x^{72} + x^{68} + x^{67}\\
&+ x^{66} + x^{64} + x^{61} + x^{60} + x^{57} + x^{56} + x^{52} + x^{50} + x^{46} + x^{45} + x^{44}\\
&+ x^{42} + x^{38} + x^{36} + x^{33} + x^{32} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{21}\\
&+ x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{9} + x^{8} + x^{5} + x^{4}\\
&+ x^{3},\\
p_{12}(x) = {}& x^{112} + x^{111} + x^{108} + x^{96} + x^{95} + x^{91} + x^{87} + x^{83} + x^{80} + x^{76} + x^{75}\\
&+ x^{71} + x^{67} + x^{63} + x^{60} + x^{48} + x^{47} + x^{43} + x^{39} + x^{35} + x^{31} + x^{27}\\
&+ x^{23} + x^{19} + x^{16} + x^{12} + x^{11} + x^{7} + x^{3} + 1,
\end{aligned}
$$

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

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

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

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

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

$$
\begin{aligned}
p_0(x) = {}& x^{117} + x^{116} + x^{112} + x^{111} + x^{109} + x^{106} + x^{105} + x^{104} + x^{98} + x^{96}\\
&+ x^{95} + x^{91} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{76} + x^{71}\\
&+ x^{70} + x^{69} + x^{66} + x^{65} + x^{64} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{51}\\
&+ x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40} + x^{38} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{33} + x^{32} + x^{27} + x^{24} + x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16}\\
&+ x^{15} + x^{14} + x^{12},\\
p_3(x) = {}& x^{116} + x^{114} + x^{109} + x^{107} + x^{105} + x^{103} + x^{102} + x^{99} + x^{98} + x^{97}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{94}+x^{91}+x^{88}+x^{86}+x^{85}+x^{84}+x^{83}+x^{82}+x^{80}+x^{76}+x^{75}\\
&+x^{74}+x^{73}+x^{71}+x^{69}+x^{66}+x^{65}+x^{62}+x^{61}+x^{60}+x^{59}+x^{56}\\
&+x^{53}+x^{48}+x^{46}+x^{44}+x^{41}+x^{39}+x^{38}+x^{37}+x^{31}+x^{29}+x^{28}\\
&+x^{25}+x^{24}+x^{22}+x^{19}+x^{14}+x^{13}+x^{11}+x^{10}+x^{8},\\
p_6(x)=&\,x^{116}+x^{114}+x^{111}+x^{110}+x^{109}+x^{107}+x^{106}+x^{104}+x^{99}+x^{97}\\
&+x^{96}+x^{94}+x^{90}+x^{89}+x^{87}+x^{83}+x^{82}+x^{80}+x^{79}+x^{78}+x^{74}\\
&+x^{73}+x^{72}+x^{70}+x^{69}+x^{67}+x^{64}+x^{62}+x^{61}+x^{59}+x^{57}+x^{56}\\
&+x^{55}+x^{52}+x^{51}+x^{50}+x^{47}+x^{44}+x^{43}+x^{42}+x^{39}+x^{37}+x^{36}\\
&+x^{35}+x^{29}+x^{28}+x^{27}+x^{26}+x^{25}+x^{23}+x^{21}+x^{20}+x^{19}+x^{18}\\
&+x^{16}+x^{15}+x^{12}+x^{11}+x^{10}+x^{9}+x^{6}+x^{4}+x^{3}+1,\\
p_9(x)=&\,x^{116}+x^{115}+x^{111}+x^{108}+x^{104}+x^{103}+x^{100}+x^{84}+x^{83}+x^{79}\\
&+x^{76}+x^{72}+x^{71}+x^{67}+x^{63}+x^{60}+x^{56}+x^{55}+x^{52}+x^{20}+x^{19}\\
&+x^{15}+x^{12}+x^{8}+x^{7}+x^{4},\\
p_{12}(x)=&\,x^{116}+x^{115}+x^{112}+x^{104}+x^{103}+x^{100}+x^{96}+x^{95}+x^{91}+x^{87}\\
&+x^{84}+x^{80}+x^{79}+x^{75}+x^{72}+x^{56}+x^{55}+x^{52}+x^{48}+x^{47}+x^{43}\\
&+x^{39}+x^{35}+x^{31}+x^{27}+x^{23}+x^{20}+x^{16}+x^{15}+x^{11}+x^{8}+x^{4}+x^{3}\\
&+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x)=&\,x^{132}+x^{129}+x^{127}+x^{125}+x^{120}+x^{118}+x^{117}+x^{116}+x^{114}+x^{112}\\
&+x^{109}+x^{108}+x^{107}+x^{106}+x^{104}+x^{103}+x^{102}+x^{99}+x^{97}+x^{96}\\
&+x^{95}+x^{94}+x^{92}+x^{90}+x^{86}+x^{85}+x^{81}+x^{79}+x^{78}+x^{77}+x^{76}\\
&+x^{75}+x^{74}+x^{72}+x^{71}+x^{69}+x^{67}+x^{66}+x^{65}+x^{64}+x^{62}+x^{56}\\
&+x^{52}+x^{50}+x^{47}+x^{46}+x^{44}+x^{41}+x^{39}+x^{38}+x^{37}+x^{36}+x^{35}\\
&+x^{34}+x^{33}+x^{31}+x^{30}+x^{29}+x^{27},\\
p_3(x)=&\,x^{125}+x^{124}+x^{122}+x^{120}+x^{116}+x^{114}+x^{113}+x^{111}+x^{110}+x^{109}\\
&+x^{108}+x^{106}+x^{104}+x^{103}+x^{100}+x^{96}+x^{95}+x^{94}+x^{92}+x^{91}\\
&+x^{90}+x^{89}+x^{77}+x^{76}+x^{74}+x^{72}+x^{69}+x^{65}+x^{64}+x^{63}+x^{62}\\
&+x^{60}+x^{58}+x^{57}+x^{54}+x^{50}+x^{49}+x^{48}+x^{47}+x^{44}+x^{43}+x^{40}\\
&+x^{39}+x^{37}+x^{35}+x^{34}+x^{31}+x^{29}+x^{28}+x^{27}+x^{25}+x^{22}+x^{19}\\
&+x^{18}+x^{17}+x^{16}+x^{15}+x^{14}+x^{12}+x^{11}+x^{10}+x^{9},\\
p_6(x)=&\,x^{126}+x^{124}+x^{120}+x^{116}+x^{108}+x^{104}+x^{102}+x^{94}+x^{90}+x^{88}\\
&+x^{86}+x^{84}+x^{82}+x^{80}+x^{78}+x^{72}+x^{68}+x^{66}+x^{64}+x^{60}+x^{56}\\
&+x^{54}+x^{48}+x^{46}+x^{44}+x^{36}+x^{34}+x^{32}+x^{30}+x^{26}+x^{18}+x^{14}\\
&+x^{8}+x^{6},
\end{aligned}
$$

$$
\begin{aligned}
p_9(x) &= x^{127} + x^{126} + x^{125} + x^{121} + x^{117} + x^{115} + x^{112} + x^{110} + x^{109} + x^{107} \\
&+ x^{106} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{91} + x^{90} \\
&+ x^{88} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{78} + x^{77} + x^{76} + x^{72} + x^{69} \\
&+ x^{68} + x^{64} + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{50} + x^{49} \\
&+ x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} \\
&+ x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{28} + x^{27} + x^{26} + x^{24} + x^{23} \\
&+ x^{22} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{9} + x^{8} + x^{4} + x^{3}, \\
p_{12}(x) &= x^{128} + x^{124} + x^{116} + x^{108} + x^{100} + x^{96} + x^{88} + x^{76} + x^{72} + x^{68} + x^{64} \\
&+ x^{60} + x^{52} + x^{44} + x^{40} + x^{36} + x^{24} + x^{16} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{110} + x^{109} + x^{108} + x^{105} + x^{103} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97} \\
&+ x^{96} + x^{93} + x^{92} + x^{91} + x^{89} + x^{87} + x^{86} + x^{84} + x^{82} + x^{77} + x^{75} \\
&+ x^{74} + x^{72} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58} \\
&+ x^{57} + x^{52} + x^{46} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{33} \\
&+ x^{32} + x^{28} + x^{23} + x^{22} + x^{21} + x^{18}, \\
p_3(x) &= x^{109} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{96} + x^{95} + x^{94} \\
&+ x^{92} + x^{91} + x^{90} + x^{89} + x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{50} + x^{49} \\
&+ x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{35} + x^{32} + x^{31} + x^{28} \\
&+ x^{27} + x^{24} + x^{23} + x^{21} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} \\
&+ x^{11} + x^{10} + x^{9}, \\
p_6(x) &= x^{110} + x^{108} + x^{106} + x^{102} + x^{100} + x^{98} + x^{96} + x^{92} + x^{90} + x^{86} + x^{84} \\
&+ x^{78} + x^{76} + x^{74} + x^{70} + x^{64} + x^{58} + x^{56} + x^{50} + x^{46} + x^{44} + x^{40} \\
&+ x^{38} + x^{36} + x^{24} + x^{22} + x^{20} + x^{14} + x^{8} + x^{6}, \\
p_9(x) &= x^{111} + x^{110} + x^{109} + x^{107} + x^{106} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} \\
&+ x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} \\
&+ x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} + x^{76} + x^{73} + x^{72} + x^{68} + x^{67} \\
&+ x^{63} + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48} \\
&+ x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37} \\
&+ x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26} \\
&+ x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{12} \\
&+ x^{9} + x^{8} + x^{4} + x^{3}, \\
p_{12}(x) &= x^{112} + x^{100} + x^{92} + x^{88} + x^{84} + x^{76} + x^{72} + x^{52} + x^{44} + x^{40} + x^{36} \\
&+ x^{32} + x^{28} + x^{24} + x^{20} + x^{12} + x^{8} + 1,
\end{aligned}
$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{113} + x^{112} + x^{102} + x^{99} + x^{96} + x^{94} + x^{93} + x^{91} + x^{88} + x^{87} \\
&\quad + x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{78} + x^{75} + x^{71} + x^{68} + x^{66} + x^{60} \\
&\quad + x^{57} + x^{56} + x^{53} + x^{51} + x^{50} + x^{46} + x^{45} + x^{44} + x^{42} + x^{41} + x^{40} \\
&\quad + x^{39} + x^{37} + x^{36} + x^{33}, \\
p_3(x) &= x^{116} + x^{113} + x^{110} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{102} + x^{99} \\
&\quad + x^{98} + x^{97} + x^{93} + x^{92} + x^{90} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{80} \\
&\quad + x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{69} + x^{61} + x^{58} + x^{57} + x^{54} + x^{53} \\
&\quad + x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{39} + x^{38} + x^{33} + x^{31} \\
&\quad + x^{28} + x^{26} + x^{25} + x^{24} + x^{21} + x^{20} + x^{18} + x^{16} + x^{12}, \\
p_6(x) &= x^{116} + x^{113} + x^{111} + x^{110} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} + x^{101} \\
&\quad + x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{91} + x^{90} + x^{86} + x^{81} + x^{79} + x^{78} \\
&\quad + x^{77} + x^{74} + x^{71} + x^{69} + x^{64} + x^{63} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} \\
&\quad + x^{52} + x^{51} + x^{50} + x^{49} + x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{39} + x^{38} \\
&\quad + x^{37} + x^{31} + x^{29} + x^{28} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} \\
&\quad + x^{14} + x^{11} + x^{8} + x^{7} + x^{3} + 1, \\
p_9(x) &= x^{116} + x^{115} + x^{111} + x^{108} + x^{104} + x^{103} + x^{100} + x^{84} + x^{83} + x^{79} \\
&\quad + x^{76} + x^{72} + x^{71} + x^{67} + x^{63} + x^{60} + x^{56} + x^{55} + x^{52} + x^{20} + x^{19} \\
&\quad + x^{15} + x^{12} + x^{8} + x^{7} + x^{4}, \\
p_{12}(x) &= x^{116} + x^{115} + x^{112} + x^{104} + x^{103} + x^{100} + x^{96} + x^{95} + x^{91} + x^{87} \\
&\quad + x^{84} + x^{80} + x^{79} + x^{75} + x^{72} + x^{56} + x^{55} + x^{52} + x^{48} + x^{47} + x^{43} \\
&\quad + x^{39} + x^{35} + x^{31} + x^{27} + x^{23} + x^{20} + x^{16} + x^{15} + x^{11} + x^{8} + x^{4} + x^{3} \\
&\quad + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{116} + x^{112} + x^{111} + x^{109} + x^{106} + x^{105} + x^{104} + x^{98} + x^{96} \\
&\quad + x^{95} + x^{91} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{79} + x^{78} + x^{76} + x^{71} \\
&\quad + x^{70} + x^{69} + x^{66} + x^{65} + x^{64} + x^{60} + x^{58} + x^{57} + x^{54} + x^{52} + x^{51} \\
&\quad + x^{50} + x^{48} + x^{47} + x^{45} + x^{44} + x^{41} + x^{40} + x^{38} + x^{37} + x^{36} + x^{35} \\
&\quad + x^{34} + x^{33} + x^{32} + x^{27} + x^{24} + x^{23} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} \\
&\quad + x^{15} + x^{14} + x^{12}, \\
p_3(x) &= x^{116} + x^{114} + x^{109} + x^{107} + x^{105} + x^{103} + x^{102} + x^{99} + x^{98} + x^{97} \\
&\quad + x^{94} + x^{91} + x^{88} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{80} + x^{76} + x^{75} \\
&\quad + x^{74} + x^{73} + x^{71} + x^{69} + x^{66} + x^{65} + x^{62} + x^{61} + x^{60} + x^{59} + x^{56} \\
&\quad + x^{53} + x^{48} + x^{46} + x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{31} + x^{29} + x^{28}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{25} + x^{24} + x^{22} + x^{19} + x^{14} + x^{13} + x^{11} + x^{10} + x^{8},\\
p_6(x) &= x^{116} + x^{114} + x^{111} + x^{110} + x^{109} + x^{107} + x^{106} + x^{104} + x^{99} + x^{97}\\
&+ x^{96} + x^{94} + x^{90} + x^{89} + x^{87} + x^{83} + x^{82} + x^{80} + x^{79} + x^{78} + x^{74}\\
&+ x^{73} + x^{72} + x^{70} + x^{69} + x^{67} + x^{64} + x^{62} + x^{61} + x^{59} + x^{57} + x^{56}\\
&+ x^{55} + x^{52} + x^{51} + x^{50} + x^{47} + x^{44} + x^{43} + x^{42} + x^{39} + x^{37} + x^{36}\\
&+ x^{35} + x^{29} + x^{28} + x^{27} + x^{26} + x^{25} + x^{23} + x^{21} + x^{20} + x^{19} + x^{18}\\
&+ x^{16} + x^{15} + x^{12} + x^{11} + x^{10} + x^{9} + x^{6} + x^{4} + x^{3} + 1,\\
p_9(x) &= x^{116} + x^{115} + x^{111} + x^{108} + x^{104} + x^{103} + x^{100} + x^{84} + x^{83} + x^{79}\\
&+ x^{76} + x^{72} + x^{71} + x^{67} + x^{63} + x^{60} + x^{56} + x^{55} + x^{52} + x^{20} + x^{19}\\
&+ x^{15} + x^{12} + x^{8} + x^{7} + x^{4},\\
p_{12}(x) &= x^{116} + x^{115} + x^{112} + x^{104} + x^{103} + x^{100} + x^{96} + x^{95} + x^{91} + x^{87}\\
&+ x^{84} + x^{80} + x^{79} + x^{75} + x^{72} + x^{56} + x^{55} + x^{52} + x^{48} + x^{47} + x^{43}\\
&+ x^{39} + x^{35} + x^{31} + x^{27} + x^{23} + x^{20} + x^{16} + x^{15} + x^{11} + x^{8} + x^{4} + x^{3}\\
&+ 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{110} + x^{109} + x^{108} + x^{105} + x^{103} + x^{101} + x^{100} + x^{99} + x^{98} + x^{97}\\
&+ x^{96} + x^{93} + x^{92} + x^{91} + x^{89} + x^{87} + x^{86} + x^{84} + x^{82} + x^{77} + x^{75}\\
&+ x^{74} + x^{72} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{61} + x^{60} + x^{59} + x^{58}\\
&+ x^{57} + x^{52} + x^{46} + x^{45} + x^{44} + x^{41} + x^{40} + x^{39} + x^{36} + x^{35} + x^{33}\\
&+ x^{32} + x^{28} + x^{23} + x^{22} + x^{21} + x^{18},\\
p_3(x) &= x^{109} + x^{108} + x^{106} + x^{105} + x^{102} + x^{101} + x^{100} + x^{96} + x^{95} + x^{94}\\
&+ x^{92} + x^{91} + x^{90} + x^{89} + x^{61} + x^{60} + x^{58} + x^{57} + x^{54} + x^{50} + x^{49}\\
&+ x^{48} + x^{47} + x^{44} + x^{43} + x^{40} + x^{39} + x^{36} + x^{35} + x^{32} + x^{31} + x^{28}\\
&+ x^{27} + x^{24} + x^{23} + x^{21} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12}\\
&+ x^{11} + x^{10} + x^{9},\\
p_6(x) &= x^{110} + x^{108} + x^{106} + x^{102} + x^{100} + x^{98} + x^{96} + x^{92} + x^{90} + x^{86} + x^{84}\\
&+ x^{78} + x^{76} + x^{74} + x^{70} + x^{64} + x^{58} + x^{56} + x^{50} + x^{46} + x^{44} + x^{40}\\
&+ x^{38} + x^{36} + x^{24} + x^{22} + x^{20} + x^{14} + x^{8} + x^{6},\\
p_9(x) &= x^{111} + x^{110} + x^{109} + x^{107} + x^{106} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97}\\
&+ x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86}\\
&+ x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} + x^{76} + x^{73} + x^{72} + x^{68} + x^{67}\\
&+ x^{63} + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{50} + x^{49} + x^{48}\\
&+ x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38} + x^{37}\\
&+ x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{26}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{25} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{12}\\
&+ x^{9} + x^{8} + x^{4} + x^{3},\\
p_{12}(x) &= x^{112} + x^{100} + x^{92} + x^{88} + x^{84} + x^{76} + x^{72} + x^{52} + x^{44} + x^{40} + x^{36}\\
&+ x^{32} + x^{28} + x^{24} + x^{20} + x^{12} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{132} + x^{129} + x^{127} + x^{125} + x^{120} + x^{118} + x^{117} + x^{116} + x^{114} + x^{112}\\
&+ x^{109} + x^{108} + x^{107} + x^{106} + x^{104} + x^{103} + x^{102} + x^{99} + x^{97} + x^{96}\\
&+ x^{95} + x^{94} + x^{92} + x^{90} + x^{86} + x^{85} + x^{81} + x^{79} + x^{78} + x^{77} + x^{76}\\
&+ x^{75} + x^{74} + x^{72} + x^{71} + x^{69} + x^{67} + x^{66} + x^{65} + x^{64} + x^{62} + x^{56}\\
&+ x^{52} + x^{50} + x^{47} + x^{46} + x^{44} + x^{41} + x^{39} + x^{38} + x^{37} + x^{36} + x^{35}\\
&+ x^{34} + x^{33} + x^{31} + x^{30} + x^{29} + x^{27},\\
p_3(x) &= x^{125} + x^{124} + x^{122} + x^{120} + x^{116} + x^{114} + x^{113} + x^{111} + x^{110} + x^{109}\\
&+ x^{108} + x^{106} + x^{104} + x^{103} + x^{100} + x^{96} + x^{95} + x^{94} + x^{92} + x^{91}\\
&+ x^{90} + x^{89} + x^{77} + x^{76} + x^{74} + x^{72} + x^{69} + x^{65} + x^{64} + x^{63} + x^{62}\\
&+ x^{60} + x^{58} + x^{57} + x^{54} + x^{50} + x^{49} + x^{48} + x^{47} + x^{44} + x^{43} + x^{40}\\
&+ x^{39} + x^{37} + x^{35} + x^{34} + x^{31} + x^{29} + x^{28} + x^{27} + x^{25} + x^{22} + x^{19}\\
&+ x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{12} + x^{11} + x^{10} + x^{9},\\
p_6(x) &= x^{126} + x^{124} + x^{120} + x^{116} + x^{108} + x^{104} + x^{102} + x^{94} + x^{90} + x^{88}\\
&+ x^{86} + x^{84} + x^{82} + x^{80} + x^{78} + x^{72} + x^{68} + x^{66} + x^{64} + x^{60} + x^{56}\\
&+ x^{54} + x^{48} + x^{46} + x^{44} + x^{36} + x^{34} + x^{32} + x^{30} + x^{26} + x^{18} + x^{14}\\
&+ x^{8} + x^{6},\\
p_9(x) &= x^{127} + x^{126} + x^{125} + x^{121} + x^{117} + x^{115} + x^{112} + x^{110} + x^{109} + x^{107}\\
&+ x^{106} + x^{103} + x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{92} + x^{91} + x^{90}\\
&+ x^{88} + x^{87} + x^{86} + x^{84} + x^{82} + x^{81} + x^{78} + x^{77} + x^{76} + x^{72} + x^{69}\\
&+ x^{68} + x^{64} + x^{62} + x^{61} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{50} + x^{49}\\
&+ x^{48} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39} + x^{38}\\
&+ x^{37} + x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{28} + x^{27} + x^{26} + x^{24} + x^{23}\\
&+ x^{22} + x^{20} + x^{18} + x^{17} + x^{15} + x^{12} + x^{9} + x^{8} + x^{4} + x^{3},\\
p_{12}(x) &= x^{128} + x^{124} + x^{116} + x^{108} + x^{100} + x^{96} + x^{88} + x^{76} + x^{72} + x^{68} + x^{64}\\
&+ x^{60} + x^{52} + x^{44} + x^{40} + x^{36} + x^{24} + x^{16} + x^{8} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{117} + x^{113} + x^{112} + x^{102} + x^{99} + x^{96} + x^{94} + x^{93} + x^{91} + x^{88} + x^{87}\\
&+ x^{84} + x^{83} + x^{82} + x^{81} + x^{79} + x^{78} + x^{75} + x^{71} + x^{68} + x^{66} + x^{60}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{57} + x^{56} + x^{53} + x^{51} + x^{50} + x^{46} + x^{45} + x^{44} + x^{42} + x^{41} + x^{40} \\
&+ x^{39} + x^{37} + x^{36} + x^{33}, \\
p_3(x) &= x^{116} + x^{113} + x^{110} + x^{109} + x^{108} + x^{105} + x^{104} + x^{103} + x^{102} + x^{99} \\
&+ x^{98} + x^{97} + x^{93} + x^{92} + x^{90} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{80} \\
&+ x^{76} + x^{75} + x^{74} + x^{73} + x^{71} + x^{69} + x^{61} + x^{58} + x^{57} + x^{54} + x^{53} \\
&+ x^{52} + x^{51} + x^{50} + x^{49} + x^{46} + x^{45} + x^{44} + x^{39} + x^{38} + x^{33} + x^{31} \\
&+ x^{28} + x^{26} + x^{25} + x^{24} + x^{21} + x^{20} + x^{18} + x^{16} + x^{12}, \\
p_6(x) &= x^{116} + x^{113} + x^{111} + x^{110} + x^{108} + x^{106} + x^{105} + x^{104} + x^{103} + x^{101} \\
&+ x^{98} + x^{97} + x^{96} + x^{95} + x^{93} + x^{91} + x^{90} + x^{86} + x^{81} + x^{79} + x^{78} \\
&+ x^{77} + x^{74} + x^{71} + x^{69} + x^{64} + x^{63} + x^{58} + x^{57} + x^{55} + x^{54} + x^{53} \\
&+ x^{52} + x^{51} + x^{50} + x^{49} + x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{39} + x^{38} \\
&+ x^{37} + x^{31} + x^{29} + x^{28} + x^{24} + x^{23} + x^{22} + x^{21} + x^{20} + x^{19} + x^{17} \\
&+ x^{14} + x^{11} + x^{8} + x^{7} + x^{3} + 1, \\
p_9(x) &= x^{116} + x^{115} + x^{111} + x^{108} + x^{104} + x^{103} + x^{100} + x^{84} + x^{83} + x^{79} \\
&+ x^{76} + x^{72} + x^{71} + x^{67} + x^{63} + x^{60} + x^{56} + x^{55} + x^{52} + x^{20} + x^{19} \\
&+ x^{15} + x^{12} + x^{8} + x^{7} + x^{4}, \\
p_{12}(x) &= x^{116} + x^{115} + x^{112} + x^{104} + x^{103} + x^{100} + x^{96} + x^{95} + x^{91} + x^{87} \\
&+ x^{84} + x^{80} + x^{79} + x^{75} + x^{72} + x^{56} + x^{55} + x^{52} + x^{48} + x^{47} + x^{43} \\
&+ x^{39} + x^{35} + x^{31} + x^{27} + x^{23} + x^{20} + x^{16} + x^{15} + x^{11} + x^{8} + x^{4} + x^{3} \\
&+ 1,
\end{aligned}
$$

