

Tables of linear cellular automata for minimal weight primitive polynomials of degrees up to 300

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Abstract

This technical report contains a table of linear cellular automata for certain primitive polynomials. For each degree from two to 300, the table lists a primitive polynomial of minimal weight (least possible number of non-zero coefficients), and its corresponding cellular automaton. The polynomials are from the tables compiled by Bardell, McAnney and Savir, which can be found in [1]. The table is computed using the recent algorithm due to Cattell and Muzio [2]. The time required to find each cellular automaton is also included.

1. Introduction

Cellular automata (CAs) have recently been explored for pattern generation and data compaction (signature analysis). Some have been found to have very good randomness properties, based on standard randomness tests, providing better pseudo-random patterns than linear feedback shift registers (LFSRs). CAs often have lower probability of aliasing than LFSRs when used as data compactors [3,6]. Also, the possible use of CAs for delay fault testing is explored in [3,6]. See [4] for an introduction to CAs.

CAs are linear finite state machines, and so they have *characteristic* polynomials from which some of their properties can be determined. Given a CA, it is very easy to calculate its characteristic polynomial (n shift-and-add operations)[4]. There have been two major open questions about the characteristic polynomials of CAs. Firstly, given a polynomial, can we efficiently calculate its corresponding CA, if it exists? Secondly, do all irreducible polynomials have corresponding CAs? The first question has been answered by Cattell and Muzio in [2], where a fast algorithm for determining the CA for a given polynomial is presented.

2. The table

The table has three columns: a polynomial, the time required by the program to find its corresponding CA, and its CA. The following is a more detailed description of each column.

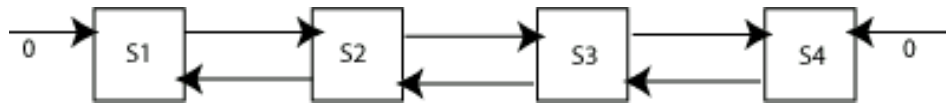
The tables list one polynomial for each degree from two to 300. The *weight* of a polynomial is the number of non-zero coefficients. Each polynomial is *lowest-weight* primitive, meaning that there is no primitive polynomial of that degree with a lower weight. The polynomials are from [1], and are represented by listing their non-zero coefficients. For example, the entry 31 3 0 represents the polynomial $x^{31} + x^3 + 1$.

The second column lists the time that the program required to find the CA for the polynomial, measured in seconds. The program is written in C++, and was run on a Sun 3/280.

The third column lists the main diagonal of the CA corresponding to the polynomial. For example, the entry 0101 represents the CA

$$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 1 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \end{bmatrix}$$

This machine is shown in the following picture:



where the next state computations for the cells are:

$$\begin{aligned} s_1^+ &= 0 + s_2 \\ s_2^+ &= s_1 + s_2 + s_3 \\ s_3^+ &= s_2 + s_4 \\ s_4^+ &= s_3 + s_4 + 0 \end{aligned}$$

See [4] for more information on the next state computation of a CA.

References

- [1] P.H. Bardell, W. H. McAnney, J. Savir, *Built-In Test for VLSI: Pseudorandom Techniques*, John Wiley & Sons, 1987.
- [2] C. Cattell, J.C. Muzio, "Synthesis of One-Dimensional Linear Hybrid Cellular Automata," *IEEE Transactions on CAD*, Vol. 15, no. 3, pp. 325-335, 1996.
- [3] D. M. Miller, W. Pries S. Zhang and, and R. D. McLeod, "Estimating aliasing in CA and LFSR based signature registers," *Proc. IEEE ICCD*, pp. 157-160, 1990.
- [4] M. Serra, T. Slater, J.C. Muzio, and D.M. Miller, "The analysis of one dimensional linear cellular automata and their aliasing properties," *IEEE Transactions on CAD*, Vol. 9, no. 7, July 1990.
- [5] S. Zhang and D. M. Miller, "A comparison of LFSR and cellular automata BISTs," *Proc. CCVLSI90*, pp. 8.4.1-8.4.9, 1990.

Poly	time	CA
2,1,0	0.01	10
3,1,0	0.01	110
4,1,0	0.01	0101
5,2,0	0.00	01111
6,1,0	0.01	000110
7,1,0	0.01	1011001
8,6,5,1,0	0.03	01001011
9,4,0	0.01	010011100
10,3,0	0.01	1111000011
11,2,0	0.01	01000011010
12,7,4,3,0	0.05	100101010011
13,4,3,1,0	0.01	0111001110110
14,12,11,1,0	0.06	01000111001111
15,1,0	0.01	100000011000001
16,5,3,2,0	0.05	0001111001001000
17,3,0	0.03	10011000110011001
18,7,0	0.05	110001000000010011
19,6,5,1,0	0.05	1101011101101001011
20,3,0	0.06	01101011100001010110
21,2,0	0.03	010010011001010010010
22,1,0	0.10	0100011010101101100010
23,5,0	0.03	01011010101100101011010
24,4,3,1,0	0.10	110100111100100111001011
25,3,0	0.05	1010000011111011100000101
26,8,7,1,0	0.08	11001101111101111010110011
27,8,7,1,0	0.05	000110100110001011101011000
28,3,0	0.10	0101101110000001100111011010
29,2,0	0.05	01001000100101111100100010010
30,16,15,1,0	0.11	101000100111001101101010000101
31,3,0	0.05	1111101101100001100011011011111
32,28,27,1,0	0.13	00001100010001110000110000000110
33,13,0	0.06	111001011001000110000100110100111
34,15,14,1,0	0.18	1000111110101101001101000011110001
35,2,0	0.06	11101000101110011110001110100010111
36,11,0	0.18	010010010001100001011111000010010010
37,12,10,2,0	0.06	1000100010110100000000110010100010001
38,6,5,1,0	0.25	11111011011100010000010000111011011111
39,4,0	0.08	01010111010011110001111111001011101010
40,21,19,2,0	0.16	1100110000011000000100010100000100110011
41,3,0	0.08	01111100100100001011101010000100100111110
42,23,22,1,0	0.23	111011101111111010101100010101000001110111
43,6,5,1,0	0.08	0011010100010100011001100000010100010101100
44,27,26,1,0	0.25	01110101111100010000011101010110010000101110
45,4,3,1,0	0.10	001110001110111111010011100111111011100011100
46,21,20,1,0	0.31	0111101000001010000001110111001101100001011110
47,5,0	0.10	10010110101010000110110111101100001010101101001
48,28,27,1,0	0.28	010100000001111101000100101101111001111000001010
49,9,0	0.10	1000010000010010101101111011011010100100000100001
50,27,26,1,0	0.30	01111110111111111101000010011111011010001101111110

