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AN ORDERED TABLE OF PRIMITIVE POLYNOMIALS
OVER GF(2) OF DEGREES 2 THROUGH 19
FOR USE WITH LINEAR MAXIMAL SEQUENCE GENERATORS

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ABSTRACT

This memorandum contains a brief discussion of the practical aspects of generating binary linear maximal sequences. Included is a table of all primitive polynomials over $GF(2)$ of degrees 2 through 19, not including reverses. These polynomials are ordered by the number of nonzero coefficients as well as by degree. This table complements other available tables.

PREFACE

The Acoustic Signal Processing Group at Cooley Electronics Laboratory (CEL) makes extensive use of binary linear maximal sequences in its research program. As a result of this, over the past several years, project personnel have, from time to time, been asked to explain how such sequences are generated.

The purpose of this memorandum is to supply some information on the practical aspects of sequence generation and to provide the user with a broad selection of potential sequences. However, no attempt is made to describe the theoretical aspects of these sequences. Such material can be found in the references.

Appendix B contains an extensive table for use in implementing binary linear maximal sequence generators. A discussion of its use is also included, making this appendix relatively self-contained. The reader who needs to select a sequence generator quickly should be able to do so by referring only to this appendix.

The table of primitive polynomials contained in Appendix B was generated some years ago at CEL for internal use. It differs from other similar tables in two respects, (1) only primitive polynomials (those which yield maximal length binary sequences) are included and (2) these are ordered by the number of nonzero coefficients,

as well as by degree. This ordering was used to facilitate the search for polynomials that could be implemented using certain configurations of modulo-2 adders (exclusive-or circuits).

The tutorial material presented here is an excerpt from a doctoral dissertation being written by one of the authors (Kurt Metzger).

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LINEAR MAXIMAL SEQUENCES

1. Introduction

This memorandum is concerned with the methods of generation of binary or two-state waveforms that are implemented using binary linear maximal sequences to select states. These waveforms are composed of equal duration digits where the amplitude of each digit is assigned one of two possible values depending on whether the corresponding bit in the governing sequence is a "one" or a "zero." When standard statistical tests are applied to these waveforms, it is found that the waveforms possess properties that closely approximate those of a two-state waveform made up of randomly selected digits with each state being equally probable (Bernoulli process). Because of these apparent random properties, waveforms generated from linear maximal sequences are often called pseudorandom or pseudonoise waveforms.

Waveforms based on linear maximal sequences are easy to generate and have been found applicable in many areas. They have been used in deep space ranging experiments by NASA (Ref. 1), in random number generation (Ref. 2), in pseudorandom noise generators (Ref. 3) and for generating test signals used in acoustic propagation studies in the ocean (Ref. 4).

This memorandum is organized in the following manner. Some of the practical aspects of linear maximal sequences are discussed. Two "canonical" forms of sequence generators are introduced and analyzed. A simple analysis shows how the sequences generated by the two forms are related. Two tables of generator connection patterns, which will permit the generation of linear maximal sequences of various lengths, are provided in the appendixes. The interested reader can find additional material on the structure of linear maximal sequences in Refs. 5 through 9.

2. Binary Sequences and Generators

A common method of generating waveforms based on binary sequences involves the use of digital networks made up of delay circuits (flip-flops) and modulo-two adders (exclusive-or circuits). The delays and adders are connected together into feedback arrangements called linear sequence generators. An example of such a generator is shown in Fig. 1.

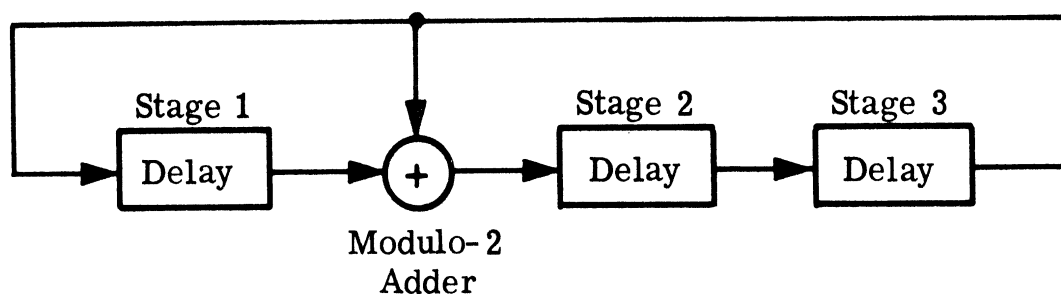


Fig. 1. A simple binary sequence generator

The symbols used in Fig. 1 are convenient mathematical abstractions of the hardware actually required to build such a device. Figure 2 illustrates how the generator of Fig. 1 would be implemented using industry standard logic symbols and the 7400 family of TTL digital integrated circuits.