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

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

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

n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$	n	$\Lambda(n)$
0	[1, 2]	1024	[1670, 1671]	2048	[1891, 526]	3072	[3488, 2413]
1	[3, 4]	1025	[1672, 203]	2049	[2691, 2692]	3073	[3489, 344]
2	[5, 6]	1026	[1673, 1674]	2050	[2693, 734]	3074	[3490, 833]
3	[7, 8]	1027	[1652, 1471]	2051	[2694, 2695]	3075	[3491, 1130]
4	[9, 10]	1028	[1495, 1675]	2052	[2696, 2697]	3076	[3251, 2473]
5	[11, 12]	1029	[1676, 1677]	2053	[2698, 553]	3077	[3492, 431]
6	[13, 14]	1030	[1473, 1678]	2054	[232, 1937]	3078	[3493, 251]
7	[15, 16]	1031	[1679, 1680]	2055	[1932, 809]	3079	[3494, 2081]
8	[17, 18]	1032	[1681, 1682]	2056	[1537, 2699]	3080	[3495, 2627]
9	[19, 20]	1033	[1683, 1637]	2057	[2700, 243]	3081	[2456, 3358]
10	[21, 22]	1034	[1684, 1685]	2058	[2701, 214]	3082	[3496, 1310]
11	[23, 24]	1035	[1686, 1687]	2059	[2702, 1993]	3083	[3497, 2199]
12	[25, 26]	1036	[1688, 1689]	2060	[2703, 2704]	3084	[3498, 2615]

13	[27, 28]	1037	[1690, 1587]	2061	[2705, 1469]	3085	[1258, 74]
14	[29, 30]	1038	[1497, 1548]	2062	[1486, 2706]	3086	[3499, 2139]
15	[31, 32]	1039	[1691, 1692]	2063	[2707, 1681]	3087	[3500, 2038]
16	[33, 34]	1040	[1693, 1624]	2064	[2708, 744]	3088	[3501, 868]
17	[35, 36]	1041	[1694, 486]	2065	[2709, 1913]	3089	[3393, 901]
18	[37, 38]	1042	[1695, 1696]	2066	[206, 1597]	3090	[3502, 1334]
19	[39, 40]	1043	[676, 483]	2067	[1386, 1547]	3091	[1271, 2391]
20	[41, 42]	1044	[1697, 168]	2068	[2710, 1483]	3092	[2496, 1266]
21	[43, 44]	1045	[1698, 1521]	2069	[520, 1511]	3093	[2375, 347]
22	[45, 46]	1046	[56, 1556]	2070	[535, 1513]	3094	[3503, 3504]
23	[47, 48]	1047	[1699, 1700]	2071	[2711, 519]	3095	[899, 24]
24	[49, 50]	1048	[1701, 1702]	2072	[2712, 2713]	3096	[833, 1169]
25	[51, 52]	1049	[742, 190]	2073	[2714, 1382]	3097	[2358, 1061]
26	[53, 54]	1050	[1703, 1522]	2074	[2715, 56]	3098	[3505, 1169]
27	[55, 56]	1051	[1704, 1705]	2075	[582, 1478]	3099	[3506, 2150]
28	[57, 58]	1052	[1706, 1707]	2076	[2716, 1731]	3100	[3507, 2100]
29	[59, 60]	1053	[1708, 704]	2077	[2717, 2718]	3101	[3508, 334]
30	[61, 62]	1054	[717, 1709]	2078	[2719, 1995]	3102	[308, 2174]
31	[63, 64]	1055	[1710, 1711]	2079	[2720, 46]	3103	[3509, 2308]
32	[65, 66]	1056	[1544, 1712]	2080	[2721, 1520]	3104	[387, 2558]
33	[67, 68]	1057	[1713, 207]	2081	[2722, 2723]	3105	[1327, 337]
34	[69, 70]	1058	[1714, 1611]	2082	[2724, 462]	3106	[3510, 1089]
35	[71, 72]	1059	[1715, 1716]	2083	[2725, 2699]	3107	[3511, 1205]
36	[73, 74]	1060	[1717, 1718]	2084	[2726, 739]	3108	[3512, 405]
37	[75, 76]	1061	[1719, 658]	2085	[2727, 238]	3109	[2583, 2367]
38	[77, 78]	1062	[1720, 1721]	2086	[2728, 1938]	3110	[2303, 15]
39	[79, 80]	1063	[1722, 1600]	2087	[2729, 795]	3111	[2506, 2273]
40	[81, 82]	1064	[1723, 649]	2088	[2730, 1678]	3112	[3513, 849]
41	[83, 84]	1065	[1687, 1724]	2089	[2731, 802]	3113	[3514, 3403]
42	[85, 86]	1066	[752, 1725]	2090	[2732, 780]	3114	[3515, 2112]
43	[87, 88]	1067	[1393, 663]	2091	[2733, 2734]	3115	[3516, 859]
44	[89, 90]	1068	[1726, 482]	2092	[515, 783]	3116	[3517, 2650]
45	[91, 92]	1069	[44, 691]	2093	[2735, 2736]	3117	[3518, 2536]
46	[93, 94]	1070	[1727, 1728]	2094	[2737, 1371]	3118	[3519, 3270]
47	[95, 96]	1071	[1729, 1628]	2095	[2738, 2739]	3119	[2615, 2593]
48	[97, 98]	1072	[203, 750]	2096	[239, 1420]	3120	[2402, 1114]
49	[99, 100]	1073	[1730, 1731]	2097	[2740, 1437]	3121	[3520, 2285]
50	[101, 102]	1074	[1732, 1733]	2098	[2741, 1376]	3122	[253, 1164]
51	[103, 104]	1075	[1734, 1735]	2099	[1977, 522]	3123	[3235, 2129]
52	[105, 106]	1076	[1736, 1438]	2100	[1560, 2689]	3124	[3521, 916]
53	[107, 108]	1077	[1737, 743]	2101	[2742, 199]	3125	[328, 2500]
54	[109, 110]	1078	[801, 1738]	2102	[2743, 2744]	3126	[2321, 289]
55	[111, 112]	1079	[1739, 578]	2103	[2745, 751]	3127	[3522, 1039]
56	[113, 114]	1080	[1740, 1741]	2104	[2746, 172]	3128	[3523, 991]

57	[115, 116]	1081	[1742, 1743]	2105	[212, 2747]	3129	[3524, 16]
58	[117, 118]	1082	[1744, 1745]	2106	[1889, 228]	3130	[3525, 1021]
59	[119, 120]	1083	[200, 1746]	2107	[1705, 705]	3131	[3526, 2174]
60	[121, 122]	1084	[1747, 1748]	2108	[2748, 2749]	3132	[3527, 262]
61	[123, 124]	1085	[1749, 1750]	2109	[2750, 1692]	3133	[3528, 355]
62	[125, 126]	1086	[1702, 1626]	2110	[2751, 1716]	3134	[266, 1340]
63	[127, 128]	1087	[1598, 1751]	2111	[2752, 2753]	3135	[3529, 2574]
64	[129, 130]	1088	[227, 1752]	2112	[2754, 542]	3136	[3530, 1298]
65	[131, 132]	1089	[202, 1560]	2113	[1809, 765]	3137	[3531, 272]
66	[133, 134]	1090	[167, 1446]	2114	[693, 2755]	3138	[2446, 2215]
67	[135, 136]	1091	[1753, 607]	2115	[2756, 2757]	3139	[2471, 1321]
68	[137, 138]	1092	[1754, 1755]	2116	[1581, 1828]	3140	[2389, 317]
69	[139, 140]	1093	[1756, 1662]	2117	[2758, 781]	3141	[3532, 2453]
70	[141, 142]	1094	[1757, 191]	2118	[2759, 2760]	3142	[2120, 2659]
71	[143, 35]	1095	[1758, 498]	2119	[2761, 1663]	3143	[3533, 2083]
72	[144, 145]	1096	[1759, 1760]	2120	[2762, 2763]	3144	[2241, 1080]
73	[146, 147]	1097	[142, 1761]	2121	[1379, 133]	3145	[2058, 2207]
74	[148, 149]	1098	[1762, 1763]	2122	[677, 1521]	3146	[3281, 1357]
75	[150, 151]	1099	[1764, 653]	2123	[2764, 169]	3147	[2585, 891]
76	[152, 153]	1100	[1765, 179]	2124	[2765, 201]	3148	[3534, 2437]
77	[154, 155]	1101	[1766, 723]	2125	[2766, 1724]	3149	[3535, 2481]
78	[156, 157]	1102	[1767, 1768]	2126	[2767, 241]	3150	[3536, 1331]
79	[158, 159]	1103	[816, 1769]	2127	[2768, 1637]	3151	[1181, 2451]
80	[160, 161]	1104	[1770, 1771]	2128	[633, 2769]	3152	[3537, 304]
81	[162, 163]	1105	[1635, 645]	2129	[2770, 1422]	3153	[3538, 2541]
82	[164, 165]	1106	[1406, 667]	2130	[2771, 1492]	3154	[1056, 1238]
83	[166, 167]	1107	[1772, 1773]	2131	[1908, 2772]	3155	[874, 2090]
84	[168, 169]	1108	[1721, 1650]	2132	[1642, 2773]	3156	[3539, 359]
85	[170, 171]	1109	[136, 1774]	2133	[2774, 2775]	3157	[2393, 3540]
86	[172, 173]	1110	[1775, 1776]	2134	[2776, 738]	3158	[3541, 2076]
87	[174, 175]	1111	[1777, 1415]	2135	[2777, 2778]	3159	[999, 2358]
88	[176, 177]	1112	[1532, 632]	2136	[1750, 774]	3160	[3542, 2474]
89	[178, 179]	1113	[1778, 1779]	2137	[2779, 1775]	3161	[3543, 3544]
90	[180, 162]	1114	[1780, 1375]	2138	[1539, 2780]	3162	[3545, 1257]
91	[181, 182]	1115	[1781, 697]	2139	[2781, 1496]	3163	[2404, 2627]
92	[183, 184]	1116	[1782, 1769]	2140	[1446, 2782]	3164	[3546, 257]
93	[185, 186]	1117	[1549, 524]	2141	[2783, 771]	3165	[3547, 1363]
94	[184, 187]	1118	[1783, 1784]	2142	[1769, 2784]	3166	[3548, 1077]
95	[188, 189]	1119	[1785, 1786]	2143	[2785, 790]	3167	[3549, 2414]
96	[190, 14]	1120	[1787, 1788]	2144	[2786, 550]	3168	[1306, 1037]
97	[191, 168]	1121	[1789, 633]	2145	[2697, 2687]	3169	[3550, 407]
98	[192, 193]	1122	[1790, 1429]	2146	[2787, 792]	3170	[1113, 21]
99	[194, 195]	1123	[1791, 1792]	2147	[2788, 2789]	3171	[2222, 3295]
100	[196, 197]	1124	[1709, 544]	2148	[2790, 1687]	3172	[413, 2425]