Poly	time	CA
76,36,35,1,0	0.76	0111100111110100001100111101101110000011110101111 111101001000010111110011110
77,31,30,1,0	0.20	1111010000110111010101111101110000111000001111010 1001101010101110110000101111
78,20,19,1,0	0.88	1001001011011010101000011011010101011111101011010 11101100001010101101101001001
79,9,0	0.21	0111011100100111111111001101101000010101110100001 01101100111111110010011101110
80,38,37,1,0	0.90	0101011001000010000010100011001110111101111010101 1011101111000000100001001101010
81,4,0	0.23	0010001000100101110000110111110110100000100100101 10111110110000111010010001000100
82,38,35,3,0	1.00	010000110010001101111111000011100001010100101010 001001100101111101100010011000010
83,46,45,1,0	0.25	110111100000000011111111010110101111001101111111 100011011001001000000000001111011
84,13,0	0.83	1100101101101000110100001001001101100110110111101 01011001001000010110001011011010011
85,28,27,1,0	0.23	1001100100000101011101111110100111101101111011100 001001011111111011101010000010011001
86,13,12,1,0	0.93	0111010010011110111100101001001110010111110100001 0000111001001010011110111100100101110
87,13,0	0.23	1010010001000110100001011000101110010011001100011 00100111010001101000010110001000100101
88,72,71,1,0	1.14	0001101101011111110001111011001100100100111001011 001000110011110110101000000000001011000
89,38,0	0.25	0001010111010001000001000110101100100011001111000 0111010100101001001000001000101110101000
90,19,18,1,0	1.14	1000100011100000001000111000100101011001101010111 11101011010010001110001000000011100010001
91,84,83,1,0	0.26	0101000100001111101011101010110011111101100110010 000111111111000101101100010111011010101110
92,13,12,1,0	0.96	0101011110000001100001010000010010100000111110000 1010100010100100000101000011000000111101010
93,2,0	0.25	00001001001001000011100011011010110111111110101001 10111111110110101101100011100010010010010000
94,21,0	1.05	1110110101101110111111001001100111110111110100110 101110001011110011001001111110111011010110111
95,11,0	0.26	0100101001000110101100000000000110011111010101011 1010101111100110000000000011010110001001010010
96,49,47,2,0	1.31	1111011110110000001000100110110111010110010001101 11000110101001100101011100001000000110111101111
97,6,0	0.28	0011111111001010001101000011100010000001111001010 111101111000000100011100001011000101001111111100
98,11,0	1.12	1011110110010011000111101110011001000110101101101 0101010010110001001100111011110001100100110111101
99,47,45,2,0	0.31	1000110011110101100101101100101101011101010010000 0110010010101110101101001101101001101011110011000 1
100,37,0	1.19	11111111110010000000111100101111111000110101100111 0100111110010000111001110100111100000001001111111 11

poly	time	CA
101,7,6,1,0	0.30	1111011001100010110110010010100111101000111010 0101101110101110001011110010100100110110100011 001101111
102,77,76,1,0	1.26	1011111001100000000001111110101110110011110110 0010111000111100101001101110010101101010100111 1001111101
103,9,0	0.31	0111111011110101000100010101000110100100011111 0101011101011111000100101100010101000100010101 11101111110
104,11,10,1,0	1.60	1010111111001101010111111100111000011100110011 0001100100110100110011100001110011111110101011 001111110101
105,16,0	0.30	0000011000110111101010011010000010100010000100 0000100111011010000010001010000010110010101111 0110001100000
106,15,0	1.35	1001101100010000100100010000101000110110000000 0010011111000101000001101100010100001000100100 00100011011001
107,65,63,2,0	0.33	1010101000010011101110011000101110010111010000 1101101111110110000101110100111010001100111011 100100001010101
108,31,0	1.42	0101001100001010110000111011010010000100100111 0001101011100010100111000000010010110111000011 0101000011001010
109,7,6,1,0	0.33	0111100110000000010011000000000001100110101011 000010010000000001101010110011000000000011001 00000000110011110
110,13,12,1,0	1.48	0111000100111111011001011000000100001100001110 1000001000001111110111000011000010000001101001 101111110010001110
111,10,0	0.35	1011011001111111110010101001111110011001111011 0001000110111000000110111100110011111100101010 0111111111001101101
112,45,43,2,0	1.56	0101001110000011100011000110100010100010010111 0000101000010010111010111011101110000101100011 00011100000111001010
113,9,0	0.40	0110100110011011000111101110101101111101111000 1111110100110101111110001111011111011010111011 110001101100110010110
114,82,81,1,0	1.85	0110111111110000111000100101000011100110110111 110010011111100010001010100000001100110100110 000000100011111110110
115,15,14,1,0	0.36	0010011100110111010000100011010101100011010001 0111011011000010000011010001011000110101011000 10000101110110011100100
116,71,70,1,0	1.71	1011000100100101011110111010100111111110110000 0001110100110001001011111100011011111011010101 111111101010010010001101
117,20,18,2,0	0.38	1111110100100010001100000001011010110011011100 1000011011010011000010111001110110011010110100 0000011000100010010111111
118,33,0	1.75	1011011110000001101111100001010101100011111110 1101111110100101010100001000000111000110101010 00011111011000000111101101