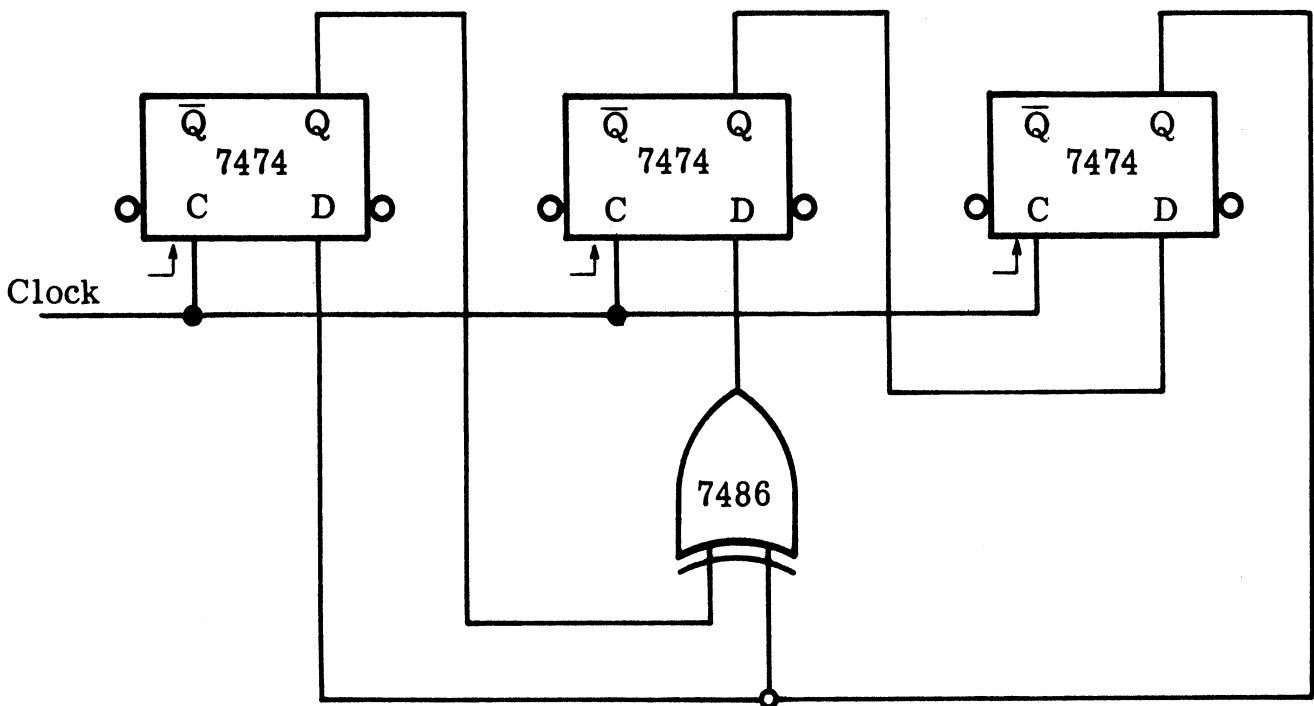


Fig. 2. Generator of Fig. 1 implemented using the 7400 family of digital TTL integrated circuits

The properties of the delays (flip-flops) and mod-2 adders (exclusive-or) circuits are given in Fig. 3.