101	[198, 60]	1125	[1793, 601]	2149	[2791, 1467]	3173	[3551, 123]
102	[199, 200]	1126	[1794, 1795]	2150	[2792, 1756]	3174	[3552, 3553]
103	[201, 202]	1127	[1796, 1797]	2151	[2773, 2793]	3175	[368, 1042]
104	[32, 203]	1128	[1798, 1799]	2152	[2794, 663]	3176	[444, 351]
105	[204, 11]	1129	[1800, 1391]	2153	[2795, 211]	3177	[1214, 959]
106	[205, 206]	1130	[1801, 1802]	2154	[1731, 2796]	3178	[1355, 2603]
107	[207, 208]	1131	[1507, 556]	2155	[2797, 759]	3179	[3554, 395]
108	[209, 210]	1132	[1803, 1538]	2156	[2798, 2799]	3180	[2178, 340]
109	[211, 212]	1133	[1804, 1798]	2157	[2800, 2801]	3181	[3358, 1136]
110	[213, 214]	1134	[219, 1805]	2158	[1817, 1750]	3182	[3555, 968]
111	[215, 216]	1135	[1806, 1807]	2159	[2802, 1745]	3183	[965, 2665]
112	[217, 218]	1136	[1808, 1809]	2160	[1674, 2803]	3184	[3556, 960]
113	[210, 219]	1137	[1550, 1791]	2161	[2804, 809]	3185	[853, 2220]
114	[220, 221]	1138	[1810, 652]	2162	[2805, 1902]	3186	[352, 393]
115	[222, 223]	1139	[1795, 1386]	2163	[2806, 2807]	3187	[876, 1175]
116	[224, 225]	1140	[1811, 1436]	2164	[2808, 774]	3188	[386, 1111]
117	[226, 227]	1141	[1612, 1685]	2165	[2789, 2809]	3189	[3557, 311]
118	[228, 34]	1142	[1614, 1812]	2166	[2810, 1601]	3190	[2041, 1353]
119	[229, 230]	1143	[1813, 1814]	2167	[2734, 1872]	3191	[271, 1277]
120	[231, 232]	1144	[1815, 1404]	2168	[2811, 553]	3192	[3558, 2624]
121	[233, 234]	1145	[1816, 1393]	2169	[802, 1948]	3193	[3559, 2656]
122	[235, 236]	1146	[2, 1817]	2170	[2812, 593]	3194	[3560, 909]
123	[237, 185]	1147	[1818, 1595]	2171	[2813, 544]	3195	[1249, 924]
124	[238, 239]	1148	[1819, 807]	2172	[2814, 1605]	3196	[3561, 2641]
125	[240, 241]	1149	[1820, 669]	2173	[2815, 59]	3197	[3562, 845]
126	[242, 243]	1150	[62, 1821]	2174	[2816, 1550]	3198	[2396, 955]
127	[244, 245]	1151	[1822, 1823]	2175	[1678, 1918]	3199	[3563, 3217]
128	[246, 247]	1152	[243, 1756]	2176	[651, 1544]	3200	[3564, 29]
129	[248, 249]	1153	[1824, 1825]	2177	[2817, 170]	3201	[3565, 1241]
130	[250, 251]	1154	[1733, 235]	2178	[2818, 627]	3202	[2550, 432]
131	[252, 253]	1155	[1826, 208]	2179	[622, 2819]	3203	[3566, 1160]
132	[254, 255]	1156	[1827, 1828]	2180	[2820, 226]	3204	[2295, 2426]
133	[256, 76]	1157	[221, 1609]	2181	[2821, 1421]	3205	[1338, 2323]
134	[257, 258]	1158	[1741, 1829]	2182	[2822, 2823]	3206	[2269, 3567]
135	[259, 260]	1159	[1830, 755]	2183	[2824, 211]	3207	[3568, 3567]
136	[261, 262]	1160	[1831, 490]	2184	[2809, 647]	3208	[3569, 2335]
137	[263, 264]	1161	[1832, 702]	2185	[2825, 1580]	3209	[3570, 1226]
138	[265, 266]	1162	[1833, 552]	2186	[2826, 216]	3210	[3571, 1064]
139	[267, 268]	1163	[1834, 1801]	2187	[2827, 1725]	3211	[3572, 389]
140	[269, 93]	1164	[1835, 541]	2188	[2828, 1569]	3212	[3573, 2659]
141	[270, 271]	1165	[1836, 1788]	2189	[2829, 2830]	3213	[3574, 1176]
142	[272, 273]	1166	[1837, 1838]	2190	[2801, 2831]	3214	[3575, 2947]
143	[274, 275]	1167	[1839, 1840]	2191	[2832, 1905]	3215	[1807, 3039]
144	[276, 277]	1168	[776, 1779]	2192	[2833, 2834]	3216	[3576, 2768]

145	[278, 279]	1169	[1841, 1842]	2193	[2835, 507]	3217	[3577, 1998]
146	[280, 82]	1170	[1843, 1844]	2194	[2836, 2837]	3218	[551, 1928]
147	[281, 282]	1171	[1845, 1452]	2195	[2838, 2839]	3219	[3578, 3039]
148	[283, 284]	1172	[1846, 726]	2196	[2840, 1642]	3220	[3579, 794]
149	[285, 286]	1173	[1847, 643]	2197	[2841, 654]	3221	[2692, 570]
150	[287, 288]	1174	[725, 537]	2198	[2842, 614]	3222	[225, 2900]
151	[289, 290]	1175	[1848, 1635]	2199	[1577, 1916]	3223	[1567, 1620]
152	[291, 292]	1176	[1849, 1850]	2200	[2843, 2002]	3224	[214, 151]
153	[293, 294]	1177	[1851, 1852]	2201	[60, 1494]	3225	[3580, 2747]
154	[295, 296]	1178	[1853, 236]	2202	[2844, 703]	3226	[223, 1967]
155	[297, 298]	1179	[1854, 1855]	2203	[480, 2845]	3227	[3581, 3582]
156	[299, 300]	1180	[1856, 753]	2204	[808, 1897]	3228	[1562, 3058]
157	[301, 302]	1181	[1855, 1857]	2205	[643, 1696]	3229	[3583, 1574]
158	[303, 304]	1182	[1858, 1859]	2206	[2846, 1527]	3230	[3584, 2015]
159	[305, 306]	1183	[1477, 237]	2207	[2847, 631]	3231	[1788, 1825]
160	[307, 308]	1184	[1860, 1448]	2208	[2848, 787]	3232	[3585, 1523]
161	[309, 310]	1185	[1861, 1610]	2209	[2849, 2850]	3233	[3586, 1617]
162	[311, 312]	1186	[1862, 686]	2210	[2851, 2852]	3234	[3587, 1768]
163	[313, 314]	1187	[790, 1742]	2211	[2853, 2854]	3235	[1784, 2771]
164	[315, 316]	1188	[1863, 1414]	2212	[2855, 2856]	3236	[620, 3588]
165	[317, 318]	1189	[1864, 512]	2213	[1440, 2797]	3237	[3213, 141]
166	[319, 320]	1190	[1481, 1865]	2214	[52, 1567]	3238	[3589, 1795]
167	[321, 322]	1191	[1866, 1735]	2215	[2857, 171]	3239	[3590, 705]
168	[323, 324]	1192	[1867, 185]	2216	[2858, 1619]	3240	[3591, 1811]
169	[325, 326]	1193	[1868, 193]	2217	[2859, 2860]	3241	[3592, 3074]
170	[327, 328]	1194	[1869, 1870]	2218	[2861, 674]	3242	[130, 730]
171	[329, 330]	1195	[1871, 1872]	2219	[2862, 1551]	3243	[1574, 2703]
172	[331, 332]	1196	[1873, 812]	2220	[2863, 1638]	3244	[609, 630]
173	[333, 334]	1197	[1874, 1518]	2221	[2864, 1732]	3245	[3593, 2004]
174	[335, 326]	1198	[1875, 1876]	2222	[2865, 2014]	3246	[3594, 2757]
175	[336, 337]	1199	[1877, 1878]	2223	[1940, 711]	3247	[3595, 1812]
176	[338, 339]	1200	[537, 561]	2224	[2866, 1420]	3248	[3596, 514]
177	[340, 341]	1201	[1879, 1880]	2225	[2867, 1422]	3249	[3597, 3017]
178	[342, 343]	1202	[1509, 588]	2226	[713, 2868]	3250	[3598, 163]
179	[344, 345]	1203	[1881, 757]	2227	[2869, 1503]	3251	[3599, 215]
180	[346, 347]	1204	[810, 806]	2228	[2870, 775]	3252	[2834, 2879]
181	[348, 349]	1205	[1882, 1883]	2229	[2871, 2872]	3253	[1609, 1466]
182	[350, 351]	1206	[1389, 132]	2230	[2873, 752]	3254	[474, 699]
183	[98, 352]	1207	[1884, 42]	2231	[2874, 554]	3255	[3600, 3099]
184	[353, 354]	1208	[1885, 484]	2232	[1607, 127]	3256	[3601, 1492]
185	[355, 356]	1209	[1886, 1887]	2233	[2013, 2875]	3257	[3602, 1618]
186	[357, 319]	1210	[1424, 1784]	2234	[2876, 1752]	3258	[236, 3603]
187	[358, 359]	1211	[1888, 1889]	2235	[1671, 734]	3259	[3604, 3605]
188	[360, 361]	1212	[1890, 1891]	2236	[1632, 493]	3260	[3606, 3607]

189	[362, 363]	1213	[1892, 1893]	2237	[1716, 2877]	3261	[2988, 3174]
190	[364, 357]	1214	[1894, 1895]	2238	[2878, 2022]	3262	[1786, 2775]
191	[365, 366]	1215	[1896, 1542]	2239	[503, 1994]	3263	[3608, 3201]
192	[367, 368]	1216	[1583, 140]	2240	[2879, 637]	3264	[3609, 479]
193	[310, 369]	1217	[1897, 612]	2241	[2880, 817]	3265	[3610, 2885]
194	[370, 371]	1218	[1619, 566]	2242	[2881, 175]	3266	[3611, 3594]
195	[372, 373]	1219	[1898, 1430]	2243	[2882, 535]	3267	[1522, 1963]
196	[374, 375]	1220	[1899, 1704]	2244	[2883, 2884]	3268	[3612, 3182]
197	[376, 311]	1221	[1900, 1712]	2245	[2689, 1988]	3269	[3613, 3212]
198	[377, 378]	1222	[1901, 730]	2246	[507, 2885]	3270	[488, 627]
199	[379, 380]	1223	[770, 1431]	2247	[688, 1583]	3271	[1779, 1944]
200	[381, 382]	1224	[1381, 1634]	2248	[2886, 2867]	3272	[773, 787]
201	[383, 384]	1225	[457, 542]	2249	[1934, 2887]	3273	[1513, 2919]
202	[385, 386]	1226	[684, 1902]	2250	[2888, 1743]	3274	[3614, 2797]
203	[64, 387]	1227	[1903, 494]	2251	[2889, 240]	3275	[3615, 2682]
204	[388, 389]	1228	[572, 682]	2252	[2890, 1964]	3276	[3616, 1413]
205	[390, 106]	1229	[1904, 1905]	2253	[2891, 1474]	3277	[2997, 2021]
206	[391, 292]	1230	[1906, 1907]	2254	[2892, 2799]	3278	[795, 3012]
207	[392, 393]	1231	[1551, 1908]	2255	[2893, 592]	3279	[3617, 1658]
208	[394, 395]	1232	[1909, 1751]	2256	[1499, 2894]	3280	[3618, 3619]
209	[396, 397]	1233	[1910, 1709]	2257	[2895, 1631]	3281	[695, 1741]
210	[398, 399]	1234	[1911, 1912]	2258	[2896, 161]	3282	[3620, 3018]
211	[400, 401]	1235	[1913, 1402]	2259	[2897, 2840]	3283	[3621, 1691]
212	[402, 403]	1236	[1597, 715]	2260	[2898, 1424]	3284	[3622, 779]
213	[404, 289]	1237	[1914, 1374]	2261	[1628, 1932]	3285	[3031, 1850]
214	[405, 406]	1238	[1915, 1916]	2262	[2899, 1755]	3286	[3623, 3624]
215	[407, 408]	1239	[618, 1763]	2263	[2900, 2763]	3287	[3625, 1668]
216	[409, 410]	1240	[1917, 1918]	2264	[2901, 2902]	3288	[3626, 3627]
217	[411, 371]	1241	[1919, 1530]	2265	[1825, 1866]	3289	[3087, 2931]
218	[412, 413]	1242	[1920, 1702]	2266	[1998, 2903]	3290	[594, 1732]
219	[414, 415]	1243	[1921, 1922]	2267	[2904, 1549]	3291	[788, 3616]
220	[416, 417]	1244	[1923, 186]	2268	[1662, 147]	3292	[2903, 737]
221	[418, 419]	1245	[38, 468]	2269	[2905, 2906]	3293	[3628, 2737]
222	[420, 421]	1246	[1924, 1586]	2270	[58, 1374]	3294	[3629, 1790]
223	[422, 107]	1247	[1925, 1634]	2271	[2907, 2704]	3295	[3630, 2837]
224	[423, 424]	1248	[1926, 228]	2272	[1760, 1907]	3296	[3631, 2005]
225	[425, 426]	1249	[761, 1534]	2273	[2908, 1799]	3297	[3632, 737]
226	[427, 428]	1250	[1927, 1632]	2274	[2909, 1371]	3298	[2920, 1890]
227	[429, 284]	1251	[1928, 1455]	2275	[497, 2718]	3299	[3633, 1689]
228	[430, 431]	1252	[1929, 788]	2276	[2910, 1381]	3300	[3634, 3213]
229	[432, 433]	1253	[754, 1930]	2277	[700, 743]	3301	[1530, 703]
230	[434, 435]	1254	[1489, 1887]	2278	[2911, 2784]	3302	[3635, 3636]
231	[436, 411]	1255	[1931, 1932]	2279	[1878, 755]	3303	[1665, 1372]
232	[437, 438]	1256	[1933, 1934]	2280	[2912, 242]	3304	[3637, 1787]

233	[439, 440]	1257	[1935, 1838]	2281	[1870, 1713]	3305	[3638, 3009]
234	[441, 442]	1258	[1680, 1936]	2282	[2913, 2914]	3306	[1773, 59]
235	[443, 444]	1259	[1937, 1938]	2283	[2915, 551]	3307	[3639, 3640]
236	[445, 446]	1260	[1939, 1940]	2284	[1434, 1884]	3308	[3641, 519]
237	[447, 28]	1261	[1569, 1941]	2285	[2916, 708]	3309	[3642, 235]
238	[448, 449]	1262	[195, 1787]	2286	[2917, 512]	3310	[1, 515]
239	[450, 343]	1263	[1417, 1722]	2287	[2918, 2829]	3311	[3643, 2798]
240	[96, 451]	1264	[1648, 1680]	2288	[2919, 2920]	3312	[3644, 1884]
241	[452, 287]	1265	[1942, 1718]	2289	[159, 1681]	3313	[1383, 2795]
242	[453, 374]	1266	[1943, 1821]	2290	[2921, 1970]	3314	[3645, 1613]
243	[454, 455]	1267	[1944, 596]	2291	[1402, 1912]	3315	[3646, 692]
244	[456, 457]	1268	[1945, 696]	2292	[1404, 717]	3316	[3647, 694]
245	[458, 459]	1269	[1922, 1946]	2293	[2679, 2922]	3317	[3648, 1804]
246	[460, 461]	1270	[1947, 1948]	2294	[2923, 1406]	3318	[3649, 1954]
247	[462, 463]	1271	[1887, 1376]	2295	[2803, 2924]	3319	[3650, 3651]
248	[464, 465]	1272	[1425, 165]	2296	[748, 2811]	3320	[3652, 3113]
249	[466, 206]	1273	[1949, 1770]	2297	[645, 2925]	3321	[3653, 597]
250	[467, 468]	1274	[1950, 1951]	2298	[2926, 1659]	3322	[3654, 2749]
251	[469, 470]	1275	[1952, 1953]	2299	[1883, 1973]	3323	[3655, 3212]
252	[471, 472]	1276	[1954, 1541]	2300	[182, 1704]	3324	[3656, 478]
253	[473, 474]	1277	[1955, 727]	2301	[771, 462]	3325	[3657, 3016]
254	[475, 476]	1278	[1956, 1682]	2302	[1752, 2829]	3326	[2925, 2881]
255	[477, 478]	1279	[1957, 177]	2303	[2927, 2029]	3327	[3058, 2988]
256	[479, 480]	1280	[494, 54]	2304	[2928, 2755]	3328	[3658, 1950]
257	[481, 482]	1281	[1958, 1959]	2305	[2929, 1868]	3329	[1396, 3098]
258	[483, 484]	1282	[1930, 1960]	2306	[2930, 776]	3330	[3044, 1663]
259	[485, 486]	1283	[1857, 1878]	2307	[2931, 506]	3331	[3659, 3012]
260	[487, 488]	1284	[1959, 753]	2308	[2932, 1442]	3332	[1951, 1888]
261	[489, 204]	1285	[681, 681]	2309	[2933, 138]	3333	[3660, 1891]
262	[478, 490]	1286	[218, 1961]	2310	[2934, 1766]	3334	[14, 3661]
263	[491, 492]	1287	[1961, 1958]	2311	[186, 2744]	3335	[533, 2735]
264	[493, 494]	1288	[1536, 1876]	2312	[2935, 1928]	3336	[3662, 1761]
265	[132, 495]	1289	[1962, 1960]	2313	[2936, 816]	3337	[3663, 731]
266	[496, 497]	1290	[1448, 639]	2314	[2704, 1934]	3338	[3664, 1738]
267	[498, 499]	1291	[189, 1945]	2315	[2937, 640]	3339	[3665, 1558]
268	[500, 61]	1292	[1963, 1964]	2316	[2938, 1700]	3340	[2976, 815]
269	[501, 184]	1293	[1965, 588]	2317	[2939, 1791]	3341	[3666, 1380]
270	[502, 503]	1294	[1966, 492]	2318	[1511, 1646]	3342	[3667, 1774]
271	[504, 505]	1295	[1967, 1939]	2319	[2940, 516]	3343	[3668, 2013]
272	[506, 507]	1296	[1968, 798]	2320	[2941, 2758]	3344	[3114, 3669]
273	[508, 509]	1297	[1969, 1546]	2321	[2942, 1557]	3345	[3670, 719]
274	[510, 511]	1298	[463, 1970]	2322	[2769, 1605]	3346	[3619, 3671]
275	[512, 513]	1299	[1971, 574]	2323	[2943, 520]	3347	[1503, 2851]
276	[514, 515]	1300	[1972, 491]	2324	[2944, 1447]	3348	[3672, 3194]