poly	time	CA
119,8,0	0.36	1100111010000100011011010111100101011001001110 1010010001100010111001001010111001001101010011 110101101100010000101110011
120,118,111,7,0	1.96	0100011010001011100100110000000010011100101000 0001001011100010111100000100100000001010011100 1001101101010011010001011010
121,18,0	0.38	1001001011101100011001101011011111011101100000 1100010110110101000010011001100000110111011111 01101011001100011011101001001
122,60,59,1,0	1.83	1010010100010011010000100111110001100110101101 110001011011100101100111011111101101100111011 111110010000101100100010100101
123,2,0	0.40	00001001111110011000101010110111110111001111010 1101110010001100101000100111011010111100111011 11011010101000110011111110010000
124,37,0	1.89	1000011100011000111001111110111110101100101011 101100000010010D011100001000100000100100110101 11110111111001110001100011100001
125,108,107,1,0	0.45	0100010100000000111101000111101111111110101000 001011001110110011010001111101011111110111001 001111100110000111010101100100010
126,37,36,1,0	1.98	1000011111101110001011000110101000100011110111 1110111011111010011101010101010101100011110001 0001010110001101000111011111100001
127,1,0	0.38	10000000000000000000D0000000000000000000000000000 000000000000000000110000000000000000000000000000 0001
128,29,27,2,0	2.04	0100100010001000001011111011110101100111000000 1100011010011110100111101001111001110000001110 011010111101111101000001000100010010
129,5,0	0.45	0010111110101110111111001001111101110110111110 0100100110101001011001001010110010010011111011 0111011111001001111110111010111110100
130,3,0	2.10	0001111010011001100101010101101110101011101101 0100100111110011011011110011111001001010110111 01010111011010101010011001100101111000
131,48,47,1,0	0.46	111011101100001110101010110010101G010111000111 0000101100101001001001000111011111100000100011 110100101010011010101011100001101110111
132,29,0	2.23	100011111011100000010010101110000000011101100 0110101101111101011101110100111100000110001101 1110000000011101010010000001110111110001
133,52,51,1,0	0.50	0010100101110110111100000101110001000011110100 0010111011111111000000001000010111100111001110 00100001000111010000011110110111010010100
134,57,0	2.27	0110100100010110011110101110100111110001000001 0100000010111100111101100110100110011010011101 010010111110010111010111100110100010010110
135,11,0	0.48	0110101010111111101101110000000011010111000011 1010110110100110000101110000110010110110101110 0001110101100000000111011011111110101010110
136,126,125,1,0	2.93	0110000011100111010000001101101000011000010101 1110100100010000100011011000101001001101100111 00100010101101010111000111100110010001110110

poly	time	CA
137,21,0	0.50	0100000000111001110010010001001110111001010010 1110110000111000111100110111100011100001101110 100101001110111001000100100111001110000000010
138,8,7,1,0	2.43	0110110010000111010011111000110100010010110101 101010110000000000101101101000000000011010101 1010110100100010110001111100101110000100110110
139,8,5,3,0	0.50	0110111000001010010110101000100010100101011110 0011110001110010010000101001110010011100011110 0011110101001010001000101011010010100000111011 0
140,29,0	2.52	1001100101110110110100111010010110010101010100 010101111111000011110101101011001011110111010 1000101010101001101001011100101101101110100110 01
141,32,31,1,0	0.51	1011011101110001111110001001111110001010000011 1100010011110001101101001100111110101101110100 0111100000101000111111001000111111000111011101 101
142,21,0	2.60	1100101001100100110010101000101000110110100001 1001001111010111110111000000010011010010111100 1001100001011011000101000101010011001001100101 0011
143,21,20,1,0	0.55	1100110010011111000000110111001000110111010111 1010111111000001110101100000000011011000011111 1010111101011101100010011101100000011111001001 10011
144,70,69,1,0	2.75	1101010000111111011100010101011011001001000010 1101011101010110100110111101000110000100111001 1011011011001110001101101010100011101111110000 101011
145,52,0	0.55	0010000011010101100001100110010010110000110100 0010101110111101101101011011100001101001001101 0000001101011000011010010011001100001101010110 0000100
146,60,59,1,0	2.81	1011100100011000010110100001101010001111001100 0110010110001100001110100000101011111000001000 0111101010100011110001010110000101101000011000 10011101
147,38,37,1,0	0.56	1011000101000001011100111110101101101100000011 0000101010101010110001000100110101111110000111 1110100001100000011011011010111110011101000001 010001101
148,27,0	2.96	0101100111110110101011011010001001001110111001 1011110000010001010101000001111110011000011010 0000111101100111011100100100010110110101011011 1110011010
149,110,109,1,0	0.61	1100001111010100001101111101010100001100010101 0000011100101000011010110101110011000000000010 010110010010111010001100010111000010D000000101 01111000011
150,53,0	2.89	0010001011111001011101000101011111111010000000 1010011010110111101101111111001001001110110000 0000001110110000000101111111101010001011101001 111101000100

poly	time	CA
151,3,0	0.57	1101111100110101100000101000011010011000011110 011010100000111100101110111110111101110100111 1000001010110011110000110010110000101000001101 0110011111011
152,66,65,1,0	3.06	0111000100000101100010011011100001011010000000 0111100111101110111001000010101101101000101000 0000111011101000010001011010000111011001000110 10000010001110
153,1,0	0.60	0100011100011001110011101101101111101000000100101 0011001101101011110000101000101110001010000111 101011011001100101001000000101111011011100111 001100011100010
154,129,127,2,0	3.25	11101001111111111101011000000001001101011111011 0111110101100011000001111110010011100011100010 0011110000011100100100100000101000010100010011 0001011110010111
155,32,31,1,0	0.63	1000000100110001111110010110101111101111010110 10110110011011011010101011111000100101101100100 0111101100110110101101011110111110101101001111 11000110010000001
156,116,115,1,0	3.29	1000111111100011110011011000111110100100111000 0101100000100110110010101110101000010010000111 1101110101110100010010110100100001110110011010 111100011111110001
157,27,26,1,0	0.61	011001000010001000010010001001001000100001001100 1010011000101011011000001000110000110110001100 0101101010001100101001100100001001010010001001 0000100010000100110
158,27,26,1,0	3.62	0111000111001011011110110001111001100011001110 0010000010010001011110000110101101101101100010 1010100010010000010001110011000110011110001101 11101101001110001110
159,31,0	0.61	0111100000011101010011010001001010000010011000 0101100010100001110101000011000101110001100001 0101110000101000110100001100100000101001000101 100101011100000011110
160,19,18,1,0	4.17	1110001000011001000111010110111001101110011100 1100010010111111110001000000000000101111011010 1000111111110100100011001110011101100111011010 1110001001100001000111
161,18,0	0.68	1100110011110011001001010101000011010010000011 0011101010101011001010101000110101111010100000 1010100110101010101110011000001001011000010101 01001001100111100110011
162,88,87,1,0	4.36	1111001110100100110001110111100000000000000011 0000011100110001000001001111011011000010101000 0100110110010011100010101100110111000000011110 111000110010010111001111
163,60,59,1,0	0.71	0110100111001011100100101010101011110011110010 0100110011010010111010111001100111110000000001 0111011001001100111000010010011110011110101010 1010010011101001110010110