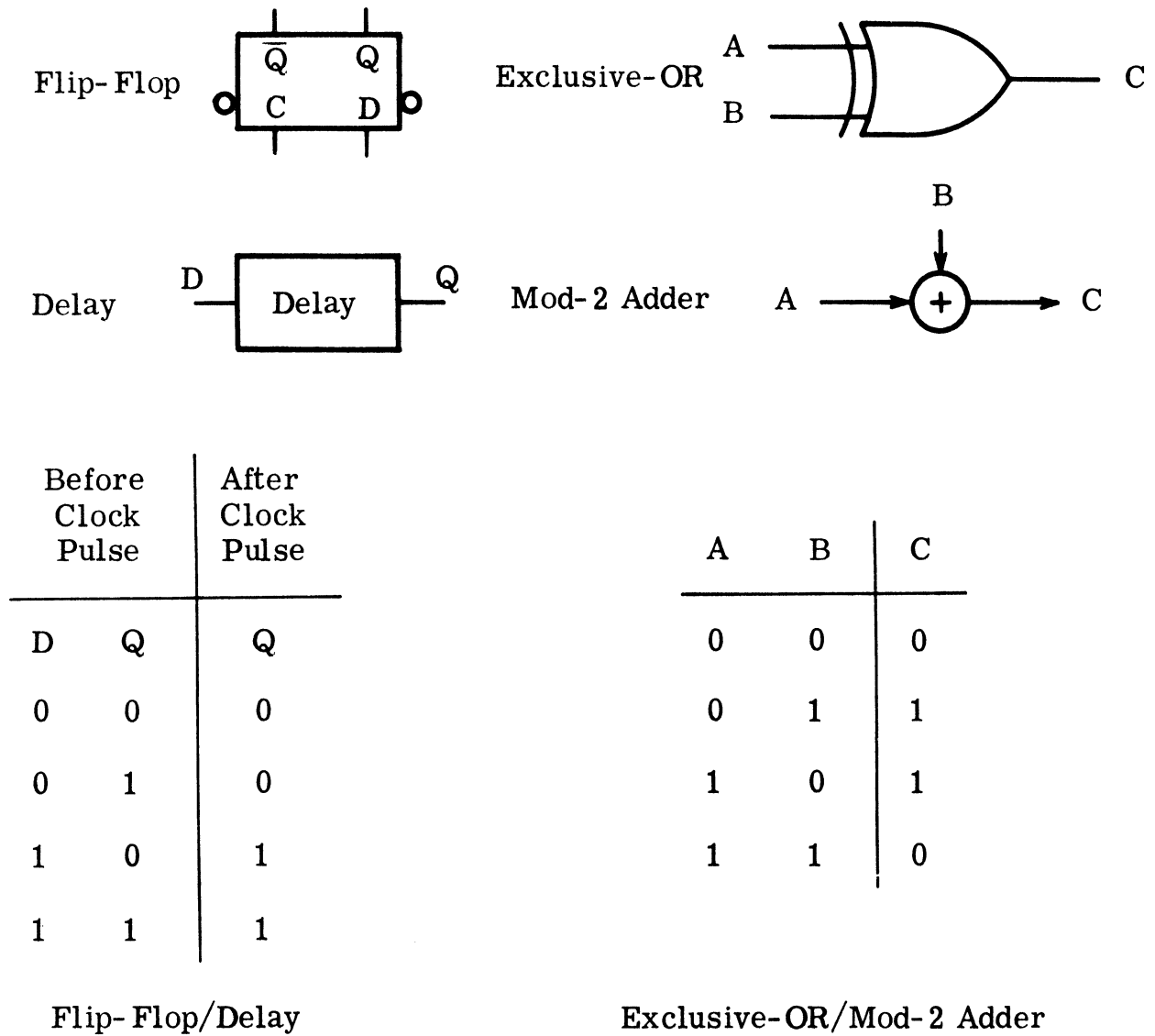


Fig. 3. Logic symbol definition

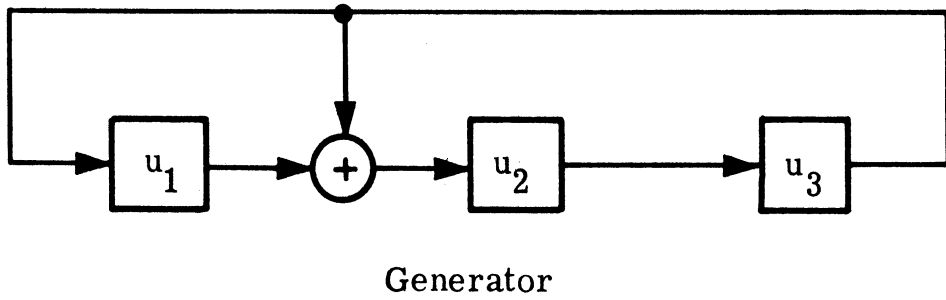
When discussing or working with sequence generators, it is often convenient to write the state of the generator in vector form. For example, if in Fig. 1 stage 1 contains a "one" and stages 2 and 3 contain a "zero," then the state of the generator can be written in shorthand form as (1,0,0). Such a representation is referred to as the content vector. The value of the content vector changes as the generator is clocked and passes through its collection of permissible states. The content vector can also be written as an octal or decimal number. The bits in the binary representation of these numbers describe the state of the generator. A diagram which shows how the associated sequence generator moves from state to state is referred to as the state diagram for that generator. Figures 4 and 5 contain the content vectors and state diagrams for two different 3-stage sequence generators.

The generator in Fig. 4 is termed a linear maximal sequence generator. If this generator is initialized using a nonzero content vector, then as it is clocked it will pass through all possible states (with the exception of the all-zero state) that can be represented using a three-bit binary number. If the all-zero state is the initial state, the generator will remain in this state. (In practice, this state is checked for and if it occurs, the generator is forced into another state.) The maximum period of a sequence generator using n stages of delay is $L = 2^n - 1$. Table I tabulates L for values of n from

2 through 19.

Table I. Maximum sequence period L versus number of stages in generator n

n	L	n	L
2	3	11	2,047
3	7	12	4,095
4	15	13	8,191
5	31	14	16,383
6	63	15	32,767
7	127	16	65,535
8	255	17	131,071
9	511	18	262,143
10	1,023	19	524,287

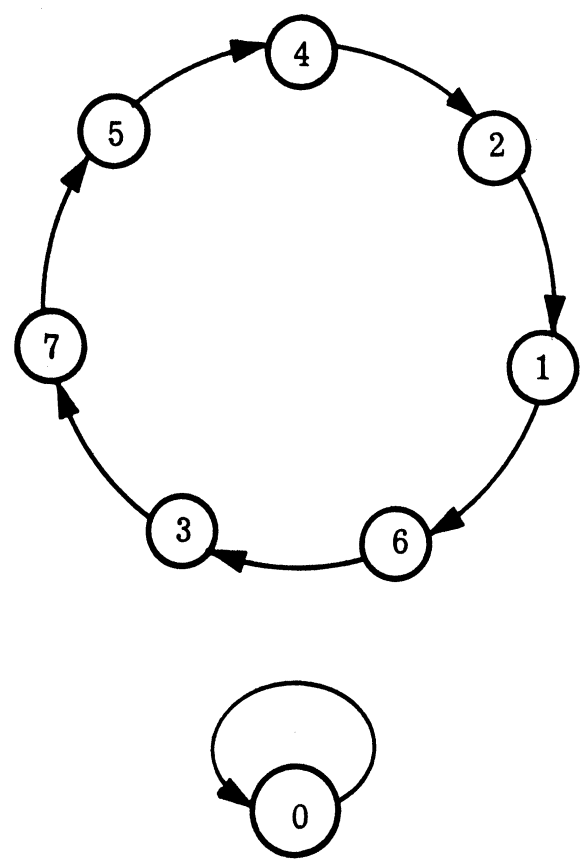


u_1	u_2	u_3	Value
1	0	0	4
0	1	0	2
0	0	1	1
1	1	0	6
0	1	1	3
1	1	1	7
1	0	1	5
1			
0	0	0	0
0			

