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

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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 $(a,b)=(z^4+z^2+z,z^3+z^2+z)$.

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 $(a,b)=(z^4+z^2+z, z^3+z^2+z)$, 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 $\mathrm{CF}(a,b)$*,*

$$\begin{aligned}
p_0(z)&=z^{15}+z^{14}+z^{13}+z^{12}+z^{10}+z^9+z^8+z^7+z^6+z^5+1,\\
p_1(z)&=z^{19}+z^{15}+z^{14}+z^{12}+z^{11}+z^8+z^6+z^5+z^4+z^3,\\
p_2(z)&=z^{22}+z^{18}+z^{16}+z^{12}+z^6+z^4+z^2,\\
p_3(z)&=z^{19}+z^{15}+z^{14}+z^{12}+z^{11}+z^8+z^6+z^5+z^4+z^3,\\
p_4(z)&=z^{16}+z^{15}+z^{14}+z^{13}+z^9+z^8+z^7+z^6+z^5+z^4+1,
\end{aligned}$$

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

$$\begin{aligned}
p_0(z)&=z^{15}+z^{14}+z^{13}+z^{12}+z^9+z^8+z^7+z^5+1,\\
p_1(z)&=z^{19}+z^{15}+z^{14}+z^{12}+z^{11}+z^8+z^6+z^5+z^4+z^3,\\
p_2(z)&=z^{22}+z^{18}+z^{16}+z^{12}+z^6+z^4+z^2,\\
p_3(z)&=z^{19}+z^{15}+z^{14}+z^{12}+z^{11}+z^8+z^6+z^5+z^4+z^3,\\
p_4(z)&=z^{16}+z^{15}+z^{14}+z^{13}+z^{10}+z^9+z^8+z^7+z^5+z^4+1.
\end{aligned}$$

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

$$\begin{aligned} M^e[:14u] = {} & M^e[:7u] + x^u M^e[:6u] + x^{5u} M^e[:2u] + x^{6u} M^e[:u] + x^u M^e[:7u] \\ & + x^{2u} M^e[:6u] + x^{6u} M^e[:2u] + x^{7u} M^e[:u] + x^{2u} M^e[:7u] \\ & + x^{3u} M^e[:6u] + x^{7u} M^e[:2u] + x^{8u} M^e[:u] + x^{3u} M^e[:7u] \\ & + x^{4u} M^e[:6u] + x^{8u} M^e[:2u] + x^{9u} M^e[:u] + x^{4u} M^e[:7u] \\ & + x^{5u} M^e[:6u] + x^{9u} M^e[:2u] + x^{10u} M^e[:u] + x^{7u} M^e[:7u] \\ & + x^{8u} M^e[:6u] + x^{13u} M^e[:u] + x^{9u} M^e[:5u] \end{aligned}$$

$$
\begin{aligned}
&+ (x^{7u} + x^{8u} + x^{9u} + x^{10u} + x^{11u})R^e,\\
W^e[:14u] &= W^e[:7u] + x^u W^e[:6u] + x^{5u} W^e[:2u] + x^{6u} W^e[:u] + x^u W^e[:7u]\\
&+ x^{2u} W^e[:6u] + x^{6u} W^e[:2u] + x^{7u} W^e[:u] + x^{2u} W^e[:7u]\\
&+ x^{3u} W^e[:6u] + x^{7u} W^e[:2u] + x^{8u} W^e[:u] + x^{3u} W^e[:7u]\\
&+ x^{4u} W^e[:6u] + x^{8u} W^e[:2u] + x^{9u} W^e[:u] + x^{4u} W^e[:7u]\\
&+ x^{5u} W^e[:6u] + x^{9u} W^e[:2u] + x^{10u} W^e[:u] + x^{7u} W^e[:7u]\\
&+ x^{8u} W^e[:6u] + x^{13u} W^e[:u] + x^{9u} W^e[:5u]\\
&+ (x^{7u} + x^{8u} + x^{9u} + x^{10u} + x^{11u})R^e.
\end{aligned}
$$

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

$$
\begin{aligned}
M^o[:14u] &= M^o[:7u] + x^u M^o[:6u] + x^{5u} M^o[:2u] + x^{6u} M^o[:u] + x^u M^o[:7u]\\
&+ x^{2u} M^o[:6u] + x^{6u} M^o[:2u] + x^{7u} M^o[:u] + x^{2u} M^o[:7u]\\
&+ x^{3u} M^o[:6u] + x^{7u} M^o[:2u] + x^{8u} M^o[:u] + x^{3u} M^o[:7u]\\
&+ x^{4u} M^o[:6u] + x^{8u} M^o[:2u] + x^{9u} M^o[:u] + x^{4u} M^o[:7u]\\
&+ x^{5u} M^o[:6u] + x^{9u} M^o[:2u] + x^{10u} M^o[:u] + x^{7u} M^o[:7u]\\
&+ x^{8u} M^o[:6u] + x^{13u} M^o[:u] + x^{9u} M^o[:5u]\\
&+ (x^{7u} + x^{8u} + x^{9u} + x^{10u} + x^{11u})R^o,\\
W^o[:14u] &= W^o[:7u] + x^u W^o[:6u] + x^{5u} W^o[:2u] + x^{6u} W^o[:u] + x^u W^o[:7u]\\
&+ x^{2u} W^o[:6u] + x^{6u} W^o[:2u] + x^{7u} W^o[:u] + x^{2u} W^o[:7u]\\
&+ x^{3u} W^o[:6u] + x^{7u} W^o[:2u] + x^{8u} W^o[:u] + x^{3u} W^o[:7u]\\
&+ x^{4u} W^o[:6u] + x^{8u} W^o[:2u] + x^{9u} W^o[:u] + x^{4u} W^o[:7u]\\
&+ x^{5u} W^o[:6u] + x^{9u} W^o[:2u] + x^{10u} W^o[:u] + x^{7u} W^o[:7u]\\
&+ x^{8u} W^o[:6u] + x^{13u} W^o[:u] + x^{9u} W^o[:5u]\\
&+ (x^{7u} + x^{8u} + x^{9u} + x^{10u} + x^{11u})R^o.
\end{aligned}
$$

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

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

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

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

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

which can be rewritten as

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.7}$$

$$0 = T[[w]_2] + T[[11w]_2] + T[[110w]_2] + T[[1000w]_2], \tag{2.8}$$

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

$$\begin{aligned}0 &= T[[w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2]\\ &\quad + T[[1010w]_2],\end{aligned} \tag{2.10}$$

$$0 = T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.11}$$

$$0 = T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.12}$$

$$0 = T[[w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.13}$$

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

$$0 = T[[w]_2] + T[[1w]_2] + T[[10w]_2] + T[[110w]_2] + T[[111w]_2], \tag{2.14}$$

$$0 = T[[w]_2] + T[[11w]_2] + T[[110w]_2] + T[[1000w]_2], \tag{2.15}$$

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

$$\begin{aligned}0 &= T[[w]_2] + T[[10w]_2] + T[[11w]_2] + T[[101w]_2] + T[[110w]_2]\\ &\quad + T[[1010w]_2],\end{aligned} \tag{2.17}$$

$$0 = T[[10w]_2] + T[[11w]_2] + T[[100w]_2] + T[[1011w]_2], \tag{2.18}$$

$$0 = T[[11w]_2] + T[[100w]_2] + T[[101w]_2] + T[[1100w]_2], \tag{2.19}$$

$$0 = T[[w]_2] + T[[100w]_2] + T[[101w]_2] + T[[110w]_2] + T[[1101w]_2], \tag{2.20}$$

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

First we calculate an 2-automaton that generates T from its minimal polynomial and its first terms. This automaton has 3929 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

$$\begin{aligned}0 &= \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,110))\\ &\quad + \tau(A(s,111)),\end{aligned} \tag{2.21}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,11)) + \tau(A(s,110)) + \tau(A(s,1000)), \tag{2.22}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,100)) + \tau(A(s,110))$$

$$+\tau(A(s,1001)), \tag{2.23}$$

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101)) \\ &\quad + \tau(A(s,110)) + \tau(A(s,1010)), \end{aligned} \tag{2.24}$$

$$0 = \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,1011)), \tag{2.25}$$

$$0 = \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1100)), \tag{2.26}$$

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,1101)), \end{aligned} \tag{2.27}$$

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

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,1)) + \tau(A(s,10)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,111)), \end{aligned} \tag{2.28}$$

$$0 = \tau(A(s,\epsilon)) + \tau(A(s,11)) + \tau(A(s,110)) + \tau(A(s,1000)), \tag{2.29}$$

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

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,101)) \\ &\quad + \tau(A(s,110)) + \tau(A(s,1010)), \end{aligned} \tag{2.31}$$

$$0 = \tau(A(s,10)) + \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,1011)), \tag{2.32}$$

$$0 = \tau(A(s,11)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,1100)), \tag{2.33}$$

$$\begin{aligned} 0 &= \tau(A(s,\epsilon)) + \tau(A(s,100)) + \tau(A(s,101)) + \tau(A(s,110)) \\ &\quad + \tau(A(s,1101)), \end{aligned} \tag{2.34}$$

for $s = A(i, 0^{2k})$. We find that $(A(i, 0^{46}), E_{46}) = (A(i, 0^{22}), E_{22})$, so that we only have to verify that identities (2.21) through (2.34) hold for $2 \le k \le 23$, which turns out to be true. $\square$

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

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

$$\begin{aligned} M_{2k} &= M^e[:7u] + x^u M^e[:6u] + x^{5u} M^e[:2u] + x^{6u} M^e[:u] + x^{7u} R^e, \\ W_{2k} &= W^e[:7u] + x^u W^e[:6u] + x^{5u} W^e[:2u] + x^{6u} W^e[:u] + x^{7u} R^e. \end{aligned}$$

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

$$\begin{aligned} M_{2k+1} &= M^o[:7u] + x^u M^o[:6u] + x^{5u} M^o[:2u] + x^{6u} M^o[:u] + x^{7u} R^o, \\ W_{2k+1} &= W^o[:7u] + x^u W^o[:6u] + x^{5u} W^o[:2u] + x^{6u} W^o[:u] + x^{7u} R^o. \end{aligned}$$

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

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

We give the proof of

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

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

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

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

$$W^e[:14v]M^e[:14v] + x^{2v}W^e[:12v]M^e[:12v] + x^{10v}W^e[:4v]M^e[:4v] + x^{12v}W^e[:2v]M^e[:2v].$$

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

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

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

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

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

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

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

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

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

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

Define

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

where

$$\begin{aligned}
q_0(x) &= x^{22}+x^{17}+x^{16}+x^{15}+x^{14}+x^{13}+x^{12}+x^{10}+x^9+x^8+x^7,\\
q_1(x) &= x^{19}+x^{18}+x^{17}+x^{16}+x^{14}+x^{11}+x^{10}+x^8+x^7+x^3,\\
q_2(x) &= x^{20}+x^{18}+x^{16}+x^{10}+x^6+x^4+1,\\
q_3(x) &= x^{19}+x^{18}+x^{17}+x^{16}+x^{14}+x^{11}+x^{10}+x^8+x^7+x^3,\\
q_4(x) &= x^{22}+x^{18}+x^{17}+x^{16}+x^{15}+x^{14}+x^{13}+x^9+x^8+x^7+x^6.
\end{aligned}$$

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

$$\begin{aligned}
p_0(x) = {}& x^{114}+x^{112}+x^{108}+x^{104}+x^{96}+x^{94}+x^{92}+x^{88}+x^{86}+x^{84}+x^{78}\\
&+x^{76}+x^{74}+x^{70}+x^{64}+x^{62}+x^{54}+x^{52}+x^{50}+x^{44}+x^{40}+x^{38}\\
&+x^{36},\\
p_3(x) = {}& x^{104}+x^{100}+x^{98}+x^{94}+x^{88}+x^{84}+x^{82}+x^{80}+x^{78}+x^{72}+x^{70}\\
&+x^{66}+x^{60}+x^{58}+x^{56}+x^{52}+x^{50}+x^{48}+x^{46}+x^{42}+x^{40}+x^{34}\\
&+x^{32}+x^{28}+x^{26}+x^{24}+x^{22}+x^{20},\\
p_6(x) = {}& x^{106}+x^{102}+x^{92}+x^{90}+x^{86}+x^{78}+x^{74}+x^{68}+x^{62}+x^{60}+x^{56}\\
&+x^{54}+x^{50}+x^{48}+x^{38}+x^{36}+x^{34}+x^{32}+x^{28}+x^{26}+x^{18}+x^{16}\\
&+x^{14}+x^{12}+x^{10}+x^8+x^4+1,\\
p_9(x) = {}& x^{100}+x^{98}+x^{96}+x^{94}+x^{92}+x^{86}+x^{78}+x^{76}+x^{68}+x^{64}+x^{62}\\
&+x^{54}+x^{50}+x^{46}+x^{44}+x^{42}+x^{40}+x^{38}+x^{36}+x^{30}+x^{28}+x^{26}\\
&+x^{24}+x^{14}+x^{10}+x^6,\\
p_{12}(x) = {}& x^{102}+x^{100}+x^{96}+x^{94}+x^{92}+x^{88}+x^{78}+x^{76}+x^{72}+x^{62}+x^{60}\\
&+x^{56}+x^{54}+x^{52}+x^{48}+x^{38}+x^{36}+x^{32}+x^{30}+x^{28}+x^{24}+x^{14}\\
&+x^{12}+x^8+x^6+x^4+1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{112} + x^{107} + x^{106} + x^{105} + x^{104} + x^{102} + x^{100} + x^{99} + x^{98}\\
&\quad + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87} + x^{85} + x^{84} + x^{82} + x^{81}\\
&\quad + x^{78} + x^{76} + x^{75} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{60} + x^{59} + x^{56}\\
&\quad + x^{55} + x^{54} + x^{52} + x^{48} + x^{47} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39},\\
p_3(x) &= x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{86} + x^{85} + x^{82} + x^{81} + x^{80}\\
&\quad + x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{67} + x^{64} + x^{63}\\
&\quad + x^{60} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50}\\
&\quad + x^{49} + x^{46} + x^{45} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32} + x^{31} + x^{28} + x^{27},\\
p_6(x) &= x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{84} + x^{83} + x^{81} + x^{80}\\
&\quad + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{64} + x^{63} + x^{61}\\
&\quad + x^{60} + x^{59} + x^{58} + x^{53} + x^{51} + x^{48} + x^{47} + x^{46} + x^{44} + x^{41} + x^{40}\\
&\quad + x^{33} + x^{29} + x^{28} + x^{27} + x^{22} + x^{19} + x^{18},\\
p_9(x) &= x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90}\\
&\quad + x^{89} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{72} + x^{71} + x^{70} + x^{69}\\
&\quad + x^{60} + x^{59} + x^{58} + x^{57} + x^{50} + x^{49} + x^{48} + x^{47} + x^{44} + x^{43} + x^{40}\\
&\quad + x^{39} + x^{38} + x^{37} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{16} + x^{15}\\
&\quad + x^{14} + x^{13} + x^{10} + x^{9},\\
p_{12}(x) &= x^{105} + x^{101} + x^{100} + x^{85} + x^{81} + x^{80} + x^{69} + x^{65} + x^{64} + x^{57} + x^{52}\\
&\quad + x^{49} + x^{48} + x^{41} + x^{37} + x^{36} + x^{21} + x^{17} + x^{16} + x^{9} + x^{4} + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{112} + x^{107} + x^{106} + x^{105} + x^{104} + x^{102} + x^{100} + x^{99} + x^{98}\\
&\quad + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{87} + x^{85} + x^{84} + x^{82} + x^{81}\\
&\quad + x^{78} + x^{76} + x^{75} + x^{71} + x^{70} + x^{69} + x^{67} + x^{63} + x^{60} + x^{59} + x^{56}\\
&\quad + x^{55} + x^{54} + x^{52} + x^{48} + x^{47} + x^{44} + x^{43} + x^{42} + x^{41} + x^{40} + x^{39},\\
p_3(x) &= x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{86} + x^{85} + x^{82} + x^{81} + x^{80}\\
&\quad + x^{79} + x^{76} + x^{75} + x^{72} + x^{71} + x^{70} + x^{69} + x^{68} + x^{67} + x^{64} + x^{63}\\
&\quad + x^{60} + x^{59} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{53} + x^{52} + x^{51} + x^{50}\\
&\quad + x^{49} + x^{46} + x^{45} + x^{38} + x^{37} + x^{34} + x^{33} + x^{32} + x^{31} + x^{28} + x^{27},\\
p_6(x) &= x^{99} + x^{97} + x^{95} + x^{94} + x^{93} + x^{92} + x^{89} + x^{84} + x^{83} + x^{81} + x^{80}\\
&\quad + x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{64} + x^{63} + x^{61}\\
&\quad + x^{60} + x^{59} + x^{58} + x^{53} + x^{51} + x^{48} + x^{47} + x^{46} + x^{44} + x^{41} + x^{40}\\
&\quad + x^{33} + x^{29} + x^{28} + x^{27} + x^{22} + x^{19} + x^{18},\\
p_9(x) &= x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{89} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{72} + x^{71} + x^{70} + x^{69} \\
&+ x^{60} + x^{59} + x^{58} + x^{57} + x^{50} + x^{49} + x^{48} + x^{47} + x^{44} + x^{43} + x^{40} \\
&+ x^{39} + x^{38} + x^{37} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{16} + x^{15} \\
&+ x^{14} + x^{13} + x^{10} + x^{9}, \\
p_{12}(x) = {}& x^{105} + x^{101} + x^{100} + x^{85} + x^{81} + x^{80} + x^{69} + x^{65} + x^{64} + x^{57} + x^{52} \\
&+ x^{49} + x^{48} + x^{41} + x^{37} + x^{36} + x^{21} + x^{17} + x^{16} + x^{9} + x^{4} + x + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) = {}& x^{120} + x^{118} + x^{116} + x^{112} + x^{108} + x^{106} + x^{104} + x^{94} + x^{88} + x^{86} \\
&+ x^{84} + x^{80} + x^{74} + x^{62} + x^{56} + x^{52} + x^{50} + x^{48} + x^{42}, \\
p_3(x) = {}& x^{110} + x^{104} + x^{100} + x^{98} + x^{94} + x^{90} + x^{88} + x^{86} + x^{80} + x^{78} + x^{74} \\
&+ x^{70} + x^{68} + x^{66} + x^{62} + x^{58} + x^{56} + x^{54} + x^{50} + x^{44} + x^{34} + x^{32} \\
&+ x^{30} + x^{28} + x^{22} + x^{18}, \\
p_6(x) = {}& x^{112} + x^{102} + x^{98} + x^{90} + x^{88} + x^{80} + x^{78} + x^{76} + x^{74} + x^{72} + x^{70} \\
&+ x^{64} + x^{62} + x^{60} + x^{58} + x^{56} + x^{52} + x^{50} + x^{40} + x^{38} + x^{34} + x^{32} \\
&+ x^{28} + x^{26} + x^{24} + x^{22} + x^{16} + x^{14} + x^{10} + x^{8} + x^{6} + x^{4} + x^{2} + 1, \\
p_9(x) = {}& x^{106} + x^{104} + x^{94} + x^{86} + x^{84} + x^{80} + x^{76} + x^{74} + x^{72} + x^{70} + x^{66} \\
&+ x^{64} + x^{58} + x^{56} + x^{54} + x^{50} + x^{48} + x^{44} + x^{42} + x^{34} + x^{30} + x^{26} \\
&+ x^{18} + x^{14} + x^{12} + x^{10} + x^{8} + x^{6}, \\
p_{12}(x) = {}& x^{108} + x^{106} + x^{104} + x^{100} + x^{98} + x^{96} + x^{92} + x^{90} + x^{88} + x^{76} + x^{74} \\
&+ x^{72} + x^{52} + x^{50} + x^{48} + x^{44} + x^{42} + x^{40} + x^{36} + x^{34} + x^{32} + x^{28} \\
&+ x^{26} + x^{24} + x^{4} + x^{2} + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) = {}& x^{120} + x^{118} + x^{116} + x^{110} + x^{108} + x^{100} + x^{98} + x^{96} + x^{90} + x^{76} \\
&+ x^{72} + x^{66} + x^{60} + x^{56} + x^{54} + x^{52} + x^{50} + x^{48} + x^{44} + x^{42} + x^{36}, \\
p_3(x) = {}& x^{110} + x^{104} + x^{102} + x^{100} + x^{96} + x^{88} + x^{84} + x^{82} + x^{80} + x^{78} + x^{74} \\
&+ x^{70} + x^{68} + x^{66} + x^{54} + x^{50} + x^{48} + x^{46} + x^{42} + x^{40} + x^{38} + x^{36} \\
&+ x^{30} + x^{20}, \\
p_6(x) = {}& x^{112} + x^{104} + x^{102} + x^{98} + x^{94} + x^{82} + x^{74} + x^{72} + x^{70} + x^{62} + x^{60} \\
&+ x^{58} + x^{54} + x^{52} + x^{46} + x^{38} + x^{36} + x^{34} + x^{32} + x^{26} + x^{24} + x^{20} \\
&+ x^{18} + x^{12} + x^{10} + x^{8} + x^{6} + x^{4} + x^{2} + 1, \\
p_9(x) = {}& x^{106} + x^{104} + x^{94} + x^{86} + x^{84} + x^{80} + x^{76} + x^{74} + x^{72} + x^{70} + x^{66} \\
&+ x^{64} + x^{58} + x^{56} + x^{54} + x^{50} + x^{48} + x^{44} + x^{42} + x^{34} + x^{30} + x^{26} \\
&+ x^{18} + x^{14} + x^{12} + x^{10} + x^{8} + x^{6},
\end{aligned}
$$

$$\begin{aligned} p_{12}(x) &= x^{108}+x^{106}+x^{104}+x^{100}+x^{98}+x^{96}+x^{92}+x^{90}+x^{88}+x^{76}+x^{74} \\ &\quad +x^{72}+x^{52}+x^{50}+x^{48}+x^{44}+x^{42}+x^{40}+x^{36}+x^{34}+x^{32}+x^{28} \\ &\quad +x^{26}+x^{24}+x^{4}+x^{2}+1, \end{aligned}$$