poly	time	CA
164,14,13,1,0	3.70	011000001010101111011001010101011000010111100001 010111010110101001001100001010111001101000000011 001001010110101110101000011110100001101010101001 10111101010100000110
165,31,30,1,0	0.70	011111001110111100011000010010010100111111101110 010100000000111000110111000110101110001110001100 110000111000000001010011101111111001010010010000 110001111011100111110
166,39,38,1,0	4.50	110100011001101100010011001101011010101101000100 000101101101000010110010010100000101001000011010 011001010010110110100000100010110101011010110011 0010001101100110001011
167,6,0	0.73	101000011001000111010100001110101110000101101001 101011101110011101001101110010101011011110100111 011001011100111011101011001011010000111010111000 01010111000100110000101
168,17,15,2,0	4.66	111101101111011111000011111011110010011001110010 010010001100101101100100100001101011100101010101 001001101101001100010010010011100110010011110111 110000111110111101101111
169,34,0	0.73	010010110000001101011001100001000101110001000111 001100111000001000010111111110001100101011000111 010000100010000011100110011100010001110100010000 1100110101100000011010010
170,23,0	4.00	110111101110100111101011011100001011011110011110 101001110011100010001100011100001111101110000011 010011000100011100111001010111100111101101000011 10110101111001011101111011
171,42,3,1,0	0.80	000000010101110110111000110011101001100011001011 011010111100010001000110000100101111000110001100 101111110101010001111010110110100110001100101110 011000111011011101010000000
172,7,0	4.04	101001011111100100101111001010000011000001011010 000011011110100100100010001110000110101110000001 110001000100100101111011000001011010000011000001 0100111101001001111110100101
173,10,2,1,0	0.75	0011100011100101000110110001110G0100011010000110 100011000111011110010010101110011001111100110100 111010100100111101110001100010110000101100010001 11000110110001010011100011100
174,13,0	4.25	00100110000011010111110011011111110001011010101 011000111001101001111010001100111000111001010101 001100010111100101100111000110101010110100011111 111011001111101011000001100100
175,6,0	0.78	001111101110110000000101011011010001111010100101 010000101110000000100011110110101111000010001110 101101111000100000001110100001010100101011110001 0110110101000000011011101111100

poly	time	CA
176,43,2,1,0	4.30	01010000001010010110111111110001100001101100011001 00000000111111010001000101100111101011100111000100 00110100110011111100000000100110001101100001100011 1111101101001010000001010
177,8,0	0.78	10011111010011101110000010100100110101011111001010 00110000100011011010010110111111001001001001011111 10110100101101100010000110001010011111010101100100 101000001110111001011111001
178,87,0	4.48	00000000101000101001111101100101011100100100010111 10000111100101011001001010010011101010110101001000 00111011001111100101011111001000010010010011101010 011011111001010001010000000
179,4,2,1,0	0.80	10000101101000001000011100010010111110000001110110 00110000101011011011000000100101000111000001000101 00100000011011011010100001100011011100000011111010 01000111000010000010110100001
180,52,2,1,0	5.48	00000011100010010110100010100011101001000010000001 01101010110011100011110101101000100001001110000100 01011010111100011100110101011010000001000010010111 000101000101101001000111000000
181,89,2,1,0	0.81	0100000011111111110100011110001000111100001000000 00000010010100100110010001101111111011000111101111 11101100010011001001010010000000000001000011110001 000111100010111111111100000010
182,121,2,1,0	5.65	11011000101001101101111100011010110101001110010000 10011000000001001001111110010110011000001110010100 01001001111101010101110111110101010000010111110000 11111000111110110110010100011011
183,56,0	0.83	01010100111110100101110101001010100000100111110001 01011010110111101111111000110010111000010100111001 10100100101111010100010110101101010001111100100000 101010010101110100101111100101010
184,41,3,1,0	4.83	10111011110000000001111010001111110010100111101100 01101111110110101000110110001100010110000010010101 01101111000010000101011011111101100011011110010100 1111110001011110000000001111011101
185,24,0	0.85	11101000010000011111100100110101000001001000001010 11110010001110010101001101111110010101100111101000 10011011110110010101001110001001111010100000100100 00010101100100111111000001000010111
186,53,2,1,0	5.95	10110010110110101001110100010101111110011101110101 01010000100100100110101000100111100000000110011000 00010110101111100100110010010000101010101110111001 111110101000101110010101101101001101
187,20,2,1,0	0.86	01101001001100111101010111010101001000001111000100 00111111001110110001010110001110000111011011011111 01111011100011010100011011100111111000010001111000 001001010101110101011100110010010110
188,186,2,1,0	6.33	11101111001001111111001001011110010100010010101110 00111011010001000011101011011100010111111111001111 11101000111011010111000010001011011100011101010010 00101001111010010011111110010011110111

poly	time	CA
189,49,2,1,0	0.88	0111101011111101010101000010100011111011011100111 1001011111010010100101100000110110110001010110000 1010001101101100000110100101001011111010011110011 101101111100010100001010101011111101011110
190,47,2,1,0	5.17	0001011000011001000001101110110011111011000100110 1110000111010011111101110011011111011100110001000 011000101111101111100011111100101110000111011001 0001101111100110111011000001001100001101000
191,9,0	0.90	1111110011011001100100100010000100011011110011111 1010111011101100101101001101100010010110000110111 1000011010010001101100101101001101110111010111111 00111101100010000100010010011001101100111111
192,112,3,1,0	5.75	001111111110111110111111101101110111001000100001 11010011100101010101000100011001011110111101110111 0110111101110100110001000101010101001110010111000 010001001110111011011111110111110111111111100
193,15,0	0.93	0010101011001110100000011011101111110101011001000 1000110010001010000110011011111011111000101101011 1011010001111101111101100110000101000100110001000 1001101010111111011101100000010111001101010100
194,87,0	5.46	0110110001110010000001100111110011011010010100000 001000100100000101101101110111110100001001100110 1110101000101001011100100111100000011111000110000 00010100101101100111110011000000100111000110110
195,37,2,1,0	0.96	1111000000110001111000000001011110111101100010010 10110111110101001110001111011101010000000101010100 1001010100000001010111011110001110010101111011010 100100011011110111101000000001111000110000001111
196,101,2,1,0	5.66	1101001001001100110000001000111000101001100101001 1101010000101010101000010000001000000011110010000 0111010010101110001010111010100001010111010101010 1011010011001010001110001000000110011001001001011
197,21,2,1,0	0.96	1111100101110010001111110000110001011100101100111 0111100001100101001001110000101100000010111101001 0010101111010000001101000011100100101001100001111 0111001101001110100011000011111100010011101001111 1
198,65,0	5.75	0010100001100001100110111110001000101000000010100 01010010101010010101110001111101010000101011000 0011111101100100100011101000111011110010101010010 1000101000000010100010001111101100110000110000101 00
199,34,0	1.00	11010100001010001111101011010111100111010110101101 1100110011001011000010011010101001001010001110100 1011101001010010011101010101100100001101001100110 0111011010110101110011110101101011111000100000101 011