Content Vectors

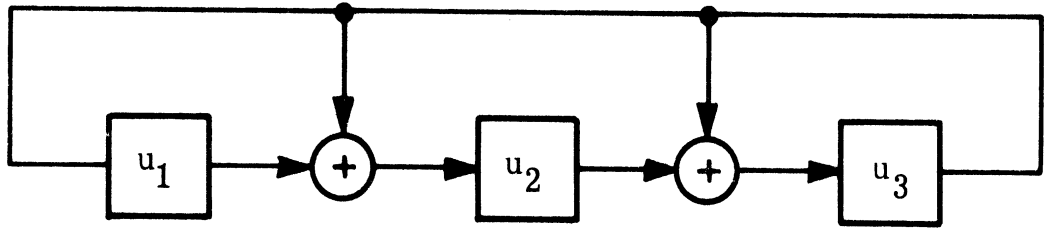
$$z^3 + z + 1$$

Characteristic Polynomial



State Diagram

Fig. 4. 3-stage linear maximal sequence generator $[3, 1, 0]_{\text{MSRG}}$



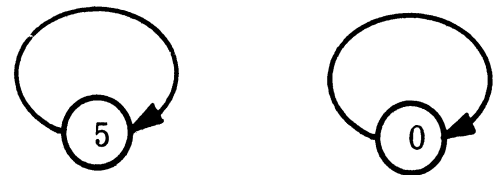
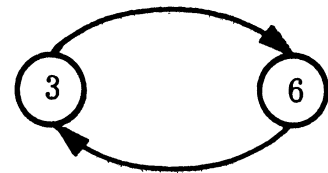
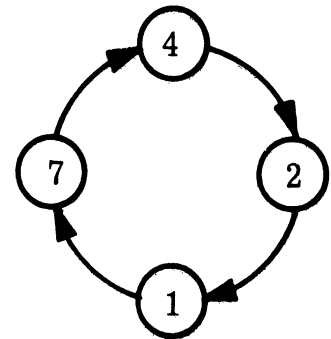
Generator

u_1	u_2	u_3	Value
1	0	0	4
0	1	0	2
0	0	1	1
1	1	1	7
<hr/>			
1	0	0	
0	1	1	3
1	1	0	6
<hr/>			
0	1	1	
1	0	1	5
<hr/>			
1	0	1	
0	0	0	0
<hr/>			
0	0	0	

Content Vectors

$$z^3 + z^2 + z + 1$$

Characteristic Polynomial



State Diagram

Fig. 5. 3-stage nonmaximal sequence generator
 $[3, 2, 1, 0]_{\text{MSRG}}$

The generator in Fig. 5 is nonmaximal and can operate in any one of the cycles shown, depending on how it is initialized. This generator is included in order to avoid the mistaken impression that all linear generators produce maximal length cycles. The class of nonmaximal generators is much larger than the class of maximal generators.

It should be noted that the ordinary n stage binary counter which cycles through 2^n states is a nonlinear sequence generator in the context of the algebraic field described using mod-2 addition [sometimes referred to as GF(2)].

The characteristic polynomials and MSRG notation found in Figs. 4 and 5 will be explained later.

An important difference between maximal and nonmaximal generators can be seen by examining the binary stream of "ones" and "zeros" produced at the output of each delay stage. For the maximal generator, the sequence produced by all stages are identical except for a time shift. However, this is not true for the nonmaximal generator.

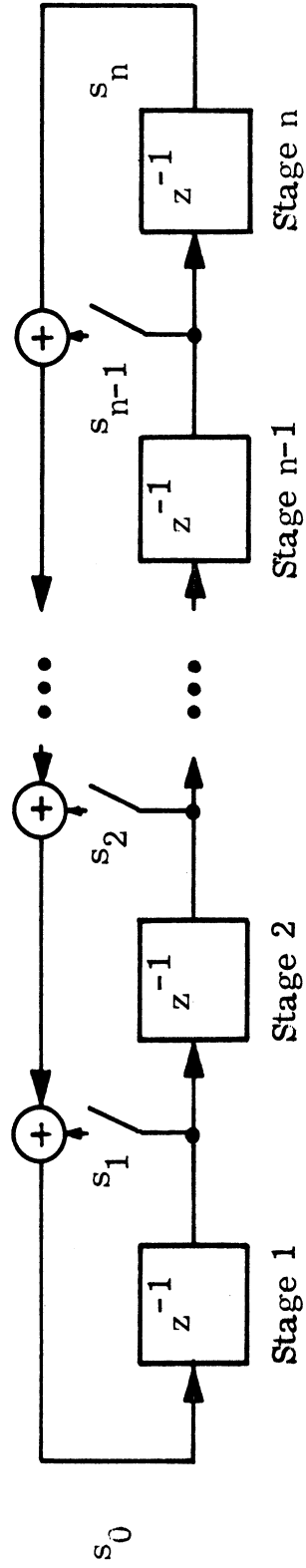
In this memo only linear maximal sequences are considered.