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

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

$$\begin{aligned} p_0(x) &= x^{117}+x^{112}+x^{106}+x^{104}+x^{96}+x^{94}+x^{92}+x^{90}+x^{78}+x^{77}+x^{75} \\ &\quad +x^{74}+x^{71}+x^{70}+x^{68}+x^{67}+x^{66}+x^{65}+x^{63}+x^{62}+x^{61}+x^{58} \\ &\quad +x^{57}+x^{56}+x^{55}+x^{51}+x^{50}+x^{48}+x^{47}+x^{45}+x^{43}+x^{42}+x^{41} \\ &\quad +x^{40}+x^{39}, \\ p_3(x) &= x^{96}+x^{95}+x^{94}+x^{93}+x^{92}+x^{91}+x^{86}+x^{85}+x^{82}+x^{81}+x^{80} \\ &\quad +x^{79}+x^{76}+x^{75}+x^{72}+x^{71}+x^{70}+x^{69}+x^{68}+x^{67}+x^{64}+x^{63} \\ &\quad +x^{60}+x^{59}+x^{58}+x^{57}+x^{56}+x^{55}+x^{54}+x^{53}+x^{52}+x^{51}+x^{50} \\ &\quad +x^{49}+x^{46}+x^{45}+x^{38}+x^{37}+x^{34}+x^{33}+x^{32}+x^{31}+x^{28}+x^{27}, \\ p_6(x) &= x^{99}+x^{97}+x^{95}+x^{94}+x^{93}+x^{92}+x^{89}+x^{84}+x^{83}+x^{81}+x^{80} \\ &\quad +x^{78}+x^{77}+x^{74}+x^{73}+x^{72}+x^{71}+x^{70}+x^{69}+x^{64}+x^{63}+x^{61} \\ &\quad +x^{60}+x^{59}+x^{58}+x^{53}+x^{51}+x^{48}+x^{47}+x^{46}+x^{44}+x^{41}+x^{40} \\ &\quad +x^{33}+x^{29}+x^{28}+x^{27}+x^{22}+x^{19}+x^{18}, \\ p_9(x) &= x^{102}+x^{101}+x^{98}+x^{97}+x^{96}+x^{95}+x^{94}+x^{93}+x^{92}+x^{91}+x^{90} \\ &\quad +x^{89}+x^{86}+x^{85}+x^{84}+x^{83}+x^{82}+x^{81}+x^{72}+x^{71}+x^{70}+x^{69} \\ &\quad +x^{60}+x^{59}+x^{58}+x^{57}+x^{50}+x^{49}+x^{48}+x^{47}+x^{44}+x^{43}+x^{40} \\ &\quad +x^{39}+x^{38}+x^{37}+x^{32}+x^{31}+x^{30}+x^{29}+x^{28}+x^{27}+x^{16}+x^{15} \\ &\quad +x^{14}+x^{13}+x^{10}+x^{9}, \\ p_{12}(x) &= x^{105}+x^{101}+x^{100}+x^{85}+x^{81}+x^{80}+x^{69}+x^{65}+x^{64}+x^{57}+x^{52} \\ &\quad +x^{49}+x^{48}+x^{41}+x^{37}+x^{36}+x^{21}+x^{17}+x^{16}+x^{9}+x^{4}+x+1, \end{aligned}$$

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

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

$$\begin{aligned} p_0(x) &= x^{117}+x^{112}+x^{106}+x^{104}+x^{96}+x^{94}+x^{92}+x^{90}+x^{78}+x^{77}+x^{75} \\ &\quad +x^{74}+x^{71}+x^{70}+x^{68}+x^{67}+x^{66}+x^{65}+x^{63}+x^{62}+x^{61}+x^{58} \\ &\quad +x^{57}+x^{56}+x^{55}+x^{51}+x^{50}+x^{48}+x^{47}+x^{45}+x^{43}+x^{42}+x^{41} \\ &\quad +x^{40}+x^{39}, \\ p_3(x) &= x^{96}+x^{95}+x^{94}+x^{93}+x^{92}+x^{91}+x^{86}+x^{85}+x^{82}+x^{81}+x^{80} \\ &\quad +x^{79}+x^{76}+x^{75}+x^{72}+x^{71}+x^{70}+x^{69}+x^{68}+x^{67}+x^{64}+x^{63} \\ &\quad +x^{60}+x^{59}+x^{58}+x^{57}+x^{56}+x^{55}+x^{54}+x^{53}+x^{52}+x^{51}+x^{50} \\ &\quad +x^{49}+x^{46}+x^{45}+x^{38}+x^{37}+x^{34}+x^{33}+x^{32}+x^{31}+x^{28}+x^{27}, \\ p_6(x) &= x^{99}+x^{97}+x^{95}+x^{94}+x^{93}+x^{92}+x^{89}+x^{84}+x^{83}+x^{81}+x^{80} \end{aligned}$$

$$
\begin{aligned}
&+ x^{78} + x^{77} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{69} + x^{64} + x^{63} + x^{61}\\
&+ x^{60} + x^{59} + x^{58} + x^{53} + x^{51} + x^{48} + x^{47} + x^{46} + x^{44} + x^{41} + x^{40}\\
&+ x^{33} + x^{29} + x^{28} + x^{27} + x^{22} + x^{19} + x^{18},\\
p_9(x) &= x^{102} + x^{101} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94} + x^{93} + x^{92} + x^{91} + x^{90}\\
&+ x^{89} + x^{86} + x^{85} + x^{84} + x^{83} + x^{82} + x^{81} + x^{72} + x^{71} + x^{70} + x^{69}\\
&+ x^{60} + x^{59} + x^{58} + x^{57} + x^{50} + x^{49} + x^{48} + x^{47} + x^{44} + x^{43} + x^{40}\\
&+ x^{39} + x^{38} + x^{37} + x^{32} + x^{31} + x^{30} + x^{29} + x^{28} + x^{27} + x^{16} + x^{15}\\
&+ x^{14} + x^{13} + x^{10} + x^{9},\\
p_{12}(x) &= x^{105} + x^{101} + x^{100} + x^{85} + x^{81} + x^{80} + x^{69} + x^{65} + x^{64} + x^{57} + x^{52}\\
&+ x^{49} + x^{48} + x^{41} + x^{37} + x^{36} + x^{21} + x^{17} + x^{16} + x^{9} + x^{4} + x + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{114} + x^{112} + x^{108} + x^{106} + x^{102} + x^{90} + x^{86} + x^{78} + x^{76} + x^{74} + x^{70}\\
&+ x^{68} + x^{66} + x^{60} + x^{58} + x^{56} + x^{54} + x^{50} + x^{46} + x^{44} + x^{42},\\
p_3(x) &= x^{104} + x^{100} + x^{98} + x^{96} + x^{94} + x^{90} + x^{80} + x^{70} + x^{68} + x^{64} + x^{62}\\
&+ x^{60} + x^{56} + x^{52} + x^{50} + x^{48} + x^{46} + x^{42} + x^{20} + x^{18},\\
p_6(x) &= x^{106} + x^{102} + x^{98} + x^{94} + x^{92} + x^{86} + x^{84} + x^{82} + x^{78} + x^{76} + x^{72}\\
&+ x^{68} + x^{54} + x^{52} + x^{50} + x^{48} + x^{42} + x^{36} + x^{32} + x^{26} + x^{22} + x^{20}\\
&+ x^{18} + x^{14} + x^{10} + x^{8} + x^{4} + 1,\\
p_9(x) &= x^{100} + x^{98} + x^{96} + x^{94} + x^{92} + x^{86} + x^{78} + x^{76} + x^{68} + x^{64} + x^{62}\\
&+ x^{54} + x^{50} + x^{46} + x^{44} + x^{42} + x^{40} + x^{38} + x^{36} + x^{30} + x^{28} + x^{26}\\
&+ x^{24} + x^{14} + x^{10} + x^{6},\\
p_{12}(x) &= x^{102} + x^{100} + x^{96} + x^{94} + x^{92} + x^{88} + x^{78} + x^{76} + x^{72} + x^{62} + x^{60}\\
&+ x^{56} + x^{54} + x^{52} + x^{48} + x^{38} + x^{36} + x^{32} + x^{30} + x^{28} + x^{24} + x^{14}\\
&+ x^{12} + x^{8} + x^{6} + x^{4} + 1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{117} + x^{113} + x^{112} + x^{111} + x^{109} + x^{100} + x^{99} + x^{98} + x^{95} + x^{94}\\
&+ x^{93} + x^{92} + x^{90} + x^{89} + x^{85} + x^{84} + x^{80} + x^{79} + x^{78} + x^{76} + x^{75}\\
&+ x^{74} + x^{70} + x^{69} + x^{68} + x^{67} + x^{64} + x^{60} + x^{56} + x^{53} + x^{50} + x^{49}\\
&+ x^{48} + x^{47} + x^{46} + x^{44} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36},\\
p_3(x) &= x^{105} + x^{100} + x^{99} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{91} + x^{89} + x^{87}\\
&+ x^{86} + x^{85} + x^{83} + x^{81} + x^{79} + x^{77} + x^{76} + x^{73} + x^{71} + x^{70} + x^{69}\\
&+ x^{66} + x^{64} + x^{60} + x^{58} + x^{52} + x^{51} + x^{50} + x^{44} + x^{40} + x^{39} + x^{37}\\
&+ x^{35} + x^{34} + x^{31} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24},
\end{aligned}
$$

$$
\begin{aligned}
p_6(x) = {} & x^{109} + x^{105} + x^{104} + x^{103} + x^{101} + x^{99} + x^{91} + x^{90} + x^{87} + x^{85} + x^{82} \\
& + x^{78} + x^{76} + x^{74} + x^{73} + x^{71} + x^{68} + x^{65} + x^{64} + x^{63} + x^{60} + x^{57} \\
& + x^{56} + x^{53} + x^{51} + x^{45} + x^{43} + x^{42} + x^{41} + x^{40} + x^{38} + x^{33} + x^{31} \\
& + x^{30} + x^{29} + x^{28} + x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{19} + x^{18} + x^{16} \\
& + x^{15} + x^{14} + x^{13} + x^{12} + x^{9} + x^{4} + x + 1, \\
p_9(x) = {} & x^{101} + x^{96} + x^{93} + x^{92} + x^{85} + x^{80} + x^{77} + x^{76} + x^{69} + x^{64} + x^{61} \\
& + x^{60} + x^{37} + x^{32} + x^{29} + x^{28} + x^{21} + x^{16} + x^{13} + x^{12}, \\
p_{12}(x) = {} & x^{105} + x^{100} + x^{96} + x^{93} + x^{92} + x^{81} + x^{77} + x^{76} + x^{65} + x^{61} + x^{60} \\
& + x^{57} + x^{52} + x^{49} + x^{48} + x^{41} + x^{36} + x^{32} + x^{29} + x^{28} + x^{17} + x^{13} \\
& + x^{12} + x^{9} + x^{4} + x + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) = {} & x^{124} + x^{118} + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{107} + x^{106} + x^{102} \\
& + x^{101} + x^{100} + x^{99} + x^{97} + x^{96} + x^{95} + x^{93} + x^{90} + x^{88} + x^{85} + x^{82} \\
& + x^{81} + x^{80} + x^{77} + x^{74} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{63} + x^{61} \\
& + x^{59} + x^{57} + x^{54} + x^{53} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{39}, \\
p_3(x) = {} & x^{103} + x^{102} + x^{98} + x^{97} + x^{94} + x^{92} + x^{91} + x^{89} + x^{88} + x^{87} + x^{85} \\
& + x^{82} + x^{81} + x^{80} + x^{78} + x^{75} + x^{74} + x^{73} + x^{71} + x^{68} + x^{67} + x^{66} \\
& + x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{51} \\
& + x^{48} + x^{47} + x^{46} + x^{44} + x^{41} + x^{40} + x^{39} + x^{37} + x^{34} + x^{33} + x^{32} \\
& + x^{31} + x^{27}, \\
p_6(x) = {} & x^{106} + x^{104} + x^{102} + x^{100} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{76} + x^{74} \\
& + x^{72} + x^{68} + x^{66} + x^{64} + x^{54} + x^{46} + x^{44} + x^{36} + x^{34} + x^{28} + x^{26} \\
& + x^{22} + x^{18}, \\
p_9(x) = {} & x^{109} + x^{108} + x^{107} + x^{106} + x^{104} + x^{103} + x^{102} + x^{96} + x^{95} + x^{94} \\
& + x^{92} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{80} + x^{79} + x^{78} + x^{76} \\
& + x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{64} + x^{63} + x^{62} + x^{61} + x^{57} \\
& + x^{45} + x^{44} + x^{43} + x^{42} + x^{40} + x^{39} + x^{38} + x^{32} + x^{31} + x^{30} + x^{28} \\
& + x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{22} + x^{16} + x^{15} + x^{14} + x^{13} + x^{9}, \\
p_{12}(x) = {} & x^{112} + x^{96} + x^{92} + x^{88} + x^{84} + x^{76} + x^{72} + x^{68} + x^{64} + x^{60} + x^{56} \\
& + x^{52} + x^{32} + x^{28} + x^{24} + x^{20} + x^{16} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) = {} & x^{120} + x^{114} + x^{112} + x^{111} + x^{107} + x^{106} + x^{105} + x^{99} + x^{94} + x^{93} \\
& + x^{91} + x^{85} + x^{81} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{71} + x^{70} + x^{68}
\end{aligned}
$$

$$
\begin{aligned}
&+x^{67}+x^{66}+x^{58}+x^{57}+x^{56}+x^{55}+x^{54}+x^{52}+x^{50}+x^{49}+x^{46}\\
&+x^{45}+x^{41}+x^{39},\\
p_3(x) &= x^{99}+x^{98}+x^{94}+x^{93}+x^{91}+x^{88}+x^{87}+x^{86}+x^{84}+x^{83}+x^{82}\\
&+x^{81}+x^{80}+x^{74}+x^{70}+x^{69}+x^{66}+x^{64}+x^{63}+x^{61}+x^{60}+x^{58}\\
&+x^{57}+x^{55}+x^{54}+x^{52}+x^{51}+x^{49}+x^{48}+x^{46}+x^{45}+x^{40}+x^{39}\\
&+x^{38}+x^{36}+x^{35}+x^{34}+x^{33}+x^{32}+x^{27},\\
p_6(x) &= x^{102}+x^{100}+x^{98}+x^{96}+x^{94}+x^{86}+x^{78}+x^{76}+x^{70}+x^{66}+x^{62}\\
&+x^{60}+x^{58}+x^{56}+x^{54}+x^{50}+x^{48}+x^{46}+x^{40}+x^{36}+x^{32}+x^{30}\\
&+x^{28}+x^{18},\\
p_9(x) &= x^{105}+x^{104}+x^{103}+x^{102}+x^{100}+x^{99}+x^{98}+x^{97}+x^{96}+x^{95}+x^{94}\\
&+x^{88}+x^{87}+x^{86}+x^{84}+x^{83}+x^{82}+x^{81}+x^{80}+x^{79}+x^{78}+x^{72}\\
&+x^{71}+x^{70}+x^{68}+x^{67}+x^{66}+x^{65}+x^{64}+x^{63}+x^{62}+x^{57}+x^{41}\\
&+x^{40}+x^{39}+x^{38}+x^{36}+x^{35}+x^{34}+x^{33}+x^{32}+x^{31}+x^{30}+x^{24}\\
&+x^{23}+x^{22}+x^{20}+x^{19}+x^{18}+x^{17}+x^{16}+x^{15}+x^{14}+x^{9},\\
p_{12}(x) &= x^{108}+x^{100}+x^{92}+x^{84}+x^{80}+x^{76}+x^{68}+x^{64}+x^{48}+x^{44}+x^{36}\\
&+x^{28}+x^{20}+x^{16}+1,
\end{aligned}
$$

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

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

$$
\begin{aligned}
p_0(x) &= x^{117}+x^{113}+x^{112}+x^{111}+x^{107}+x^{105}+x^{104}+x^{102}+x^{100}+x^{99}\\
&+x^{92}+x^{91}+x^{87}+x^{86}+x^{85}+x^{82}+x^{77}+x^{75}+x^{73}+x^{70}+x^{69}\\
&+x^{68}+x^{64}+x^{62}+x^{61}+x^{60}+x^{54}+x^{53}+x^{52}+x^{50}+x^{48}+x^{47}\\
&+x^{46}+x^{45}+x^{44}+x^{43}+x^{42},\\
p_3(x) &= x^{105}+x^{100}+x^{99}+x^{96}+x^{93}+x^{90}+x^{88}+x^{86}+x^{85}+x^{83}+x^{82}\\
&+x^{78}+x^{77}+x^{73}+x^{72}+x^{70}+x^{69}+x^{68}+x^{67}+x^{59}+x^{58}+x^{56}\\
&+x^{54}+x^{51}+x^{49}+x^{48}+x^{46}+x^{44}+x^{43}+x^{42}+x^{40}+x^{37}+x^{35}\\
&+x^{33}+x^{29}+x^{28}+x^{27}+x^{26},\\
p_6(x) &= x^{109}+x^{105}+x^{104}+x^{103}+x^{96}+x^{95}+x^{94}+x^{92}+x^{91}+x^{90}+x^{89}\\
&+x^{88}+x^{87}+x^{85}+x^{83}+x^{82}+x^{76}+x^{70}+x^{61}+x^{60}+x^{59}+x^{58}\\
&+x^{53}+x^{49}+x^{47}+x^{46}+x^{45}+x^{44}+x^{43}+x^{42}+x^{41}+x^{38}+x^{36}\\
&+x^{33}+x^{32}+x^{31}+x^{30}+x^{29}+x^{27}+x^{26}+x^{25}+x^{23}+x^{15}+x^{14}\\
&+x^{9}+x^{4}+x+1,\\
p_9(x) &= x^{101}+x^{96}+x^{93}+x^{92}+x^{85}+x^{80}+x^{77}+x^{76}+x^{69}+x^{64}+x^{61}\\
&+x^{60}+x^{37}+x^{32}+x^{29}+x^{28}+x^{21}+x^{16}+x^{13}+x^{12},\\
p_{12}(x) &= x^{105}+x^{100}+x^{96}+x^{93}+x^{92}+x^{81}+x^{77}+x^{76}+x^{65}+x^{61}+x^{60}\\
&+x^{57}+x^{52}+x^{49}+x^{48}+x^{41}+x^{36}+x^{32}+x^{29}+x^{28}+x^{17}+x^{13}
\end{aligned}
$$

$$+ x^{12} + x^9 + x^4 + x + 1,$$

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

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

$$\begin{aligned}
p_0(x) &= x^{117} + x^{113} + x^{112} + x^{111} + x^{109} + x^{100} + x^{99} + x^{98} + x^{95} + x^{94} \\
&\quad + x^{93} + x^{92} + x^{90} + x^{89} + x^{85} + x^{84} + x^{80} + x^{79} + x^{78} + x^{76} + x^{75} \\
&\quad + x^{74} + x^{70} + x^{69} + x^{68} + x^{67} + x^{64} + x^{60} + x^{56} + x^{53} + x^{50} + x^{49} \\
&\quad + x^{48} + x^{47} + x^{46} + x^{44} + x^{40} + x^{39} + x^{38} + x^{37} + x^{36}, \\
p_3(x) &= x^{105} + x^{100} + x^{99} + x^{97} + x^{96} + x^{95} + x^{93} + x^{92} + x^{91} + x^{89} + x^{87} \\
&\quad + x^{86} + x^{85} + x^{83} + x^{81} + x^{79} + x^{77} + x^{76} + x^{73} + x^{71} + x^{70} + x^{69} \\
&\quad + x^{66} + x^{64} + x^{60} + x^{58} + x^{52} + x^{51} + x^{50} + x^{44} + x^{40} + x^{39} + x^{37} \\
&\quad + x^{35} + x^{34} + x^{31} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{24}, \\
p_6(x) &= x^{109} + x^{105} + x^{104} + x^{103} + x^{101} + x^{99} + x^{91} + x^{90} + x^{87} + x^{85} + x^{82} \\
&\quad + x^{78} + x^{76} + x^{74} + x^{73} + x^{71} + x^{68} + x^{65} + x^{64} + x^{63} + x^{60} + x^{57} \\
&\quad + x^{56} + x^{53} + x^{51} + x^{45} + x^{43} + x^{42} + x^{41} + x^{40} + x^{38} + x^{33} + x^{31} \\
&\quad + x^{30} + x^{29} + x^{28} + x^{26} + x^{24} + x^{23} + x^{22} + x^{21} + x^{19} + x^{18} + x^{16} \\
&\quad + x^{15} + x^{14} + x^{13} + x^{12} + x^9 + x^4 + x + 1, \\
p_9(x) &= x^{101} + x^{96} + x^{93} + x^{92} + x^{85} + x^{80} + x^{77} + x^{76} + x^{69} + x^{64} + x^{61} \\
&\quad + x^{60} + x^{37} + x^{32} + x^{29} + x^{28} + x^{21} + x^{16} + x^{13} + x^{12}, \\
p_{12}(x) &= x^{105} + x^{100} + x^{96} + x^{93} + x^{92} + x^{81} + x^{77} + x^{76} + x^{65} + x^{61} + x^{60} \\
&\quad + x^{57} + x^{52} + x^{49} + x^{48} + x^{41} + x^{36} + x^{32} + x^{29} + x^{28} + x^{17} + x^{13} \\
&\quad + x^{12} + x^9 + x^4 + x + 1,
\end{aligned}$$