277	[193, 516]	1301	[1463, 58]	2325	[2945, 630]	3349	[1639, 642]
278	[517, 518]	1302	[1973, 1454]	2326	[2946, 808]	3350	[3673, 1430]
279	[519, 520]	1303	[1436, 1463]	2327	[54, 2947]	3351	[3674, 3588]
280	[521, 522]	1304	[545, 1974]	2328	[2948, 813]	3352	[216, 1852]
281	[523, 524]	1305	[1975, 1620]	2329	[1564, 2949]	3353	[3675, 3080]
282	[525, 526]	1306	[1865, 225]	2330	[2687, 726]	3354	[3676, 1722]
283	[527, 528]	1307	[1976, 1977]	2331	[2950, 227]	3355	[763, 1954]
284	[529, 530]	1308	[1978, 1614]	2332	[738, 620]	3356	[3677, 473]
285	[531, 44]	1309	[796, 1618]	2333	[2951, 2769]	3357	[1689, 1767]
286	[532, 533]	1310	[1979, 471]	2334	[2952, 773]	3358	[3678, 1920]
287	[534, 535]	1311	[1980, 1392]	2335	[719, 149]	3359	[3679, 3094]
288	[536, 537]	1312	[1981, 804]	2336	[2953, 1842]	3360	[3680, 1862]
289	[538, 539]	1313	[1982, 1746]	2337	[2954, 1413]	3361	[3074, 1765]
290	[540, 541]	1314	[1983, 585]	2338	[2955, 793]	3362	[3681, 2787]
291	[542, 543]	1315	[1984, 1538]	2339	[2956, 2865]	3363	[2884, 1593]
292	[544, 466]	1316	[1797, 1665]	2340	[1432, 2957]	3364	[3682, 1443]
293	[526, 545]	1317	[1985, 1489]	2341	[2958, 1748]	3365	[524, 712]
294	[546, 547]	1318	[1696, 1986]	2342	[2959, 1977]	3366	[1501, 534]
295	[548, 549]	1319	[1987, 1988]	2343	[2960, 815]	3367	[3683, 1981]
296	[550, 551]	1320	[1989, 1509]	2344	[2961, 1967]	3368	[3684, 640]
297	[552, 476]	1321	[1990, 789]	2345	[2887, 2723]	3369	[3685, 1677]
298	[553, 554]	1322	[459, 1818]	2346	[2962, 167]	3370	[1814, 1398]
299	[555, 556]	1323	[1991, 529]	2347	[2963, 55]	3371	[3686, 1482]
300	[557, 558]	1324	[1992, 1993]	2348	[2964, 1822]	3372	[3080, 2959]
301	[559, 560]	1325	[492, 567]	2349	[2763, 532]	3373	[3687, 156]
302	[561, 562]	1326	[1994, 718]	2350	[1946, 2787]	3374	[3688, 2793]
303	[563, 564]	1327	[606, 32]	2351	[2965, 2913]	3375	[3689, 1794]
304	[565, 566]	1328	[1516, 1502]	2352	[2966, 1894]	3376	[3690, 1890]
305	[567, 469]	1329	[1995, 1452]	2353	[1799, 1811]	3377	[1964, 2779]
306	[568, 187]	1330	[1996, 1997]	2354	[2967, 2968]	3378	[163, 3129]
307	[569, 570]	1331	[804, 1998]	2355	[2969, 2970]	3379	[147, 3691]
308	[571, 572]	1332	[1829, 1999]	2356	[2782, 215]	3380	[2856, 629]
309	[573, 574]	1333	[2000, 763]	2357	[2971, 2972]	3381	[3692, 2914]
310	[171, 461]	1334	[2001, 2002]	2358	[2973, 1810]	3382	[2749, 2788]
311	[575, 576]	1335	[2003, 491]	2359	[511, 1505]	3383	[3693, 1865]
312	[577, 578]	1336	[2004, 772]	2360	[2974, 1621]	3384	[1970, 2009]
313	[579, 580]	1337	[2005, 794]	2361	[2975, 549]	3385	[3694, 1897]
314	[581, 582]	1338	[2006, 533]	2362	[1414, 1809]	3386	[3695, 1523]
315	[583, 136]	1339	[2007, 1946]	2363	[1850, 2976]	3387	[1792, 2758]
316	[584, 585]	1340	[2008, 2009]	2364	[2977, 1883]	3388	[3696, 1599]
317	[586, 587]	1341	[153, 1437]	2365	[2978, 1713]	3389	[543, 1707]
318	[588, 166]	1342	[2010, 1660]	2366	[2979, 1728]	3390	[1735, 1417]
319	[589, 590]	1343	[2011, 1686]	2367	[2980, 470]	3391	[486, 1950]
320	[591, 592]	1344	[2012, 543]	2368	[2981, 1686]	3392	[3697, 472]

321	[593, 594]	1345	[1912, 1403]	2369	[2982, 1880]	3393	[3698, 1802]
322	[595, 596]	1346	[208, 2013]	2370	[2983, 1805]	3394	[660, 654]
323	[597, 598]	1347	[2014, 2004]	2371	[230, 1482]	3395	[3699, 3044]
324	[599, 600]	1348	[2015, 558]	2372	[2984, 1490]	3396	[1542, 1666]
325	[522, 601]	1349	[2016, 811]	2373	[637, 2985]	3397	[3700, 3061]
326	[602, 234]	1350	[1479, 1868]	2374	[2986, 1936]	3398	[1450, 3196]
327	[603, 604]	1351	[2017, 508]	2375	[2819, 1459]	3399	[3701, 3699]
328	[605, 606]	1352	[2018, 2019]	2376	[2987, 2988]	3400	[1986, 3640]
329	[601, 607]	1353	[2020, 1823]	2377	[2989, 2836]	3401	[649, 1858]
330	[234, 223]	1354	[2021, 1920]	2378	[1692, 622]	3402	[1743, 1969]
331	[608, 609]	1355	[1988, 1648]	2379	[2990, 598]	3403	[3702, 1495]
332	[610, 587]	1356	[2022, 1814]	2380	[2991, 1466]	3404	[3071, 465]
333	[611, 612]	1357	[2023, 545]	2381	[2992, 1372]	3405	[558, 2001]
334	[613, 614]	1358	[670, 582]	2382	[2755, 201]	3406	[3143, 3641]
335	[615, 616]	1359	[241, 1389]	2383	[2993, 761]	3407	[3636, 589]
336	[617, 618]	1360	[2024, 1941]	2384	[2778, 1507]	3408	[3703, 514]
337	[619, 620]	1361	[2025, 1904]	2385	[750, 2994]	3409	[3704, 1502]
338	[621, 622]	1362	[1844, 676]	2386	[2995, 1497]	3410	[3099, 1652]
339	[623, 624]	1363	[672, 1893]	2387	[2996, 2924]	3411	[1948, 135]
340	[625, 626]	1364	[624, 1667]	2388	[2906, 2997]	3412	[3705, 2753]
341	[627, 50]	1365	[2026, 199]	2389	[2998, 232]	3413	[3706, 652]
342	[628, 629]	1366	[2027, 200]	2390	[2999, 1548]	3414	[3707, 2959]
343	[630, 631]	1367	[2028, 2029]	2391	[3000, 2780]	3415	[1438, 1832]
344	[632, 633]	1368	[2030, 506]	2392	[1457, 1717]	3416	[3708, 2887]
345	[634, 635]	1369	[2031, 655]	2393	[3001, 742]	3417	[2753, 1691]
346	[636, 637]	1370	[2032, 1939]	2394	[3002, 3003]	3418	[3709, 3616]
347	[638, 639]	1371	[2033, 21]	2395	[3004, 2925]	3419	[3710, 3691]
348	[640, 641]	1372	[451, 2034]	2396	[1427, 2906]	3420	[3711, 3153]
349	[642, 643]	1373	[2035, 2036]	2397	[1650, 602]	3421	[576, 3712]
350	[644, 645]	1374	[2037, 1003]	2398	[3005, 1989]	3422	[179, 3034]
351	[646, 647]	1375	[118, 1088]	2399	[516, 2836]	3423	[3713, 1387]
352	[648, 649]	1376	[2038, 2039]	2400	[3006, 746]	3424	[1905, 2884]
353	[650, 651]	1377	[2040, 2041]	2401	[3007, 1373]	3425	[3714, 3712]
354	[652, 653]	1378	[2042, 2043]	2402	[2985, 1638]	3426	[3715, 2021]
355	[654, 655]	1379	[2044, 899]	2403	[3008, 3009]	3427	[1677, 2778]
356	[656, 501]	1380	[2045, 2046]	2404	[3010, 2852]	3428	[3716, 2845]
357	[657, 658]	1381	[2047, 2048]	2405	[3011, 2920]	3429	[3203, 668]
358	[659, 130]	1382	[2049, 1215]	2406	[3012, 52]	3430	[2772, 3161]
359	[495, 660]	1383	[2050, 400]	2407	[3013, 3014]	3431	[1842, 3008]
360	[661, 662]	1384	[20, 1106]	2408	[3015, 1403]	3432	[2736, 2938]
361	[663, 664]	1385	[2051, 2052]	2409	[1415, 3016]	3433	[3717, 1666]
362	[665, 659]	1386	[2053, 297]	2410	[1999, 724]	3434	[3718, 559]
363	[666, 667]	1387	[2054, 1370]	2411	[3017, 1968]	3435	[3719, 483]
364	[668, 669]	1388	[440, 254]	2412	[3018, 1981]	3436	[3720, 812]

365	[42, 670]	1389	[2055, 889]	2413	[2723, 204]	3437	[3721, 1908]
366	[671, 672]	1390	[2056, 2046]	2414	[1828, 1515]	3438	[1812, 679]
367	[673, 674]	1391	[1122, 1027]	2415	[3019, 1441]	3439	[3722, 1493]
368	[675, 676]	1392	[1077, 1070]	2416	[2877, 2019]	3440	[1916, 3207]
369	[472, 677]	1393	[2057, 1151]	2417	[3020, 1859]	3441	[635, 39]
370	[678, 679]	1394	[2052, 2058]	2418	[3021, 1646]	3442	[3671, 2752]
371	[680, 681]	1395	[2059, 1259]	2419	[3022, 603]	3443	[1771, 3585]
372	[682, 172]	1396	[2060, 2061]	2420	[1520, 210]	3444	[3723, 2702]
373	[683, 684]	1397	[2062, 309]	2421	[3016, 3023]	3445	[3724, 1775]
374	[685, 686]	1398	[2063, 1031]	2422	[3024, 1873]	3446	[2695, 159]
375	[687, 688]	1399	[397, 2064]	2423	[3025, 772]	3447	[2713, 527]
376	[689, 577]	1400	[1353, 1329]	2424	[3026, 3027]	3448	[3725, 1888]
377	[690, 691]	1401	[1087, 1144]	2425	[3028, 1961]	3449	[2894, 662]
378	[692, 693]	1402	[2065, 2066]	2426	[3029, 765]	3450	[1529, 2896]
379	[694, 695]	1403	[2066, 1235]	2427	[3030, 1411]	3451	[1918, 2867]
380	[696, 697]	1404	[324, 1087]	2428	[691, 2025]	3452	[1527, 3018]
381	[698, 548]	1405	[2067, 1157]	2429	[2757, 3031]	3453	[3726, 1639]
382	[699, 700]	1406	[2068, 2069]	2430	[3032, 606]	3454	[3727, 12]
383	[701, 702]	1407	[288, 2070]	2431	[1515, 2695]	3455	[3027, 3117]
384	[703, 704]	1408	[2071, 2072]	2432	[3033, 1392]	3456	[1398, 1983]
385	[705, 706]	1409	[2073, 823]	2433	[647, 1501]	3457	[3728, 3641]
386	[707, 708]	1410	[2074, 1313]	2434	[3034, 1864]	3458	[3729, 2819]
387	[128, 709]	1411	[1333, 2075]	2435	[3035, 572]	3459	[2831, 3194]
388	[710, 711]	1412	[1314, 2076]	2436	[3036, 677]	3460	[3730, 133]
389	[712, 713]	1413	[2077, 2078]	2437	[3037, 1496]	3461	[1838, 1467]
390	[714, 715]	1414	[1152, 903]	2438	[3038, 501]	3462	[3731, 1843]
391	[716, 717]	1415	[2079, 440]	2439	[3039, 3040]	3463	[3732, 1858]
392	[718, 719]	1416	[2080, 2081]	2440	[530, 1671]	3464	[3733, 1547]
393	[720, 721]	1417	[2082, 421]	2441	[3041, 2931]	3465	[2775, 3636]
394	[722, 723]	1418	[2083, 2084]	2442	[554, 1570]	3466	[1728, 176]
395	[724, 725]	1419	[2085, 123]	2443	[3042, 1733]	3467	[3734, 3624]
396	[726, 727]	1420	[449, 853]	2444	[2968, 2739]	3468	[3735, 1806]
397	[728, 195]	1421	[2086, 63]	2445	[3043, 3044]	3469	[629, 1989]
398	[729, 61]	1422	[2087, 1226]	2446	[1802, 573]	3470	[1936, 2751]
399	[730, 731]	1423	[2088, 2034]	2447	[1558, 1984]	3471	[3736, 1411]
400	[732, 733]	1424	[2089, 1348]	2448	[3045, 1937]	3472	[3737, 1519]
401	[734, 471]	1425	[2090, 1212]	2449	[1711, 1913]	3473	[798, 1382]
402	[735, 736]	1426	[2091, 2092]	2450	[3046, 2949]	3474	[3738, 740]
403	[737, 738]	1427	[2093, 1279]	2451	[3047, 1959]	3475	[3739, 3066]
404	[739, 540]	1428	[2094, 2048]	2452	[3048, 561]	3476	[664, 580]
405	[740, 457]	1429	[2095, 2096]	2453	[2747, 613]	3477	[3740, 2993]
406	[741, 742]	1430	[2097, 2098]	2454	[3049, 2900]	3478	[3741, 3054]
407	[743, 744]	1431	[1308, 2099]	2455	[3050, 2861]	3479	[1872, 2856]
408	[745, 746]	1432	[2100, 2101]	2456	[3051, 477]	3480	[3742, 2860]

409	[747, 748]	1433	[2102, 2103]	2457	[3052, 2796]	3481	[3743, 2748]
410	[749, 750]	1434	[2104, 85]	2458	[574, 3017]	3482	[3744, 1770]
411	[751, 752]	1435	[2105, 2075]	2459	[3053, 498]	3483	[1768, 531]
412	[753, 754]	1436	[2106, 117]	2460	[1707, 1611]	3484	[3745, 1864]
413	[755, 218]	1437	[2107, 876]	2461	[766, 3054]	3485	[3746, 2795]
414	[756, 609]	1438	[294, 1304]	2462	[1375, 3055]	3486	[556, 2840]
415	[566, 757]	1439	[2108, 1151]	2463	[3040, 3056]	3487	[3747, 3748]
416	[758, 759]	1440	[2109, 2110]	2464	[3057, 3058]	3488	[3749, 3633]
417	[760, 761]	1441	[2111, 1145]	2465	[3059, 36]	3489	[757, 634]
418	[762, 763]	1442	[2112, 2113]	2466	[3060, 1767]	3490	[3014, 517]
419	[764, 548]	1443	[2114, 1007]	2467	[197, 180]	3491	[2839, 3199]
420	[765, 766]	1444	[2115, 2116]	2468	[3061, 1461]	3492	[3750, 1889]
421	[767, 474]	1445	[2117, 2118]	2469	[3062, 2877]	3493	[704, 191]
422	[768, 741]	1446	[2119, 2120]	2470	[1505, 2737]	3494	[3607, 35]
423	[769, 770]	1447	[2121, 2058]	2471	[3063, 2803]	3495	[3661, 3182]
424	[547, 771]	1448	[2122, 1297]	2472	[3064, 2894]	3496	[3751, 1974]
425	[772, 773]	1449	[2123, 1113]	2473	[3065, 762]	3497	[1474, 2705]
426	[774, 775]	1450	[2124, 2122]	2474	[3066, 1862]	3498	[2739, 3027]
427	[155, 776]	1451	[2125, 413]	2475	[733, 3067]	3499	[3752, 1983]
428	[777, 153]	1452	[2126, 2127]	2476	[3068, 811]	3500	[3753, 2938]
429	[778, 463]	1453	[2128, 996]	2477	[2760, 3069]	3501	[1700, 745]
430	[779, 780]	1454	[2129, 2130]	2478	[3070, 3071]	3502	[3754, 2859]
431	[781, 226]	1455	[981, 1141]	2479	[3072, 2879]	3503	[3755, 2896]
432	[782, 783]	1456	[2131, 2132]	2480	[3073, 1765]	3504	[3756, 1537]
433	[784, 635]	1457	[2133, 2134]	2481	[476, 3071]	3505	[3117, 1843]
434	[785, 724]	1458	[2135, 415]	2482	[2860, 3074]	3506	[3651, 1754]
435	[786, 162]	1459	[1084, 2136]	2483	[3075, 2760]	3507	[539, 2742]
436	[787, 788]	1460	[2137, 2138]	2484	[173, 616]	3508	[3603, 756]
437	[789, 790]	1461	[1019, 2139]	2485	[3076, 2735]	3509	[3757, 2933]
438	[791, 626]	1462	[2140, 282]	2486	[1461, 1477]	3510	[3758, 1819]
439	[792, 793]	1463	[2141, 398]	2487	[3077, 1798]	3511	[3759, 3056]
440	[794, 477]	1464	[2142, 1181]	2488	[3078, 528]	3512	[3760, 3583]
441	[490, 795]	1465	[2143, 2144]	2489	[3079, 1532]	3513	[3761, 2742]
442	[702, 796]	1466	[2145, 2084]	2490	[2922, 3080]	3514	[3762, 3067]
443	[797, 798]	1467	[2146, 2074]	2491	[2868, 552]	3515	[596, 3113]
444	[667, 799]	1468	[2147, 1074]	2492	[1880, 1419]	3516	[3763, 2834]
445	[800, 801]	1469	[2148, 293]	2493	[3081, 493]	3517	[3764, 1898]
446	[541, 802]	1470	[2149, 877]	2494	[3082, 1675]	3518	[3765, 2998]
447	[803, 804]	1471	[2150, 1092]	2495	[3083, 9]	3519	[731, 683]
448	[805, 806]	1472	[2151, 1286]	2496	[3084, 1810]	3520	[3766, 2025]
449	[807, 808]	1473	[2152, 2153]	2497	[3085, 1792]	3521	[3767, 2712]
450	[809, 810]	1474	[1074, 2154]	2498	[3086, 2011]	3522	[3768, 1693]
451	[811, 539]	1475	[2155, 850]	2499	[2850, 3087]	3523	[3769, 3661]
452	[812, 813]	1476	[2156, 2157]	2500	[3088, 575]	3524	[3691, 618]

453	[814, 729]	1477	[2158, 2159]	2501	[3089, 2958]	3525	[3770, 1786]
454	[815, 816]	1478	[1027, 2160]	2502	[3090, 142]	3526	[3771, 3669]
455	[736, 817]	1479	[2161, 2162]	2503	[3091, 219]	3527	[2780, 1475]
456	[818, 819]	1480	[2163, 2040]	2504	[1419, 729]	3528	[3772, 656]
457	[820, 308]	1481	[2164, 425]	2505	[598, 48]	3529	[3773, 706]
458	[821, 822]	1482	[2165, 2166]	2506	[3092, 1742]	3530	[3774, 1935]
459	[823, 824]	1483	[2167, 2168]	2507	[3093, 62]	3531	[2947, 508]
460	[825, 826]	1484	[1178, 1250]	2508	[3094, 1599]	3532	[3775, 2001]
461	[827, 454]	1485	[2169, 1121]	2509	[1377, 3014]	3533	[3776, 1999]
462	[828, 829]	1486	[2170, 1299]	2510	[3095, 670]	3534	[3640, 2933]
463	[830, 831]	1487	[2171, 391]	2511	[2796, 2970]	3535	[3777, 3734]
464	[832, 833]	1488	[2172, 975]	2512	[1960, 751]	3536	[711, 1693]
465	[834, 835]	1489	[1017, 2140]	2513	[1459, 1564]	3537	[2830, 3084]
466	[836, 837]	1490	[2173, 268]	2514	[3096, 2868]	3538	[1682, 1586]
467	[838, 20]	1491	[2174, 1145]	2515	[3097, 766]	3539	[3778, 2703]
468	[76, 839]	1492	[2175, 2176]	2516	[3098, 2861]	3540	[3779, 513]
469	[840, 841]	1493	[2177, 2178]	2517	[1997, 1840]	3541	[3780, 3613]
470	[842, 843]	1494	[2179, 2180]	2518	[2718, 505]	3542	[562, 2854]
471	[844, 845]	1495	[2181, 2100]	2519	[2793, 3099]	3543	[3781, 3055]
472	[846, 847]	1496	[2036, 372]	2520	[3100, 1431]	3544	[3782, 2773]
473	[848, 849]	1497	[2182, 2183]	2521	[3056, 2011]	3545	[3783, 2903]
474	[850, 851]	1498	[2061, 841]	2522	[3101, 1980]	3546	[2914, 2823]
475	[852, 853]	1499	[2166, 2184]	2523	[169, 1659]	3547	[2872, 3784]
476	[854, 855]	1500	[918, 1338]	2524	[3102, 213]	3548	[3748, 1727]
477	[856, 857]	1501	[2185, 955]	2525	[746, 3103]	3549	[3785, 1475]
478	[858, 859]	1502	[2186, 2187]	2526	[3104, 2875]	3550	[3786, 745]
479	[860, 861]	1503	[2113, 2188]	2527	[1738, 240]	3551	[1907, 1806]
480	[862, 863]	1504	[2189, 1133]	2528	[3105, 634]	3552	[1407, 2958]
481	[864, 865]	1505	[2190, 2191]	2529	[1840, 1870]	3553	[3787, 2014]
482	[866, 267]	1506	[2192, 1302]	2530	[3106, 2736]	3554	[3207, 740]
483	[867, 868]	1507	[2193, 2194]	2531	[3107, 157]	3555	[3788, 11]
484	[869, 870]	1508	[2195, 2196]	2532	[3108, 1576]	3556	[3605, 2859]
485	[871, 872]	1509	[2197, 987]	2533	[2029, 1536]	3557	[1469, 3619]
486	[873, 874]	1510	[2198, 2074]	2534	[775, 1631]	3558	[2852, 1794]
487	[875, 876]	1511	[375, 2138]	2535	[3109, 1667]	3559	[3789, 3684]
488	[877, 878]	1512	[435, 386]	2536	[3110, 657]	3560	[3790, 3164]
489	[879, 880]	1513	[954, 2199]	2537	[2845, 575]	3561	[1823, 1804]
490	[881, 882]	1514	[116, 2200]	2538	[1902, 1380]	3562	[3791, 3596]
491	[262, 883]	1515	[378, 407]	2539	[36, 1427]	3563	[3792, 2751]
492	[884, 64]	1516	[2201, 2202]	2540	[3111, 1895]	3564	[3069, 3607]
493	[885, 886]	1517	[2203, 2136]	2541	[3112, 613]	3565	[3793, 1807]
494	[887, 888]	1518	[16, 104]	2542	[3113, 3114]	3566	[3794, 1832]
495	[889, 450]	1519	[2204, 116]	2543	[3115, 3040]	3567	[3795, 2713]
496	[890, 891]	1520	[1218, 414]	2544	[3116, 3117]	3568	[1953, 1580]