3. Maximal Length Sequence Generators

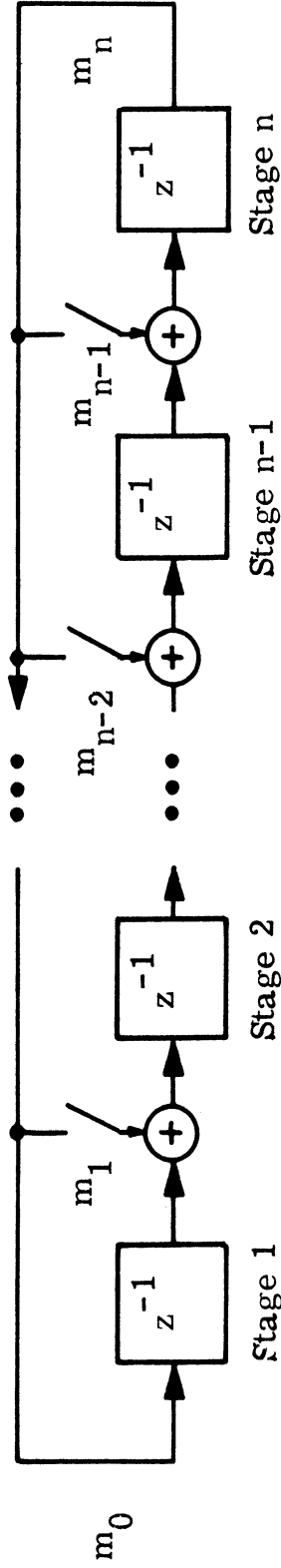
There exist many ways in which a collection of flip-flops and exclusive-or circuits can be connected together in order to generate digital sequences of maximal length. Out of all possible interconnection patterns attention will be restricted to the two canonical forms shown in Fig. 6. (Other canonical forms are described in Ref. 10.)

The generator in Fig. 6(a) is called the simple shift register generator (SSRG). This configuration is extremely easy to implement using integrated circuit shift register units. The maximum clock rate is limited by the cumulative delay through the mod-2 adders. The particular sequence generated by the SSRG depends upon the number of delay stages present and which switches (s_i) are closed.

The generator of Fig. 6(b) is called the modular shift register generator (MSRG). This generator is an extremely convenient one to program on a digital computer. Also, because this generator never incurs more than one stage of mod-2 adder delay, it can often be operated at clock rates greater than those usable with the SSRG. The sequence generated by the MSRG depends on the number of delay stages present and which of the switches (m_i) are closed.



(a) Simple shift register generator (SFRG)



(b) Modular shift register generator (MSRG)

Fig. 6. Two shift register generators

In Section 2 sequence generators were discussed in physical terms; however, their operation can be easily modeled using finite field mathematics and operator notation.

Let the state of stage n in a sequence generator at clock time j be written as $u_n(j)$. The state of stage n at clock time $j-1$ is then $u_n(j-1)$. Define the shift operator z such that

$$u_n(j) = zu_n(j-1)$$

Using this notation the input and output of a delay unit can be modeled as shown in Fig. 7.

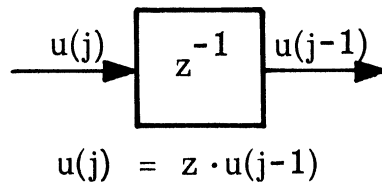


Fig. 7. Input/output relations of a delay element using the shift operator

Closed switches will be assigned value 1 and open switches assigned value 0.

3.1 The SSRG. Denote the input to stage 1 of Fig. 6(a) as $u_0(j)$. Then (mod-2 addition)

$$u_0(j) = s_n u_n(j) + s_{n-1} u_{n-1}(j) + \dots + s_1 u_1(j)$$

But

$$u_i(j) = u_0(j-i) = z^{-i} u_0(j)$$

Substituting gives

$$u_0(j) = \left(s_n z^{-n} + s_{n-1} z^{-(n-1)} + \dots + s_1 z^{-1} \right) u_0(j)$$

For convenience define $s_0 \equiv 1$ so that

$$s_0 u_0(j) = \left(z^{-n} \sum_{i=0}^{n-1} s_{n-i} z^i \right) u_0(j)$$

Since

$$s_0 u_0(j) + s_0 u_0(j) \equiv 0 \pmod{2}$$

then

$$\left(s_0 + z^{-n} \sum_{i=0}^{n-1} s_{n-i} z^i \right) u_0(j) = 0$$

Multiplying through by z^n and combining terms gives

$$\left(\sum_{i=0}^n s_{n-i} z^i \right) u_0(j) = 0$$

The term

$$\sum_{i=0}^n s_{n-i} z^i$$

is called the characteristic polynomial of the binary sequence generated by the SSRG. The properties of the resulting sequence are governed by the properties of this polynomial.