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

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

$$\begin{aligned}
p_0(x) &= x^{120} + x^{114} + x^{112} + x^{111} + x^{107} + x^{106} + x^{105} + x^{99} + x^{94} + x^{93} \\
&\quad + x^{91} + x^{85} + x^{81} + x^{79} + x^{78} + x^{77} + x^{74} + x^{72} + x^{71} + x^{70} + x^{68} \\
&\quad + x^{67} + x^{66} + x^{58} + x^{57} + x^{56} + x^{55} + x^{54} + x^{52} + x^{50} + x^{49} + x^{46} \\
&\quad + x^{45} + x^{41} + x^{39}, \\
p_3(x) &= x^{99} + x^{98} + x^{94} + x^{93} + x^{91} + x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} \\
&\quad + x^{81} + x^{80} + x^{74} + x^{70} + x^{69} + x^{66} + x^{64} + x^{63} + x^{61} + x^{60} + x^{58} \\
&\quad + x^{57} + x^{55} + x^{54} + x^{52} + x^{51} + x^{49} + x^{48} + x^{46} + x^{45} + x^{40} + x^{39} \\
&\quad + x^{38} + x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{27}, \\
p_6(x) &= x^{102} + x^{100} + x^{98} + x^{96} + x^{94} + x^{86} + x^{78} + x^{76} + x^{70} + x^{66} + x^{62} \\
&\quad + x^{60} + x^{58} + x^{56} + x^{54} + x^{50} + x^{48} + x^{46} + x^{40} + x^{36} + x^{32} + x^{30} \\
&\quad + x^{28} + x^{18}, \\
p_9(x) &= x^{105} + x^{104} + x^{103} + x^{102} + x^{100} + x^{99} + x^{98} + x^{97} + x^{96} + x^{95} + x^{94}
\end{aligned}$$

$$
\begin{aligned}
&+ x^{88} + x^{87} + x^{86} + x^{84} + x^{83} + x^{82} + x^{81} + x^{80} + x^{79} + x^{78} + x^{72} \\
&+ x^{71} + x^{70} + x^{68} + x^{67} + x^{66} + x^{65} + x^{64} + x^{63} + x^{62} + x^{57} + x^{41} \\
&+ x^{40} + x^{39} + x^{38} + x^{36} + x^{35} + x^{34} + x^{33} + x^{32} + x^{31} + x^{30} + x^{24} \\
&+ x^{23} + x^{22} + x^{20} + x^{19} + x^{18} + x^{17} + x^{16} + x^{15} + x^{14} + x^{9}, \\
p_{12}(x) &= x^{108} + x^{100} + x^{92} + x^{84} + x^{80} + x^{76} + x^{68} + x^{64} + x^{48} + x^{44} + x^{36} \\
&+ x^{28} + x^{20} + x^{16} + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) &= x^{124} + x^{118} + x^{115} + x^{114} + x^{111} + x^{109} + x^{108} + x^{107} + x^{106} + x^{102} \\
&+ x^{101} + x^{100} + x^{99} + x^{97} + x^{96} + x^{95} + x^{93} + x^{90} + x^{88} + x^{85} + x^{82} \\
&+ x^{81} + x^{80} + x^{77} + x^{74} + x^{73} + x^{69} + x^{68} + x^{67} + x^{66} + x^{63} + x^{61} \\
&+ x^{59} + x^{57} + x^{54} + x^{53} + x^{50} + x^{47} + x^{46} + x^{44} + x^{43} + x^{41} + x^{39}, \\
p_3(x) &= x^{103} + x^{102} + x^{98} + x^{97} + x^{94} + x^{92} + x^{91} + x^{89} + x^{88} + x^{87} + x^{85} \\
&+ x^{82} + x^{81} + x^{80} + x^{78} + x^{75} + x^{74} + x^{73} + x^{71} + x^{68} + x^{67} + x^{66} \\
&+ x^{64} + x^{63} + x^{62} + x^{61} + x^{60} + x^{59} + x^{58} + x^{55} + x^{54} + x^{53} + x^{51} \\
&+ x^{48} + x^{47} + x^{46} + x^{44} + x^{41} + x^{40} + x^{39} + x^{37} + x^{34} + x^{33} + x^{32} \\
&+ x^{31} + x^{27}, \\
p_6(x) &= x^{106} + x^{104} + x^{102} + x^{100} + x^{96} + x^{94} + x^{92} + x^{90} + x^{88} + x^{76} + x^{74} \\
&+ x^{72} + x^{68} + x^{66} + x^{64} + x^{54} + x^{46} + x^{44} + x^{36} + x^{34} + x^{28} + x^{26} \\
&+ x^{22} + x^{18}, \\
p_9(x) &= x^{109} + x^{108} + x^{107} + x^{106} + x^{104} + x^{103} + x^{102} + x^{96} + x^{95} + x^{94} \\
&+ x^{92} + x^{91} + x^{90} + x^{89} + x^{88} + x^{87} + x^{86} + x^{80} + x^{79} + x^{78} + x^{76} \\
&+ x^{75} + x^{74} + x^{73} + x^{72} + x^{71} + x^{70} + x^{64} + x^{63} + x^{62} + x^{61} + x^{57} \\
&+ x^{45} + x^{44} + x^{43} + x^{42} + x^{40} + x^{39} + x^{38} + x^{32} + x^{31} + x^{30} + x^{28} \\
&+ x^{27} + x^{26} + x^{25} + x^{24} + x^{23} + x^{22} + x^{16} + x^{15} + x^{14} + x^{13} + x^{9}, \\
p_{12}(x) &= x^{112} + x^{96} + x^{92} + x^{88} + x^{84} + x^{76} + x^{72} + x^{68} + x^{64} + x^{60} + x^{56} \\
&+ x^{52} + x^{32} + x^{28} + x^{24} + x^{20} + x^{16} + x^{12} + x^{8} + x^{4} + 1,
\end{aligned}
$$

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

$$
\begin{aligned}
p_0(x) &= x^{117} + x^{113} + x^{112} + x^{111} + x^{107} + x^{105} + x^{104} + x^{102} + x^{100} + x^{99} \\
&+ x^{92} + x^{91} + x^{87} + x^{86} + x^{85} + x^{82} + x^{77} + x^{75} + x^{73} + x^{70} + x^{69} \\
&+ x^{68} + x^{64} + x^{62} + x^{61} + x^{60} + x^{54} + x^{53} + x^{52} + x^{50} + x^{48} + x^{47} \\
&+ x^{46} + x^{45} + x^{44} + x^{43} + x^{42}, \\
p_3(x) &= x^{105} + x^{100} + x^{99} + x^{96} + x^{93} + x^{90} + x^{88} + x^{86} + x^{85} + x^{83} + x^{82} \\
&+ x^{78} + x^{77} + x^{73} + x^{72} + x^{70} + x^{69} + x^{68} + x^{67} + x^{59} + x^{58} + x^{56}
\end{aligned}
$$

$$
\begin{aligned}
&+ x^{54} + x^{51} + x^{49} + x^{48} + x^{46} + x^{44} + x^{43} + x^{42} + x^{40} + x^{37} + x^{35}\\
&+ x^{33} + x^{29} + x^{28} + x^{27} + x^{26},\\
p_6(x) &= x^{109} + x^{105} + x^{104} + x^{103} + x^{96} + x^{95} + x^{94} + x^{92} + x^{91} + x^{90} + x^{89}\\
&+ x^{88} + x^{87} + x^{85} + x^{83} + x^{82} + x^{76} + x^{70} + x^{61} + x^{60} + x^{59} + x^{58}\\
&+ x^{53} + x^{49} + x^{47} + x^{46} + x^{45} + x^{44} + x^{43} + x^{42} + x^{41} + x^{38} + x^{36}\\
&+ x^{33} + x^{32} + x^{31} + x^{30} + x^{29} + x^{27} + x^{26} + x^{25} + x^{23} + x^{15} + x^{14}\\
&+ x^{9} + x^{4} + x + 1,\\
p_9(x) &= x^{101} + x^{96} + x^{93} + x^{92} + x^{85} + x^{80} + x^{77} + x^{76} + x^{69} + x^{64} + x^{61}\\
&+ x^{60} + x^{37} + x^{32} + x^{29} + x^{28} + x^{21} + x^{16} + x^{13} + x^{12},\\
p_{12}(x) &= x^{105} + x^{100} + x^{96} + x^{93} + x^{92} + x^{81} + x^{77} + x^{76} + x^{65} + x^{61} + x^{60}\\
&+ x^{57} + x^{52} + x^{49} + x^{48} + x^{41} + x^{36} + x^{32} + x^{29} + x^{28} + x^{17} + x^{13}\\
&+ x^{12} + x^{9} + x^{4} + x + 1,
\end{aligned}
$$

and the initial terms are [0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 0, 0, 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]	983	[1592, 1593]	1966	[995, 2307]	2949	[3292, 1246]
1	[3, 4]	984	[1594, 677]	1967	[2608, 2266]	2950	[3293, 2169]
2	[5, 6]	985	[1595, 1596]	1968	[372, 2284]	2951	[3294, 1030]
3	[7, 8]	986	[1597, 1598]	1969	[2609, 327]	2952	[3295, 2354]
4	[9, 10]	987	[1599, 1595]	1970	[2610, 2415]	2953	[3184, 2192]
5	[11, 12]	988	[1600, 143]	1971	[28, 2436]	2954	[3148, 1151]
6	[13, 14]	989	[1601, 1602]	1972	[82, 2611]	2955	[3296, 1201]
7	[15, 16]	990	[1603, 1414]	1973	[2431, 2612]	2956	[3297, 2245]
8	[17, 18]	991	[1604, 504]	1974	[2613, 2179]	2957	[3298, 2177]
9	[19, 20]	992	[1605, 1606]	1975	[2339, 2614]	2958	[2220, 2349]
10	[21, 22]	993	[1607, 602]	1976	[2615, 2616]	2959	[3299, 431]
11	[23, 24]	994	[1608, 1609]	1977	[2370, 971]	2960	[3300, 1380]
12	[25, 26]	995	[1610, 1611]	1978	[2617, 1217]	2961	[3301, 980]
13	[27, 28]	996	[1, 841]	1979	[1020, 2618]	2962	[3302, 1308]
14	[29, 30]	997	[1543, 1612]	1980	[2619, 2437]	2963	[3303, 80]
15	[31, 32]	998	[684, 1613]	1981	[1107, 2358]	2964	[3304, 2203]
16	[33, 34]	999	[1614, 652]	1982	[2620, 464]	2965	[3158, 2650]
17	[35, 36]	1000	[638, 1615]	1983	[2177, 2588]	2966	[3305, 385]
18	[37, 38]	1001	[1616, 1617]	1984	[1050, 2621]	2967	[3306, 1372]
19	[39, 40]	1002	[1618, 1619]	1985	[2622, 1319]	2968	[1064, 2286]
20	[41, 42]	1003	[1620, 502]	1986	[2623, 1167]	2969	[3307, 2159]
21	[43, 44]	1004	[1621, 1622]	1987	[2603, 2597]	2970	[2426, 1071]
22	[45, 46]	1005	[1623, 1624]	1988	[2624, 1293]	2971	[1310, 1328]

23	[47, 48]	1006	[1625, 572]	1989	[2234, 1230]	2972	[3308, 404]
24	[49, 50]	1007	[1626, 1627]	1990	[2625, 1228]	2973	[1296, 2439]
25	[51, 52]	1008	[1628, 1629]	1991	[2626, 1255]	2974	[3309, 2490]
26	[53, 54]	1009	[1630, 1631]	1992	[881, 2213]	2975	[2222, 2580]
27	[55, 56]	1010	[1632, 1633]	1993	[2627, 312]	2976	[3310, 1049]
28	[57, 58]	1011	[1634, 1603]	1994	[2628, 468]	2977	[3311, 393]
29	[59, 60]	1012	[1635, 1636]	1995	[2350, 2173]	2978	[1000, 3173]
30	[61, 62]	1013	[1637, 1638]	1996	[1081, 1218]	2979	[3312, 1077]
31	[63, 64]	1014	[1639, 1640]	1997	[2629, 2630]	2980	[3313, 947]
32	[65, 66]	1015	[1641, 1642]	1998	[1012, 1082]	2981	[3314, 2187]
33	[67, 68]	1016	[1643, 1502]	1999	[398, 2603]	2982	[3315, 2201]
34	[69, 70]	1017	[1644, 691]	2000	[2631, 959]	2983	[3316, 1012]
35	[71, 72]	1018	[190, 844]	2001	[2153, 2386]	2984	[1394, 983]
36	[73, 74]	1019	[1645, 1646]	2002	[2149, 272]	2985	[3317, 2451]
37	[75, 76]	1020	[1647, 1524]	2003	[2632, 2313]	2986	[3318, 2395]
38	[77, 78]	1021	[795, 473]	2004	[262, 2429]	2987	[3319, 2230]
39	[79, 80]	1022	[1617, 1648]	2005	[2205, 2411]	2988	[3320, 1067]
40	[81, 82]	1023	[1649, 53]	2006	[2633, 2273]	2989	[3321, 2248]
41	[83, 84]	1024	[172, 688]	2007	[2201, 2634]	2990	[364, 2208]
42	[85, 86]	1025	[1650, 1651]	2008	[1384, 2635]	2991	[3322, 259]
43	[87, 88]	1026	[1652, 1515]	2009	[2636, 1168]	2992	[1154, 2409]
44	[89, 90]	1027	[1653, 1654]	2010	[2637, 1205]	2993	[3323, 1183]
45	[91, 92]	1028	[1655, 40]	2011	[1314, 1347]	2994	[3324, 939]
46	[93, 94]	1029	[1656, 620]	2012	[1145, 2236]	2995	[3325, 2612]
47	[95, 96]	1030	[1657, 1623]	2013	[1115, 28]	2996	[3326, 1193]
48	[97, 98]	1031	[1658, 245]	2014	[1017, 2607]	2997	[3327, 2351]
49	[99, 100]	1032	[1659, 592]	2015	[284, 1048]	2998	[3328, 963]
50	[101, 102]	1033	[1660, 1661]	2016	[2231, 1096]	2999	[3329, 120]
51	[103, 104]	1034	[1662, 1663]	2017	[2188, 296]	3000	[3330, 2580]
52	[105, 106]	1035	[1664, 1665]	2018	[327, 1249]	3001	[3331, 373]
53	[107, 108]	1036	[825, 1666]	2019	[2638, 1250]	3002	[3332, 2488]
54	[109, 110]	1037	[1667, 1668]	2020	[2639, 1208]	3003	[1270, 349]
55	[111, 112]	1038	[1669, 1670]	2021	[1372, 1041]	3004	[415, 1317]
56	[100, 113]	1039	[1671, 1672]	2022	[2640, 1231]	3005	[3333, 2594]
57	[114, 115]	1040	[1673, 1674]	2023	[1364, 2641]	3006	[370, 114]
58	[116, 117]	1041	[1675, 1676]	2024	[2549, 2642]	3007	[3334, 1151]
59	[118, 119]	1042	[1677, 140]	2025	[2643, 2277]	3008	[3335, 1303]
60	[120, 121]	1043	[1678, 1679]	2026	[2644, 2645]	3009	[3336, 2635]
61	[122, 123]	1044	[1680, 1681]	2027	[2646, 2260]	3010	[3337, 1116]
62	[124, 125]	1045	[206, 1682]	2028	[1401, 2421]	3011	[3338, 2209]
63	[126, 127]	1046	[1683, 1684]	2029	[2647, 397]	3012	[3339, 2207]
64	[128, 129]	1047	[1685, 1686]	2030	[305, 440]	3013	[2458, 2316]
65	[130, 131]	1048	[1687, 850]	2031	[400, 2648]	3014	[1382, 1394]
66	[132, 133]	1049	[1688, 1689]	2032	[2649, 1180]	3015	[3340, 891]

67	[134, 135]	1050	[1690, 1691]	2033	[2650, 934]	3016	[3341, 1124]
68	[136, 137]	1051	[1692, 1499]	2034	[2651, 2168]	3017	[3342, 2178]
69	[138, 139]	1052	[1693, 1694]	2035	[2652, 1356]	3018	[3343, 927]
70	[140, 141]	1053	[541, 1695]	2036	[2653, 380]	3019	[3344, 381]
71	[142, 143]	1054	[1696, 1697]	2037	[2412, 913]	3020	[3345, 1389]
72	[144, 145]	1055	[1698, 1699]	2038	[2654, 1024]	3021	[3346, 2527]
73	[146, 147]	1056	[1700, 1701]	2039	[22, 1053]	3022	[3347, 2280]
74	[148, 149]	1057	[1702, 1703]	2040	[2655, 880]	3023	[2493, 2545]
75	[150, 151]	1058	[1704, 1705]	2041	[2656, 2402]	3024	[3348, 286]
76	[152, 153]	1059	[1706, 1707]	2042	[2657, 1315]	3025	[2474, 299]
77	[154, 155]	1060	[1708, 1709]	2043	[1125, 2514]	3026	[3349, 329]
78	[60, 156]	1061	[1710, 1711]	2044	[2658, 1009]	3027	[3350, 2671]
79	[157, 158]	1062	[1712, 1713]	2045	[2659, 960]	3028	[3351, 63]
80	[159, 160]	1063	[1714, 1715]	2046	[432, 73]	3029	[3352, 1072]
81	[161, 162]	1064	[1716, 802]	2047	[2660, 2365]	3030	[3353, 2431]
82	[163, 164]	1065	[1717, 847]	2048	[2287, 1181]	3031	[2326, 2456]
83	[165, 166]	1066	[1718, 1719]	2049	[2661, 919]	3032	[3354, 1192]
84	[167, 168]	1067	[1720, 1644]	2050	[2418, 1061]	3033	[3355, 2303]
85	[169, 170]	1068	[1443, 852]	2051	[1298, 2378]	3034	[3356, 1219]
86	[171, 172]	1069	[40, 1721]	2052	[2630, 2472]	3035	[3357, 1262]
87	[173, 174]	1070	[1722, 1723]	2053	[2662, 2206]	3036	[3358, 2192]
88	[175, 176]	1071	[1724, 1725]	2054	[2379, 2663]	3037	[2251, 2703]
89	[177, 178]	1072	[1726, 1645]	2055	[2189, 2227]	3038	[3359, 411]
90	[179, 180]	1073	[1727, 1728]	2056	[1350, 2331]	3039	[2484, 2292]
91	[181, 182]	1074	[1729, 571]	2057	[2664, 1351]	3040	[3360, 1145]
92	[183, 184]	1075	[1730, 667]	2058	[2355, 2365]	3041	[3361, 460]
93	[185, 186]	1076	[1731, 1732]	2059	[1052, 1203]	3042	[3362, 344]
94	[187, 188]	1077	[1733, 1734]	2060	[1278, 1187]	3043	[3363, 3173]
95	[189, 190]	1078	[1735, 1736]	2061	[1174, 2560]	3044	[2554, 1093]
96	[191, 192]	1079	[1737, 1738]	2062	[2665, 2436]	3045	[3364, 105]
97	[193, 194]	1080	[1739, 1740]	2063	[2666, 250]	3046	[3365, 375]
98	[195, 196]	1081	[1741, 665]	2064	[960, 927]	3047	[1233, 909]
99	[197, 198]	1082	[1742, 1743]	2065	[2667, 2278]	3048	[3366, 2355]
100	[199, 200]	1083	[1744, 1745]	2066	[2668, 2336]	3049	[3367, 2141]
101	[201, 202]	1084	[1746, 1747]	2067	[2669, 2557]	3050	[3368, 2453]
102	[203, 204]	1085	[1581, 1748]	2068	[374, 1278]	3051	[3369, 1333]
103	[205, 206]	1086	[1749, 681]	2069	[1138, 2405]	3052	[3370, 1118]
104	[207, 208]	1087	[1750, 1751]	2070	[2670, 1120]	3053	[3371, 2300]
105	[209, 210]	1088	[1752, 1753]	2071	[2671, 1194]	3054	[3372, 2243]
106	[211, 212]	1089	[1754, 1755]	2072	[2597, 1298]	3055	[3373, 2261]
107	[213, 214]	1090	[1756, 1567]	2073	[2672, 2433]	3056	[3374, 325]
108	[215, 216]	1091	[1757, 1758]	2074	[469, 2644]	3057	[947, 2706]
109	[217, 218]	1092	[527, 1759]	2075	[1411, 2458]	3058	[3375, 888]
110	[219, 220]	1093	[1760, 219]	2076	[2527, 998]	3059	[3376, 2472]