497	[892, 893]	1521	[847, 1263]	2545	[3118, 1754]	3569	[2957, 2953]
498	[341, 894]	1522	[1174, 2205]	2546	[3119, 754]	3570	[1644, 2923]
499	[895, 405]	1523	[2206, 2207]	2547	[3120, 792]	3571	[3796, 3103]
500	[896, 125]	1524	[923, 2208]	2548	[3121, 764]	3572	[1658, 1766]
501	[897, 358]	1525	[2209, 2210]	2549	[669, 1721]	3573	[721, 3201]
502	[898, 899]	1526	[2211, 893]	2550	[3122, 799]	3574	[2009, 2759]
503	[900, 901]	1527	[2212, 2095]	2551	[560, 2697]	3575	[296, 429]
504	[902, 903]	1528	[2213, 2214]	2552	[3123, 1973]	3576	[2430, 2334]
505	[893, 418]	1529	[2215, 309]	2553	[3124, 2809]	3577	[3797, 986]
506	[904, 333]	1530	[2216, 1217]	2554	[3125, 699]	3578	[3798, 2468]
507	[905, 355]	1531	[2217, 2218]	2555	[3126, 1478]	3579	[3799, 856]
508	[906, 907]	1532	[2219, 2220]	2556	[3127, 589]	3580	[2221, 1073]
509	[908, 437]	1533	[2176, 2123]	2557	[3128, 3129]	3581	[3287, 1247]
510	[909, 910]	1534	[1295, 1325]	2558	[3130, 1705]	3582	[3800, 250]
511	[911, 912]	1535	[2194, 2221]	2559	[3131, 1576]	3583	[3801, 1155]
512	[913, 914]	1536	[1216, 2222]	2560	[3132, 2003]	3584	[3802, 312]
513	[915, 916]	1537	[1296, 2223]	2561	[1776, 1922]	3585	[3803, 3362]
514	[917, 918]	1538	[2224, 2225]	2562	[2744, 748]	3586	[3804, 2318]
515	[919, 920]	1539	[2226, 2227]	2563	[3133, 237]	3587	[3805, 287]
516	[921, 275]	1540	[1367, 2228]	2564	[3134, 733]	3588	[3806, 3496]
517	[922, 923]	1541	[2229, 2230]	2565	[513, 1486]	3589	[3807, 855]
518	[924, 925]	1542	[1049, 1349]	2566	[3135, 1894]	3590	[3362, 394]
519	[926, 375]	1543	[1111, 2231]	2567	[2799, 603]	3591	[2342, 2354]
520	[927, 928]	1544	[978, 2232]	2568	[1412, 2682]	3592	[3808, 107]
521	[929, 930]	1545	[2233, 969]	2569	[3136, 594]	3593	[1176, 2437]
522	[931, 88]	1546	[2234, 2235]	2570	[3137, 141]	3594	[3809, 2354]
523	[932, 933]	1547	[2236, 1317]	2571	[3138, 1556]	3595	[1059, 2180]
524	[934, 935]	1548	[2237, 2238]	2572	[3139, 1600]	3596	[3810, 2286]
525	[936, 937]	1549	[2239, 244]	2573	[3140, 562]	3597	[1182, 1366]
526	[938, 939]	1550	[22, 1311]	2574	[3141, 1844]	3598	[2356, 2351]
527	[940, 941]	1551	[2240, 2241]	2575	[3142, 3143]	3599	[2159, 850]
528	[942, 943]	1552	[2242, 78]	2576	[10, 230]	3600	[3811, 1304]
529	[944, 945]	1553	[2243, 260]	2577	[3067, 2998]	3601	[2628, 2401]
530	[946, 947]	1554	[2244, 1054]	2578	[3144, 2953]	3602	[1184, 2313]
531	[948, 949]	1555	[2245, 843]	2579	[3145, 732]	3603	[3812, 3813]
532	[950, 376]	1556	[2246, 1166]	2580	[499, 213]	3604	[3540, 2152]
533	[951, 952]	1557	[2138, 2247]	2581	[1595, 1819]	3605	[3814, 2369]
534	[953, 954]	1558	[2248, 2224]	2582	[3146, 527]	3606	[3815, 883]
535	[955, 956]	1559	[2249, 956]	2583	[1685, 672]	3607	[3816, 3325]
536	[957, 958]	1560	[6, 296]	2584	[3147, 1598]	3608	[108, 2478]
537	[959, 960]	1561	[337, 306]	2585	[1751, 1711]	3609	[3817, 1217]
538	[122, 961]	1562	[2250, 2251]	2586	[3055, 2850]	3610	[2400, 2159]
539	[962, 379]	1563	[2252, 1184]	2587	[590, 3148]	3611	[3818, 2533]
540	[963, 964]	1564	[2253, 2156]	2588	[3149, 2788]	3612	[3819, 952]

541	[349, 965]	1565	[2254, 2255]	2589	[658, 1790]	3613	[3820, 1248]
542	[819, 4]	1566	[2256, 837]	2590	[697, 2913]	3614	[3553, 863]
543	[966, 967]	1567	[2257, 2258]	2591	[3150, 3031]	3615	[865, 2134]
544	[968, 969]	1568	[2259, 2260]	2592	[1941, 2768]	3616	[3821, 1023]
545	[970, 971]	1569	[1072, 2261]	2593	[3151, 1930]	3617	[1310, 2057]
546	[972, 973]	1570	[2262, 2263]	2594	[3152, 3153]	3618	[943, 2624]
547	[361, 974]	1571	[2264, 2265]	2595	[3154, 2]	3619	[3822, 2625]
548	[975, 976]	1572	[2266, 1032]	2596	[3155, 2976]	3620	[3823, 1142]
549	[977, 978]	1573	[2267, 1361]	2597	[3156, 1904]	3621	[3824, 2384]
550	[979, 424]	1574	[2268, 2269]	2598	[3157, 1744]	3622	[255, 3343]
551	[980, 981]	1575	[2255, 1307]	2599	[3158, 1717]	3623	[3825, 114]
552	[982, 983]	1576	[2270, 2271]	2600	[3159, 459]	3624	[3826, 1042]
553	[102, 984]	1577	[2272, 1165]	2601	[1465, 529]	3625	[3827, 364]
554	[985, 986]	1578	[2273, 1007]	2602	[3160, 3161]	3626	[2603, 2306]
555	[987, 988]	1579	[2274, 1210]	2603	[3162, 530]	3627	[3828, 2044]
556	[989, 315]	1580	[2275, 2276]	2604	[145, 597]	3628	[3829, 1137]
557	[990, 600]	1581	[2277, 378]	2605	[3163, 2994]	3629	[124, 2095]
558	[312, 991]	1582	[872, 2241]	2606	[3164, 503]	3630	[3830, 831]
559	[992, 993]	1583	[1191, 1306]	2607	[3165, 3166]	3631	[3831, 979]
560	[994, 995]	1584	[2278, 2279]	2608	[3167, 3084]	3632	[3832, 1267]
561	[996, 997]	1585	[2280, 330]	2609	[1587, 3030]	3633	[3833, 946]
562	[998, 999]	1586	[2281, 867]	2610	[3168, 1818]	3634	[3834, 2375]
563	[1000, 928]	1587	[80, 2282]	2611	[3169, 2782]	3635	[3835, 454]
564	[1001, 979]	1588	[1006, 2283]	2612	[3170, 2919]	3636	[3836, 2254]
565	[1002, 1003]	1589	[2284, 1206]	2613	[3171, 3148]	3637	[1322, 2487]
566	[1004, 823]	1590	[2285, 2286]	2614	[1725, 1855]	3638	[3837, 2225]
567	[1005, 1006]	1591	[2287, 2141]	2615	[3172, 1958]	3639	[3838, 341]
568	[1007, 1008]	1592	[2288, 947]	2616	[3173, 3174]	3640	[3839, 75]
569	[1009, 345]	1593	[2289, 2290]	2617	[3175, 591]	3641	[3840, 927]
570	[1010, 832]	1594	[903, 69]	2618	[1895, 1607]	3642	[290, 445]
571	[1011, 1012]	1595	[824, 1224]	2619	[3176, 1986]	3643	[3841, 2439]
572	[1013, 99]	1596	[106, 1233]	2620	[2924, 2]	3644	[2610, 3842]
573	[1014, 1015]	1597	[837, 2291]	2621	[3177, 2957]	3645	[3843, 320]
574	[1016, 396]	1598	[2291, 2292]	2622	[165, 3143]	3646	[3844, 1200]
575	[863, 1017]	1599	[2293, 1234]	2623	[149, 2692]	3647	[3845, 2194]
576	[1018, 1019]	1600	[442, 2294]	2624	[3178, 2771]	3648	[1126, 410]
577	[1020, 1021]	1601	[1321, 2295]	2625	[3179, 1866]	3649	[1325, 1045]
578	[339, 277]	1602	[2296, 2297]	2626	[3180, 176]	3650	[1099, 897]
579	[1022, 1023]	1603	[2298, 2101]	2627	[3181, 1940]	3651	[3846, 2452]
580	[1024, 1025]	1604	[2299, 1271]	2628	[3182, 1773]	3652	[2387, 2610]
581	[1026, 1027]	1605	[2300, 1050]	2629	[3174, 3061]	3653	[90, 2574]
582	[24, 1028]	1606	[841, 244]	2630	[1546, 1822]	3654	[3847, 2427]
583	[1029, 245]	1607	[2301, 246]	2631	[3183, 2759]	3655	[3848, 2672]
584	[1030, 290]	1608	[2302, 374]	2632	[3184, 1951]	3656	[334, 881]

585	[1031, 1032]	1609	[1268, 2303]	2633	[1755, 156]	3657	[3419, 422]
586	[401, 1033]	1610	[1008, 1264]	2634	[3185, 3023]	3658	[3849, 70]
587	[1034, 1035]	1611	[2304, 2305]	2635	[3186, 1384]	3659	[2417, 2507]
588	[1036, 1037]	1612	[2306, 2214]	2636	[2875, 593]	3660	[3850, 1355]
589	[1038, 303]	1613	[2307, 2064]	2637	[3187, 173]	3661	[3851, 2473]
590	[1039, 1040]	1614	[2308, 2309]	2638	[3153, 1801]	3662	[318, 1059]
591	[1041, 288]	1615	[2310, 1100]	2639	[3188, 540]	3663	[3852, 414]
592	[1042, 1043]	1616	[1360, 77]	2640	[3189, 3087]	3664	[373, 1053]
593	[1044, 1045]	1617	[2311, 1180]	2641	[3190, 1570]	3665	[960, 2536]
594	[1046, 838]	1618	[2312, 961]	2642	[3191, 3192]	3666	[1212, 2047]
595	[1047, 965]	1619	[2313, 1290]	2643	[1518, 1760]	3667	[2191, 2641]
596	[1048, 1049]	1620	[2314, 1014]	2644	[3193, 3079]	3668	[3567, 2432]
597	[1050, 1051]	1621	[2258, 994]	2645	[585, 38]	3669	[3853, 1129]
598	[1052, 1053]	1622	[2315, 824]	2646	[3194, 3131]	3670	[3854, 285]
599	[1054, 1055]	1623	[2316, 1174]	2647	[3195, 517]	3671	[3855, 1116]
600	[600, 600]	1624	[2317, 2318]	2648	[2823, 1633]	3672	[3856, 1201]
601	[930, 1056]	1625	[2319, 89]	2649	[783, 2972]	3673	[3857, 821]
602	[1057, 422]	1626	[2320, 2321]	2650	[578, 2807]	3674	[2509, 2254]
603	[1058, 1059]	1627	[2322, 2323]	2651	[34, 2872]	3675	[3858, 2431]
604	[1060, 1061]	1628	[835, 109]	2652	[12, 2993]	3676	[3859, 442]
605	[1062, 369]	1629	[2324, 273]	2653	[3196, 2003]	3677	[3860, 3290]
606	[1063, 1064]	1630	[2325, 2294]	2654	[3197, 2789]	3678	[3861, 2169]
607	[88, 427]	1631	[2326, 2327]	2655	[744, 2712]	3679	[1037, 875]
608	[1065, 1066]	1632	[2328, 887]	2656	[1391, 2022]	3680	[3862, 914]
609	[1067, 1068]	1633	[2329, 1179]	2657	[3198, 3098]	3681	[3863, 2175]
610	[995, 877]	1634	[2046, 2330]	2658	[3199, 2798]	3682	[3864, 1106]
611	[1069, 1070]	1635	[2331, 2332]	2659	[3200, 590]	3683	[3865, 403]
612	[1071, 1072]	1636	[2333, 27]	2660	[3201, 2801]	3684	[3866, 3842]
613	[1073, 1074]	1637	[2334, 1327]	2661	[3202, 2922]	3685	[3867, 2537]
614	[1075, 985]	1638	[2335, 2336]	2662	[1761, 694]	3686	[3868, 2167]
615	[1076, 1077]	1639	[2337, 1114]	2663	[607, 3203]	3687	[2202, 3356]
616	[1078, 1079]	1640	[2338, 1311]	2664	[3204, 2831]	3688	[28, 2400]
617	[1080, 366]	1641	[2339, 2340]	2665	[3205, 2679]	3689	[1201, 967]
618	[1081, 1071]	1642	[2341, 2342]	2666	[3206, 3207]	3690	[3869, 3303]
619	[1082, 417]	1643	[2290, 1132]	2667	[3208, 2985]	3691	[82, 325]
620	[1083, 1039]	1644	[2168, 1354]	2668	[3209, 127]	3692	[1107, 2374]
621	[408, 1084]	1645	[2343, 356]	2669	[3210, 567]	3693	[3333, 1002]
622	[1085, 1084]	1646	[928, 2340]	2670	[3211, 712]	3694	[1025, 1071]
623	[1086, 1087]	1647	[2344, 894]	2671	[1675, 770]	3695	[3870, 2060]
624	[1088, 1089]	1648	[2345, 2116]	2672	[604, 2968]	3696	[3871, 1088]
625	[1090, 1017]	1649	[2346, 1297]	2673	[3212, 2865]	3697	[395, 1173]
626	[1091, 125]	1650	[1161, 441]	2674	[1601, 591]	3698	[1277, 1014]
627	[1092, 1093]	1651	[2347, 999]	2675	[1718, 479]	3699	[3872, 2611]
628	[1094, 1095]	1652	[2348, 1033]	2676	[3003, 3213]	3700	[3873, 1019]