3.2 The MSRG. Because mod-2 addition is linear, the principle of superposition can be used to determine the form of the characteristic polynomial for the MSRG. Denote the input of stage one as $u_0(j)$. (Note that $u_0(j)$ and $u_n(j)$ are identical here.) If the input to stage one is assumed to pass through a fictitious switch m_0 , then the contribution to the output of stage n through switch m_i ($0 \leq i \leq n-1$) can be written as (mod-2 addition)

$$m_i z^{i-n} u_0(j)$$

Thus

$$u_0(j) = \left(\sum_{i=0}^{n-1} m_i z^{i-n} \right) u_0(j)$$

For convenience, define $m_n = 1$ and let it be the multiplier of $u_0(j)$ on the left side of the above equation.

Since

$$m_n u_0(j) + m_n u_0(j) \equiv 0 \pmod{2}$$

Then

$$\left(m_n + \sum_{i=0}^{n-1} m_i z^{i-n} \right) u_0(j) = 0$$

Multiplying through by z^n and grouping terms gives

$$\left(\sum_{i=0}^n m_i z^i \right) u_0(j) = 0$$

The term

$$\sum_{i=0}^n m_i z^i$$

is the characteristic polynomial of the binary sequence generated by the MSRG. The properties of the resulting sequence are determined by the properties of this polynomial.

3.3 Comparison of the SSRG and the MSRG. The sequences generated by the SSRG and the MSRG are the same if

$$s_{n-i} = m_i \quad 0 \leq i \leq n$$

In general, however, the state diagrams for the two generators are not the same.

It is easily shown that if

$$s_i = m_i \quad 0 \leq i \leq n$$

then the sequences generated by the SSRG and the MSRG are the time reverses of each other.

When discussing sequences and sequence generators, it is customary to adopt a shorthand notation. Usually this consists of listing either the nonzero coefficients of the defining characteristic polynomial or the closed switches of the associated generator. Careless use of this shorthand notation can cause difficulties since the representations, although closely related, are different. The following convention will be followed when discussing sequences and generators. Parentheses will be used to describe the characteristic polynomial associated with a particular sequence. For example, the characteristic polynomial $z^6 + z + 1$ is represented as $(6, 1, 0)$. Square brackets will be used to denote switch closures for the generator named by a subscript. For example, the $(6, 1, 0)$ sequence is generated by the $[6, 1, 0]_{\text{MSRG}}$ and the $[6, 5, 0]_{\text{SSRG}}$.

In general when discussing sequences it is best to talk in terms of the defining characteristic polynomial.

4. Characteristic Polynomials Yielding Maximal Length Sequences

It is beyond the scope of this work to describe how the coefficients of the characteristic polynomials are selected to produce maximal length sequences. The interested reader is referred to Refs. 5 through 9. The article by Elspas (Ref. 6) is particularly lucid.

In the above references it is established that if the characteristic polynomial,

$$c_n z^n + c_{n-1} z^{n-1} + \dots + c_1 z + c_0 \pmod{2}$$

is primitive (and thus also irreducible) on $GF(2)$, then the associated generator will generate a linear maximal sequence. Thus the study of maximal length sequence generators is intimately connected to the study of these polynomials.

It can also be established that if the set of $n + 1$ coefficients $\{c_i\}$ yield a primitive polynomial (and thus a maximal length sequence generator), then the polynomial

$$d_n z^n + d_{n-1} z^{n-1} + \dots + d_1 z + d_0$$

where

$$d_i = c_{n-1-i} \quad 0 \leq i \leq n$$

is also a primitive polynomial.

For a given form of sequence generator the use of the above two polynomials will yield sequences which are the time reverses of each other. It is common to refer to the polynomials formed by the c 's and the d 's (when related as above) as being "the reverses" of each other.

For the reader's general information, $GF(2)$ is the algebraic field generated when all operations are performed mod-2. An irreducible polynomial is one which cannot be factored. A primitive polynomial is one which divides $z^k + 1$ if $k = 2^n - 1$ but does not divide (without remainder) $z^k + 1$ for $k < 2^n - 1$. (Primitive polynomials are irreducible but the converse is not necessarily true.)

The switch settings on a generator necessary to generate a linear maximal sequence are determined by the coefficients of the associated polynomial. Each primitive polynomial yields a unique binary maximal length sequence.

In the case of the MSRSG there is a direct one-to-one correspondence between coefficients of the primitive polynomial and the switch settings used on the generator, i. e. ,

$$m_i = c_i \quad 0 \leq i \leq n$$

For the SSRG the switch settings and the polynomial co-

efficients are related as

$$s_i = c_{n-i} \quad 0 \leq i \leq n$$

Two tables of primitive polynomials are provided in the appendixes. The table in Appendix A contains one polynomial for each degree from 2 through 100. Using the techniques described in Ref. 9, these sequences can be used as "seeds" to determine others of the same degree. The notation used in this table is the same as the one used in Section 3.3.

Table IV in Appendix B lists all primitive polynomials of degrees 2 through 19. These are ordered in terms of the number of nonzero coefficients as well as by degree. Several examples of the use of Table IV are also included.

APPENDIX A

Table II contains one primitive polynomial (mod-2) for degrees 2 through 100. This table is from Ref. 11. By applying the techniques described in Ref. 9, these polynomials can be used to determine others of the same degree.