111	[221, 222]	1094	[1761, 656]	2077	[417, 2269]	3060	[3377, 1062]
112	[223, 224]	1095	[1762, 696]	2078	[1201, 2143]	3061	[2396, 993]
113	[225, 226]	1096	[1763, 1764]	2079	[2313, 2673]	3062	[3378, 2361]
114	[227, 228]	1097	[1765, 138]	2080	[2294, 67]	3063	[3379, 1128]
115	[229, 230]	1098	[1766, 1767]	2081	[2674, 2412]	3064	[3380, 2342]
116	[231, 232]	1099	[149, 1768]	2082	[2550, 2675]	3065	[3381, 898]
117	[147, 233]	1100	[1769, 1770]	2083	[2676, 1266]	3066	[3382, 2455]
118	[234, 235]	1101	[1771, 37]	2084	[2677, 1300]	3067	[3383, 29]
119	[236, 237]	1102	[1772, 1425]	2085	[382, 2229]	3068	[3384, 101]
120	[238, 239]	1103	[1773, 1774]	2086	[2678, 379]	3069	[3385, 1144]
121	[240, 128]	1104	[1775, 1776]	2087	[307, 1308]	3070	[3386, 907]
122	[241, 242]	1105	[1777, 182]	2088	[2435, 308]	3071	[3387, 441]
123	[243, 244]	1106	[1778, 1779]	2089	[2679, 2607]	3072	[3388, 1150]
124	[245, 246]	1107	[1780, 1749]	2090	[952, 2361]	3073	[3389, 2401]
125	[247, 248]	1108	[1442, 1781]	2091	[2502, 2671]	3074	[3390, 1304]
126	[249, 250]	1109	[1782, 1783]	2092	[2680, 2211]	3075	[1250, 2183]
127	[251, 252]	1110	[1784, 1785]	2093	[275, 942]	3076	[3391, 911]
128	[253, 254]	1111	[1786, 1787]	2094	[2681, 1383]	3077	[2439, 2258]
129	[255, 256]	1112	[1788, 1789]	2095	[2682, 360]	3078	[3392, 1288]
130	[257, 258]	1113	[1790, 1791]	2096	[2185, 1232]	3079	[3393, 377]
131	[259, 260]	1114	[1417, 1792]	2097	[317, 995]	3080	[2315, 1407]
132	[261, 262]	1115	[1793, 622]	2098	[986, 2310]	3081	[2635, 468]
133	[263, 264]	1116	[1794, 1795]	2099	[2683, 2164]	3082	[3394, 913]
134	[265, 93]	1117	[1796, 1797]	2100	[1339, 1180]	3083	[1255, 119]
135	[266, 267]	1118	[1798, 1716]	2101	[2407, 1333]	3084	[3395, 1384]
136	[268, 269]	1119	[1799, 1800]	2102	[2485, 2505]	3085	[3396, 2334]
137	[270, 271]	1120	[1425, 674]	2103	[2684, 374]	3086	[3397, 2170]
138	[272, 273]	1121	[1774, 179]	2104	[2621, 1124]	3087	[329, 981]
139	[274, 275]	1122	[1801, 1746]	2105	[2685, 976]	3088	[3398, 2295]
140	[276, 277]	1123	[1802, 1566]	2106	[2686, 1031]	3089	[3399, 1292]
141	[278, 279]	1124	[1803, 1804]	2107	[2687, 2427]	3090	[3400, 1317]
142	[280, 273]	1125	[1805, 1806]	2108	[2688, 2316]	3091	[311, 873]
143	[281, 282]	1126	[649, 1807]	2109	[2689, 990]	3092	[3401, 376]
144	[283, 284]	1127	[1808, 1809]	2110	[2690, 918]	3093	[3402, 2650]
145	[285, 286]	1128	[1810, 197]	2111	[1111, 2326]	3094	[3403, 309]
146	[287, 255]	1129	[1811, 629]	2112	[2691, 2692]	3095	[3404, 2545]
147	[288, 289]	1130	[1812, 1597]	2113	[2693, 1343]	3096	[3405, 370]
148	[290, 291]	1131	[1813, 482]	2114	[2694, 2634]	3097	[3406, 930]
149	[292, 293]	1132	[680, 1522]	2115	[2695, 1061]	3098	[3407, 452]
150	[294, 295]	1133	[1814, 1554]	2116	[2696, 405]	3099	[2450, 1306]
151	[296, 92]	1134	[235, 159]	2117	[2697, 1108]	3100	[3408, 1076]
152	[297, 298]	1135	[1815, 853]	2118	[2698, 2161]	3101	[3409, 2332]
153	[299, 300]	1136	[1566, 1816]	2119	[2699, 2324]	3102	[3410, 1133]
154	[301, 296]	1137	[1817, 1818]	2120	[1156, 360]	3103	[2253, 946]

155	[302, 303]	1138	[1819, 1820]	2121	[2700, 407]	3104	[3411, 2396]
156	[304, 305]	1139	[1821, 1822]	2122	[121, 459]	3105	[3412, 1190]
157	[306, 307]	1140	[1523, 543]	2123	[2264, 1038]	3106	[3413, 2493]
158	[308, 309]	1141	[1676, 1823]	2124	[1306, 2526]	3107	[3414, 874]
159	[310, 311]	1142	[1824, 1825]	2125	[2701, 2154]	3108	[3415, 1325]
160	[312, 313]	1143	[1826, 1827]	2126	[90, 2556]	3109	[3416, 910]
161	[314, 315]	1144	[1828, 664]	2127	[2702, 1238]	3110	[2377, 2205]
162	[316, 317]	1145	[1537, 1616]	2128	[1165, 2521]	3111	[3417, 2349]
163	[318, 319]	1146	[1829, 1830]	2129	[2524, 1404]	3112	[3418, 953]
164	[320, 321]	1147	[1831, 1832]	2130	[2703, 1118]	3113	[3419, 2595]
165	[322, 323]	1148	[1833, 1834]	2131	[2704, 1115]	3114	[3420, 940]
166	[324, 325]	1149	[1835, 1828]	2132	[2705, 2706]	3115	[3421, 932]
167	[326, 327]	1150	[1836, 236]	2133	[2707, 1183]	3116	[3422, 2317]
168	[328, 329]	1151	[599, 1837]	2134	[2708, 2568]	3117	[3423, 1039]
169	[330, 331]	1152	[1838, 1839]	2135	[2709, 1041]	3118	[3424, 1129]
170	[332, 333]	1153	[1840, 1841]	2136	[2710, 1312]	3119	[3425, 1401]
171	[334, 335]	1154	[1842, 1843]	2137	[2706, 2534]	3120	[3426, 1184]
172	[336, 24]	1155	[1844, 1845]	2138	[2144, 1067]	3121	[3427, 895]
173	[337, 338]	1156	[551, 1609]	2139	[2711, 2712]	3122	[3428, 975]
174	[339, 340]	1157	[1834, 1846]	2140	[2713, 522]	3123	[3429, 1078]
175	[341, 342]	1158	[1792, 1847]	2141	[574, 1690]	3124	[3430, 427]
176	[343, 344]	1159	[1848, 1846]	2142	[2714, 1933]	3125	[3431, 2475]
177	[345, 346]	1160	[194, 1849]	2143	[2715, 2716]	3126	[3432, 2589]
178	[347, 348]	1161	[1850, 1851]	2144	[2717, 1443]	3127	[3433, 2144]
179	[349, 350]	1162	[1852, 575]	2145	[2718, 1802]	3128	[3434, 3150]
180	[351, 352]	1163	[1505, 577]	2146	[2719, 2720]	3129	[3435, 1037]
181	[353, 354]	1164	[645, 1853]	2147	[2721, 2722]	3130	[3436, 1143]
182	[355, 255]	1165	[1854, 1855]	2148	[2012, 188]	3131	[3437, 22]
183	[356, 357]	1166	[1856, 705]	2149	[1694, 2068]	3132	[3438, 17]
184	[358, 359]	1167	[246, 1452]	2150	[14, 1887]	3133	[3260, 1036]
185	[360, 361]	1168	[1703, 1857]	2151	[2723, 528]	3134	[3439, 2348]
186	[74, 362]	1169	[743, 1858]	2152	[2724, 2725]	3135	[3440, 1198]
187	[363, 364]	1170	[1859, 1604]	2153	[1770, 2726]	3136	[3441, 1313]
188	[365, 366]	1171	[1860, 1720]	2154	[1951, 2072]	3137	[3442, 351]
189	[367, 368]	1172	[1861, 1862]	2155	[2727, 1807]	3138	[3443, 1182]
190	[369, 370]	1173	[1555, 549]	2156	[2728, 33]	3139	[3187, 1271]
191	[371, 372]	1174	[1863, 692]	2157	[2729, 761]	3140	[3444, 116]
192	[373, 374]	1175	[1864, 1691]	2158	[1797, 1684]	3141	[3445, 935]
193	[375, 376]	1176	[1865, 1866]	2159	[2730, 2731]	3142	[3446, 2372]
194	[377, 378]	1177	[1867, 701]	2160	[2732, 660]	3143	[3447, 2183]
195	[286, 379]	1178	[208, 1868]	2161	[2733, 2734]	3144	[1195, 2460]
196	[380, 381]	1179	[1869, 594]	2162	[788, 2735]	3145	[3448, 1141]
197	[94, 382]	1180	[1870, 1522]	2163	[1758, 1839]	3146	[3449, 276]
198	[383, 111]	1181	[1871, 1872]	2164	[2736, 2112]	3147	[1935, 1998]

199	[384, 385]	1182	[480, 1786]	2165	[2737, 590]	3148	[2037, 497]
200	[386, 387]	1183	[1873, 1874]	2166	[2738, 43]	3149	[3450, 529]
201	[388, 389]	1184	[1875, 515]	2167	[2739, 733]	3150	[799, 3451]
202	[390, 391]	1185	[1876, 1877]	2168	[2740, 1541]	3151	[3452, 1529]
203	[392, 94]	1186	[1878, 1879]	2169	[2741, 746]	3152	[3453, 2138]
204	[393, 394]	1187	[1880, 1881]	2170	[606, 1879]	3153	[2098, 3031]
205	[395, 396]	1188	[1882, 1883]	2171	[2742, 1921]	3154	[1804, 2090]
206	[397, 398]	1189	[1533, 1884]	2172	[2743, 775]	3155	[3013, 1595]
207	[333, 399]	1190	[1885, 1886]	2173	[2744, 2093]	3156	[3454, 510]
208	[321, 400]	1191	[1887, 1888]	2174	[56, 2021]	3157	[62, 1501]
209	[24, 401]	1192	[1889, 1570]	2175	[2745, 2746]	3158	[3455, 1759]
210	[26, 328]	1193	[735, 1850]	2176	[1791, 1519]	3159	[3456, 1555]
211	[402, 403]	1194	[1890, 1891]	2177	[2747, 2030]	3160	[3457, 140]
212	[117, 404]	1195	[1892, 33]	2178	[2748, 2715]	3161	[1719, 1783]
213	[405, 406]	1196	[1593, 1623]	2179	[2749, 1457]	3162	[3458, 1615]
214	[407, 408]	1197	[1893, 785]	2180	[856, 2750]	3163	[1909, 1535]
215	[409, 288]	1198	[1894, 1868]	2181	[2751, 2752]	3164	[3459, 1983]
216	[410, 411]	1199	[1895, 1486]	2182	[2753, 2754]	3165	[3460, 1718]
217	[412, 413]	1200	[8, 1896]	2183	[1751, 1724]	3166	[3461, 229]
218	[414, 415]	1201	[10, 737]	2184	[1674, 2755]	3167	[2018, 726]
219	[416, 417]	1202	[1830, 622]	2185	[2756, 1893]	3168	[3462, 1857]
220	[418, 419]	1203	[1897, 808]	2186	[2757, 2758]	3169	[836, 1676]
221	[420, 421]	1204	[1795, 814]	2187	[2759, 1525]	3170	[1832, 2749]
222	[422, 423]	1205	[1898, 1899]	2188	[2760, 2761]	3171	[3463, 493]
223	[424, 425]	1206	[1900, 1514]	2189	[2762, 2763]	3172	[3464, 1543]
224	[426, 427]	1207	[1666, 1862]	2190	[609, 2026]	3173	[2023, 2760]
225	[428, 305]	1208	[1901, 1902]	2191	[2764, 2752]	3174	[3465, 675]
226	[429, 430]	1209	[1699, 1903]	2192	[2765, 1634]	3175	[3466, 2936]
227	[431, 432]	1210	[1904, 1905]	2193	[1558, 2766]	3176	[3467, 799]
228	[433, 434]	1211	[636, 1906]	2194	[2767, 2768]	3177	[747, 2846]
229	[435, 436]	1212	[1907, 200]	2195	[1989, 2769]	3178	[1707, 866]
230	[437, 438]	1213	[1908, 1909]	2196	[2770, 2063]	3179	[3003, 1512]
231	[439, 440]	1214	[1910, 139]	2197	[820, 2771]	3180	[3468, 186]
232	[325, 441]	1215	[780, 1911]	2198	[1434, 248]	3181	[2769, 2111]
233	[442, 443]	1216	[1912, 693]	2199	[2772, 2773]	3182	[3469, 2012]
234	[444, 445]	1217	[1913, 1914]	2200	[2774, 1768]	3183	[2990, 1480]
235	[446, 447]	1218	[1915, 1916]	2201	[2775, 2776]	3184	[3470, 2942]
236	[448, 449]	1219	[248, 1917]	2202	[1502, 567]	3185	[3471, 599]
237	[450, 451]	1220	[1918, 1919]	2203	[1734, 1635]	3186	[791, 232]
238	[452, 453]	1221	[1920, 1921]	2204	[2777, 137]	3187	[3472, 3023]
239	[454, 455]	1222	[1922, 1923]	2205	[2778, 2779]	3188	[3473, 1644]
240	[456, 442]	1223	[1924, 1925]	2206	[1855, 181]	3189	[1816, 1996]
241	[457, 458]	1224	[1926, 1927]	2207	[2780, 1455]	3190	[1454, 1442]
242	[459, 460]	1225	[1928, 1929]	2208	[2781, 1549]	3191	[3474, 2091]

243	[461, 462]	1226	[1930, 811]	2209	[2782, 726]	3192	[1841, 693]
244	[271, 442]	1227	[1931, 1718]	2210	[2783, 2784]	3193	[2766, 2975]
245	[463, 464]	1228	[1932, 1933]	2211	[2785, 2736]	3194	[1954, 195]
246	[465, 466]	1229	[239, 1669]	2212	[2786, 1964]	3195	[3475, 1764]
247	[467, 300]	1230	[1934, 1935]	2213	[2787, 2788]	3196	[141, 1422]
248	[468, 469]	1231	[1896, 1632]	2214	[2789, 1460]	3197	[3476, 2946]
249	[470, 471]	1232	[1936, 1937]	2215	[2790, 2791]	3198	[3477, 2064]
250	[472, 473]	1233	[1820, 732]	2216	[2792, 2060]	3199	[3478, 1834]
251	[202, 474]	1234	[1938, 1939]	2217	[1753, 2793]	3200	[3479, 1457]
252	[475, 476]	1235	[1612, 666]	2218	[145, 42]	3201	[3480, 2793]
253	[477, 478]	1236	[478, 166]	2219	[2794, 621]	3202	[3481, 716]
254	[479, 480]	1237	[1940, 1941]	2220	[2795, 2796]	3203	[3482, 1516]
255	[481, 482]	1238	[653, 1942]	2221	[2797, 725]	3204	[3483, 2072]
256	[483, 484]	1239	[1943, 833]	2222	[2798, 2799]	3205	[3484, 1888]
257	[485, 486]	1240	[504, 1944]	2223	[1648, 1770]	3206	[1879, 244]
258	[487, 488]	1241	[1945, 1766]	2224	[1779, 476]	3207	[3485, 214]
259	[489, 490]	1242	[192, 1694]	2225	[2800, 237]	3208	[3486, 2945]
260	[491, 492]	1243	[1946, 1947]	2226	[2801, 631]	3209	[3487, 661]
261	[493, 494]	1244	[1948, 1949]	2227	[2802, 827]	3210	[3488, 576]
262	[495, 496]	1245	[1950, 1951]	2228	[1723, 545]	3211	[2907, 501]
263	[497, 498]	1246	[1952, 1726]	2229	[2803, 2804]	3212	[2992, 2056]
264	[499, 500]	1247	[1953, 1954]	2230	[2805, 1712]	3213	[3047, 1833]
265	[501, 502]	1248	[1955, 563]	2231	[1937, 1662]	3214	[3489, 2970]
266	[503, 504]	1249	[1956, 1751]	2232	[2806, 522]	3215	[1800, 526]
267	[505, 506]	1250	[619, 1420]	2233	[2807, 717]	3216	[3490, 1849]
268	[507, 508]	1251	[1957, 1958]	2234	[1436, 2808]	3217	[576, 1741]
269	[509, 510]	1252	[1959, 1960]	2235	[2809, 842]	3218	[3491, 2757]
270	[511, 512]	1253	[1961, 1962]	2236	[2810, 2748]	3219	[1853, 1902]
271	[513, 514]	1254	[1963, 1571]	2237	[1979, 485]	3220	[3492, 732]
272	[515, 516]	1255	[1535, 572]	2238	[1556, 2811]	3221	[3493, 1497]
273	[517, 518]	1256	[1927, 1964]	2239	[2812, 1633]	3222	[3494, 2001]
274	[519, 520]	1257	[1965, 811]	2240	[2804, 2764]	3223	[1477, 746]
275	[490, 521]	1258	[547, 1966]	2241	[2813, 1728]	3224	[1999, 2776]
276	[522, 523]	1259	[1967, 1968]	2242	[2814, 1850]	3225	[3495, 1944]
277	[524, 525]	1260	[1969, 583]	2243	[2815, 55]	3226	[3496, 1763]
278	[526, 527]	1261	[1970, 1971]	2244	[2816, 2101]	3227	[3497, 2866]
279	[528, 529]	1262	[1972, 1973]	2245	[1568, 2801]	3228	[2755, 1951]
280	[530, 531]	1263	[1974, 1975]	2246	[1456, 1697]	3229	[2101, 3014]
281	[532, 533]	1264	[1976, 1977]	2247	[1966, 1413]	3230	[1611, 218]
282	[488, 190]	1265	[1978, 1979]	2248	[2817, 1925]	3231	[3498, 1616]
283	[534, 535]	1266	[1980, 1981]	2249	[2818, 2819]	3232	[2750, 1948]
284	[536, 537]	1267	[1982, 193]	2250	[1947, 660]	3233	[3499, 2088]
285	[538, 539]	1268	[1881, 762]	2251	[2820, 1798]	3234	[3500, 2061]
286	[540, 541]	1269	[1983, 1984]	2252	[2722, 2802]	3235	[3501, 1437]

287	[542, 543]	1270	[1985, 579]	2253	[473, 1539]	3236	[669, 2060]
288	[544, 545]	1271	[1986, 1741]	2254	[2821, 806]	3237	[3502, 497]
289	[546, 547]	1272	[1960, 1987]	2255	[2822, 2823]	3238	[186, 648]
290	[548, 549]	1273	[1988, 1956]	2256	[2824, 1587]	3239	[3083, 606]
291	[550, 551]	1274	[127, 680]	2257	[2825, 1813]	3240	[2113, 1977]
292	[552, 553]	1275	[129, 1931]	2258	[2005, 507]	3241	[753, 1843]
293	[554, 555]	1276	[166, 1989]	2259	[2826, 2056]	3242	[156, 2754]
294	[556, 557]	1277	[198, 1593]	2260	[2827, 2828]	3243	[769, 1806]
295	[558, 559]	1278	[698, 1692]	2261	[2829, 694]	3244	[3503, 2013]
296	[560, 561]	1279	[1823, 1638]	2262	[2796, 2830]	3245	[2978, 1995]
297	[562, 563]	1280	[817, 1688]	2263	[2831, 1669]	3246	[3504, 1903]
298	[564, 565]	1281	[1990, 1580]	2264	[2832, 2833]	3247	[3505, 3133]
299	[566, 567]	1282	[1991, 1992]	2265	[2834, 1660]	3248	[2970, 2722]
300	[568, 569]	1283	[1993, 159]	2266	[2835, 207]	3249	[3506, 1452]
301	[570, 571]	1284	[1672, 1924]	2267	[2836, 2799]	3250	[2102, 1495]
302	[572, 51]	1285	[1883, 1430]	2268	[2837, 1923]	3251	[3507, 1999]
303	[573, 574]	1286	[1886, 764]	2269	[776, 534]	3252	[3508, 141]
304	[575, 576]	1287	[1994, 1995]	2270	[170, 500]	3253	[3509, 663]
305	[577, 471]	1288	[1996, 1450]	2271	[1525, 2030]	3254	[797, 2071]
306	[578, 579]	1289	[1997, 1998]	2272	[151, 1488]	3255	[1825, 3025]
307	[580, 581]	1290	[1682, 1999]	2273	[2838, 2740]	3256	[2823, 1554]
308	[582, 583]	1291	[721, 8]	2274	[1488, 613]	3257	[553, 2850]
309	[584, 585]	1292	[12, 209]	2275	[196, 557]	3258	[3510, 2760]
310	[586, 587]	1293	[2000, 1859]	2276	[2839, 2840]	3259	[784, 1686]
311	[588, 589]	1294	[2001, 2002]	2277	[2841, 2842]	3260	[1745, 3099]
312	[590, 591]	1295	[2003, 2004]	2278	[2843, 1778]	3261	[2840, 1424]
313	[592, 593]	1296	[1479, 2005]	2279	[2844, 1540]	3262	[1921, 1493]
314	[594, 595]	1297	[2006, 1781]	2280	[2845, 2846]	3263	[1785, 608]
315	[596, 597]	1298	[2007, 2008]	2281	[2847, 1871]	3264	[1827, 1717]
316	[598, 599]	1299	[688, 1660]	2282	[651, 1548]	3265	[706, 1881]
317	[600, 601]	1300	[2009, 1612]	2283	[2848, 715]	3266	[3511, 2892]
318	[602, 46]	1301	[838, 602]	2284	[2849, 2850]	3267	[3512, 2076]
319	[603, 604]	1302	[2010, 494]	2285	[2851, 534]	3268	[725, 161]
320	[605, 606]	1303	[2011, 2012]	2286	[2852, 804]	3269	[3099, 1586]
321	[607, 608]	1304	[782, 2013]	2287	[2853, 1940]	3270	[46, 2051]
322	[563, 609]	1305	[1971, 2014]	2288	[2854, 2048]	3271	[3513, 674]
323	[610, 611]	1306	[2015, 2016]	2289	[220, 2077]	3272	[1987, 1455]
324	[612, 613]	1307	[745, 600]	2290	[2855, 1796]	3273	[2924, 2037]
325	[614, 615]	1308	[579, 1579]	2291	[2856, 2008]	3274	[3514, 1724]
326	[616, 617]	1309	[1493, 2017]	2292	[2857, 600]	3275	[625, 3144]
327	[618, 619]	1310	[583, 2018]	2293	[224, 1468]	3276	[3515, 496]
328	[52, 620]	1311	[2019, 642]	2294	[2811, 136]	3277	[3516, 2875]
329	[54, 621]	1312	[2020, 2021]	2295	[2858, 2766]	3278	[3517, 539]
330	[622, 623]	1313	[2022, 2023]	2296	[771, 242]	3279	[717, 2920]