poly	time	CA
200,163,2,1,0	6.65	100000110011000000101010110011110001111111000000 110011110000100010000001111101111101100100001000 011010000011001110111111100001111110010010000010 010010011100111110101010111011100100011000001100 11000001
201,14,0	1.01	111001110111100000000111001110101010110010001100 100010100000110001011011110100010001111101101100 010110011111001101111100010001011110110100011000 00101000100110001001101010101110011100000001111 011100111
202,55,0	5.95	000010111001010001001001111001101111000000100000 111010011100000011011111100110100011110000001110 101101100000110011100010100111110011111011000000 111001011100000100000011110110011110010010001010 0111010000
203,45,2,1,0	1.05	0100110010101111101100000001000111111000010100111 010010001000010110000111100111011001101010110011 110111100111100110101011001101110011110000110100 001000100101110010100001111100010000000110111110 10100110010
204,86,2,1,0	7.40	111011110101011100101001011010001001111010011001 101011010111110000010000000101011010011010011100 101100111101001110010110010110101000000010000011 111010110101100110010111100100010110100101001110 101011110111
205,21,2,1,0	1.03	011011100011110110011000110101011001010111110000 001110101110101101000001011001101111010101110101 101011000010110101110101011110110011010000010110 101110101110000001111101010011010101100011001101 1110001110110
206,147,2,1,0	7.61	00100011011100101000011001110000111111100111000 10100010000011111110100011100001001001011101011 111101000111111000010101101010101100111110111101 110110001010100100111000111101110111100110000101 00111011000100
207,43,0	1.08	011010010011110101011010000010001011001010111110 001011101011110110000011101010101110101100111111 1011101100111011111110011010111010101110000011 011110101110100011111010100110100010000010110101 011110010010110
208,83,2,1,0	6.71	000110010101011000001001100101110111100101011011 01011101011001101110101010111001100011111110110 10010111111100000100010111011011111100001101100 110001101011101011011010100111101110100110010000 0110101010011000
209,6,0	1.14	111110001001011001010000001111001001001000110101 000000011000100000100100111111010000110110010001 110111010111010111000100110110000101111110010010 000010001100000001010110001001001001111000000101 00110100100011111
210,31,2,1,0	7.25	111000100101010010110010000001000000101000100010 001001101001001001100100110101101100111100100010 001100101001111000010010111111001101101011001001 100100100101100100010001000101000000100000010011 010010101001000111

poly	time	CA
211,165,2,1,0	1.15	111010000111101000001010100111111101100001111110 0100010011110101010010010001010011110010111100101 1101001001010111010011110100111100101000100100101 0101111001000100111111000011011111111001010100000 101111000010111
212,105,0	6.96	0101011000011010111001101011001111111101110110010 1100111010110111001010101000011110100110110101000 1100001011111001101011010001110111011000111011000 011100011111011010011011101111111100110101100111 0101100001101010
213,62,2,1,0	1.20	1000001001011000010101111100000110110011010010110 1010111100000101001100111010110111000001011011101 0011000011100111010010000100110011111011111100110 0101000001111010101101001011001101100000111110101 00001101001000001
214,87,2,1,0	7.08	1010100011110100110011101100000011111010111000110 0110111111011101000110111000001010011010110110110 1101111011111101000001110111010000100100110101011 1111011011111101100110001110101111100000011011100 110010111100010101
215,23,0	1.14	0110001101110000111000010011111101010101110111010 1110110010010111001000110111011101111010111111101 1100010111010100011101111111010111101110111011000 1001110100100110111010111011101010101111110010000 1110000111011000110
216,107,2,1,0	8.09	1111100110111110111111000001100101100100111101010 1110101110011111000010100100100001101110010101100 0100010111110011101110001000010111010000110010110 1100110000110000011101010111100100110100110000011 11110111110110011111
217,45,0	1.17	1000110101001100100100100011110100100101011100001 1111010000001011001111011111000011100001110011000 1100110110111101100110001100111000011100001111101 1110011010000001011111000011101010010010111100010 010010011001010110001
218,11,0	7.29	01000011100111100001000011110110000110101101111100 1110101010110111100001000010001000010011001001111 0001110000010111001000111100100110010000100010000 1000011110110101010111001111011010110000110111100 0010000111100111000010
219,65,2,1,0	1.15	01011001000011000101100101111100000000001100010011 1010100000000000111000101001000011110101100110110 1100101001001000101001101101100110101111000010010 1000111000000000001010111001000110000000000111101 00110100011000010011010
220,53,3,1,0	9.15	01011100000100110011001111101001010011110(>011000 0001101011100001011011101001101011100111101000000 0011101010111001010000001101100000101110011010110 0101110110100001110101100000011000111100101001011 1110011001100100000111010

poly	time	CA
221,18,2,1,0	1.19	0101100110001101111000101111001011111100110100010 0111101011010011100001111000000000011010100011001 000111000101100100100110010011000101011000000000 1111000011100101101011110010001011001111110100111 1010001111011000110011010
222,73,2,1,0	7.96	1000110000110101111100111001010011011100000110100 1101101100001111110001101110001100110111100001110 1101010001011001111011111011010101100010110001101 0001100011111100001101101100101100000111011001010 01110011111010110000110001
223,33,0	1.28	1100001011101100111010111001001001001010100011001 1101011000001111001010100001111010010000010110011 0110101110000110001110101101100110100000100101111 0000101010011110000011010111001100010101001001001 001110101110011011101000011
224,159,2,1,0	8.73	001011000110110100010000000010000000011100101001 0100101001111000010010000101110101100111101001010 1001101100110101000110001010101100000101110000001 1011101000000010101101110100011011110111000011001 0000000010001011011000110100
225,32,0	1.23	110101011001100011100010000000100011000100011000 0101111100101010100000001100110010111001111011100 1010000110101010011010011110001011011110011101001 1001100000001010101001111101000011000100011000100 00000010001110001100110101011
226,57,2,1,0	9.42	110000100000001110001111111001110101010111000010 0111101011111010100010101001011100111001010111111 0011111001111110011100001010100110000111110100011 1010010101000101011111010111100100001110101010111 001111111100011100000001000011
227,21,2,1,0	1.28	0011000101111110011011010101010110000100111001000 0011100110110101001100010000100111101010000111001 0101011110011110001100111101010100111000010101111 0010000100011001010110110011100000100111001000011 0101010101101100111111010001100
228,58,2,1,0	9.73	0010101011000111001000110101110111101100010010010 1011111111100011001000001000011000010000111110000 1010110100000111001000001011010100001111100001000 011000010000010011000111111110101001001000110111 10111010110001001110001101010100
229,21,2,1,0	1.30	0001010111001100111100010101111001010001111001101 0000000010101000000101001101110000001110101001111 0000001011111000011011111010000001111001010111000 0001110110010100000010101000000001011001111000101 001111010100011110011001110101000
230,25,2,1,0	9.88	1100101101111111001110010111111100100100001011000 0001011001001000000100011101001101011111110111010 1011101001011100010101100011100101010111011111110 1011001011100010000001001001101000000110100001001 0011111110100111001111111011010011
231,26,0	1.33	0010000101010101001100011111101101111110011011000 0100001100011100110110011110111011011000011111111 110010010001011000001110110110110111111111000011 0110111011110011011001110001100001000011011001111 11011011111100011001010101010000100