Table II. Primitive Polynomials (Mod 2)*

(1, 0)		(51, 6, 3, 1, 0)	
(2, 1, 0)		(52, 3, 0)	
(3, 1, 0)		(53, 6, 2, 1, 0)	
(4, 1, 0)		(54, 6, 5, 4, 3, 2, 0)	
(5, 2, 0)		(55, 6, 2, 1, 0)	
(6, 1, 0)		(56, 7, 4, 2, 0)	
(7, 1, 0)		(57, 5, 3, 2, 0)	
(8, 4, 3, 2, 0)		(58, 6, 5, 1, 0)	
(9, 4, 0)		(59, 6, 5, 4, 3, 1, 0)	
(10, 3, 0)		(60, 1, 0)	
(11, 2, 0)		(61, 5, 2, 1, 0)	
(12, 6, 4, 1, 0)		(62, 6, 5, 3, 0)	
(13, 4, 3, 1, 0)		(63, 1, 0)	
(14, 5, 3, 1, 0)		(64, 4, 3, 1, 0)	
(15, 1, 0)		(65, 4, 3, 1, 0)	
(16, 5, 3, 2, 0)		(66, 8, 6, 5, 3, 2, 0)	
(17, 3, 0)		(67, 5, 2, 1, 0)	
(18, 5, 2, 1, 0)		(68, 7, 5, 1, 0)	
(19, 5, 2, 1, 0)		(69, 6, 5, 2, 0)	
(20, 3, 0)		(70, 5, 3, 1, 0)	
(21, 2, 0)		(71, 5, 3, 1, 0)	
(22, 1, 0)		(72, 6, 4, 3, 2, 1, 0)	
(23, 5, 0)		(73, 4, 3, 2, 0)	
(24, 4, 3, 1, 0)		(74, 7, 4, 3, 0)	
(25, 3, 0)		(75, 6, 3, 1, 0)	
(26, 6, 2, 1, 0)		(76, 5, 4, 2, 0)	
(27, 5, 2, 1, 0)		(77, 6, 5, 2, 0)	
(28, 3, 0)		(78, 7, 2, 1, 0)	
(29, 2, 0)		(79, 4, 3, 2, 0)	
(30, 6, 4, 1, 0)		(80, 7, 5, 3, 2, 1, 0)	
(31, 3, 0)		(81, 4, 0)	
(32, 7, 5, 3, 2, 1, 0)		(82, 8, 7, 6, 4, 1, 0)	
(33, 6, 4, 1, 0)		(83, 7, 4, 2, 0)	
(34, 7, 6, 5, 2, 1, 0)		(84, 8, 7, 5, 3, 1, 0)	
(35, 2, 0)		(85, 8, 2, 1, 0)	
(36, 6, 5, 4, 2, 1, 0)		(86, 6, 5, 2, 0)	
(37, 5, 4, 3, 2, 1, 0)		(87, 7, 5, 1, 0)	
(38, 6, 5, 1, 0)		(88, 8, 5, 4, 3, 1, 0)	
(39, 4, 0)		(89, 6, 5, 3, 0)	
(40, 5, 4, 3, 0)		(90, 5, 3, 2, 0)	
(41, 3, 0)		(91, 7, 6, 5, 3, 2, 0)	
(42, 5, 4, 3, 2, 1, 0)		(92, 6, 5, 2, 0)	
(43, 6, 4, 3, 0)		(93, 2, 0)	
(44, 6, 5, 2, 0)		(94, 6, 5, 1, 0)	
(45, 4, 3, 1, 0)		(95, 6, 5, 4, 2, 1, 0)	
(46, 8, 5, 3, 2, 1, 0)		(96, 7, 6, 4, 3, 2, 0)	
(47, 5, 0)		(97, 6, 0)	
(48, 7, 5, 4, 2, 1, 0)		(98, 7, 4, 3, 2, 1, 0)	
(49, 6, 5, 4, 0)		(99, 7, 5, 4, 0)	
(50, 4, 3, 2, 0)		(100, 8, 7, 2, 0)	
(107, 7, 5, 3, 2, 1, 0)		(127, 1, 0)	

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APPENDIX B

This appendix contains two tables concerning the primitive polynomials of degrees 2 through 19 on $GF(2)$. Table III tabulates the number of primitive polynomials (including reverses) of degrees 2 through 19, segregated according to degree and number of nonzero coefficients. Table IV tabulates the actual polynomials which are also grouped on this basis (reverses are not included).

1. Extracting a Polynomial from Table IV

Because the coefficients of the primitive polynomials on $GF(2)$ are ones and zeros, it is convenient to treat them as if they were the coefficients in the binary representation of an integer. Such integers are tabulated in Table IV in octal form.

In order to recover a particular polynomial, e. g. , that associated with the entry 235_8 for $n = 7$, first write the octal value as a binary number.

$$235_8 = 010011101_2$$

The coefficients of the associated polynomial are obtained by associating the right most binary digit with the zero-th power, the second right most binary digit with the first power, etc. The left most 1 is associated with the n -th power. Any zeros to the left of

the left most 1 are merely fillers and should be ignored.