331	[624, 625]	1314	[686, 2024]	2297	[2126, 2859]	3280	[702, 2907]
332	[626, 627]	1315	[1981, 1729]	2298	[2860, 2861]	3281	[3518, 1573]
333	[628, 501]	1316	[2025, 2026]	2299	[813, 1454]	3282	[557, 512]
334	[629, 630]	1317	[2027, 2028]	2300	[2862, 2863]	3283	[2761, 686]
335	[631, 177]	1318	[2029, 762]	2301	[153, 1932]	3284	[1781, 1634]
336	[632, 633]	1319	[1510, 716]	2302	[793, 2864]	3285	[486, 671]
337	[634, 514]	1320	[1721, 1972]	2303	[2093, 513]	3286	[1845, 713]
338	[635, 636]	1321	[2030, 2031]	2304	[2096, 185]	3287	[3519, 562]
339	[637, 638]	1322	[2032, 2033]	2305	[2865, 838]	3288	[1944, 2823]
340	[639, 540]	1323	[2034, 486]	2306	[1968, 506]	3289	[3520, 2934]
341	[640, 507]	1324	[2035, 1847]	2307	[1609, 2866]	3290	[3521, 144]
342	[641, 509]	1325	[2036, 2037]	2308	[1580, 2867]	3291	[861, 133]
343	[642, 643]	1326	[2038, 2039]	2309	[2868, 627]	3292	[3522, 1931]
344	[644, 645]	1327	[2040, 609]	2310	[2869, 2870]	3293	[3523, 1853]
345	[646, 647]	1328	[2041, 1542]	2311	[38, 170]	3294	[1508, 1658]
346	[648, 649]	1329	[539, 1654]	2312	[2871, 1942]	3295	[3524, 1872]
347	[650, 651]	1330	[2042, 2043]	2313	[2872, 1600]	3296	[3525, 2715]
348	[652, 653]	1331	[2044, 1692]	2314	[2873, 1972]	3297	[623, 841]
349	[654, 655]	1332	[2045, 2046]	2315	[2874, 2875]	3298	[537, 3080]
350	[656, 657]	1333	[2047, 1451]	2316	[2137, 1929]	3299	[1942, 636]
351	[658, 659]	1334	[2048, 2001]	2317	[1686, 2876]	3300	[842, 172]
352	[660, 661]	1335	[1483, 1437]	2318	[168, 31]	3301	[3526, 245]
353	[662, 663]	1336	[2049, 2050]	2319	[647, 863]	3302	[1747, 1521]
354	[664, 193]	1337	[2051, 1937]	2320	[2877, 2770]	3303	[1445, 10]
355	[665, 483]	1338	[2052, 1763]	2321	[2878, 493]	3304	[3527, 651]
356	[666, 667]	1339	[2053, 1989]	2322	[2879, 2051]	3305	[3528, 145]
357	[668, 669]	1340	[2054, 2055]	2323	[733, 1700]	3306	[3529, 39]
358	[670, 671]	1341	[2056, 1699]	2324	[1440, 723]	3307	[1923, 1798]
359	[672, 673]	1342	[2057, 2058]	2325	[2880, 2018]	3308	[3530, 840]
360	[674, 675]	1343	[2059, 1482]	2326	[2881, 2882]	3309	[3531, 1489]
361	[601, 676]	1344	[2060, 2061]	2327	[678, 1677]	3310	[3532, 1690]
362	[677, 678]	1345	[2062, 2063]	2328	[2883, 53]	3311	[3533, 862]
363	[679, 680]	1346	[2046, 2064]	2329	[2884, 1598]	3312	[1462, 588]
364	[681, 682]	1347	[2065, 1658]	2330	[2885, 1792]	3313	[3534, 178]
365	[683, 684]	1348	[2066, 1480]	2331	[2886, 2864]	3314	[3535, 1966]
366	[685, 686]	1349	[2067, 2068]	2332	[2055, 2887]	3315	[3536, 483]
367	[687, 688]	1350	[2069, 57]	2333	[1877, 789]	3316	[500, 1668]
368	[689, 690]	1351	[2070, 1996]	2334	[2888, 2819]	3317	[3087, 1935]
369	[691, 227]	1352	[2071, 683]	2335	[2889, 2745]	3318	[2026, 1606]
370	[692, 229]	1353	[2072, 1743]	2336	[2890, 630]	3319	[3537, 643]
371	[693, 694]	1354	[2073, 650]	2337	[2891, 2892]	3320	[608, 127]
372	[695, 696]	1355	[1941, 1755]	2338	[2893, 2713]	3321	[3538, 31]
373	[697, 698]	1356	[1917, 2074]	2339	[2894, 2895]	3322	[2819, 1576]
374	[699, 623]	1357	[2075, 2076]	2340	[2896, 2123]	3323	[829, 3110]

375	[700, 167]	1358	[661, 1817]	2341	[2897, 2898]	3324	[1517, 2740]
376	[701, 702]	1359	[2077, 2078]	2342	[2899, 2080]	3325	[3539, 1645]
377	[703, 704]	1360	[1874, 1681]	2343	[615, 1508]	3326	[3540, 194]
378	[705, 706]	1361	[2079, 2080]	2344	[2900, 860]	3327	[494, 662]
379	[707, 198]	1362	[2081, 2082]	2345	[2901, 209]	3328	[2735, 552]
380	[708, 709]	1363	[2083, 233]	2346	[2902, 552]	3329	[3541, 2784]
381	[710, 711]	1364	[2084, 2085]	2347	[1449, 1514]	3330	[3542, 682]
382	[712, 713]	1365	[1732, 176]	2348	[2903, 2090]	3331	[3543, 2944]
383	[714, 715]	1366	[2086, 2087]	2349	[2904, 2905]	3332	[1964, 1841]
384	[716, 717]	1367	[1725, 2088]	2350	[2906, 2907]	3333	[3544, 2726]
385	[510, 718]	1368	[2089, 1922]	2351	[1622, 2810]	3334	[3545, 179]
386	[719, 720]	1369	[1528, 2004]	2352	[2908, 748]	3335	[866, 1914]
387	[617, 721]	1370	[729, 1905]	2353	[2909, 538]	3336	[803, 1962]
388	[722, 723]	1371	[2090, 2091]	2354	[2122, 199]	3337	[2050, 184]
389	[724, 725]	1372	[1857, 1889]	2355	[2910, 2893]	3338	[3546, 2783]
390	[726, 727]	1373	[2092, 1482]	2356	[565, 2911]	3339	[3547, 3077]
391	[728, 729]	1374	[852, 2093]	2357	[139, 2912]	3340	[3548, 1688]
392	[730, 731]	1375	[2094, 56]	2358	[2913, 2914]	3341	[1759, 55]
393	[732, 733]	1376	[2095, 2096]	2359	[1564, 1427]	3342	[673, 2931]
394	[734, 735]	1377	[1642, 562]	2360	[1911, 2028]	3343	[3549, 1481]
395	[736, 737]	1378	[1958, 2097]	2361	[2915, 2017]	3344	[2088, 810]
396	[738, 739]	1379	[1872, 2098]	2362	[2916, 2758]	3345	[3550, 653]
397	[740, 741]	1380	[2099, 2100]	2363	[2917, 698]	3346	[3551, 684]
398	[742, 743]	1381	[1998, 2101]	2364	[2918, 2016]	3347	[3552, 2761]
399	[744, 745]	1382	[476, 2102]	2365	[2919, 2920]	3348	[3553, 589]
400	[746, 747]	1383	[2103, 2104]	2366	[2921, 2922]	3349	[3554, 1837]
401	[48, 748]	1384	[2105, 863]	2367	[630, 1597]	3350	[3133, 2731]
402	[749, 750]	1385	[2106, 1817]	2368	[1866, 585]	3351	[182, 128]
403	[751, 752]	1386	[2107, 2015]	2369	[1868, 2133]	3352	[3555, 227]
404	[232, 753]	1387	[2108, 1700]	2370	[2923, 2924]	3353	[3556, 2932]
405	[754, 755]	1388	[2109, 2078]	2371	[659, 1711]	3354	[1919, 735]
406	[756, 757]	1389	[2110, 2111]	2372	[2925, 2769]	3355	[2002, 2100]
407	[758, 759]	1390	[2112, 2113]	2373	[2033, 551]	3356	[3557, 780]
408	[760, 761]	1391	[2114, 631]	2374	[2926, 2927]	3357	[731, 1883]
409	[762, 763]	1392	[2115, 588]	2375	[2928, 779]	3358	[1681, 2898]
410	[764, 765]	1393	[2116, 474]	2376	[2929, 1428]	3359	[3558, 58]
411	[766, 767]	1394	[2117, 624]	2377	[1486, 1975]	3360	[3559, 2810]
412	[768, 769]	1395	[2118, 1530]	2378	[2930, 2931]	3361	[1809, 1626]
413	[770, 771]	1396	[2119, 524]	2379	[2008, 2932]	3362	[3560, 1456]
414	[772, 773]	1397	[748, 2120]	2380	[2933, 1797]	3363	[3561, 527]
415	[774, 161]	1398	[2121, 2122]	2381	[2087, 2922]	3364	[58, 211]
416	[775, 776]	1399	[2104, 2123]	2382	[2771, 1474]	3365	[1891, 701]
417	[777, 778]	1400	[2014, 2124]	2383	[2828, 2934]	3366	[2720, 3087]
418	[779, 780]	1401	[2125, 2126]	2384	[2935, 2798]	3367	[3562, 758]

419	[781, 782]	1402	[2127, 2128]	2385	[720, 2936]	3368	[3563, 3451]
420	[783, 784]	1403	[2129, 857]	2386	[2725, 2937]	3369	[3564, 1510]
421	[785, 779]	1404	[1476, 2130]	2387	[204, 2914]	3370	[178, 2082]
422	[595, 786]	1405	[2131, 782]	2388	[1768, 565]	3371	[3565, 2808]
423	[787, 788]	1406	[2132, 2133]	2389	[2938, 2939]	3372	[3566, 230]
424	[789, 645]	1407	[2134, 1568]	2390	[2940, 2830]	3373	[3567, 1786]
425	[790, 791]	1408	[2135, 1428]	2391	[545, 2865]	3374	[1424, 669]
426	[792, 793]	1409	[2130, 2039]	2392	[2941, 518]	3375	[42, 2905]
427	[794, 795]	1410	[474, 226]	2393	[2942, 1524]	3376	[2895, 207]
428	[796, 797]	1411	[2136, 2137]	2394	[2943, 2929]	3377	[216, 155]
429	[798, 799]	1412	[44, 2138]	2395	[1807, 2944]	3378	[3568, 1666]
430	[800, 801]	1413	[996, 454]	2396	[737, 2945]	3379	[3569, 180]
431	[802, 803]	1414	[2139, 2140]	2397	[694, 1809]	3380	[1888, 2942]
432	[804, 805]	1415	[2141, 1056]	2398	[143, 2946]	3381	[3570, 633]
433	[806, 807]	1416	[2142, 2143]	2399	[1709, 574]	3382	[3571, 2764]
434	[808, 603]	1417	[1004, 2144]	2400	[2947, 857]	3383	[3572, 1949]
435	[809, 810]	1418	[1176, 1220]	2401	[1663, 2054]	3384	[3573, 1713]
436	[811, 798]	1419	[2145, 1382]	2402	[1905, 833]	3385	[2768, 1537]
437	[812, 813]	1420	[1103, 1120]	2403	[1906, 202]	3386	[3574, 210]
438	[814, 815]	1421	[2146, 1036]	2404	[2948, 1649]	3387	[3575, 2771]
439	[816, 817]	1422	[978, 2147]	2405	[2949, 724]	3388	[1902, 729]
440	[818, 781]	1423	[2148, 1101]	2406	[2950, 1627]	3389	[1849, 655]
441	[819, 820]	1424	[1390, 1213]	2407	[1427, 2048]	3390	[3576, 3091]
442	[821, 536]	1425	[1243, 2149]	2408	[2951, 1729]	3391	[2061, 2893]
443	[514, 822]	1426	[2150, 2151]	2409	[2952, 2953]	3392	[3091, 1619]
444	[823, 478]	1427	[2152, 2153]	2410	[1843, 2129]	3393	[604, 1992]
445	[824, 825]	1428	[2154, 2155]	2411	[137, 2954]	3394	[3577, 516]
446	[826, 211]	1429	[2156, 1385]	2412	[1962, 531]	3395	[135, 2842]
447	[827, 828]	1430	[1086, 1099]	2413	[2955, 2077]	3396	[2927, 36]
448	[667, 829]	1431	[2157, 961]	2414	[2956, 32]	3397	[502, 2990]
449	[830, 495]	1432	[1105, 1265]	2415	[2957, 2958]	3398	[3578, 771]
450	[831, 832]	1433	[2158, 1226]	2416	[2959, 598]	3399	[1638, 1551]
451	[833, 834]	1434	[2147, 2159]	2417	[2960, 2749]	3400	[663, 219]
452	[835, 836]	1435	[2160, 469]	2418	[2961, 1948]	3401	[523, 2122]
453	[837, 838]	1436	[2161, 416]	2419	[2962, 1851]	3402	[2068, 3061]
454	[839, 840]	1437	[256, 2162]	2420	[2123, 1553]	3403	[3579, 1635]
455	[841, 842]	1438	[2163, 2164]	2421	[2963, 1617]	3404	[3580, 718]
456	[843, 844]	1439	[2165, 366]	2422	[2964, 2965]	3405	[3581, 1725]
457	[845, 846]	1440	[1091, 2166]	2423	[2966, 1413]	3406	[704, 1795]
458	[847, 848]	1441	[2167, 303]	2424	[2967, 2968]	3407	[3061, 1432]
459	[849, 662]	1442	[2168, 2169]	2425	[840, 1529]	3408	[727, 555]
460	[850, 235]	1443	[2170, 1332]	2426	[2969, 1932]	3409	[1695, 1877]
461	[851, 852]	1444	[2171, 2172]	2427	[2914, 2970]	3410	[3582, 525]
462	[853, 854]	1445	[2173, 274]	2428	[559, 2971]	3411	[3583, 1689]

463	[855, 856]	1446	[2174, 292]	2429	[2972, 1833]	3412	[1651, 2958]
464	[857, 858]	1447	[2175, 1327]	2430	[2779, 2973]	3413	[3584, 1701]
465	[859, 770]	1448	[2176, 352]	2431	[158, 2087]	3414	[3585, 814]
466	[860, 861]	1449	[1386, 2177]	2432	[671, 216]	3415	[3586, 1483]
467	[862, 488]	1450	[2178, 2179]	2433	[2974, 2975]	3416	[3587, 1556]
468	[863, 864]	1451	[1182, 1110]	2434	[2976, 582]	3417	[1548, 2870]
469	[865, 866]	1452	[464, 2180]	2435	[184, 2742]	3418	[1665, 3003]
470	[867, 868]	1453	[2181, 2182]	2436	[2977, 763]	3419	[3588, 681]
471	[869, 870]	1454	[2183, 1395]	2437	[508, 2978]	3420	[1591, 1774]
472	[871, 872]	1455	[2184, 2185]	2438	[2979, 129]	3421	[3589, 2120]
473	[873, 874]	1456	[2186, 1017]	2439	[2004, 2079]	3422	[846, 520]
474	[389, 875]	1457	[1380, 1024]	2440	[2980, 1695]	3423	[3590, 553]
475	[876, 877]	1458	[2187, 2188]	2441	[2981, 54]	3424	[3057, 2840]
476	[378, 878]	1459	[1226, 435]	2442	[2982, 2052]	3425	[218, 795]
477	[879, 324]	1460	[935, 2189]	2443	[2983, 2984]	3426	[2773, 1979]
478	[880, 881]	1461	[2190, 2191]	2444	[1670, 1899]	3427	[3591, 759]
479	[882, 883]	1462	[293, 357]	2445	[2985, 2865]	3428	[3592, 1464]
480	[884, 885]	1463	[2192, 1002]	2446	[2986, 1984]	3429	[715, 1960]
481	[886, 64]	1464	[868, 120]	2447	[2987, 1420]	3430	[1470, 2941]
482	[887, 888]	1465	[2193, 1158]	2448	[2988, 238]	3431	[611, 1549]
483	[889, 890]	1466	[344, 2194]	2449	[1503, 2015]	3432	[3593, 508]
484	[891, 892]	1467	[2195, 1220]	2450	[2989, 2990]	3433	[2968, 1720]
485	[893, 894]	1468	[1127, 1284]	2451	[2991, 2992]	3434	[242, 856]
486	[895, 295]	1469	[2196, 2197]	2452	[1975, 2927]	3435	[3594, 714]
487	[896, 369]	1470	[1304, 1128]	2453	[1977, 2917]	3436	[1654, 2863]
488	[897, 898]	1471	[2198, 1334]	2454	[713, 769]	3437	[3595, 541]
489	[899, 900]	1472	[381, 2199]	2455	[2993, 2971]	3438	[2763, 2137]
490	[436, 901]	1473	[2200, 1275]	2456	[2994, 1887]	3439	[3596, 2748]
491	[902, 107]	1474	[1140, 2201]	2457	[1551, 37]	3440	[1422, 1591]
492	[903, 904]	1475	[2202, 281]	2458	[2995, 2827]	3441	[1715, 650]
493	[352, 905]	1476	[2203, 1261]	2459	[2996, 1735]	3442	[3597, 864]
494	[354, 906]	1477	[64, 1274]	2460	[2997, 1628]	3443	[3598, 702]
495	[907, 908]	1478	[2204, 2205]	2461	[2998, 526]	3444	[244, 147]
496	[909, 910]	1479	[1206, 929]	2462	[2999, 739]	3445	[739, 581]
497	[911, 912]	1480	[2206, 2207]	2463	[3000, 2124]	3446	[3599, 1748]
498	[913, 914]	1481	[2208, 954]	2464	[1631, 853]	3447	[3600, 1662]
499	[915, 916]	1482	[2209, 2210]	2465	[3001, 753]	3448	[3601, 1824]
500	[113, 288]	1483	[2211, 2163]	2466	[212, 495]	3449	[1847, 524]
501	[917, 918]	1484	[2212, 1114]	2467	[3002, 3003]	3450	[3602, 1348]
502	[919, 920]	1485	[2213, 2214]	2468	[3004, 781]	3451	[988, 883]
503	[921, 922]	1486	[1334, 1219]	2469	[2861, 158]	3452	[3603, 283]
504	[923, 924]	1487	[2215, 1083]	2470	[3005, 1911]	3453	[3604, 969]
505	[925, 926]	1488	[319, 1014]	2471	[844, 3006]	3454	[3605, 437]
506	[927, 928]	1489	[2216, 2217]	2472	[3007, 2069]	3455	[3606, 1346]

507	[929, 930]	1490	[2218, 336]	2473	[1481, 490]	3456	[3607, 999]
508	[931, 932]	1491	[1375, 949]	2474	[3008, 2098]	3457	[3608, 278]
509	[348, 933]	1492	[2219, 2220]	2475	[1764, 1824]	3458	[3609, 399]
510	[934, 935]	1493	[1159, 253]	2476	[3009, 52]	3459	[3610, 1247]
511	[936, 937]	1494	[2221, 2222]	2477	[2911, 590]	3460	[3611, 2237]
512	[938, 939]	1495	[2223, 2152]	2478	[1818, 60]	3461	[3612, 933]
513	[940, 941]	1496	[2224, 2145]	2479	[1787, 1859]	3462	[3613, 2287]
514	[942, 943]	1497	[406, 979]	2480	[1858, 656]	3463	[3614, 253]
515	[944, 945]	1498	[2225, 2226]	2481	[3010, 721]	3464	[3615, 1019]
516	[946, 947]	1499	[2227, 446]	2482	[3011, 2059]	3465	[3616, 2180]
517	[948, 382]	1500	[2228, 2229]	2483	[3012, 2079]	3466	[3617, 2155]
518	[949, 950]	1501	[894, 2230]	2484	[2076, 3013]	3467	[3618, 2253]
519	[951, 952]	1502	[125, 1167]	2485	[3014, 797]	3468	[3619, 1161]
520	[953, 259]	1503	[1338, 2231]	2486	[3015, 2055]	3469	[3620, 1171]
521	[954, 955]	1504	[2232, 1040]	2487	[3016, 861]	3470	[3621, 894]
522	[956, 957]	1505	[918, 869]	2488	[3017, 632]	3471	[3622, 2391]
523	[269, 384]	1506	[2233, 2234]	2489	[496, 2968]	3472	[3623, 2584]
524	[399, 958]	1507	[2235, 2236]	2490	[3018, 2791]	3473	[3624, 1203]
525	[959, 960]	1508	[1403, 463]	2491	[1837, 2043]	3474	[3625, 2390]
526	[961, 962]	1509	[1300, 1234]	2492	[3019, 2746]	3475	[3626, 1378]
527	[963, 292]	1510	[1184, 2237]	2493	[1933, 1491]	3476	[3627, 2356]
528	[964, 965]	1511	[2238, 2239]	2494	[1713, 561]	3477	[3628, 1273]
529	[892, 332]	1512	[2240, 2241]	2495	[3020, 1539]	3478	[3629, 1004]
530	[966, 967]	1513	[2242, 384]	2496	[3021, 2075]	3479	[3630, 108]
531	[968, 969]	1514	[2243, 65]	2497	[3022, 2014]	3480	[3631, 254]
532	[970, 272]	1515	[2244, 343]	2498	[567, 12]	3481	[3632, 1236]
533	[971, 972]	1516	[1072, 1367]	2499	[2863, 1738]	3482	[3633, 2223]
534	[973, 974]	1517	[2245, 877]	2500	[858, 1886]	3483	[3634, 1088]
535	[975, 976]	1518	[2246, 1091]	2501	[1615, 3023]	3484	[3635, 2404]
536	[977, 978]	1519	[2247, 2248]	2502	[3024, 3025]	3485	[3636, 1408]
537	[979, 980]	1520	[2249, 2250]	2503	[2864, 62]	3486	[3637, 110]
538	[981, 982]	1521	[403, 2251]	2504	[3026, 2113]	3487	[3638, 361]
539	[983, 331]	1522	[2252, 1139]	2505	[2793, 598]	3488	[3639, 2263]
540	[984, 116]	1523	[900, 2253]	2506	[3027, 2912]	3489	[3640, 2418]
541	[985, 986]	1524	[2182, 2254]	2507	[1515, 2788]	3490	[3641, 313]
542	[987, 988]	1525	[937, 2255]	2508	[3028, 168]	3491	[3642, 2328]
543	[989, 990]	1526	[2256, 1005]	2509	[3029, 1414]	3492	[3643, 1253]
544	[991, 992]	1527	[2257, 917]	2510	[1532, 2104]	3493	[3644, 2381]
545	[993, 452]	1528	[2258, 2259]	2511	[3030, 802]	3494	[3645, 2149]
546	[994, 995]	1529	[340, 285]	2512	[3031, 1968]	3495	[3646, 878]
547	[878, 996]	1530	[2260, 2261]	2513	[1419, 2126]	3496	[3647, 929]
548	[997, 998]	1531	[2262, 1053]	2514	[3032, 2071]	3497	[3648, 897]
549	[999, 1000]	1532	[2263, 2264]	2515	[3033, 848]	3498	[3649, 2346]
550	[1001, 1002]	1533	[901, 429]	2516	[807, 1447]	3499	[3650, 1235]