629	[1096, 951]	1653	[2349, 2350]	2677	[686, 1797]	3701	[3874, 118]
630	[1097, 930]	1654	[2351, 2352]	2678	[1023, 331]	3702	[3875, 2309]
631	[1068, 361]	1655	[2353, 1139]	2679	[3214, 2335]	3703	[3876, 2160]
632	[1098, 1099]	1656	[2354, 18]	2680	[3215, 882]	3704	[3877, 2113]
633	[1100, 1101]	1657	[2355, 1284]	2681	[2637, 1360]	3705	[3878, 1343]
634	[1102, 1034]	1658	[1118, 2356]	2682	[3216, 2126]	3706	[3813, 912]
635	[1103, 892]	1659	[2357, 2358]	2683	[868, 3217]	3707	[3879, 1280]
636	[1104, 887]	1660	[326, 329]	2684	[2614, 2103]	3708	[3880, 90]
637	[1105, 432]	1661	[2261, 1172]	2685	[2098, 303]	3709	[3881, 2282]
638	[1106, 1107]	1662	[92, 2132]	2686	[417, 1248]	3710	[3882, 117]
639	[247, 1108]	1663	[2359, 2360]	2687	[3218, 1250]	3711	[3883, 3222]
640	[1109, 261]	1664	[2361, 451]	2688	[2370, 1317]	3712	[3884, 2635]
641	[1110, 1111]	1665	[1189, 2362]	2689	[956, 2345]	3713	[3885, 1264]
642	[1112, 1113]	1666	[2363, 2364]	2690	[3219, 997]	3714	[1203, 3553]
643	[1114, 844]	1667	[2365, 2366]	2691	[2092, 854]	3715	[3886, 2336]
644	[1115, 1116]	1668	[2367, 1363]	2692	[3220, 2079]	3716	[3887, 2110]
645	[1117, 1118]	1669	[2368, 1034]	2693	[3221, 844]	3717	[1043, 2183]
646	[1119, 1120]	1670	[2369, 2370]	2694	[857, 2120]	3718	[1358, 2083]
647	[1121, 1122]	1671	[2371, 2080]	2695	[2200, 3222]	3719	[1012, 869]
648	[1123, 1124]	1672	[1227, 1279]	2696	[2650, 2540]	3720	[3888, 396]
649	[1125, 1126]	1673	[2372, 1101]	2697	[993, 2672]	3721	[3889, 269]
650	[1127, 1128]	1674	[2373, 2374]	2698	[3223, 985]	3722	[343, 2089]
651	[1129, 1130]	1675	[2180, 2375]	2699	[920, 3224]	3723	[2208, 3309]
652	[1131, 1132]	1676	[2376, 2047]	2700	[3225, 419]	3724	[3890, 373]
653	[1133, 1134]	1677	[2377, 2193]	2701	[3226, 1028]	3725	[1331, 1369]
654	[1135, 1136]	1678	[2378, 352]	2702	[3227, 2129]	3726	[2199, 3437]
655	[1137, 1067]	1679	[2160, 907]	2703	[3228, 2669]	3727	[3891, 86]
656	[1138, 353]	1680	[894, 1295]	2704	[2184, 2167]	3728	[3892, 994]
657	[1139, 1140]	1681	[2379, 1232]	2705	[3229, 1115]	3729	[3893, 67]
658	[1141, 1142]	1682	[2096, 2265]	2706	[3230, 2089]	3730	[3435, 257]
659	[1143, 1144]	1683	[2380, 995]	2707	[3231, 2096]	3731	[3894, 2247]
660	[1145, 1137]	1684	[2381, 1166]	2708	[2555, 2276]	3732	[3504, 2548]
661	[1146, 1147]	1685	[2305, 2382]	2709	[249, 2065]	3733	[2323, 2243]
662	[1148, 448]	1686	[2157, 2383]	2710	[3232, 1056]	3734	[3895, 2215]
663	[1149, 1150]	1687	[332, 2384]	2711	[3233, 30]	3735	[3896, 2154]
664	[1151, 1152]	1688	[2385, 2144]	2712	[3234, 280]	3736	[3897, 1314]
665	[1153, 1154]	1689	[2386, 2387]	2713	[1272, 3235]	3737	[3898, 2454]
666	[1155, 1156]	1690	[2388, 2389]	2714	[952, 2050]	3738	[3899, 820]
667	[1157, 931]	1691	[2390, 2391]	2715	[3236, 1283]	3739	[2427, 1208]
668	[1158, 1159]	1692	[2384, 67]	2716	[3237, 2621]	3740	[3900, 1260]
669	[1160, 1161]	1693	[2392, 2393]	2717	[1154, 3238]	3741	[986, 1013]
670	[1162, 1163]	1694	[2394, 981]	2718	[3239, 1300]	3742	[3901, 1225]
671	[1164, 1165]	1695	[2395, 2080]	2719	[3240, 2261]	3743	[2070, 1160]
672	[1166, 819]	1696	[2327, 2396]	2720	[3241, 455]	3744	[3902, 3471]

673	[1167, 1168]	1697	[2397, 325]	2721	[3242, 398]	3745	[3903, 913]
674	[1169, 1170]	1698	[72, 2393]	2722	[3243, 387]	3746	[3238, 2163]
675	[1171, 867]	1699	[2398, 2303]	2723	[1195, 2638]	3747	[66, 2572]
676	[1172, 1022]	1700	[2399, 2400]	2724	[914, 72]	3748	[3904, 2426]
677	[1173, 1174]	1701	[286, 975]	2725	[1315, 832]	3749	[3321, 2143]
678	[1175, 1176]	1702	[2401, 2402]	2726	[2515, 246]	3750	[3905, 430]
679	[1177, 1178]	1703	[2162, 1370]	2727	[3244, 450]	3751	[2214, 1221]
680	[1179, 1180]	1704	[2403, 2404]	2728	[3245, 1315]	3752	[3906, 1193]
681	[1180, 1181]	1705	[351, 2297]	2729	[120, 1203]	3753	[3907, 93]
682	[126, 1182]	1706	[2405, 420]	2730	[910, 2476]	3754	[3908, 1161]
683	[1183, 1184]	1707	[2406, 2306]	2731	[976, 2600]	3755	[3403, 2506]
684	[1185, 1186]	1708	[2366, 2407]	2732	[3246, 2420]	3756	[110, 920]
685	[1187, 847]	1709	[1234, 1124]	2733	[282, 3247]	3757	[3909, 265]
686	[1188, 1189]	1710	[1055, 2408]	2734	[3248, 2228]	3758	[399, 1171]
687	[1190, 1191]	1711	[2292, 1345]	2735	[3249, 2367]	3759	[3217, 315]
688	[1192, 269]	1712	[2231, 2409]	2736	[3250, 3251]	3760	[3910, 2409]
689	[1193, 339]	1713	[2410, 394]	2737	[3252, 2243]	3761	[2438, 2611]
690	[1194, 1195]	1714	[2411, 63]	2738	[320, 2164]	3762	[284, 26]
691	[1196, 1197]	1715	[2412, 921]	2739	[1061, 2675]	3763	[3911, 3912]
692	[1198, 1199]	1716	[2413, 2414]	2740	[104, 2251]	3764	[3913, 825]
693	[1200, 1201]	1717	[2415, 860]	2741	[3253, 267]	3765	[3914, 437]
694	[1202, 1203]	1718	[2416, 2417]	2742	[3254, 381]	3766	[3915, 3379]
695	[988, 980]	1719	[2075, 2078]	2743	[2340, 987]	3767	[2645, 3544]
696	[1204, 1205]	1720	[2418, 2369]	2744	[3255, 3256]	3768	[2069, 2317]
697	[1206, 1207]	1721	[2419, 1107]	2745	[2103, 112]	3769	[2518, 927]
698	[1208, 889]	1722	[2081, 2420]	2746	[2453, 333]	3770	[3916, 2548]
699	[1209, 826]	1723	[2421, 836]	2747	[3257, 1075]	3771	[3917, 1346]
700	[851, 1210]	1724	[2422, 1185]	2748	[3258, 340]	3772	[3918, 897]
701	[1211, 1212]	1725	[2187, 411]	2749	[3259, 1048]	3773	[3919, 22]
702	[1213, 1214]	1726	[2423, 2164]	2750	[3260, 399]	3774	[3920, 2590]
703	[1215, 1216]	1727	[2424, 2425]	2751	[3261, 368]	3775	[94, 314]
704	[1217, 1218]	1728	[2426, 2427]	2752	[3262, 2313]	3776	[3921, 122]
705	[1219, 433]	1729	[2428, 1170]	2753	[3263, 3264]	3777	[2238, 2202]
706	[1220, 1221]	1730	[2429, 1015]	2754	[2297, 2328]	3778	[3922, 2184]
707	[1222, 1223]	1731	[1040, 2430]	2755	[3265, 1278]	3779	[345, 1188]
708	[1224, 27]	1732	[1045, 84]	2756	[3266, 2106]	3780	[3923, 1103]
709	[245, 1225]	1733	[1350, 2210]	2757	[3267, 2543]	3781	[2154, 3504]
710	[1226, 1227]	1734	[2431, 978]	2758	[3268, 936]	3782	[1292, 2085]
711	[1228, 1229]	1735	[2432, 2218]	2759	[3269, 2231]	3783	[3264, 322]
712	[1230, 445]	1736	[2433, 1092]	2760	[2665, 3270]	3784	[3924, 957]
713	[935, 1231]	1737	[403, 923]	2761	[3271, 2156]	3785	[2527, 1178]
714	[969, 1232]	1738	[2434, 2435]	2762	[330, 2216]	3786	[3925, 1274]
715	[292, 1054]	1739	[2436, 2404]	2763	[426, 3272]	3787	[3926, 1016]
716	[1233, 1234]	1740	[2437, 2438]	2764	[3273, 2585]	3788	[393, 935]

717	[1235, 1236]	1741	[882, 2439]	2765	[3274, 428]	3789	[2604, 3813]
718	[1237, 1238]	1742	[1334, 2277]	2766	[2263, 3264]	3790	[275, 2418]
719	[1239, 1240]	1743	[2440, 2234]	2767	[1134, 2494]	3791	[3927, 2295]
720	[1028, 938]	1744	[2441, 108]	2768	[3275, 2540]	3792	[2362, 3321]
721	[1241, 1242]	1745	[2409, 2442]	2769	[3276, 879]	3793	[3928, 851]
722	[1243, 380]	1746	[2443, 2444]	2770	[3277, 2638]	3794	[2566, 1213]
723	[1244, 1245]	1747	[2445, 298]	2771	[1348, 2169]	3795	[3929, 426]
724	[1246, 959]	1748	[901, 2446]	2772	[3278, 121]	3796	[2675, 2252]
725	[1247, 996]	1749	[2447, 446]	2773	[3279, 1274]	3797	[3930, 3931]
726	[1248, 1249]	1750	[2448, 1227]	2774	[3280, 3281]	3798	[3932, 2781]
727	[1250, 1251]	1751	[891, 2449]	2775	[3282, 2368]	3799	[3933, 1433]
728	[1252, 1253]	1752	[428, 1168]	2776	[3283, 1083]	3800	[3934, 469]
729	[1254, 1255]	1753	[2364, 2166]	2777	[3284, 3285]	3801	[3935, 1994]
730	[1256, 397]	1754	[2450, 2451]	2778	[3286, 3287]	3802	[3936, 1627]
731	[251, 825]	1755	[2452, 301]	2779	[3288, 2487]	3803	[3937, 45]
732	[1257, 1258]	1756	[419, 2453]	2780	[2225, 848]	3804	[1859, 1726]
733	[1259, 1260]	1757	[859, 2454]	2781	[3289, 1156]	3805	[3938, 1771]
734	[947, 1261]	1758	[2455, 2456]	2782	[322, 3290]	3806	[1876, 1873]
735	[1262, 1263]	1759	[2457, 2257]	2783	[86, 829]	3807	[2972, 1674]
736	[1264, 1257]	1760	[2458, 2459]	2784	[3291, 866]	3808	[3931, 3583]
737	[1265, 1266]	1761	[2460, 988]	2785	[2127, 271]	3809	[3939, 2752]
738	[1267, 1268]	1762	[2461, 1358]	2786	[3292, 2438]	3810	[3940, 1776]
739	[880, 349]	1763	[2462, 1244]	2787	[1051, 2072]	3811	[3941, 3942]
740	[1269, 1270]	1764	[2463, 449]	2788	[3293, 1173]	3812	[3943, 2786]
741	[870, 364]	1765	[2464, 2086]	2789	[3294, 1121]	3813	[3944, 573]
742	[268, 29]	1766	[2465, 2443]	2790	[3295, 962]	3814	[2807, 3748]
743	[826, 1271]	1767	[2466, 254]	2791	[306, 1001]	3815	[3945, 2963]
744	[1210, 1272]	1768	[2467, 89]	2792	[2196, 92]	3816	[3946, 3069]
745	[1273, 101]	1769	[1093, 2468]	2793	[3296, 1213]	3817	[1774, 3931]
746	[1274, 430]	1770	[2469, 2317]	2794	[2541, 2360]	3818	[723, 2702]
747	[1275, 329]	1771	[2470, 2471]	2795	[3297, 402]	3819	[653, 1627]
748	[1276, 1277]	1772	[2472, 1236]	2796	[1015, 3285]	3820	[40, 1457]
749	[1278, 388]	1773	[2473, 2474]	2797	[3298, 2090]	3821	[3947, 1633]
750	[1279, 1280]	1774	[2475, 2476]	2798	[3299, 2200]	3822	[1400, 3582]
751	[1281, 1282]	1775	[2477, 2478]	2799	[2439, 1267]	3823	[3948, 3008]
752	[1283, 1284]	1776	[2479, 2068]	2800	[3300, 1362]	3824	[3949, 135]
753	[1159, 1285]	1777	[2480, 2223]	2801	[1242, 3301]	3825	[3950, 2830]
754	[1286, 1287]	1778	[886, 1020]	2802	[3302, 888]	3826	[509, 3164]
755	[1066, 1253]	1779	[298, 2481]	2803	[1101, 895]	3827	[3951, 2997]
756	[1288, 1289]	1780	[2482, 1290]	2804	[855, 1155]	3828	[3952, 1494]
757	[1290, 1103]	1781	[1298, 300]	2805	[3256, 381]	3829	[655, 3684]
758	[1291, 1292]	1782	[2483, 328]	2806	[945, 1050]	3830	[3953, 3199]
759	[1293, 317]	1783	[26, 2364]	2807	[1021, 3303]	3831	[2784, 3942]
760	[1294, 1295]	1784	[2034, 2175]	2808	[3304, 1316]	3832	[3954, 1945]

761	[1260, 1296]	1785	[2484, 1126]	2809	[3305, 2124]	3833	[1610, 3955]
762	[1297, 915]	1786	[2485, 924]	2810	[1128, 2305]	3834	[1993, 3594]
763	[1108, 1298]	1787	[2486, 937]	2811	[3306, 2520]	3835	[3956, 485]
764	[1299, 253]	1788	[2487, 1147]	2812	[3307, 302]	3836	[3957, 1963]
765	[1300, 1301]	1789	[2488, 1108]	2813	[2408, 836]	3837	[484, 2902]
766	[1302, 1303]	1790	[2489, 2331]	2814	[3308, 278]	3838	[465, 3958]
767	[1304, 1075]	1791	[971, 2092]	2815	[3309, 121]	3839	[3959, 807]
768	[1305, 1306]	1792	[2490, 842]	2816	[3310, 971]	3840	[3960, 1541]
769	[1307, 1308]	1793	[2294, 949]	2817	[1089, 3256]	3841	[3961, 1944]
770	[1309, 1310]	1794	[2491, 2053]	2818	[2101, 101]	3842	[3962, 221]
771	[1311, 830]	1795	[967, 2492]	2819	[3311, 2253]	3843	[3963, 2898]
772	[1312, 1313]	1796	[973, 2471]	2820	[3312, 110]	3844	[3964, 1879]
773	[861, 1314]	1797	[2493, 2494]	2821	[84, 983]	3845	[1593, 1447]
774	[446, 1315]	1798	[410, 1139]	2822	[1120, 75]	3846	[1621, 559]
775	[1316, 1120]	1799	[431, 2106]	2823	[3313, 2152]	3847	[2699, 3651]
776	[1317, 264]	1800	[2495, 1258]	2824	[3314, 2430]	3848	[3009, 3003]
777	[1318, 1233]	1801	[304, 2496]	2825	[3315, 2277]	3849	[1712, 1744]
778	[1319, 974]	1802	[2330, 1016]	2826	[997, 2632]	3850	[3965, 2851]
779	[1320, 1321]	1803	[2497, 2292]	2827	[1285, 2043]	3851	[157, 3066]
780	[1225, 1322]	1804	[2498, 68]	2828	[3316, 2221]	3852	[3966, 3034]
781	[1323, 429]	1805	[2391, 821]	2829	[1240, 1063]	3853	[2019, 3079]
782	[1324, 1325]	1806	[2499, 2500]	2830	[3317, 2503]	3854	[3967, 532]
783	[4, 913]	1807	[2501, 2502]	2831	[3318, 383]	3855	[1429, 1562]
784	[1326, 1327]	1808	[1303, 1300]	2832	[433, 2435]	3856	[3968, 3203]
785	[1328, 1329]	1809	[1140, 1302]	2833	[3319, 2188]	3857	[3627, 1378]
786	[1330, 124]	1810	[2503, 1133]	2834	[3320, 3321]	3858	[1626, 189]
787	[1313, 1331]	1811	[2504, 2141]	2835	[3322, 1182]	3859	[3969, 2923]
788	[1332, 1333]	1812	[2064, 272]	2836	[3323, 3324]	3860	[3148, 2927]
789	[382, 1334]	1813	[1221, 2271]	2837	[3325, 113]	3861	[3970, 531]
790	[1335, 1083]	1814	[2505, 2506]	2838	[3326, 2513]	3862	[3971, 534]
791	[1336, 1307]	1815	[1124, 2171]	2839	[3327, 1002]	3863	[3972, 3671]
792	[1337, 1338]	1816	[2507, 1149]	2840	[3328, 3279]	3864	[2854, 496]
793	[1339, 1340]	1817	[2508, 929]	2841	[260, 2191]	3865	[3161, 485]
794	[1341, 858]	1818	[822, 2509]	2842	[2500, 1115]	3866	[1421, 3627]
795	[1342, 856]	1819	[2510, 1357]	2843	[3329, 99]	3867	[3973, 1676]
796	[316, 1343]	1820	[2511, 2512]	2844	[2078, 2417]	3868	[3974, 2811]
797	[1344, 1345]	1821	[347, 2513]	2845	[3330, 1018]	3869	[3975, 1984]
798	[1245, 1095]	1822	[2514, 2262]	2846	[3331, 3238]	3870	[3976, 2705]
799	[1156, 1346]	1823	[2235, 2302]	2847	[3332, 2628]	3871	[3977, 202]
800	[1347, 1348]	1824	[2183, 2515]	2848	[2110, 3333]	3872	[528, 3699]
801	[1349, 96]	1825	[2516, 2432]	2849	[3334, 2527]	3873	[1373, 2781]
802	[964, 1350]	1826	[2517, 839]	2850	[3335, 2208]	3874	[3978, 3770]
803	[1351, 408]	1827	[30, 120]	2851	[3336, 2123]	3875	[2885, 2716]
804	[1352, 1353]	1828	[2276, 2518]	2852	[2188, 420]	3876	[3979, 641]