poly	time	CA
232,23,2,1,0	10.09	00100000001101010001010111001111100111110000110 01100101110101111100111001111011000001000101011 00010111100101011101000100011001101111101000110 10100010000011011110011100111110101110100110011 00001111100111110011101010001010110000000100
233,74,0	1.35	11011100000100101000000000100000011110010000101 10011000100000111101001100100101100001011010010 10111011100101101101010011111011101000001100001 10101101101110010010011001011110000010001100110 100001001111000000100000000010100100000111011
234,31,0	8.59	00110001001100001000001001001110110101111101000 00000111000101000000010011110110110100100010001 01001101111110111001010001010111000101111100101 00010001001011011011110010000000101000111000000 0010111110101101110010010000010000110010001100
235,45,2,1,0	1.37	011000000110100100011111100110101111011101100011 1110010111111111001110000001100110100110111100 10101110001001111100101001100111110010001110101 0011110110010110011000000111001111111110100111 11000110111011110101100111110001001011000000110
236,5,0	8.65	11011000100001100000100110001111101100111001010 11101100100000010100101111100010010110110011111 00000110100101101110001111110111011010010110000 01111100110110100100011111010010100000010011011 10101001110011011111000110010000011000010001101 1
237,163,2,1,0	1.40	00011001100100011101101110100000100110010010001 01111100101110101011101010100101110000000010100 11100011000011110011101100001110011110000110001 11001010000000011101001010101110101011101001111 10100010010011001000001011101101110001001100110 00
238,5,2,1,0	8.88	01100111111111000011111101101100011100010001101 01111010001011010101101001010101100000110110101 01001111101111010100000000011000101011110111110 01010101101100000110101010010110101011010001011 11010110001000111000110110111111000011111111100 110
239,36,0	1.42	00001000110010101001100101101001010110010101110 11000011000111011001111111001011011000100111101 11010011001111011100100000100110011110000001000 10111011110010001101101001111111001101110001100 00110111010100110101001011010011001010100110001 0000
240,49,3,1,0	9.19	11111000100111101100111000001100110110110000100 11111000011111000011101011110111101001101111010 1000010111111111110000110101010001110011100111 01010010111101100101111011110101110000111110000 11111001000011011011001100000111001101111001000 11111

poly	time	CA
241,70,0	1.42	01101101000001011100101101101011000100100100010 10111000001101011001010101010101010101010011011000 00100011010100110110101110100001001000101100111 0010001000110011101101010101010101010011010110000 01110101000100100100011010110110100111010000010 110110
242,81,4,1,0	10.30	00111111100101000110101001111110001101000101101 10100101101101000110100000100111010001111010000 11001110100100000100100101011011110100000101011 0001010010011111100111111001000(>01011000101101 10100101101101000101100011111100101011000101001 11111100
243,17,2,1,0	1.65	01101011101101111101111001001010110000110101010 10001100000010010001110011111010010110110000100 11010110110001100011101011001010101110001100011 0110101100100001101101(>01011111001110001001000 00011000101010101100001101010010011110111110110 111010110
244,96,2,1,0	11.65	11100001000110011000100100000010100011111111110 11011010001110011100000100100111111010110001001 10111000001100000011001010010101010011000000110 00001110110010001101011111100100100000111001110 00101101101111111111000101000000100100011001100 010000111
245,37,2,1,0	1.46	11111100010010011110100011111010011101010111110 11111011011100011111011110100011000001010010100 01110110110100011001000011111101100001001100010 11011011100010100101000001100010111101111100011 10110111110111110101011100101111100010111100100 10001111111
246,11,2,1,0	11.55	0000110101001001110111111011001011001010110110 00000111010100001101110000100110001110010010000 01011001001111110011100011101010110101110011111 10010011010000010010011100011001000011101100001 01011100000011011010100110100110111111101110010 01010110000
247,82,0	1.50	10110100100011011100011101001100010000010010111 11011001000000010100100010000111011100100101111 101000001111001111111111001000100100101001101111 011110111001000001011000101011100001000100101000 00001001101111101001000001000110010111000111011 000100101101
248,243,2,1,0	12.55	00001010011100011101010110011101000100011101100 10010001110111111110110101101011010011111000001 00000000011110111010001000101101010110100010011 00111110010011111001010011111100111100111101110 10100111110111100011101101000100111000100010010 0000001111110
249,86,0	1.56	11111111010111111110000000000000000000010001000111 001010011111001110001111100111011011101111101011 00000111110100000101010001010010101010000100101 10110110001110110101101100011101110011111000111 00111110010100111000100010000000000000000000011111 11101011111111

poly	time	CA
250,103,0	10.25	0101000110110110111100010101001000100011000000000 0100110110001100010000100101101000101010101010010 1010111001111001101001110010001000101110111011000 0101110111001001101010001011011100001000110001101 1001000000000011000100010010101000111101101101100 01010
251,45,2,1,0	1.58	1001101101110110001100010011101000100100011100000 1010100011000011010010000001010001001000001001101 10011111111000000001000011000000010000000011111 1110011011001000001001000101000000100101100001100 0101010000011100010010001011100100011000110111011 011001
252,67,0	10.41	0000111000011111000101010011110010111110010101110 1100110100001100011000010001000001000011010111010 1101001010111010101100010101111101001000101010001 1000101010101110110000100000100010000110001100001 0110011011101010011111010011110010101000111110000 1110000
253,33,2,1,0	1.55	1110000100010001000111000100100000010111000111110 1110011010001001100100111001100010010100011011100 0001011000001001010100100000011000100101010010000 0110100000111011000101001000110011100100110010001 0110011101111100011101000000100100011100010001000 10000111
254,7,2,1,0	12.52	0101110110001100101001110110010110001110110110001 1001001001011101001100100010011011111000001010001 0010010110101011000001110001110001111000001101010 1101001001000101000001111101100100010011001011101 0010010011000110110111000110100110111001010011000 110111010
255,52,0	1.61	0101011111110101011100110001010001000110000101111 1111000000000001100111000001011011111000101100100 0101111001011101001110100010101100000011010000000 0101010110001001101000111110110100000111001100000 000000111111101000011000100010100011001110101011 1111101010
256,16,3,1,0	11.80	0001110011100100101001100011001111000111101001101 1100101010010111110010100010001101100001110000000 1011001100010000111101011111011101111010111100001 0001100110100000001110000110110001000101001111101 0010101001110110010111100011110011000110010100100 11100111000
257,12,0	1.61	1010000010110110110011111101110110110101100011110 0011000101101001001110100010100010101100111011101 0000100111010011010100011011110101000000010101100 1011100100001011101110011010100010100010111001001 0110100011000111100011010110110111011111100110110 110100000101
258,83,0	11.08	110000001010111101100111100010111110101111011011 1100000001000001100111000001101110011001000110001 1111011001100111100111100010111111100000101011011 0010001100111100001001001110011101100000111001100 0001000000011110110111101011111010001111001101111 1010100000011