551	[84, 1003]	1534	[2265, 1032]	2517	[3034, 703]	3500	[3651, 252]
552	[932, 1004]	1535	[2266, 103]	2518	[3035, 3013]	3501	[3652, 1191]
553	[1005, 124]	1536	[2267, 2208]	2519	[133, 793]	3502	[3653, 1289]
554	[1006, 1007]	1537	[1148, 29]	2520	[3036, 3037]	3503	[3654, 416]
555	[1008, 1009]	1538	[870, 1114]	2521	[3038, 3039]	3504	[3655, 350]
556	[1010, 1011]	1539	[872, 336]	2522	[2111, 1802]	3505	[3656, 1314]
557	[309, 1012]	1540	[874, 372]	2523	[3037, 1476]	3506	[3657, 285]
558	[1013, 264]	1541	[877, 2226]	2524	[2799, 1746]	3507	[3658, 2357]
559	[1014, 1015]	1542	[2140, 1166]	2525	[1432, 813]	3508	[3659, 2315]
560	[1016, 1017]	1543	[1348, 1338]	2526	[3040, 2011]	3509	[3660, 266]
561	[1018, 338]	1544	[2268, 124]	2527	[3041, 2874]	3510	[3661, 3218]
562	[102, 251]	1545	[2269, 1241]	2528	[3042, 1965]	3511	[3662, 1360]
563	[1019, 1020]	1546	[2270, 1060]	2529	[3043, 3044]	3512	[3663, 2434]
564	[1021, 268]	1547	[2271, 400]	2530	[3045, 51]	3513	[3664, 1181]
565	[1022, 6]	1548	[458, 1059]	2531	[3046, 664]	3514	[3665, 1397]
566	[1023, 25]	1549	[1045, 1289]	2532	[2776, 3047]	3515	[3666, 884]
567	[1024, 1025]	1550	[2272, 2247]	2533	[2975, 1922]	3516	[3667, 2550]
568	[1026, 21]	1551	[2273, 324]	2534	[3048, 1459]	3517	[3668, 402]
569	[1027, 1028]	1552	[2274, 448]	2535	[3049, 786]	3518	[3669, 436]
570	[1029, 263]	1553	[2275, 2276]	2536	[3050, 1632]	3519	[3670, 76]
571	[1030, 1031]	1554	[2277, 1398]	2537	[3051, 1626]	3520	[3671, 332]
572	[1032, 1033]	1555	[2278, 1262]	2538	[2936, 594]	3521	[3672, 466]
573	[1034, 1035]	1556	[342, 268]	2539	[1582, 2953]	3522	[3673, 2210]
574	[1036, 1037]	1557	[2279, 1020]	2540	[3052, 1458]	3523	[3674, 1048]
575	[1038, 1039]	1558	[2280, 2281]	2541	[525, 1855]	3524	[3675, 2467]
576	[394, 25]	1559	[2282, 972]	2542	[3053, 1727]	3525	[3676, 2558]
577	[1040, 276]	1560	[2172, 20]	2543	[2058, 1726]	3526	[3677, 103]
578	[1041, 1042]	1561	[2283, 2284]	2544	[1560, 138]	3527	[3678, 2534]
579	[110, 1043]	1562	[875, 1246]	2545	[3054, 2941]	3528	[3679, 2386]
580	[1044, 1045]	1563	[2285, 2286]	2546	[805, 820]	3529	[3680, 1165]
581	[1046, 1047]	1564	[2281, 2287]	2547	[3055, 1917]	3530	[3681, 340]
582	[1048, 63]	1565	[2288, 928]	2548	[1711, 575]	3531	[3682, 90]
583	[1049, 1050]	1566	[1303, 2263]	2549	[2085, 1509]	3532	[3683, 1079]
584	[1051, 1052]	1567	[2289, 1252]	2550	[3056, 3057]	3533	[3684, 293]
585	[1053, 1054]	1568	[2290, 1116]	2551	[3058, 1987]	3534	[3685, 1137]
586	[1055, 1056]	1569	[2291, 2292]	2552	[3059, 2005]	3535	[3686, 885]
587	[1057, 1058]	1570	[443, 1098]	2553	[613, 149]	3536	[3687, 2663]
588	[1059, 1060]	1571	[2293, 2240]	2554	[3060, 3061]	3537	[3688, 964]
589	[1061, 1062]	1572	[2239, 2294]	2555	[3062, 1823]	3538	[3689, 2692]
590	[1063, 1064]	1573	[2295, 2296]	2556	[3063, 2878]	3539	[3690, 2241]
591	[1065, 1066]	1574	[2297, 2298]	2557	[3064, 1463]	3540	[3691, 18]
592	[427, 85]	1575	[2299, 251]	2558	[2958, 1983]	3541	[3692, 1299]
593	[1067, 1068]	1576	[1209, 2300]	2559	[2859, 1971]	3542	[3693, 1234]
594	[1069, 1070]	1577	[2301, 1227]	2560	[549, 738]	3543	[3694, 2482]

595	[1071, 1072]	1578	[2302, 2296]	2561	[585, 2929]	3544	[3695, 68]
596	[1073, 1074]	1579	[1042, 1141]	2562	[3065, 2876]	3545	[3696, 1110]
597	[1075, 1076]	1580	[1043, 2289]	2563	[3066, 1581]	3546	[3697, 98]
598	[1077, 278]	1581	[260, 2303]	2564	[3067, 1624]	3547	[3698, 944]
599	[1078, 1008]	1582	[1377, 2304]	2565	[2875, 642]	3548	[3699, 3260]
600	[434, 1079]	1583	[2305, 299]	2566	[3068, 578]	3549	[3700, 2429]
601	[1080, 1081]	1584	[2214, 1109]	2567	[657, 2783]	3550	[3701, 398]
602	[1082, 1083]	1585	[2306, 1284]	2568	[3069, 648]	3551	[3702, 1121]
603	[1084, 1085]	1586	[2307, 880]	2569	[50, 1642]	3552	[3703, 1085]
604	[965, 1086]	1587	[1282, 2308]	2570	[3070, 1747]	3553	[3704, 2618]
605	[1087, 304]	1588	[2309, 2310]	2571	[3071, 1858]	3554	[3705, 390]
606	[106, 1088]	1589	[926, 1052]	2572	[1587, 2891]	3555	[3706, 870]
607	[1089, 1090]	1590	[2311, 1271]	2573	[3072, 1682]	3556	[3707, 104]
608	[910, 79]	1591	[1351, 2239]	2574	[3073, 498]	3557	[3708, 1117]
609	[1090, 1091]	1592	[2312, 1014]	2575	[3074, 1787]	3558	[3709, 1209]
610	[1092, 1093]	1593	[1291, 2313]	2576	[2870, 1785]	3559	[3710, 2166]
611	[1094, 307]	1594	[2314, 446]	2577	[1839, 3057]	3560	[3711, 121]
612	[1095, 111]	1595	[998, 2315]	2578	[2017, 3039]	3561	[3712, 977]
613	[1096, 1097]	1596	[2316, 2260]	2579	[555, 3075]	3562	[3713, 2163]
614	[1098, 884]	1597	[1330, 2317]	2580	[3076, 195]	3563	[3714, 2377]
615	[1099, 364]	1598	[1316, 2318]	2581	[633, 1735]	3564	[3715, 1189]
616	[1100, 423]	1599	[2319, 1256]	2582	[593, 1672]	3565	[3716, 81]
617	[1101, 17]	1600	[1237, 2320]	2583	[1684, 151]	3566	[3717, 2294]
618	[1102, 1103]	1601	[2321, 1290]	2584	[1776, 3077]	3567	[3718, 996]
619	[331, 1104]	1602	[2230, 2322]	2585	[750, 1600]	3568	[3719, 2537]
620	[104, 1045]	1603	[2323, 2141]	2586	[3078, 676]	3569	[3720, 2410]
621	[108, 919]	1604	[2324, 1108]	2587	[3079, 246]	3570	[3721, 2443]
622	[438, 1105]	1605	[2325, 2326]	2588	[3080, 2790]	3571	[3722, 1368]
623	[421, 342]	1606	[2327, 2328]	2589	[1512, 1572]	3572	[3723, 984]
624	[1106, 1107]	1607	[2329, 333]	2590	[2932, 3081]	3573	[3724, 391]
625	[1108, 421]	1608	[2330, 2331]	2591	[2752, 804]	3574	[3725, 2289]
626	[1109, 897]	1609	[1002, 1022]	2592	[1562, 2757]	3575	[3726, 1407]
627	[1110, 1111]	1610	[2332, 2333]	2593	[3082, 760]	3576	[3727, 378]
628	[1112, 1113]	1611	[2334, 952]	2594	[1992, 3083]	3577	[3728, 1058]
629	[298, 872]	1612	[2298, 953]	2595	[2124, 1965]	3578	[3729, 459]
630	[1114, 1115]	1613	[1121, 89]	2596	[3084, 2007]	3579	[3730, 2358]
631	[1116, 1117]	1614	[2335, 114]	2597	[1705, 784]	3580	[3731, 2338]
632	[1118, 1119]	1615	[425, 2197]	2598	[1627, 710]	3581	[3732, 1377]
633	[1120, 1121]	1616	[2336, 2337]	2599	[1929, 1470]	3582	[3733, 2554]
634	[1122, 26]	1617	[2338, 2339]	2600	[2971, 1528]	3583	[3734, 346]
635	[1123, 362]	1618	[2340, 1237]	2601	[3085, 1610]	3584	[3735, 1008]
636	[1124, 1125]	1619	[2341, 2342]	2602	[506, 1705]	3585	[3736, 2216]
637	[1126, 1127]	1620	[2343, 2344]	2603	[741, 2798]	3586	[3737, 256]
638	[1128, 1129]	1621	[2345, 1188]	2604	[3086, 3087]	3587	[3738, 2526]

639	[1130, 985]	1622	[2254, 1243]	2605	[3088, 1572]	3588	[3739, 869]
640	[1131, 931]	1623	[1346, 2346]	2606	[3089, 704]	3589	[3740, 429]
641	[1132, 934]	1624	[2259, 418]	2607	[3090, 1717]	3590	[3741, 2442]
642	[346, 1133]	1625	[2347, 465]	2608	[3075, 222]	3591	[3742, 2333]
643	[1007, 1134]	1626	[78, 2273]	2609	[1743, 1956]	3592	[3743, 433]
644	[1135, 1136]	1627	[2348, 316]	2610	[2064, 1909]	3593	[3744, 1000]
645	[1137, 1138]	1628	[2349, 2350]	2611	[162, 1938]	3594	[3745, 1232]
646	[1139, 1140]	1629	[2351, 353]	2612	[160, 3091]	3595	[3746, 2405]
647	[1141, 1142]	1630	[2352, 1396]	2613	[3092, 1896]	3596	[3747, 2308]
648	[1143, 903]	1631	[2353, 999]	2614	[2876, 1958]	3597	[3748, 406]
649	[1144, 1145]	1632	[376, 2354]	2615	[3039, 720]	3598	[3749, 359]
650	[1146, 1147]	1633	[1221, 2355]	2616	[174, 2007]	3599	[3750, 1352]
651	[992, 1148]	1634	[2356, 956]	2617	[2937, 624]	3600	[3751, 320]
652	[1149, 1150]	1635	[70, 2357]	2618	[3093, 3004]	3601	[3752, 1399]
653	[1151, 263]	1636	[2358, 2359]	2619	[3094, 196]	3602	[561, 2052]
654	[1152, 308]	1637	[2360, 282]	2620	[696, 801]	3603	[1497, 536]
655	[1153, 1154]	1638	[2361, 1207]	2621	[3095, 3031]	3604	[3753, 1596]
656	[350, 1155]	1639	[2362, 2327]	2622	[2905, 832]	3605	[3754, 695]
657	[335, 1156]	1640	[890, 1040]	2623	[1584, 1451]	3606	[1519, 791]
658	[1157, 1015]	1641	[2363, 1302]	2624	[3096, 1533]	3607	[690, 638]
659	[1158, 1159]	1642	[1113, 2298]	2625	[3097, 738]	3608	[484, 528]
660	[1160, 1161]	1643	[2364, 1104]	2626	[2833, 236]	3609	[3023, 1589]
661	[1162, 1163]	1644	[2286, 431]	2627	[2138, 592]	3610	[1806, 2878]
662	[1164, 1165]	1645	[2365, 2338]	2628	[3098, 3099]	3611	[1736, 1947]
663	[906, 97]	1646	[2241, 93]	2629	[1949, 1567]	3612	[3755, 2112]
664	[1166, 377]	1647	[2366, 981]	2630	[3100, 2888]	3613	[164, 1418]
665	[1167, 891]	1648	[2337, 2367]	2631	[2021, 619]	3614	[643, 1640]
666	[1168, 1169]	1649	[1093, 109]	2632	[3101, 854]	3615	[3756, 1825]
667	[1170, 1171]	1650	[2368, 383]	2633	[3102, 1924]	3616	[3757, 647]
668	[1172, 1105]	1651	[1104, 2244]	2634	[543, 3103]	3617	[3758, 3075]
669	[1173, 1174]	1652	[2369, 2370]	2635	[2842, 2720]	3618	[3759, 834]
670	[1175, 1176]	1653	[2371, 78]	2636	[1914, 743]	3619	[3760, 1438]
671	[123, 1177]	1654	[115, 2372]	2637	[3104, 1636]	3620	[3761, 1906]
672	[1178, 1179]	1655	[2373, 2337]	2638	[3105, 577]	3621	[518, 204]
673	[1180, 1035]	1656	[2374, 923]	2639	[3106, 815]	3622	[1613, 43]
674	[447, 1170]	1657	[2375, 2259]	2640	[3107, 847]	3623	[1738, 1562]
675	[1181, 1182]	1658	[2344, 465]	2641	[3108, 2031]	3624	[2712, 806]
676	[1037, 383]	1659	[2376, 454]	2642	[2031, 862]	3625	[3762, 603]
677	[1183, 1184]	1660	[1025, 2377]	2643	[2016, 767]	3626	[1755, 1628]
678	[1185, 868]	1661	[419, 1294]	2644	[864, 1813]	3627	[1701, 2734]
679	[1186, 1187]	1662	[2378, 2379]	2645	[3109, 3110]	3628	[3763, 593]
680	[250, 900]	1663	[1011, 96]	2646	[3111, 807]	3629	[3764, 1503]
681	[1188, 1189]	1664	[2380, 2240]	2647	[3112, 239]	3630	[3765, 764]
682	[1190, 1191]	1665	[1323, 1270]	2648	[3113, 3080]	3631	[778, 1745]

683	[1192, 1193]	1666	[1367, 2381]	2649	[1468, 773]	3632	[2887, 1940]
684	[1194, 1195]	1667	[2382, 1177]	2650	[3114, 1663]	3633	[1573, 2773]
685	[1196, 1197]	1668	[2383, 1205]	2651	[1668, 1732]	3634	[3766, 805]
686	[323, 1198]	1669	[2180, 984]	2652	[3115, 228]	3635	[1553, 2796]
687	[1199, 1025]	1670	[1344, 393]	2653	[1624, 1460]	3636	[1542, 2075]
688	[1200, 1201]	1671	[2384, 2385]	2654	[1596, 492]	3637	[1689, 569]
689	[1202, 949]	1672	[2386, 964]	2655	[3116, 2074]	3638	[3767, 1582]
690	[441, 425]	1673	[2387, 117]	2656	[3117, 1816]	3639	[3768, 747]
691	[1203, 433]	1674	[76, 1153]	2657	[3118, 208]	3640	[3769, 615]
692	[1204, 437]	1675	[2388, 2389]	2658	[3119, 2024]	3641	[3770, 822]
693	[1205, 1206]	1676	[2354, 2390]	2659	[3120, 1509]	3642	[3771, 1889]
694	[1207, 1208]	1677	[2229, 2391]	2660	[2758, 1472]	3643	[1466, 1927]
695	[1056, 1209]	1678	[2392, 2188]	2661	[1589, 2770]	3644	[3772, 2002]
696	[1058, 1168]	1679	[1039, 1127]	2662	[1728, 2833]	3645	[3103, 515]
697	[1210, 1068]	1680	[2393, 962]	2663	[2931, 2745]	3646	[3773, 2973]
698	[1211, 1057]	1681	[2394, 2395]	2664	[589, 752]	3647	[512, 860]
699	[1212, 1213]	1682	[396, 2396]	2665	[3121, 765]	3648	[620, 1740]
700	[1214, 1215]	1683	[2397, 1240]	2666	[233, 817]	3649	[3774, 829]
701	[1216, 1143]	1684	[2398, 1176]	2667	[3122, 827]	3650	[3775, 803]
702	[1217, 262]	1685	[2399, 1042]	2668	[3123, 691]	3651	[3776, 2102]
703	[1218, 355]	1686	[912, 368]	2669	[1447, 559]	3652	[1939, 587]
704	[1219, 1215]	1687	[2400, 1185]	2670	[131, 1530]	3653	[3777, 1941]
705	[1220, 1221]	1688	[1359, 1137]	2671	[2080, 1892]	3654	[675, 2939]
706	[387, 1222]	1689	[1360, 1315]	2672	[1629, 2046]	3655	[228, 1665]
707	[1223, 1224]	1690	[1035, 2401]	2673	[854, 1610]	3656	[3778, 535]
708	[1225, 434]	1691	[1079, 100]	2674	[3124, 1419]	3657	[1973, 2096]
709	[958, 1226]	1692	[1068, 2402]	2675	[3125, 2811]	3658	[3779, 3081]
710	[282, 989]	1693	[2403, 2264]	2676	[1822, 1874]	3659	[3780, 3006]
711	[1227, 1228]	1694	[2310, 2404]	2677	[3126, 1938]	3660	[3781, 156]
712	[1229, 102]	1695	[2405, 1197]	2678	[3127, 44]	3661	[1846, 1828]
713	[1230, 323]	1696	[2406, 2407]	2679	[3128, 2891]	3662	[1661, 808]
714	[1231, 895]	1697	[957, 2209]	2680	[2128, 1758]	3663	[1916, 1796]
715	[1232, 1233]	1698	[2408, 1003]	2681	[3077, 2882]	3664	[591, 480]
716	[1234, 1235]	1699	[2409, 2410]	2682	[3129, 601]	3665	[2934, 1674]
717	[1236, 1237]	1700	[2411, 390]	2683	[3130, 2742]	3666	[3782, 1779]
718	[933, 1238]	1701	[1256, 2412]	2684	[2024, 2011]	3667	[520, 2861]
719	[1239, 125]	1702	[2413, 2414]	2685	[3131, 2130]	3668	[2898, 197]
720	[1240, 101]	1703	[2415, 2151]	2686	[1606, 724]	3669	[1571, 709]
721	[1241, 283]	1704	[2416, 2417]	2687	[3132, 2801]	3670	[1576, 1830]
722	[1242, 1243]	1705	[2197, 2418]	2688	[828, 206]	3671	[3783, 1719]
723	[366, 312]	1706	[2419, 993]	2689	[627, 1462]	3672	[2784, 582]
724	[1244, 1245]	1707	[905, 1392]	2690	[2944, 1545]	3673	[765, 2779]
725	[1246, 1227]	1708	[2420, 1047]	2691	[2892, 3133]	3674	[3784, 1430]
726	[1247, 1248]	1709	[2421, 2422]	2692	[2091, 1789]	3675	[1984, 1866]