805	[1354, 1241]	1829	[2519, 2181]	2853	[3337, 2150]	3877	[612, 2828]
806	[843, 1355]	1830	[1287, 2230]	2854	[3338, 2579]	3878	[175, 3613]
807	[1356, 390]	1831	[2520, 1342]	2855	[2332, 250]	3879	[3192, 777]
808	[1357, 1358]	1832	[2521, 316]	2856	[3339, 2050]	3880	[3784, 1490]
809	[1359, 1360]	1833	[2522, 286]	2857	[3340, 827]	3881	[2949, 3737]
810	[1361, 1362]	1834	[2523, 2330]	2858	[3341, 1004]	3882	[3980, 3585]
811	[1363, 1004]	1835	[2524, 1261]	2859	[3342, 3343]	3883	[1493, 692]
812	[1364, 1365]	1836	[2525, 970]	2860	[3344, 2597]	3884	[3712, 2005]
813	[1366, 1335]	1837	[2526, 1235]	2861	[3345, 3214]	3885	[616, 1935]
814	[68, 1367]	1838	[1079, 2527]	2862	[1003, 2457]	3886	[3981, 2916]
815	[1368, 100]	1839	[2528, 2529]	2863	[3346, 354]	3887	[3958, 3032]
816	[1369, 827]	1840	[2530, 2531]	2864	[3347, 1350]	3888	[3982, 1433]
817	[1370, 1259]	1841	[2532, 1141]	2865	[3348, 1076]	3889	[3669, 1997]
818	[1371, 9]	1842	[2533, 2534]	2866	[2232, 2086]	3890	[3983, 3196]
819	[1372, 1373]	1843	[2535, 1172]	2867	[3349, 880]	3891	[3984, 2706]
820	[1374, 1375]	1844	[2536, 2389]	2868	[3350, 854]	3892	[3985, 3737]
821	[1376, 1377]	1845	[2537, 376]	2869	[3351, 1282]	3893	[3986, 656]
822	[1378, 1379]	1846	[2538, 1214]	2870	[1280, 2326]	3894	[3987, 1378]
823	[1380, 1381]	1847	[2539, 2327]	2871	[1266, 874]	3895	[3988, 1516]
824	[1382, 1383]	1848	[2540, 2541]	2872	[3352, 1091]	3896	[3989, 39]
825	[468, 1384]	1849	[2542, 1022]	2873	[2512, 2187]	3897	[3990, 2716]
826	[1385, 1386]	1850	[2543, 1292]	2874	[3222, 2262]	3898	[3991, 1727]
827	[1387, 736]	1851	[2544, 2302]	2875	[3353, 1208]	3899	[3942, 571]
828	[1388, 1389]	1852	[2545, 1171]	2876	[3354, 1240]	3900	[3992, 1968]
829	[1390, 212]	1853	[1132, 954]	2877	[3355, 3356]	3901	[3993, 3744]
830	[793, 1391]	1854	[2230, 2546]	2878	[1231, 1163]	3902	[3994, 3955]
831	[1392, 1393]	1855	[1284, 2279]	2879	[3357, 3358]	3903	[3995, 1519]
832	[1394, 709]	1856	[2043, 1179]	2880	[3224, 945]	3904	[3996, 3030]
833	[1395, 1396]	1857	[2546, 1066]	2881	[3359, 3360]	3905	[3997, 781]
834	[1397, 1398]	1858	[2547, 881]	2882	[3361, 444]	3906	[3998, 1969]
835	[1399, 1400]	1859	[2548, 2056]	2883	[1168, 3362]	3907	[3999, 2772]
836	[1401, 1402]	1860	[2549, 247]	2884	[3363, 2370]	3908	[1974, 2963]
837	[1403, 1404]	1861	[1032, 2550]	2885	[3364, 3295]	3909	[4000, 496]
838	[1405, 1406]	1862	[302, 2551]	2886	[912, 2087]	3910	[1442, 3734]
839	[151, 1407]	1863	[2552, 1140]	2887	[3365, 388]	3911	[4001, 3603]
840	[1408, 642]	1864	[2553, 2319]	2888	[878, 2198]	3912	[4002, 550]
841	[1409, 458]	1865	[2554, 2555]	2889	[3366, 452]	3913	[4003, 3784]
842	[1410, 664]	1866	[1147, 1128]	2890	[3367, 2362]	3914	[4004, 791]
843	[1411, 1412]	1867	[2556, 357]	2891	[961, 2520]	3915	[1852, 2916]
844	[1413, 1414]	1868	[2286, 921]	2892	[3368, 2518]	3916	[1805, 3094]
845	[570, 1415]	1869	[2557, 1207]	2893	[3369, 406]	3917	[1624, 3633]
846	[1416, 1417]	1870	[2558, 278]	2894	[3370, 2515]	3918	[3582, 659]
847	[1418, 1419]	1871	[2559, 2099]	2895	[369, 2124]	3919	[3166, 1980]
848	[1420, 1421]	1872	[2444, 1154]	2896	[3371, 2328]	3920	[1938, 1488]

849	[1422, 739]	1873	[2560, 1366]	2897	[3372, 2341]	3921	[2970, 1953]
850	[1423, 1424]	1874	[2561, 2039]	2898	[3373, 2668]	3922	[1746, 2734]
851	[759, 1425]	1875	[1150, 860]	2899	[3374, 1287]	3923	[4005, 2881]
852	[1426, 1427]	1876	[2562, 2163]	2900	[424, 1223]	3924	[2994, 194]
853	[806, 721]	1877	[1289, 1289]	2901	[2360, 957]	3925	[709, 779]
854	[1428, 1429]	1878	[2279, 412]	2902	[3375, 1125]	3926	[4006, 3114]
855	[1430, 458]	1879	[2563, 2085]	2903	[3376, 2483]	3927	[780, 3763]
856	[1431, 1432]	1880	[2564, 1191]	2904	[3377, 2036]	3928	[3129, 2839]
857	[1433, 1434]	1881	[849, 2098]	2905	[3378, 66]	3929	[4007, 718]
858	[1435, 1436]	1882	[2565, 2408]	2906	[74, 3379]	3930	[4008, 2153]
859	[1437, 1438]	1883	[2534, 2566]	2907	[3380, 939]	3931	[4009, 3540]
860	[1439, 1440]	1884	[2567, 443]	2908	[3381, 115]	3932	[907, 2238]
861	[1441, 1442]	1885	[958, 1018]	2909	[3382, 297]	3933	[4010, 2104]
862	[662, 1443]	1886	[2309, 2038]	2910	[3383, 401]	3934	[3471, 842]
863	[1444, 509]	1887	[2568, 2040]	2911	[415, 2502]	3935	[4011, 2070]
864	[1445, 1446]	1888	[2569, 2252]	2912	[3290, 2368]	3936	[2153, 835]
865	[1447, 1448]	1889	[2570, 69]	2913	[300, 3384]	3937	[2099, 3251]
866	[1449, 1450]	1890	[2571, 938]	2914	[1207, 265]	3938	[4012, 1229]
867	[1451, 693]	1891	[2572, 970]	2915	[2130, 2555]	3939	[4013, 2332]
868	[1452, 197]	1892	[937, 1270]	2916	[3385, 2216]	3940	[4014, 1242]
869	[1453, 1454]	1893	[2382, 1193]	2917	[3386, 915]	3941	[4015, 2056]
870	[1455, 657]	1894	[2573, 1157]	2918	[1064, 3214]	3942	[4016, 1013]
871	[1456, 1457]	1895	[2574, 933]	2919	[3387, 2573]	3943	[2352, 2635]
872	[1458, 1459]	1896	[2575, 412]	2920	[3388, 2572]	3944	[1251, 1076]
873	[799, 1441]	1897	[2576, 1149]	2921	[845, 3324]	3945	[354, 363]
874	[1460, 1461]	1898	[2577, 875]	2922	[3389, 2087]	3946	[3343, 2452]
875	[1462, 1463]	1899	[2578, 2396]	2923	[3390, 2273]	3947	[4017, 2446]
876	[1464, 1465]	1900	[421, 353]	2924	[3384, 285]	3948	[2132, 1025]
877	[1466, 688]	1901	[2579, 941]	2925	[1116, 2590]	3949	[3324, 261]
878	[1467, 564]	1902	[2136, 2537]	2926	[925, 3360]	3950	[2207, 2381]
879	[1468, 1469]	1903	[2580, 109]	2927	[3391, 2407]	3951	[1238, 1197]
880	[1470, 1471]	1904	[1197, 452]	2928	[3301, 383]	3952	[941, 2181]
881	[1472, 1473]	1905	[359, 2060]	2929	[3392, 310]	3953	[4018, 425]
882	[614, 1474]	1906	[2581, 2235]	2930	[933, 3393]	3954	[4019, 1204]
883	[1475, 473]	1907	[2582, 2148]	2931	[3394, 905]	3955	[4020, 2143]
884	[1476, 1477]	1908	[1035, 2583]	2932	[3395, 255]	3956	[4021, 1272]
885	[1478, 1479]	1909	[1345, 2584]	2933	[3396, 1020]	3957	[1130, 2387]
886	[1480, 1481]	1910	[1236, 968]	2934	[18, 1244]	3958	[4022, 2381]
887	[1482, 1483]	1911	[1232, 390]	2935	[2383, 872]	3959	[4023, 3235]
888	[813, 789]	1912	[1144, 2585]	2936	[3397, 1093]	3960	[4024, 1049]
889	[1484, 796]	1913	[2449, 249]	2937	[3398, 85]	3961	[406, 1048]
890	[1485, 1486]	1914	[380, 943]	2938	[3399, 1192]	3962	[4025, 1268]
891	[1487, 466]	1915	[2586, 2382]	2939	[3379, 973]	3963	[4026, 2176]
892	[639, 762]	1916	[2271, 820]	2940	[2551, 65]	3964	[2265, 2564]

893	[1488, 764]	1917	[2587, 358]	2941	[3400, 1006]	3965	[3270, 3912]
894	[626, 1489]	1918	[2476, 2431]	2942	[1070, 3279]	3966	[389, 2079]
895	[1490, 741]	1919	[2247, 1215]	2943	[3401, 2127]	3967	[455, 951]
896	[461, 242]	1920	[2336, 2285]	2944	[3402, 2122]	3968	[2210, 936]
897	[1491, 495]	1921	[2588, 1354]	2945	[2414, 3403]	3969	[279, 2068]
898	[1492, 1493]	1922	[2589, 1194]	2946	[3404, 2066]	3970	[4027, 2402]
899	[1494, 1495]	1923	[2118, 993]	2947	[888, 908]	3971	[4028, 2061]
900	[1496, 1497]	1924	[2590, 80]	2948	[3405, 382]	3972	[4029, 2258]
901	[1498, 1499]	1925	[2134, 2331]	2949	[3406, 2287]	3973	[4030, 2356]
902	[1500, 1501]	1926	[2591, 2509]	2950	[3303, 1278]	3974	[4031, 102]
903	[1502, 1503]	1927	[258, 2162]	2951	[2529, 2395]	3975	[4032, 94]
904	[1504, 1505]	1928	[2592, 115]	2952	[3407, 1150]	3976	[2048, 2148]
905	[1506, 1507]	1929	[2407, 2543]	2953	[3408, 15]	3977	[3912, 6]
906	[1508, 1509]	1930	[2593, 1281]	2954	[3409, 1152]	3978	[3544, 2234]
907	[1510, 1511]	1931	[1053, 886]	2955	[3410, 1122]	3979	[4033, 2604]
908	[1483, 1499]	1932	[1170, 1361]	2956	[3411, 318]	3980	[4034, 1189]
909	[1512, 1513]	1933	[2350, 435]	2957	[2228, 2533]	3981	[4035, 1224]
910	[1514, 1515]	1934	[2594, 1195]	2958	[3412, 3393]	3982	[4036, 1043]
911	[1384, 1516]	1935	[2595, 2171]	2959	[3413, 1164]	3983	[2531, 2290]
912	[1517, 684]	1936	[2116, 2413]	2960	[3414, 1082]	3984	[4037, 1187]
913	[8, 1518]	1937	[2596, 2326]	2961	[2435, 2597]	3985	[4038, 1072]
914	[1519, 1520]	1938	[438, 1187]	2962	[3285, 2308]	3986	[4039, 3224]
915	[1521, 1522]	1939	[2597, 1228]	2963	[3415, 910]	3987	[4040, 1322]
916	[1523, 1396]	1940	[2492, 1316]	2964	[366, 2459]	3988	[1165, 448]
917	[1524, 180]	1941	[2260, 2196]	2965	[264, 2531]	3989	[1142, 2579]
918	[1525, 713]	1942	[2598, 2222]	2966	[3416, 279]	3990	[4041, 1040]
919	[1526, 1527]	1943	[1186, 1012]	2967	[3417, 1301]	3991	[4042, 3301]
920	[1528, 1529]	1944	[2599, 2600]	2968	[273, 865]	3992	[4043, 1245]
921	[708, 1530]	1945	[2601, 2436]	2969	[1301, 2193]	3993	[2478, 2104]
922	[1531, 1532]	1946	[2602, 2603]	2970	[3418, 3381]	3994	[2669, 98]
923	[1533, 1534]	1947	[2494, 838]	2971	[916, 3419]	3995	[4044, 1218]
924	[1535, 1536]	1948	[2600, 2604]	2972	[3420, 2395]	3996	[314, 1333]
925	[1534, 1537]	1949	[2605, 438]	2973	[3421, 1281]	3997	[4045, 427]
926	[1538, 1539]	1950	[2606, 998]	2974	[3422, 2496]	3998	[4046, 925]
927	[1540, 1432]	1951	[70, 1082]	2975	[1163, 1129]	3999	[2513, 1125]
928	[1541, 1542]	1952	[2607, 418]	2976	[3423, 1369]	4000	[4047, 892]
929	[1543, 1544]	1953	[2608, 2198]	2977	[3424, 2449]	4001	[949, 929]
930	[1545, 1546]	1954	[2609, 2610]	2978	[2220, 879]	4002	[4048, 980]
931	[1547, 155]	1955	[2611, 1118]	2979	[3425, 2614]	4003	[4049, 2130]
932	[1548, 1549]	1956	[2612, 2291]	2980	[3426, 2168]	4004	[2251, 1091]
933	[706, 1550]	1957	[2613, 266]	2981	[3427, 332]	4005	[3247, 1079]
934	[587, 1551]	1958	[1199, 2512]	2982	[3428, 2342]	4006	[4050, 1068]
935	[1552, 10]	1959	[2425, 1286]	2983	[984, 2253]	4007	[4051, 2345]
936	[1553, 128]	1960	[2451, 1283]	2984	[3429, 870]	4008	[1893, 3933]

937	[1554, 497]	1961	[1253, 2614]	2985	[3430, 1008]	4009	[1748, 3605]
938	[1555, 810]	1962	[112, 2615]	2986	[974, 3354]	4010	[1660, 170]
939	[1556, 1529]	1963	[2616, 2035]	2987	[3431, 1035]	4011	[1745, 2748]
940	[1557, 1558]	1964	[2205, 1200]	2988	[3432, 1367]	4012	[4052, 2779]
941	[1559, 1560]	1965	[2617, 319]	2989	[2420, 3325]	4013	[518, 3770]
942	[1561, 1562]	1966	[2318, 1005]	2990	[1270, 1194]	4014	[2837, 511]
943	[1563, 1564]	1967	[2618, 2052]	2991	[356, 1192]	4015	[3588, 3166]
944	[1565, 480]	1968	[2619, 2065]	2992	[2218, 2035]	4016	[4053, 194]
945	[1566, 1567]	1969	[2620, 391]	2993	[3433, 3354]	4017	[1454, 791]
946	[1568, 1569]	1970	[829, 1206]	2994	[3434, 3435]	4018	[1763, 1676]
947	[1570, 1400]	1971	[2227, 2621]	2995	[1346, 3435]	4019	[4054, 1882]
948	[1571, 40]	1972	[2622, 1285]	2996	[2072, 2456]	4020	[564, 2786]
949	[1572, 134]	1973	[2623, 958]	2997	[3436, 3437]	4021	[4055, 2846]
950	[1573, 1574]	1974	[939, 1204]	2998	[3438, 2546]	4022	[3054, 2015]
951	[1575, 576]	1975	[2624, 2625]	2999	[3439, 1349]	4023	[4056, 602]
952	[817, 732]	1976	[2626, 931]	3000	[3440, 1335]	4024	[1668, 2016]
953	[1576, 1577]	1977	[2627, 2628]	3001	[1329, 2366]	4025	[4057, 2927]
954	[1578, 660]	1978	[2629, 2263]	3002	[3441, 2444]	4026	[4058, 1723]
955	[1579, 518]	1979	[384, 964]	3003	[3442, 1308]	4027	[1821, 8]
956	[1580, 1581]	1980	[2630, 2057]	3004	[3443, 1249]	4028	[4059, 571]
957	[1582, 1583]	1981	[2631, 2632]	3005	[3444, 3272]	4029	[50, 3192]
958	[1584, 1434]	1982	[1255, 1365]	3006	[3445, 878]	4030	[46, 2846]
959	[1585, 700]	1983	[2633, 77]	3007	[1261, 2668]	4031	[3955, 1617]
960	[1586, 1587]	1984	[2634, 2584]	3008	[3446, 2352]	4032	[4060, 1758]
961	[1588, 499]	1985	[2635, 1255]	3009	[3447, 3247]	4033	[592, 3744]
962	[1589, 696]	1986	[2636, 2637]	3010	[3448, 1296]	4034	[3624, 3596]
963	[1590, 1479]	1987	[2638, 367]	3011	[3449, 258]	4035	[4061, 55]
964	[1591, 1412]	1988	[2639, 2283]	3012	[3450, 2257]	4036	[2002, 1879]
965	[1471, 488]	1989	[2640, 2334]	3013	[2084, 858]	4037	[4062, 3958]
966	[1592, 1593]	1990	[2454, 2227]	3014	[2039, 3281]	4038	[1724, 1898]
967	[1594, 1595]	1991	[2641, 946]	3015	[2584, 324]	4039	[580, 1882]
968	[1596, 1597]	1992	[2642, 2566]	3016	[2223, 1100]	4040	[4063, 2828]
969	[715, 1598]	1993	[2643, 1080]	3017	[3451, 3309]	4041	[4064, 3032]
970	[1599, 624]	1994	[2644, 367]	3018	[3452, 1073]	4042	[4065, 2016]
971	[1600, 1601]	1995	[2076, 2645]	3019	[1136, 2112]	4043	[177, 1758]
972	[1602, 207]	1996	[2646, 976]	3020	[3453, 857]	4044	[4066, 756]
973	[1603, 725]	1997	[2647, 2558]	3021	[1365, 3337]	4045	[4067, 777]
974	[482, 1481]	1998	[2632, 2118]	3022	[2468, 2483]	4046	[134, 3135]
975	[1604, 1581]	1999	[2648, 1247]	3023	[3454, 2051]	4047	[4068, 1488]
976	[1605, 145]	2000	[1205, 2319]	3024	[3455, 400]	4048	[3103, 1613]
977	[1606, 1607]	2001	[2649, 331]	3025	[3456, 861]	4049	[679, 3152]
978	[1608, 1609]	2002	[991, 2650]	3026	[2621, 905]	4050	[4069, 3933]
979	[187, 1610]	2003	[2651, 2593]	3027	[3457, 2564]	4051	[4070, 3131]
980	[1611, 1612]	2004	[2652, 2255]	3028	[1282, 1199]	4052	[2481, 2178]