poly	time	CA
259,254,2,1,0	1.85	1110101000110101100110100011000110000100101011111 1011100001011000010101010101110000010100000111111 1111101101100010101000110110110011110001110000110 0000011010010111010011001101100110011010010001111 0110011001011111010101110111101101010100111000011 10100011011101
260,74,3,1,0	11.27	0111101011110001100100010111110110101100011001011 0000111110100001100001000000100010100100101011010 1001001010011111100000100101010111001010010000011 1111001010010010101101010010010100010000001000011 0000101111100001101001100011010110111110100010011 000111101011110
261,74,2,1,0	1.76	0100000001111100000110011100000110000111100011100 1101100110011111011110100110111110010101010101111 1100000000100111010011000110111101011110011100001 101010110011111101000010101010011111011001011110 1111100110011011001110001111000011000001110011000 0011111000000010
262,252,2,1,0	14.17	1111101111001110111111110101011100100101111011111 1110001110100001010110000100010011011010100010010 1011000001001010111100010111010001101011101000111 1010100100000110101001000101011011001000100001101 010000101110001111111011110100100111010101111111 10111001111011111
263,93,0	1.71	11000010101010011010011110000100101101110110011 1100110100001001110101111101100001001010101111010 001000101110110111001010110111110111111011010100 1110110111010001000101111010101001000011011111010 111001000010110011110011011011010010000111100101 100101011101000011
264,169,2,1,0	11.84	1000110101100010001101011011000001011110001100011 0111001011011011111000110111010100101100111001010 1001000010011110000010001000101100010111011110111 0110111100111010100100111001110110000011000010100 1101100010100110100011001100011110100000110110101 1000100011010110001
265,42,0	1.76	0001011111100110101110111001101011011001111010001 0001110110100110011101111101100111010011111011100 0101001000111100111100100100000000001100010111111 0011010011000100101000111011111001011100110111110 1110011001011011100010001011110011011010110011101 11010110011111101000
266,47,0	11.92	1110010100110001111011101100110011011001101110010 0100101010110001010010001111010010001010111110000 0011111101001000101101000110010010011110100100111 0000001000110111111000000111110101000100101111000 1001010001101010100100100111011001101100110011011 101111000110010100111
267,29,2,1,0	1.75	1011001111100000010011111010101111110101001011110 0111001100110000100001110100101100110010000010100 100010000010111100111011100100111111011100100111 0111001111010000010(>0100101000001001100110100101 1100001000011001100111001111010010101111110101011 11100100000011111001101

poly	time	CA
268,25,0	12.23	00000100101110101111100110101110110000100101000 11111000001101100100111011101010000010001110101 01010000111101101011000111010110000100011101011 10110011110001101011011110000101010101110001000 00101011101110010011011000001111100010100100001 101110101100111110101110100100000
269,117,2,1,0	1.75	11000000000011000010111110111110000001011110110 01110011010100100100110101000001010000010001100 1110000001010111111100100010011001100000110011 00110010001001111111101010000001110011000100000 10100000101011001001001010110011100110111101000 0001111101111101000011000000000011
270,53,0	12.52	01000110010101111010111000101111010001100110110 10101011000001110011101101011111011110101100101 10010011101111110110001001000011111000010011001 10000100110101000100101110111001001101001101011 11011111010110111001110000011010101011011001100 01011110100011101011110101001100010
271,58,0	1.80	10100100000110110011101010000010111101000001100 00111010000000010011010010110000000011100110100 0110001100111011100111111011000001000110011110 00100000111001100111011001001100011000101100111 00000000110100101100100000000101110000110000010 111101000001010111001101100000100101
272,56,3,1,0	13.88	10100011011110000111110001011010011110000111010 11000110001010010111101111010100110001010000101 01000111001010100111010101001010110111000010101 11011010100101010111001010100111000101010000101 00011001010111101111010010100011000110101110000 1111001011010001111100001111011000101
273,23,0	1.86	10010100101001011000010100010011101100011100011 10101110101111100010100001101111100111101011111 01100100001011001000100110001011000101100110001 10100011010001100100010011010000100110111110101 11100111110110000101000111110101110101110001110 00110111001000101000011010010100101001
274,67,0	12.96	1010011010001010100000110001011100111(>01111001 11010100100101000011011101111110100011010000110 010010101101101000001000101011110101010100100 10010110101101111000001010111010101010010011000 0101100010111110111011000010100100101011100111 1001110011101000110000010101000101100101
275,28,2,1,0	1.89	10011100101011101101001001010011001100111000100 00110010000011000010110110010111100111011100001 11100110000101000001000101100001000100110100111 01111001101101101000100000101000011001111000011 10111001111010011011010000110000010011000010001 1100110011001010010010110111010100111001
276,28,2,1,0	15.80	00001001000000101000100110010010111011001100001 01100111000001000110010110100000001110110001111 00100000001111111100011110000010101011100101011 001110101010000011110001111111000000100111100 01101110000000101101101100010000011100110100001 10011011101001001100100010100000010010000