727	[1249, 1250]	1710	[2423, 2424]	2693	[3134, 3014]	3676	[34, 1734]
728	[1251, 1252]	1711	[2425, 2426]	2694	[1862, 2725]	3677	[1602, 2888]
729	[1177, 1253]	1712	[2162, 405]	2695	[1767, 1712]	3678	[752, 1791]
730	[1254, 986]	1713	[2427, 2407]	2696	[3135, 2750]	3679	[3785, 2867]
731	[945, 1255]	1714	[2428, 2318]	2697	[3136, 785]	3680	[3786, 1541]
732	[423, 931]	1715	[2429, 992]	2698	[237, 775]	3681	[2984, 538]
733	[1253, 1256]	1716	[1280, 1341]	2699	[2063, 757]	3682	[3787, 1538]
734	[1257, 1080]	1717	[2164, 1389]	2700	[3137, 626]	3683	[3788, 199]
735	[1258, 1259]	1718	[2210, 2430]	2701	[2830, 2768]	3684	[3789, 1670]
736	[1260, 1261]	1719	[2237, 2250]	2702	[2133, 659]	3685	[3790, 828]
737	[20, 1069]	1720	[112, 2211]	2703	[3138, 3139]	3686	[2846, 2059]
738	[1262, 1106]	1721	[80, 2431]	2704	[3140, 57]	3687	[3791, 160]
739	[930, 1204]	1722	[2432, 1355]	2705	[3141, 1646]	3688	[3792, 789]
740	[1263, 1264]	1723	[1245, 2433]	2706	[3142, 2859]	3689	[3793, 2978]
741	[1265, 1266]	1724	[2434, 2435]	2707	[3143, 3144]	3690	[3794, 185]
742	[1267, 1097]	1725	[1397, 2184]	2708	[3145, 646]	3691	[3006, 2069]
743	[1268, 373]	1726	[279, 2295]	2709	[3146, 1677]	3692	[2945, 1822]
744	[1269, 1270]	1727	[2436, 1411]	2710	[2973, 1776]	3693	[815, 2874]
745	[1271, 1080]	1728	[2318, 2424]	2711	[3147, 410]	3694	[3795, 2937]
746	[1272, 1273]	1729	[2437, 2275]	2712	[1332, 1345]	3695	[2922, 1723]
747	[1274, 1275]	1730	[2438, 2439]	2713	[2673, 3148]	3696	[3796, 2828]
748	[96, 1018]	1731	[2440, 905]	2714	[3149, 1375]	3697	[3797, 1570]
749	[1276, 415]	1732	[462, 4]	2715	[3150, 923]	3698	[3798, 649]
750	[258, 281]	1733	[2441, 946]	2716	[2558, 2203]	3699	[2726, 1417]
751	[1277, 1278]	1734	[2442, 1030]	2717	[3151, 1395]	3700	[3799, 2790]
752	[1279, 75]	1735	[2443, 2223]	2718	[3152, 2645]	3701	[1899, 2085]
753	[440, 1280]	1736	[1193, 1160]	2719	[3153, 65]	3702	[3800, 177]
754	[1281, 1282]	1737	[2444, 2254]	2720	[267, 1240]	3703	[3801, 1611]
755	[1083, 445]	1738	[1238, 926]	2721	[3154, 3155]	3704	[1586, 1558]
756	[1283, 79]	1739	[2445, 1204]	2722	[2401, 1063]	3705	[3802, 2887]
757	[1284, 266]	1740	[2446, 258]	2723	[3156, 1160]	3706	[2097, 825]
758	[1189, 1285]	1741	[1288, 889]	2724	[3157, 2464]	3707	[2120, 2827]
759	[1191, 1286]	1742	[2447, 1096]	2725	[962, 3158]	3708	[1884, 213]
760	[1287, 1288]	1743	[1340, 2448]	2726	[2367, 2691]	3709	[3803, 2716]
761	[1289, 1290]	1744	[2449, 2450]	2727	[3159, 2642]	3710	[1679, 224]
762	[1222, 1291]	1745	[1327, 2451]	2728	[3160, 69]	3711	[3804, 3047]
763	[1292, 1293]	1746	[2452, 2453]	2729	[3161, 1081]	3712	[2788, 1707]
764	[1294, 1279]	1747	[2454, 1258]	2730	[3162, 279]	3713	[1516, 547]
765	[1295, 1296]	1748	[2455, 2191]	2731	[1198, 298]	3714	[2866, 2763]
766	[1297, 1298]	1749	[2456, 1190]	2732	[3163, 1295]	3715	[200, 1778]
767	[1299, 1300]	1750	[2457, 2458]	2733	[3164, 348]	3716	[1438, 533]
768	[1301, 881]	1751	[2448, 2332]	2734	[1248, 1179]	3717	[1538, 2965]
769	[1302, 1303]	1752	[2459, 2460]	2735	[1031, 1005]	3718	[2754, 1631]
770	[1273, 386]	1753	[2461, 1077]	2736	[2482, 2693]	3719	[226, 1622]

771	[1142, 1304]	1754	[2462, 1050]	2737	[3165, 1065]	3720	[2716, 1485]
772	[1305, 1306]	1755	[2463, 2464]	2738	[3166, 2590]	3721	[3805, 1648]
773	[969, 1146]	1756	[2465, 354]	2739	[3167, 2411]	3722	[1474, 174]
774	[1307, 316]	1757	[2466, 983]	2740	[1235, 87]	3723	[3806, 2735]
775	[1308, 973]	1758	[2372, 2467]	2741	[3168, 1222]	3724	[3807, 3083]
776	[451, 975]	1759	[408, 1113]	2742	[357, 448]	3725	[848, 1466]
777	[1309, 1310]	1760	[2468, 418]	2743	[3169, 2323]	3726	[3808, 1818]
778	[1311, 1312]	1761	[2469, 1200]	2744	[3170, 2379]	3727	[3809, 3103]
779	[1313, 347]	1762	[2470, 115]	2745	[2422, 1011]	3728	[188, 1505]
780	[1033, 1314]	1763	[338, 2471]	2746	[3171, 410]	3729	[1499, 850]
781	[1315, 1316]	1764	[2472, 2334]	2747	[3172, 2707]	3730	[1495, 1564]
782	[1317, 81]	1765	[2473, 274]	2748	[2166, 2293]	3731	[3081, 3044]
783	[1318, 1311]	1766	[2404, 2474]	2749	[3173, 2187]	3732	[2867, 540]
784	[928, 1319]	1767	[2359, 2427]	2750	[1357, 2595]	3733	[2939, 153]
785	[1293, 105]	1768	[1097, 2475]	2751	[3174, 1409]	3734	[3810, 858]
786	[1070, 1320]	1769	[2476, 1404]	2752	[1368, 2616]	3735	[3811, 1884]
787	[1321, 1163]	1770	[2199, 2477]	2753	[3175, 875]	3736	[767, 755]
788	[1322, 1323]	1771	[2478, 77]	2754	[2611, 1032]	3737	[571, 788]
789	[1197, 389]	1772	[2479, 447]	2755	[1370, 2186]	3738	[3812, 625]
790	[1324, 920]	1773	[2480, 349]	2756	[3176, 2448]	3739	[597, 1871]
791	[1134, 1325]	1774	[2250, 351]	2757	[2584, 320]	3740	[676, 1679]
792	[1326, 1327]	1775	[2481, 1169]	2758	[2328, 1192]	3741	[3813, 706]
793	[1328, 1101]	1776	[2333, 2482]	2759	[3177, 2353]	3742	[3814, 2954]
794	[1329, 904]	1777	[2483, 2484]	2760	[72, 2234]	3743	[1415, 1981]
795	[86, 1330]	1778	[2451, 2341]	2761	[2641, 2549]	3744	[822, 2023]
796	[1331, 1332]	1779	[2217, 2485]	2762	[3178, 1390]	3745	[222, 1820]
797	[1333, 1334]	1780	[2486, 430]	2763	[2648, 2450]	3746	[763, 1893]
798	[1335, 988]	1781	[303, 2323]	2764	[883, 2398]	3747	[1489, 705]
799	[1336, 365]	1782	[2487, 1258]	2765	[3179, 451]	3748	[2850, 1753]
800	[1337, 1338]	1783	[66, 2488]	2766	[2296, 1090]	3749	[773, 1727]
801	[982, 1339]	1784	[2489, 112]	2767	[3180, 2255]	3750	[759, 3139]
802	[1119, 1340]	1785	[2191, 2490]	2768	[2572, 2336]	3751	[3815, 181]
803	[1341, 1049]	1786	[1066, 458]	2769	[920, 2344]	3752	[210, 167]
804	[1342, 414]	1787	[885, 2324]	2770	[1074, 2280]	3753	[3816, 277]
805	[1343, 1344]	1788	[2491, 275]	2771	[455, 2666]	3754	[3817, 945]
806	[295, 1247]	1789	[2390, 319]	2772	[3181, 2644]	3755	[3818, 2463]
807	[1345, 1346]	1790	[2492, 1216]	2773	[2207, 893]	3756	[3819, 2162]
808	[1347, 1348]	1791	[1213, 2277]	2774	[3182, 2648]	3757	[3820, 943]
809	[1349, 1350]	1792	[2143, 2493]	2775	[3183, 1233]	3758	[3821, 1057]
810	[888, 1351]	1793	[2494, 1265]	2776	[2557, 3184]	3759	[3822, 2435]
811	[1352, 1336]	1794	[2495, 328]	2777	[3185, 3148]	3760	[3823, 1211]
812	[1353, 1354]	1795	[2496, 967]	2778	[3186, 2359]	3761	[3824, 1248]
813	[1355, 123]	1796	[2300, 887]	2779	[2618, 3187]	3762	[3825, 965]
814	[1215, 1356]	1797	[2497, 2170]	2780	[3188, 2186]	3763	[3826, 1339]

815	[967, 1357]	1798	[2498, 2443]	2781	[3189, 1287]	3764	[3827, 85]
816	[1358, 1359]	1799	[2499, 1412]	2782	[3190, 979]	3765	[3828, 1162]
817	[1266, 1360]	1800	[2169, 2497]	2783	[1155, 2567]	3766	[3829, 3187]
818	[1361, 1362]	1801	[2500, 311]	2784	[98, 968]	3767	[3830, 2430]
819	[1363, 455]	1802	[2236, 2417]	2785	[3191, 2691]	3768	[3831, 73]
820	[1285, 1364]	1803	[2501, 86]	2786	[3192, 887]	3769	[3832, 908]
821	[1365, 1249]	1804	[2342, 2502]	2787	[3193, 1164]	3770	[3833, 1140]
822	[941, 72]	1805	[2503, 1244]	2788	[2692, 961]	3771	[3834, 443]
823	[1187, 77]	1806	[1085, 2243]	2789	[3194, 97]	3772	[3835, 284]
824	[1366, 1367]	1807	[277, 944]	2790	[980, 2572]	3773	[3836, 414]
825	[1133, 1368]	1808	[2504, 113]	2791	[943, 1188]	3774	[3837, 1347]
826	[1369, 1370]	1809	[2505, 2348]	2792	[3195, 906]	3775	[3838, 271]
827	[6, 1292]	1810	[2506, 426]	2793	[2460, 1078]	3776	[3839, 924]
828	[1371, 985]	1811	[2507, 2173]	2794	[3196, 1069]	3777	[3840, 2693]
829	[1169, 1372]	1812	[2508, 1316]	2795	[3197, 2621]	3778	[3841, 2614]
830	[1373, 909]	1813	[1408, 2245]	2796	[2424, 2266]	3779	[3842, 1098]
831	[1374, 260]	1814	[2509, 463]	2797	[3198, 449]	3780	[3843, 2567]
832	[413, 1375]	1815	[2510, 1398]	2798	[1264, 2452]	3781	[3844, 2185]
833	[1376, 1377]	1816	[2417, 2178]	2799	[289, 2454]	3782	[3845, 1153]
834	[1378, 1272]	1817	[359, 1046]	2800	[3199, 1245]	3783	[3846, 1272]
835	[1379, 1094]	1818	[1163, 304]	2801	[2568, 345]	3784	[3847, 958]
836	[1047, 1380]	1819	[2511, 1241]	2802	[3155, 1371]	3785	[3848, 401]
837	[1381, 1382]	1820	[1354, 1376]	2803	[3200, 1066]	3786	[3849, 1107]
838	[385, 916]	1821	[2512, 914]	2804	[1171, 2537]	3787	[3850, 1106]
839	[1383, 1384]	1822	[2155, 2394]	2805	[3201, 2231]	3788	[3851, 386]
840	[1385, 16]	1823	[2389, 2356]	2806	[3202, 269]	3789	[3852, 326]
841	[1062, 1386]	1824	[2471, 1211]	2807	[3203, 2184]	3790	[3853, 355]
842	[4, 1200]	1825	[1399, 84]	2808	[2261, 2383]	3791	[3854, 2454]
843	[1387, 955]	1826	[2513, 2514]	2809	[3204, 1075]	3792	[3855, 1027]
844	[368, 1299]	1827	[2514, 1362]	2810	[430, 3150]	3793	[3856, 432]
845	[1388, 1170]	1828	[1015, 1313]	2811	[2303, 270]	3794	[3857, 74]
846	[466, 413]	1829	[2515, 1146]	2812	[3205, 2304]	3795	[3858, 1046]
847	[1362, 1352]	1830	[2490, 1354]	2813	[3206, 1392]	3796	[3859, 2641]
848	[1389, 1390]	1831	[2516, 2251]	2814	[3207, 3171]	3797	[3860, 2293]
849	[1391, 1174]	1832	[2488, 2389]	2815	[3208, 358]	3798	[3861, 978]
850	[1392, 310]	1833	[2430, 2442]	2816	[3209, 1054]	3799	[3862, 1364]
851	[1393, 1394]	1834	[404, 2425]	2817	[3210, 2505]	3800	[3863, 347]
852	[1395, 940]	1835	[2517, 1166]	2818	[3211, 982]	3801	[3864, 1285]
853	[1396, 1397]	1836	[2518, 2378]	2819	[1076, 2579]	3802	[3865, 422]
854	[1398, 1399]	1837	[2391, 21]	2820	[3212, 1280]	3803	[3866, 106]
855	[1400, 1357]	1838	[2519, 2520]	2821	[3213, 267]	3804	[3867, 66]
856	[1147, 1401]	1839	[2521, 2206]	2822	[3214, 1134]	3805	[3868, 2199]
857	[1402, 1403]	1840	[2522, 343]	2823	[1320, 2278]	3806	[3869, 2350]
858	[1404, 1084]	1841	[1409, 1216]	2824	[3215, 310]	3807	[3870, 2446]

859	[1405, 1142]	1842	[2523, 2524]	2825	[3216, 2398]	3808	[3871, 3158]
860	[1406, 1322]	1843	[2410, 1402]	2826	[3217, 435]	3809	[3872, 2269]
861	[30, 1268]	1844	[2525, 1111]	2827	[391, 3218]	3810	[3873, 1064]
862	[1325, 1335]	1845	[2526, 1302]	2828	[2612, 1019]	3811	[3874, 1018]
863	[1407, 1408]	1846	[2477, 2527]	2829	[3219, 2281]	3812	[3875, 87]
864	[976, 1409]	1847	[88, 959]	2830	[1290, 2707]	3813	[3876, 403]
865	[1410, 1411]	1848	[2528, 2258]	2831	[3220, 1344]	3814	[3877, 1340]
866	[1412, 917]	1849	[18, 1350]	2832	[3221, 1159]	3815	[3878, 2496]
867	[1413, 238]	1850	[2529, 314]	2833	[2402, 450]	3816	[3879, 484]
868	[1414, 1415]	1851	[1259, 2247]	2834	[3222, 419]	3817	[1925, 1479]
869	[1416, 1417]	1852	[2530, 394]	2835	[3223, 321]	3818	[3110, 839]
870	[1418, 1419]	1853	[1136, 462]	2836	[3224, 2153]	3819	[3880, 523]
871	[1420, 632]	1854	[2531, 353]	2837	[3225, 1386]	3820	[1748, 1845]
872	[1421, 1422]	1855	[2532, 397]	2838	[3226, 2485]	3821	[3881, 1604]
873	[587, 695]	1856	[2533, 387]	2839	[3227, 2542]	3822	[535, 770]
874	[1423, 1424]	1857	[2414, 1359]	2840	[2248, 2461]	3823	[3882, 1613]
875	[723, 1425]	1858	[291, 335]	2841	[3228, 1345]	3824	[581, 2058]
876	[1426, 1427]	1859	[2534, 2446]	2842	[916, 2370]	3825	[2791, 1749]
877	[1428, 578]	1860	[2535, 2152]	2843	[3229, 2217]	3826	[1633, 611]
878	[1429, 839]	1861	[2536, 408]	2844	[3230, 2498]	3827	[709, 1832]
879	[1430, 614]	1862	[2537, 2351]	2845	[3231, 2666]	3828	[1697, 1703]
880	[1431, 1432]	1863	[2538, 2409]	2846	[2614, 2414]	3829	[2082, 1804]
881	[1433, 1434]	1864	[2539, 912]	2847	[3232, 2322]	3830	[3883, 1415]
882	[1435, 1436]	1865	[2540, 2276]	2848	[3233, 1279]	3831	[3884, 212]
883	[1437, 1438]	1866	[950, 339]	2849	[3234, 1173]	3832	[3885, 666]
884	[1439, 1440]	1867	[2541, 893]	2850	[68, 1264]	3833	[180, 690]
885	[1441, 1442]	1868	[1356, 2542]	2851	[3235, 1371]	3834	[1636, 1766]
886	[155, 1443]	1869	[2543, 1071]	2852	[3236, 1343]	3835	[3886, 1661]
887	[1444, 1445]	1870	[2544, 954]	2853	[3237, 89]	3836	[2100, 1954]
888	[1446, 1447]	1871	[2545, 2520]	2854	[3238, 2452]	3837	[3887, 1629]
889	[1448, 1449]	1872	[2322, 1244]	2855	[3239, 2497]	3838	[2074, 823]
890	[1450, 703]	1873	[2546, 2194]	2856	[3240, 345]	3839	[3888, 1517]
891	[1451, 626]	1874	[264, 977]	2857	[3241, 2529]	3840	[1640, 1440]
892	[1452, 846]	1875	[2547, 70]	2858	[3242, 1206]	3841	[2946, 1800]
893	[1453, 1454]	1876	[2548, 2549]	2859	[1054, 2630]	3842	[3889, 591]
894	[1455, 1456]	1877	[2467, 2550]	2860	[3243, 2421]	3843	[761, 1532]
895	[1457, 1458]	1878	[2551, 1149]	2861	[2675, 1287]	3844	[3890, 2917]
896	[1459, 692]	1879	[119, 302]	2862	[3244, 2556]	3845	[1995, 3037]
897	[1460, 48]	1880	[2552, 1274]	2863	[1208, 2353]	3846	[3891, 1973]
898	[1461, 1462]	1881	[2453, 2496]	2864	[914, 2182]	3847	[2028, 2992]
899	[1463, 509]	1882	[2553, 1086]	2865	[2433, 2154]	3848	[1903, 192]
900	[471, 1464]	1883	[2520, 2554]	2866	[2331, 1158]	3849	[3892, 1767]
901	[1465, 1466]	1884	[955, 407]	2867	[1228, 396]	3850	[3893, 2097]
902	[1467, 1468]	1885	[2555, 1294]	2868	[3245, 1022]	3851	[1545, 617]

903	[1469, 1470]	1886	[908, 1295]	2869	[3246, 1230]	3852	[3894, 727]
904	[1471, 1472]	1887	[2556, 2557]	2870	[2255, 1383]	3853	[2746, 164]
905	[1473, 1474]	1888	[939, 2168]	2871	[3247, 2275]	3854	[2078, 2736]
906	[1475, 1476]	1889	[2151, 2558]	2872	[3248, 2703]	3855	[2731, 836]
907	[32, 1477]	1890	[2559, 1207]	2873	[3249, 1341]	3856	[3895, 1939]
908	[1478, 1479]	1891	[449, 1217]	2874	[1129, 1027]	3857	[2882, 677]
909	[1480, 1481]	1892	[2560, 1065]	2875	[460, 1007]	3858	[1485, 1463]
910	[1482, 1483]	1893	[1224, 375]	2876	[1319, 2589]	3859	[3144, 741]
911	[1484, 1485]	1894	[2561, 1148]	2877	[3250, 339]	3860	[3451, 2804]
912	[1472, 1486]	1895	[2562, 2339]	2878	[2645, 2290]	3861	[1619, 2924]
913	[1487, 1488]	1896	[16, 907]	2879	[3251, 950]	3862	[3896, 537]
914	[531, 1489]	1897	[2563, 1084]	2880	[3252, 2175]	3863	[2954, 652]
915	[1490, 1491]	1898	[2564, 1291]	2881	[3253, 2425]	3864	[3897, 1736]
916	[1492, 1493]	1899	[401, 1282]	2882	[990, 1185]	3865	[1691, 2050]
917	[1494, 1495]	1900	[2565, 2244]	2883	[3254, 2502]	3866	[3898, 34]
918	[1496, 1418]	1901	[2566, 302]	2884	[3255, 2252]	3867	[2043, 1560]
919	[214, 1497]	1902	[2567, 2568]	2885	[3256, 88]	3868	[3899, 2911]
920	[1498, 1499]	1903	[1003, 1074]	2886	[3257, 2461]	3869	[2965, 1445]
921	[1500, 678]	1904	[2569, 1376]	2887	[2663, 2590]	3870	[3139, 1919]
922	[1501, 1502]	1905	[1252, 1378]	2888	[2276, 402]	3871	[655, 131]
923	[801, 1503]	1906	[362, 1136]	2889	[3258, 1259]	3872	[1491, 1449]
924	[1504, 1505]	1907	[2570, 2307]	2890	[3259, 1330]	3873	[1789, 2712]
925	[1506, 604]	1908	[2571, 2572]	2891	[445, 3260]	3874	[621, 50]
926	[1507, 1508]	1909	[974, 1396]	2892	[2308, 2594]	3875	[3900, 1477]
927	[1509, 1510]	1910	[2573, 2320]	2893	[2317, 2139]	3876	[1521, 1434]
928	[1511, 1512]	1911	[1117, 107]	2894	[3261, 2383]	3877	[1646, 2895]
929	[1513, 213]	1912	[2574, 75]	2895	[2346, 2145]	3878	[3901, 2755]
930	[1514, 1515]	1913	[2575, 1328]	2896	[3262, 1322]	3879	[3902, 2581]
931	[786, 1516]	1914	[2226, 291]	2897	[3263, 2588]	3880	[3903, 2611]
932	[482, 1517]	1915	[2576, 438]	2898	[2381, 2220]	3881	[3904, 2213]
933	[1518, 1519]	1916	[252, 963]	2899	[3264, 2560]	3882	[3905, 2140]
934	[1520, 1521]	1917	[2159, 2252]	2900	[3265, 30]	3883	[3906, 1195]
935	[1522, 1523]	1918	[2577, 2147]	2901	[3266, 941]	3884	[3907, 1221]
936	[1524, 1525]	1919	[1179, 2529]	2902	[3267, 1099]	3885	[3908, 453]
937	[516, 731]	1920	[2578, 1038]	2903	[3268, 109]	3886	[3909, 365]
938	[1526, 614]	1921	[361, 426]	2904	[3269, 2675]	3887	[3910, 1323]
939	[1527, 1528]	1922	[2579, 1075]	2905	[1028, 2161]	3888	[3911, 2604]
940	[1529, 144]	1923	[2580, 2524]	2906	[3270, 1268]	3889	[3912, 1403]
941	[1530, 1436]	1924	[2385, 2222]	2907	[1161, 358]	3890	[3913, 2474]
942	[1531, 1532]	1925	[2581, 1385]	2908	[3271, 1156]	3891	[3914, 957]
943	[521, 1533]	1926	[2582, 2394]	2909	[3272, 2521]	3892	[3915, 971]
944	[1534, 1535]	1927	[2542, 1342]	2910	[3273, 2673]	3893	[3916, 890]
945	[1536, 1537]	1928	[2583, 1147]	2911	[2475, 69]	3894	[3917, 1125]
946	[1464, 1538]	1929	[1312, 2584]	2912	[273, 937]	3895	[3918, 2227]