981	[1613, 1614]	2005	[2653, 2507]	3029	[1223, 3287]	4053	[4071, 372]
982	[1615, 632]	2006	[2654, 2645]	3030	[3458, 3333]	4054	[4072, 2534]
983	[1616, 1407]	2007	[2655, 1051]	3031	[3459, 869]	4055	[3272, 2224]
984	[1617, 1465]	2008	[2283, 2436]	3032	[3460, 65]	4056	[2144, 2051]
985	[1618, 1619]	2009	[831, 2656]	3033	[3461, 1251]	4057	[4073, 2660]
986	[1620, 1621]	2010	[2657, 822]	3034	[3462, 3419]	4058	[4074, 2583]
987	[1622, 166]	2011	[2658, 1175]	3035	[3463, 126]	4059	[4075, 1303]
988	[1623, 1624]	2012	[277, 918]	3036	[3464, 2551]	4060	[3356, 2637]
989	[48, 1387]	2013	[839, 2529]	3037	[3465, 2069]	4061	[4076, 113]
990	[1625, 1626]	2014	[2659, 2660]	3038	[3466, 2232]	4062	[4077, 1134]
991	[1627, 1628]	2015	[2661, 1055]	3039	[3467, 1342]	4063	[2625, 2287]
992	[1629, 604]	2016	[2662, 962]	3040	[2502, 2341]	4064	[4078, 1063]
993	[1630, 1612]	2017	[1362, 909]	3041	[3468, 2140]	4065	[3360, 3496]
994	[1631, 1450]	2018	[2663, 301]	3042	[363, 443]	4066	[4079, 1067]
995	[161, 1632]	2019	[2664, 2665]	3043	[3469, 379]	4067	[4080, 293]
996	[1633, 1473]	2020	[2666, 984]	3044	[3470, 2109]	4068	[883, 1299]
997	[1634, 1635]	2021	[2667, 2401]	3045	[2442, 3471]	4069	[78, 1031]
998	[1636, 1383]	2022	[1340, 2350]	3046	[100, 2109]	4070	[4081, 908]
999	[1637, 610]	2023	[2668, 2669]	3047	[371, 1159]	4071	[4082, 683]
1000	[1638, 1639]	2024	[2282, 2126]	3048	[1033, 998]	4072	[4083, 3135]
1001	[1640, 547]	2025	[2670, 2550]	3049	[1343, 280]	4073	[2706, 2898]
1002	[1641, 1642]	2026	[2671, 1186]	3050	[3472, 1231]	4074	[4084, 546]
1003	[1643, 239]	2027	[2672, 2443]	3051	[3473, 2041]	4075	[4085, 668]
1004	[470, 1644]	2028	[2673, 1216]	3052	[2139, 402]	4076	[505, 220]
1005	[1645, 560]	2029	[2660, 2260]	3053	[3474, 895]	4077	[4086, 1817]
1006	[1646, 1557]	2030	[2674, 2675]	3054	[3475, 2351]	4078	[2902, 1723]
1007	[1647, 1648]	2031	[2676, 1228]	3055	[3476, 1001]	4079	[4087, 1726]
1008	[1649, 1650]	2032	[2677, 2492]	3056	[3477, 2157]	4080	[631, 546]
1009	[1651, 1652]	2033	[140, 45]	3057	[3478, 294]	4081	[4088, 3763]
1010	[1653, 1577]	2034	[549, 651]	3058	[3479, 2457]	4082	[2474, 1185]
1011	[1654, 1539]	2035	[2678, 682]	3059	[3480, 830]	4083	[3842, 2573]
1012	[1655, 1455]	2036	[674, 2679]	3060	[3481, 2205]	4084	[114, 2321]
1013	[1656, 1377]	2037	[641, 182]	3061	[3482, 3337]	4085	[4089, 2442]
1014	[1657, 1379]	2038	[2680, 695]	3062	[1229, 2503]	4086	[4090, 384]
1015	[727, 1658]	2039	[138, 577]	3063	[3483, 3384]	4087	[2459, 866]
1016	[1659, 1660]	2040	[2681, 1644]	3064	[2374, 2269]	4088	[2656, 2044]
1017	[1443, 238]	2041	[2682, 1995]	3065	[1263, 1099]	4089	[4091, 220]
1018	[1661, 1662]	2042	[2683, 1829]	3066	[3484, 1188]	4090	[3023, 3772]
1019	[1663, 1440]	2043	[2684, 1857]	3067	[3485, 2418]	4091	[1095, 3381]
1020	[1664, 1665]	2044	[2685, 190]	3068	[3486, 2383]		
1021	[1666, 801]	2045	[2686, 2687]	3069	[3487, 1005]		
1022	[1667, 1668]	2046	[2688, 2689]	3070	[3437, 2053]		
1023	[1669, 610]	2047	[2690, 1425]	3071	[983, 344]		

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	683	1	1366	0	2049	1	2732	0	3415	1
1	0	684	0	1367	0	2050	0	2733	1	3416	1
2	1	685	1	1368	1	2051	0	2734	1	3417	1
3	0	686	0	1369	1	2052	0	2735	1	3418	0
4	1	687	0	1370	0	2053	0	2736	0	3419	1
5	1	688	0	1371	0	2054	0	2737	0	3420	1
6	0	689	0	1372	1	2055	0	2738	1	3421	1
7	0	690	1	1373	0	2056	1	2739	0	3422	0
8	0	691	0	1374	0	2057	0	2740	1	3423	0
9	1	692	1	1375	1	2058	1	2741	1	3424	1
10	1	693	1	1376	0	2059	1	2742	0	3425	0
11	1	694	1	1377	0	2060	0	2743	0	3426	0
12	1	695	1	1378	0	2061	0	2744	0	3427	0
13	0	696	1	1379	1	2062	1	2745	1	3428	1
14	0	697	0	1380	0	2063	0	2746	0	3429	0
15	0	698	1	1381	1	2064	1	2747	0	3430	1
16	0	699	0	1382	1	2065	0	2748	1	3431	1
17	0	700	0	1383	0	2066	0	2749	1	3432	0
18	0	701	1	1384	0	2067	0	2750	0	3433	1
19	1	702	0	1385	0	2068	1	2751	0	3434	1
20	0	703	1	1386	0	2069	0	2752	1	3435	0
21	1	704	1	1387	0	2070	1	2753	1	3436	1
22	1	705	1	1388	0	2071	1	2754	1	3437	1
23	1	706	1	1389	0	2072	0	2755	0	3438	1
24	0	707	1	1390	1	2073	0	2756	1	3439	1
25	1	708	1	1391	1	2074	1	2757	0	3440	1
26	1	709	0	1392	1	2075	0	2758	1	3441	1
27	0	710	0	1393	0	2076	1	2759	1	3442	1
28	0	711	1	1394	0	2077	1	2760	0	3443	0
29	0	712	1	1395	1	2078	1	2761	1	3444	0
30	1	713	0	1396	0	2079	0	2762	1	3445	0
31	0	714	1	1397	1	2080	0	2763	1	3446	0
32	1	715	1	1398	0	2081	1	2764	0	3447	0
33	0	716	0	1399	1	2082	1	2765	1	3448	1
34	1	717	1	1400	0	2083	0	2766	0	3449	0
35	0	718	1	1401	0	2084	1	2767	0	3450	0
36	0	719	1	1402	0	2085	0	2768	1	3451	1
37	0	720	1	1403	0	2086	0	2769	1	3452	1
38	1	721	0	1404	1	2087	0	2770	1	3453	0
39	1	722	0	1405	0	2088	0	2771	0	3454	0
40	1	723	1	1406	1	2089	0	2772	1	3455	1

41	0	724	0	1407	1	2090	0	2773	1	3456	0
42	1	725	0	1408	1	2091	1	2774	0	3457	1
43	1	726	1	1409	0	2092	1	2775	0	3458	1
44	0	727	0	1410	1	2093	1	2776	0	3459	1
45	1	728	1	1411	0	2094	0	2777	1	3460	0
46	0	729	1	1412	0	2095	1	2778	0	3461	1
47	1	730	0	1413	1	2096	1	2779	1	3462	1
48	1	731	1	1414	1	2097	1	2780	0	3463	0
49	0	732	0	1415	0	2098	1	2781	1	3464	1
50	1	733	1	1416	0	2099	1	2782	0	3465	0
51	1	734	0	1417	1	2100	0	2783	1	3466	1
52	0	735	1	1418	0	2101	0	2784	1	3467	1
53	1	736	0	1419	0	2102	0	2785	1	3468	0
54	0	737	1	1420	0	2103	1	2786	1	3469	1
55	0	738	1	1421	0	2104	0	2787	0	3470	0
56	1	739	0	1422	0	2105	1	2788	1	3471	0
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58	0	741	0	1424	0	2107	0	2790	1	3473	1
59	0	742	0	1425	0	2108	1	2791	0	3474	0
60	1	743	0	1426	1	2109	0	2792	0	3475	1
61	1	744	0	1427	1	2110	0	2793	1	3476	1
62	1	745	1	1428	0	2111	1	2794	1	3477	0
63	0	746	1	1429	1	2112	1	2795	0	3478	1
64	0	747	1	1430	1	2113	0	2796	0	3479	0
65	1	748	1	1431	1	2114	1	2797	0	3480	1
66	1	749	1	1432	0	2115	1	2798	1	3481	1
67	0	750	0	1433	0	2116	0	2799	1	3482	0
68	1	751	1	1434	0	2117	1	2800	0	3483	0
69	1	752	0	1435	1	2118	1	2801	0	3484	0
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71	0	754	1	1437	0	2120	1	2803	1	3486	1
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74	0	757	0	1440	0	2123	0	2806	1	3489	0
75	0	758	1	1441	1	2124	1	2807	0	3490	1
76	1	759	0	1442	1	2125	0	2808	0	3491	0
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78	1	761	0	1444	1	2127	1	2810	1	3493	1
79	1	762	1	1445	1	2128	1	2811	1	3494	1
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83	0	766	0	1449	0	2132	0	2815	0	3498	0
84	1	767	1	1450	1	2133	0	2816	0	3499	1

85	1	768	1	1451	0	2134	0	2817	1	3500	1
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87	1	770	1	1453	1	2136	1	2819	0	3502	1
88	1	771	0	1454	1	2137	1	2820	1	3503	1
89	0	772	0	1455	0	2138	0	2821	1	3504	0
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92	1	775	1	1458	1	2141	1	2824	1	3507	0
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94	1	777	0	1460	1	2143	1	2826	1	3509	0
95	1	778	1	1461	0	2144	1	2827	1	3510	0
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98	1	781	0	1464	0	2147	1	2830	0	3513	1
99	0	782	0	1465	1	2148	1	2831	1	3514	0
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101	1	784	0	1467	0	2150	0	2833	1	3516	0
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105	0	788	1	1471	0	2154	0	2837	1	3520	1
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114	1	797	0	1480	1	2163	1	2846	0	3529	0
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116	0	799	1	1482	0	2165	0	2848	0	3531	0
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118	1	801	0	1484	1	2167	1	2850	0	3533	0
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122	0	805	0	1488	0	2171	0	2854	1	3537	0
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124	0	807	0	1490	0	2173	0	2856	1	3539	0
125	1	808	1	1491	0	2174	0	2857	0	3540	1
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132	1	815	1	1498	0	2181	1	2864	0	3547	1
133	1	816	1	1499	1	2182	0	2865	0	3548	0
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135	0	818	0	1501	0	2184	1	2867	0	3550	0
136	1	819	1	1502	1	2185	0	2868	0	3551	1
137	1	820	0	1503	0	2186	1	2869	0	3552	1
138	1	821	0	1504	1	2187	1	2870	0	3553	1
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140	0	823	0	1506	1	2189	1	2872	1	3555	1
141	0	824	1	1507	0	2190	0	2873	0	3556	0
142	1	825	1	1508	0	2191	0	2874	0	3557	1
143	0	826	0	1509	1	2192	1	2875	0	3558	1
144	1	827	0	1510	1	2193	0	2876	0	3559	0
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147	0	830	0	1513	0	2196	0	2879	0	3562	0
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149	0	832	0	1515	1	2198	1	2881	0	3564	1
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153	0	836	0	1519	1	2202	1	2885	1	3568	1
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156	1	839	0	1522	0	2205	1	2888	0	3571	0
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158	1	841	0	1524	1	2207	0	2890	0	3573	0
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167	0	850	0	1533	1	2216	0	2899	0	3582	0
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171	0	854	0	1537	1	2220	0	2903	1	3586	1
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173	0	856	1	1539	0	2222	0	2905	0	3588	0
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175	0	858	1	1541	0	2224	0	2907	1	3590	1
176	1	859	0	1542	0	2225	0	2908	0	3591	1
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183	1	866	0	1549	1	2232	0	2915	0	3598	0
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202	1	885	1	1568	0	2251	0	2934	0	3617	1
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267	1	950	1	1633	0	2316	1	2999	1	3682	1
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279	0	962	0	1645	1	2328	0	3011	0	3694	0
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312	0	995	1	1678	0	2361	0	3044	0	3727	0
313	0	996	0	1679	1	2362	1	3045	1	3728	1
314	0	997	1	1680	1	2363	0	3046	1	3729	1
315	1	998	0	1681	0	2364	1	3047	0	3730	0
316	1	999	1	1682	1	2365	0	3048	0	3731	1
317	0	1000	1	1683	0	2366	0	3049	1	3732	0
318	0	1001	0	1684	0	2367	0	3050	1	3733	1
319	0	1002	1	1685	0	2368	0	3051	1	3734	1
320	1	1003	1	1686	0	2369	1	3052	1	3735	0
321	0	1004	1	1687	1	2370	1	3053	0	3736	0
322	0	1005	1	1688	0	2371	1	3054	1	3737	1
323	1	1006	0	1689	0	2372	0	3055	1	3738	0
324	1	1007	0	1690	0	2373	1	3056	0	3739	1
325	0	1008	1	1691	1	2374	0	3057	1	3740	0
326	0	1009	1	1692	0	2375	0	3058	0	3741	1
327	1	1010	1	1693	0	2376	1	3059	1	3742	1
328	1	1011	1	1694	1	2377	0	3060	1	3743	1
329	0	1012	0	1695	0	2378	0	3061	0	3744	0
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332	1	1015	0	1698	1	2381	0	3064	0	3747	1
333	0	1016	0	1699	0	2382	0	3065	1	3748	0
334	0	1017	1	1700	1	2383	1	3066	0	3749	1
335	1	1018	1	1701	1	2384	0	3067	1	3750	0
336	0	1019	0	1702	0	2385	0	3068	1	3751	0
337	0	1020	0	1703	1	2386	0	3069	1	3752	1
338	1	1021	0	1704	0	2387	0	3070	1	3753	1
339	0	1022	0	1705	0	2388	0	3071	1	3754	1
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341	1	1024	1	1707	0	2390	1	3073	0	3756	0
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346	1	1029	1	1712	0	2395	0	3078	1	3761	1
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352	0	1035	0	1718	0	2401	0	3084	0	3767	1
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355	0	1038	0	1721	0	2404	1	3087	1	3770	1
356	0	1039	1	1722	1	2405	0	3088	1	3771	0
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368	0	1051	0	1734	1	2417	0	3100	0	3783	1
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371	0	1054	1	1737	1	2420	0	3103	0	3786	0
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381	1	1064	1	1747	1	2430	0	3113	0	3796	0
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389	1	1072	0	1755	0	2438	1	3121	1	3804	1
390	1	1073	0	1756	0	2439	1	3122	0	3805	0
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395	0	1078	0	1761	0	2444	0	3127	0	3810	1
396	1	1079	1	1762	0	2445	1	3128	1	3811	0
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398	1	1081	1	1764	1	2447	0	3130	1	3813	1
399	0	1082	0	1765	1	2448	1	3131	0	3814	0
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417	0	1100	1	1783	1	2466	1	3149	0	3832	0
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419	0	1102	1	1785	0	2468	0	3151	0	3834	0
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421	1	1104	1	1787	0	2470	0	3153	1	3836	1
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424	0	1107	0	1790	1	2473	1	3156	0	3839	1
425	0	1108	0	1791	0	2474	0	3157	1	3840	0
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431	0	1114	1	1797	1	2480	0	3163	1	3846	0
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434	1	1117	1	1800	1	2483	0	3166	0	3849	0
435	0	1118	1	1801	1	2484	0	3167	1	3850	1
436	0	1119	0	1802	0	2485	1	3168	1	3851	0

437	0	1120	0	1803	1	2486	0	3169	0	3852	1
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439	1	1122	1	1805	1	2488	1	3171	0	3854	0
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441	1	1124	1	1807	0	2490	1	3173	1	3856	0
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443	0	1126	0	1809	0	2492	1	3175	0	3858	0
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446	1	1129	1	1812	1	2495	1	3178	1	3861	1
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450	1	1133	1	1816	0	2499	0	3182	1	3865	0
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453	1	1136	0	1819	0	2502	1	3185	0	3868	0
454	1	1137	1	1820	0	2503	0	3186	0	3869	1
455	0	1138	0	1821	1	2504	0	3187	0	3870	0
456	0	1139	1	1822	1	2505	0	3188	1	3871	0
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460	1	1143	1	1826	0	2509	0	3192	1	3875	1
461	0	1144	1	1827	1	2510	0	3193	0	3876	0
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523	0	1206	0	1889	0	2572	0	3255	0	3938	0
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526	0	1209	0	1892	0	2575	1	3258	1	3941	0
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556	1	1239	1	1922	1	2605	1	3288	1	3971	1
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584	1	1267	1	1950	1	2633	0	3316	1	3999	1
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587	0	1270	0	1953	1	2636	0	3319	1	4002	0
588	0	1271	0	1954	1	2637	0	3320	0	4003	0
589	0	1272	0	1955	0	2638	1	3321	1	4004	0
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591	1	1274	1	1957	0	2640	1	3323	0	4006	1
592	0	1275	1	1958	1	2641	0	3324	0	4007	1
593	0	1276	1	1959	0	2642	0	3325	1	4008	0
594	1	1277	0	1960	0	2643	0	3326	0	4009	0
595	0	1278	1	1961	1	2644	0	3327	0	4010	0
596	1	1279	0	1962	1	2645	1	3328	0	4011	0
597	1	1280	0	1963	1	2646	0	3329	0	4012	0
598	0	1281	1	1964	1	2647	0	3330	0	4013	0
599	1	1282	0	1965	0	2648	0	3331	0	4014	1
600	0	1283	0	1966	0	2649	1	3332	0	4015	0
601	0	1284	0	1967	1	2650	0	3333	1	4016	0
602	0	1285	1	1968	1	2651	1	3334	0	4017	1
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604	0	1287	1	1970	1	2653	1	3336	0	4019	0
605	1	1288	0	1971	0	2654	0	3337	1	4020	0
606	1	1289	1	1972	0	2655	0	3338	1	4021	1
607	1	1290	0	1973	0	2656	1	3339	1	4022	1
608	1	1291	1	1974	1	2657	1	3340	0	4023	1
609	0	1292	1	1975	1	2658	1	3341	0	4024	0
610	1	1293	0	1976	0	2659	1	3342	0	4025	0
611	0	1294	0	1977	1	2660	1	3343	1	4026	1
612	0	1295	1	1978	1	2661	0	3344	1	4027	1

613	0	1296	1	1979	1	2662	0	3345	0	4028	1
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615	1	1298	0	1981	0	2664	1	3347	0	4030	0
616	0	1299	0	1982	0	2665	0	3348	0	4031	0
617	0	1300	0	1983	0	2666	0	3349	0	4032	1
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626	1	1309	1	1992	0	2675	0	3358	1	4041	0
627	1	1310	1	1993	0	2676	1	3359	0	4042	1
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647	1	1330	0	2013	0	2696	0	3379	0	4062	0
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671	1	1354	0	2037	0	2720	0	3403	1	4086	0
672	1	1355	1	2038	0	2721	0	3404	1	4087	0
673	1	1356	0	2039	1	2722	1	3405	0	4088	1
674	1	1357	1	2040	0	2723	0	3406	0	4089	1
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679	0	1362	1	2045	0	2728	0	3411	1		
680	0	1363	1	2046	1	2729	0	3412	0		
681	1	1364	1	2047	1	2730	0	3413	1		
682	1	1365	1	2048	0	2731	0	3414	1		

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