poly	time	CA
277,254,5,1,0	2.08	101111110001001111111011001000111110101010001010 010101101001001111100111101001011101110000111000 001011000111010011010100110011101110011101101000 10011111101000101000110010110001011001011010010 101111111010101000011000011000011100001011000100 00001001010000111010010110011111101
278,5,0	13.30	001010110001010111000111010100011101011101011110 101010010001010010111011100011100110110000000001 111110101101000101101100111111001001100001111110 01100100111110011011010001011010111111000000000 1101100111000111011101001010001001010111101011 10101110001010111000111010100011010100
279,5,0	1.96	11110001101011100101011010010011111101000101100 010000010100010010110010110100011100010010101101 10110101000000011100101010111001101111111110111 111110110011101010100111000000010101101101101010 010001110101010011010010001010000010001101000 101111111001001011010100111010110001111
280,146,3,1,0	13.63	001010110111110011010000101010110010100001110110 010000011001010011100010010111110010000110001010 1010111010001010101010011000010100110011111001 001100101000011001010101010100010111010101010001 100001001111101001000111001010011000001001101110 0001010011010101000010110011111011010100
281,93,0	1.96	101011101110100111000011111011010001101011100101 010000000001101001111001000111010001011100010000 101011001100011101110011101000000011101011101111 101011100000001011100111011100011001101010000100 011101000101110001001111001011000000000101010011 1010110001011011110000111001011101110101
282,35,0	13.77	011010000110101001101101001111010011101100100100 000110001111001111100100000100100100101111010101 000001110000111011100111100000101010110101010001 010011110010101101111001110111000011100000101010 111101001001001000001001111100111100011000001001 001101110010111100101101100101011000010110
283,200,2,1,0	2.16	001010001100011010101111000100111000101000011100 001011010101011101100101000100101010111000000111 101110000100000100101101100111011101001010111001 000100010100011000010101001000111100000100011010 011111110011010010100000100110100010010001001101 1110101000111001000111101010110001100010100
284,119,0	14.30	000100000000100100010111100100110101001111000011 100101011000110111101110011111110001111001001101 111000101000010000011111101110100011101111011110 110100100000010010101011011110010111010110100000 000001110110111111100111011110110001101010011100 00111100101011001001111010001001000000001000
285,77,2,1,0	2.08	010001111101100000101110011011111101011110110001 011011101000110001000110000100000100000110111111 11111011111110011111001010001100010100001011001 01010000101000110001010011111001111111011111111 111011000001000001000011000100011000101110110100 011011110101111110110011101000001101111100010

poly	time	CA
286,69,0	14.81	000101111111110001001100101011100010110011010011 100111100111111011000011010111110001100000001101 011110111001111000001010001000110000111110011010 011000111100100000011011001100010100011101111010 110000000110001111101011000011011111100111100111 0010110011010001110101001100100011111111101000
287,71,0	2.10	110000000111111110110000111101100001100110001101 100110010001011001000001011100110011000000001100 110111100111001111001101000001000001010011010011 000101100101000001000001011001111001110011110110 011000000001100110011101000001001101000100110011 01100011001100001101111000011011111111000000011
288,11,10,1,0	17.37	000100000011001001000011101001101010011100000100 000010101100000001100111010001011100100110100011 000010011111001110100101010001111011100001000000 110010000001110111100010101001011100111110010000 110001011001001110100010111001100000001101010000 001000001110010101100101110000100100110000001000
289,21,0	2.10	100011011110101010111011010110110100101101010001 000011001101001100101100110101010001100001111010 001001000000100110101110111011010101001101101111 101110110110010101011011101110101100100000010010 001011110000110001010101100110100110010110011000 010001010110100101101101011011101010101111011000 1
290,5,3,2,0	17.69	110101011101111000101111010100101100111011001100 0111011100110011011000011011101000011001100000010 011011110011101101110101100001111010001101111010 101011111011000101111000011010111011011100111101 100100000110011000010111011000011011001100111011 100011001101110011010010101111010001111011101010 11
291,76,2,1,0	2.20	101100100101110011000000011100001011110011001000 101100111111111000110001011001011000010011011010 011110000011110001011110101101000100001110101001 100011111010110110010011010100110100011100000011 110010110110010000110100110100011000111111111001 101000100110011110100001110000000110011101001001 101
292,97,0	15.21	010010010100010001000100100001010010010101110011 110110010101111010001000010110110101101101010011 110110100101100000011010110101110000101100110010 001110011101110110011010100000010000110001100100 11001100101011011010110110100(>01000101111010100 110111100111010100100101000010010001000100010100 10010
293,154,3,1,0	2.25	010110111111011100001101111000101111110101011100 101110001000110101010111000110101011101010110101 111010101000010000010101100000110010100000110010 110001100011110100001001001110111000001111011111 001000011010100011110010011110101101010110.00100 011101001110101011111101000111101100001110111111 011010

poly	time	CA
294,61,0	15.56	0011000111001001110010000111001010111001010010 1110101100010010111011100001000010100000010100 1100101010010101011101111000111000111111000010 1100001001010110000110110100110100110111011011 1010101001010100110010100000010100001000011101 1101001000110101110100101001110101001110000100 111001001110001100
295,48,0	2.20	0110010001111110010011101001101111011100101101 0100010100011000000010001101100100111000111101 10110001001111001111110001111000111111110110 0001011010100101100111001100000010111110001111 1110011110010001101101111000111001001101100010 0000001100010100010101101001110111101100101110 0100111111000100110
296,11,9,4,0	17.21	0111100011011110100001010010101011100100111011 1100000000000001001100011110101111010011110111 0010011111011110110000111010010001010110001011 1010101000010000110111010001101010001001011100 0011011110111110010011101111001011110101111000 110010000000000001111011100100111010101001010 00010111101100011110
297,5,0	2.23	0111001011011000110111100110110111011100100010 0110010100000000100001110111101111000101101010 0011011001010011010110000100110101011101111111 101111010011010111101111111011101010110010000 1101011001010011011000101011010001111011110111 0000100000000101001100100010011101110110110011 110110001101101001110
298,78,2,1,0	19.01	0100010110000110110111101101110101011100101001 0100011110001111000100111111011010011111010111 0010011100100110010111101001011100100101101011 1110001010011101000111110101101001001110100101 1110100110010011100100111010111110010110111111 0010001111000111100010100101001110101011101101 1110110110000110100010
299,21,2,1,0	2.25	0100100000100010010100010001000001010110011100 0010011111001011001100010000110101100010001101 1111010011100101001001011100111001110110001110 1110110101111001011011101110001101110011100111 0100100101001110010111110110001000110101100001 0001100110100111110010000111001101010000010001 00010100100010000010010
300,7,0	16.07	0000100101110111110101001000000000110000001010 100101010011100011101010101010101101111110011111 10111010001101101101100101100000000101110000001 0100111010111100111100101000000111010000000110 1001101101101100010111011111100111111011010101 0101011100011100101010010101000000110000000001 001010111110111010010000