947	[1539, 1540]	1930	[2585, 1335]	2913	[3274, 2426]	3896	[3919, 903]
948	[1541, 1542]	1931	[254, 1236]	2914	[2395, 1311]	3897	[3920, 1320]
949	[529, 1543]	1932	[2304, 2455]	2915	[3275, 2290]	3898	[3921, 2477]
950	[1544, 1545]	1933	[300, 2498]	2916	[3276, 938]	3899	[3922, 1063]
951	[1546, 485]	1934	[2586, 1406]	2917	[2616, 2385]	3900	[3923, 3184]
952	[36, 714]	1935	[411, 2415]	2918	[3277, 1138]	3901	[3924, 2341]
953	[1547, 1548]	1936	[2587, 450]	2919	[3278, 873]	3902	[2039, 1602]
954	[682, 758]	1937	[2588, 938]	2920	[2604, 2172]	3903	[1598, 1916]
955	[1549, 760]	1938	[315, 422]	2921	[3279, 314]	3904	[492, 750]
956	[1550, 1551]	1939	[2589, 2437]	2922	[379, 1412]	3905	[230, 1715]
957	[711, 646]	1940	[1009, 2463]	2923	[3280, 2214]	3906	[2013, 2128]
958	[1552, 1553]	1941	[2590, 2175]	2924	[904, 911]	3907	[3044, 1459]
959	[1554, 1555]	1942	[1150, 1144]	2925	[3281, 1059]	3908	[2953, 629]
960	[176, 1556]	1943	[2591, 2471]	2926	[3282, 974]	3909	[1540, 597]
961	[1557, 1558]	1944	[922, 2327]	2927	[2179, 1231]	3910	[810, 1709]
962	[1559, 1560]	1945	[2592, 1296]	2928	[3283, 1033]	3911	[569, 2033]
963	[1561, 1562]	1946	[2593, 892]	2929	[1275, 1103]	3912	[1851, 1891]
964	[1563, 1564]	1947	[924, 1162]	2930	[3284, 2422]	3913	[533, 1827]
965	[1565, 1566]	1948	[2594, 326]	2931	[1286, 3171]	3914	[718, 14]
966	[1567, 1568]	1949	[2595, 2484]	2932	[2634, 2532]	3915	[2734, 1584]
967	[1569, 1501]	1950	[2596, 2597]	2933	[3285, 1342]	3916	[498, 778]
968	[1570, 1571]	1951	[313, 1149]	2934	[3218, 1370]	3917	[2920, 3004]
969	[1572, 1573]	1952	[2598, 1109]	2935	[3286, 289]	3918	[1458, 1651]
970	[1574, 38]	1953	[2599, 1028]	2936	[2292, 3155]	3919	[1740, 1649]
971	[1575, 1576]	1954	[972, 380]	2937	[2464, 922]	3920	[2808, 135]
972	[1577, 710]	1955	[2600, 2579]	2938	[3287, 1286]	3921	[2912, 2984]
973	[1578, 823]	1956	[92, 2434]	2939	[453, 1094]	3922	[3925, 1716]
974	[1579, 1580]	1957	[2601, 317]	2940	[3288, 2456]	3923	[3025, 673]
975	[832, 1581]	1958	[898, 2581]	2941	[2284, 1224]	3924	[1783, 745]
976	[834, 1582]	1959	[2602, 2603]	2942	[2357, 1406]	3925	[3926, 1119]
977	[1583, 1584]	1960	[1060, 2604]	2943	[3289, 1082]	3926	[3927, 2054]
978	[1585, 1586]	1961	[2605, 968]	2944	[2642, 1173]	3927	[3928, 2189]
979	[755, 1587]	1962	[1088, 2216]	2945	[1261, 1310]	3928	[2, 2802]
980	[757, 39]	1963	[2606, 2532]	2946	[2320, 1355]		
981	[1588, 1589]	1964	[2194, 1164]	2947	[3290, 2367]		
982	[1590, 1591]	1965	[2607, 369]	2948	[3291, 1154]		

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	655	1	1310	1	1965	1	2620	1	3275	0
1	0	656	0	1311	1	1966	0	2621	1	3276	1
2	0	657	1	1312	1	1967	0	2622	1	3277	1
3	0	658	0	1313	1	1968	0	2623	0	3278	0
4	0	659	0	1314	1	1969	0	2624	1	3279	1

5	0	660	1	1315	1	1970	0	2625	0	3280	0
6	1	661	0	1316	0	1971	0	2626	0	3281	0
7	0	662	0	1317	1	1972	1	2627	0	3282	1
8	1	663	1	1318	1	1973	1	2628	0	3283	0
9	0	664	0	1319	1	1974	0	2629	0	3284	0
10	1	665	0	1320	0	1975	0	2630	0	3285	1
11	0	666	0	1321	1	1976	0	2631	1	3286	0
12	0	667	1	1322	1	1977	0	2632	0	3287	1
13	1	668	1	1323	1	1978	1	2633	1	3288	0
14	1	669	0	1324	1	1979	1	2634	1	3289	0
15	0	670	0	1325	1	1980	0	2635	1	3290	1
16	0	671	0	1326	0	1981	1	2636	0	3291	0
17	1	672	0	1327	1	1982	1	2637	0	3292	0
18	0	673	1	1328	0	1983	0	2638	1	3293	1
19	0	674	1	1329	1	1984	1	2639	1	3294	0
20	0	675	0	1330	0	1985	1	2640	1	3295	1
21	1	676	1	1331	0	1986	0	2641	0	3296	0
22	0	677	1	1332	0	1987	1	2642	1	3297	1
23	0	678	1	1333	1	1988	1	2643	0	3298	0
24	0	679	0	1334	1	1989	1	2644	1	3299	1
25	0	680	0	1335	0	1990	0	2645	1	3300	0
26	0	681	0	1336	0	1991	0	2646	1	3301	1
27	1	682	0	1337	0	1992	1	2647	1	3302	1
28	0	683	1	1338	0	1993	0	2648	1	3303	1
29	1	684	1	1339	0	1994	0	2649	1	3304	1
30	0	685	1	1340	0	1995	1	2650	1	3305	1
31	0	686	1	1341	1	1996	0	2651	1	3306	1
32	0	687	0	1342	1	1997	0	2652	1	3307	1
33	0	688	1	1343	1	1998	1	2653	1	3308	0
34	0	689	1	1344	1	1999	1	2654	0	3309	0
35	1	690	0	1345	1	2000	1	2655	1	3310	0
36	1	691	0	1346	1	2001	0	2656	0	3311	0
37	0	692	0	1347	1	2002	0	2657	0	3312	1
38	1	693	0	1348	1	2003	0	2658	0	3313	0
39	0	694	0	1349	1	2004	0	2659	0	3314	1
40	0	695	0	1350	1	2005	1	2660	1	3315	1
41	0	696	1	1351	1	2006	1	2661	0	3316	0
42	0	697	0	1352	0	2007	0	2662	0	3317	0
43	1	698	1	1353	0	2008	0	2663	0	3318	1
44	1	699	1	1354	1	2009	0	2664	1	3319	1
45	0	700	1	1355	1	2010	0	2665	1	3320	1
46	1	701	0	1356	0	2011	1	2666	1	3321	1
47	0	702	0	1357	0	2012	1	2667	1	3322	0
48	1	703	1	1358	0	2013	0	2668	1	3323	0

49	0	704	0	1359	1	2014	0	2669	1	3324	0
50	0	705	1	1360	1	2015	0	2670	1	3325	0
51	0	706	0	1361	1	2016	0	2671	0	3326	0
52	0	707	1	1362	1	2017	0	2672	1	3327	0
53	0	708	1	1363	0	2018	0	2673	1	3328	0
54	0	709	0	1364	0	2019	1	2674	1	3329	0
55	1	710	1	1365	1	2020	1	2675	1	3330	1
56	0	711	1	1366	0	2021	1	2676	0	3331	1
57	0	712	1	1367	0	2022	1	2677	0	3332	0
58	0	713	1	1368	1	2023	0	2678	0	3333	1
59	1	714	0	1369	1	2024	1	2679	1	3334	1
60	0	715	1	1370	1	2025	0	2680	0	3335	1
61	0	716	0	1371	1	2026	1	2681	0	3336	1
62	0	717	1	1372	1	2027	1	2682	0	3337	1
63	0	718	0	1373	0	2028	1	2683	1	3338	0
64	0	719	1	1374	0	2029	1	2684	1	3339	1
65	0	720	1	1375	0	2030	1	2685	0	3340	1
66	1	721	1	1376	0	2031	1	2686	1	3341	0
67	0	722	0	1377	0	2032	1	2687	1	3342	1
68	1	723	1	1378	1	2033	1	2688	1	3343	1
69	0	724	1	1379	0	2034	1	2689	0	3344	0
70	1	725	1	1380	1	2035	1	2690	1	3345	1
71	1	726	1	1381	1	2036	1	2691	0	3346	0
72	0	727	0	1382	1	2037	0	2692	0	3347	1
73	1	728	0	1383	1	2038	0	2693	1	3348	0
74	1	729	1	1384	0	2039	0	2694	1	3349	1
75	0	730	0	1385	1	2040	1	2695	0	3350	1
76	0	731	1	1386	1	2041	0	2696	0	3351	0
77	1	732	1	1387	1	2042	0	2697	0	3352	1
78	0	733	0	1388	0	2043	1	2698	0	3353	1
79	0	734	1	1389	1	2044	0	2699	1	3354	0
80	0	735	0	1390	0	2045	0	2700	1	3355	0
81	0	736	0	1391	1	2046	1	2701	1	3356	0
82	1	737	0	1392	0	2047	1	2702	1	3357	1
83	0	738	1	1393	0	2048	1	2703	1	3358	0
84	1	739	1	1394	0	2049	0	2704	0	3359	1
85	0	740	0	1395	0	2050	1	2705	1	3360	0
86	1	741	1	1396	1	2051	0	2706	0	3361	0
87	1	742	1	1397	0	2052	0	2707	1	3362	1
88	0	743	0	1398	1	2053	0	2708	0	3363	0
89	1	744	0	1399	1	2054	0	2709	0	3364	0
90	1	745	0	1400	0	2055	0	2710	0	3365	0
91	0	746	1	1401	1	2056	1	2711	1	3366	1
92	0	747	1	1402	1	2057	1	2712	0	3367	1

93	1	748	0	1403	0	2058	0	2713	1	3368	1
94	0	749	1	1404	1	2059	1	2714	0	3369	1
95	0	750	0	1405	0	2060	1	2715	0	3370	0
96	0	751	0	1406	1	2061	1	2716	0	3371	0
97	1	752	1	1407	0	2062	1	2717	0	3372	0
98	1	753	1	1408	0	2063	1	2718	0	3373	1
99	0	754	0	1409	1	2064	0	2719	0	3374	0
100	0	755	0	1410	1	2065	1	2720	1	3375	0
101	0	756	0	1411	0	2066	1	2721	0	3376	1
102	0	757	0	1412	1	2067	1	2722	1	3377	0
103	0	758	0	1413	0	2068	1	2723	1	3378	0
104	1	759	0	1414	1	2069	1	2724	0	3379	0
105	0	760	0	1415	1	2070	1	2725	0	3380	0
106	1	761	0	1416	0	2071	0	2726	1	3381	0
107	0	762	1	1417	1	2072	0	2727	0	3382	0
108	1	763	0	1418	0	2073	1	2728	0	3383	0
109	0	764	0	1419	0	2074	1	2729	1	3384	0
110	0	765	0	1420	0	2075	0	2730	0	3385	0
111	1	766	1	1421	0	2076	0	2731	1	3386	1
112	1	767	1	1422	0	2077	1	2732	1	3387	1
113	0	768	0	1423	1	2078	1	2733	1	3388	1
114	0	769	0	1424	0	2079	1	2734	1	3389	0
115	1	770	1	1425	1	2080	0	2735	0	3390	0
116	0	771	1	1426	1	2081	1	2736	0	3391	1
117	1	772	0	1427	0	2082	0	2737	0	3392	1
118	1	773	1	1428	1	2083	0	2738	1	3393	1
119	1	774	0	1429	0	2084	0	2739	0	3394	1
120	0	775	0	1430	0	2085	1	2740	0	3395	0
121	1	776	0	1431	1	2086	0	2741	1	3396	0
122	0	777	1	1432	1	2087	0	2742	1	3397	0
123	0	778	1	1433	1	2088	0	2743	1	3398	0
124	0	779	1	1434	0	2089	1	2744	1	3399	0
125	1	780	0	1435	1	2090	1	2745	1	3400	1
126	0	781	1	1436	1	2091	0	2746	0	3401	0
127	1	782	1	1437	1	2092	0	2747	0	3402	1
128	0	783	1	1438	0	2093	0	2748	1	3403	0
129	1	784	0	1439	0	2094	0	2749	0	3404	1
130	0	785	1	1440	1	2095	0	2750	0	3405	1
131	1	786	0	1441	0	2096	1	2751	0	3406	0
132	1	787	1	1442	0	2097	1	2752	1	3407	0
133	1	788	1	1443	1	2098	0	2753	0	3408	0
134	0	789	1	1444	1	2099	1	2754	1	3409	0
135	0	790	1	1445	1	2100	0	2755	1	3410	1
136	1	791	1	1446	0	2101	0	2756	1	3411	0

137	0	792	0	1447	1	2102	1	2757	0	3412	1
138	0	793	0	1448	1	2103	1	2758	1	3413	1
139	0	794	1	1449	1	2104	1	2759	1	3414	1
140	1	795	1	1450	1	2105	0	2760	0	3415	0
141	1	796	0	1451	0	2106	1	2761	0	3416	1
142	1	797	1	1452	1	2107	1	2762	0	3417	1
143	1	798	0	1453	0	2108	1	2763	1	3418	1
144	0	799	0	1454	1	2109	0	2764	1	3419	1
145	1	800	0	1455	0	2110	1	2765	1	3420	1
146	1	801	1	1456	0	2111	1	2766	1	3421	1
147	1	802	0	1457	1	2112	0	2767	0	3422	1
148	1	803	1	1458	1	2113	1	2768	0	3423	0
149	1	804	1	1459	0	2114	1	2769	0	3424	0
150	0	805	1	1460	1	2115	0	2770	0	3425	0
151	1	806	0	1461	1	2116	0	2771	1	3426	0
152	0	807	1	1462	1	2117	0	2772	0	3427	1
153	0	808	1	1463	1	2118	0	2773	0	3428	1
154	1	809	1	1464	1	2119	1	2774	0	3429	1
155	1	810	0	1465	0	2120	1	2775	0	3430	1
156	1	811	0	1466	0	2121	1	2776	0	3431	1
157	0	812	0	1467	1	2122	1	2777	0	3432	0
158	1	813	1	1468	1	2123	1	2778	1	3433	0
159	0	814	0	1469	0	2124	0	2779	1	3434	1
160	1	815	1	1470	1	2125	1	2780	0	3435	0
161	0	816	0	1471	0	2126	1	2781	0	3436	1
162	1	817	0	1472	1	2127	1	2782	1	3437	0
163	1	818	1	1473	0	2128	0	2783	1	3438	1
164	1	819	0	1474	0	2129	0	2784	1	3439	1
165	0	820	0	1475	1	2130	1	2785	0	3440	0
166	1	821	1	1476	1	2131	0	2786	1	3441	0
167	1	822	0	1477	0	2132	1	2787	1	3442	1
168	0	823	1	1478	0	2133	1	2788	0	3443	1
169	0	824	0	1479	0	2134	0	2789	0	3444	0
170	0	825	1	1480	0	2135	0	2790	0	3445	1
171	1	826	1	1481	0	2136	0	2791	0	3446	0
172	1	827	1	1482	1	2137	0	2792	1	3447	1
173	1	828	1	1483	0	2138	0	2793	0	3448	0
174	1	829	0	1484	1	2139	1	2794	1	3449	0
175	0	830	0	1485	1	2140	1	2795	0	3450	0
176	0	831	0	1486	1	2141	1	2796	1	3451	0
177	1	832	1	1487	0	2142	0	2797	0	3452	0
178	0	833	0	1488	0	2143	0	2798	0	3453	0
179	1	834	1	1489	1	2144	0	2799	0	3454	1
180	0	835	0	1490	1	2145	0	2800	0	3455	0

181	0	836	1	1491	0	2146	0	2801	0	3456	0
182	0	837	1	1492	1	2147	0	2802	0	3457	0
183	0	838	0	1493	1	2148	1	2803	1	3458	0
184	0	839	1	1494	0	2149	0	2804	1	3459	1
185	1	840	1	1495	0	2150	1	2805	1	3460	0
186	1	841	1	1496	0	2151	1	2806	0	3461	1
187	0	842	0	1497	0	2152	0	2807	1	3462	1
188	1	843	1	1498	0	2153	0	2808	1	3463	0
189	0	844	1	1499	0	2154	1	2809	0	3464	0
190	0	845	0	1500	0	2155	0	2810	0	3465	0
191	0	846	1	1501	0	2156	0	2811	0	3466	0
192	0	847	1	1502	1	2157	1	2812	1	3467	1
193	1	848	1	1503	0	2158	1	2813	1	3468	0
194	1	849	1	1504	0	2159	0	2814	1	3469	0
195	1	850	0	1505	0	2160	1	2815	1	3470	1
196	1	851	0	1506	1	2161	1	2816	0	3471	0
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201	0	856	1	1511	0	2166	1	2821	1	3476	0
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205	0	860	1	1515	0	2170	1	2825	0	3480	1
206	0	861	0	1516	1	2171	1	2826	1	3481	0
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208	0	863	0	1518	0	2173	1	2828	1	3483	0
209	0	864	1	1519	0	2174	0	2829	1	3484	1
210	0	865	1	1520	0	2175	1	2830	1	3485	1
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212	1	867	0	1522	1	2177	0	2832	1	3487	0
213	0	868	1	1523	0	2178	1	2833	0	3488	0
214	0	869	0	1524	0	2179	0	2834	0	3489	1
215	1	870	0	1525	1	2180	1	2835	0	3490	0
216	0	871	0	1526	1	2181	0	2836	1	3491	0
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219	0	874	1	1529	0	2184	0	2839	1	3494	0
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221	1	876	1	1531	1	2186	0	2841	1	3496	1
222	0	877	1	1532	0	2187	1	2842	1	3497	1
223	1	878	0	1533	0	2188	0	2843	0	3498	0
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225	0	880	1	1535	0	2190	1	2845	0	3500	0
226	0	881	1	1536	1	2191	1	2846	1	3501	1
227	0	882	1	1537	1	2192	1	2847	0	3502	1
228	0	883	1	1538	0	2193	0	2848	1	3503	0
229	1	884	0	1539	0	2194	0	2849	0	3504	0
230	0	885	0	1540	1	2195	1	2850	1	3505	1
231	0	886	1	1541	1	2196	0	2851	1	3506	1
232	0	887	1	1542	1	2197	0	2852	0	3507	0
233	1	888	0	1543	1	2198	0	2853	1	3508	0
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235	1	890	1	1545	0	2200	0	2855	0	3510	1
236	1	891	0	1546	0	2201	0	2856	1	3511	1
237	0	892	1	1547	1	2202	1	2857	1	3512	1
238	0	893	0	1548	1	2203	1	2858	1	3513	0
239	1	894	0	1549	0	2204	0	2859	1	3514	0
240	1	895	1	1550	1	2205	1	2860	0	3515	1
241	0	896	0	1551	1	2206	0	2861	1	3516	1
242	1	897	1	1552	0	2207	0	2862	0	3517	0
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244	0	899	1	1554	1	2209	1	2864	1	3519	1
245	0	900	0	1555	0	2210	1	2865	0	3520	0
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253	0	908	0	1563	1	2218	1	2873	1	3528	1
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261	1	916	1	1571	0	2226	0	2881	1	3536	1
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263	1	918	0	1573	1	2228	0	2883	1	3538	1
264	1	919	0	1574	1	2229	1	2884	1	3539	0
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266	0	921	0	1576	1	2231	0	2886	1	3541	0
267	1	922	0	1577	0	2232	0	2887	0	3542	1
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271	0	926	0	1581	1	2236	0	2891	0	3546	0
272	0	927	0	1582	0	2237	1	2892	0	3547	1
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276	1	931	0	1586	0	2241	1	2896	0	3551	0
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293	1	948	1	1603	0	2258	1	2913	0	3568	0
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295	0	950	0	1605	0	2260	0	2915	0	3570	0
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306	0	961	1	1616	0	2271	1	2926	1	3581	1
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339	1	994	0	1649	0	2304	1	2959	1	3614	0
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356	0	1011	1	1666	0	2321	1	2976	0	3631	1

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435	1	1090	1	1745	1	2400	1	3055	1	3710	0
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