For the given example

$$235_8 \text{ yields } z^7 + z^4 + z^3 + z^2 + 1 \text{ or } (7, 4, 3, 2, 0)$$

Table IV does not contain entries for the reverse polynomials associated with the given entries. (It should be recalled that for a given generator form, the sequences generated using a given polynomial and its reverse are the time reverses of each other.) For a given polynomial, the reverse polynomial can be found by reordering the coefficients so the the i -th coefficient in the original polynomial becomes the $(n - i)$ th coefficient in the reverse polynomial.

For example, the table entry 1131_8 ($n = 9$) yields the polynomial

$$1131_8 \rightarrow 001001011001_2 \rightarrow z^9 + z^6 + z^4 + z^3 + 1 \rightarrow (9, 6, 4, 3, 0)$$

The reverse polynomial of 1131_8 may be found in many simple ways. For example, reversing the base 2 representation gives

$$1001101001 \rightarrow z^9 + z^6 + z^5 + z^3 + 1 \rightarrow (9, 6, 5, 3, 0)$$

An equivalent procedure involves subtracting each decimal digit in the parenthesized representation from n , e. g.,

$$(9, 6, 4, 3, 0) \text{ becomes } (0, 3, 5, 6, 9)$$

Another equivalent procedure is to read the powers in the original binary representation from left to right, starting with the left most one as the zero-th power.

Since $1001101001 = 1151_8$ is the reverse of the table entry 1131_8 , it is not contained in Table IV.

2. Converting Table Entries to Sequence Generators

Select an entry of the desired degree. For example, for $n = 9$ and 5 nonzero coefficients 1033_8 might be selected.

$$1033_8 = 001\ 000\ 011\ 011_2$$

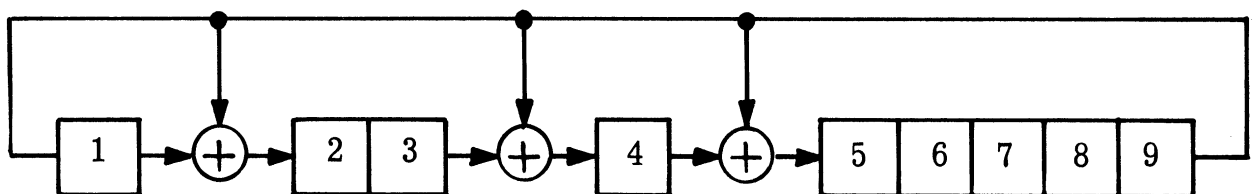
Reading from right to left and starting with zero, the positions containing ones are

$$0, 1, 3, 4, 9$$

The zeros in positions 10 and 11 are merely fillers and should be ignored. The resulting polynomial is written as

$$(9, 4, 3, 1, 0)$$

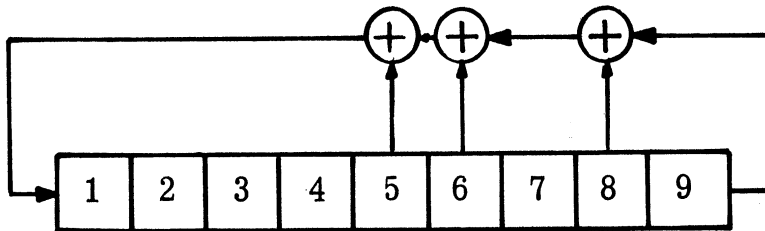
The corresponding MSRSG is $[9, 4, 3, 1, 0]_{\text{MSRSG}}$



The "0" serves as a reminder to feed back the output to the input of the first stage and the "9" is a reminder that this is a 9-stage register. The other numbers "1," "3" and "4" indicate that there are mod-2 adders after the first, third and fourth stages.

The SSRG corresponding to this polynomial is $[9, 8, 6, 5, 0]_{\text{SSRG}}$.

[Recall that the i -th switch position for the SSRG corresponds to the $(n - i)$ th polynomial coefficient.]



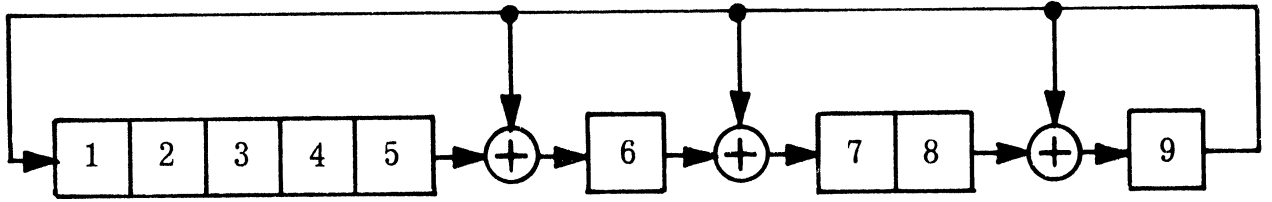
The "0" again serves as a reminder to feed back to the input of the first stage and the "9" serves as a reminder that this is a nine-stage generator. The "5," "6," "8," and "9" are the stages which are mod-2 summed together to obtain the input to the first stage.

The generators associated with the reverse polynomial are easily found by subtracting the positions of the ones in the original polynomial from n and proceeding as above.

For the polynomial used above, this results in the polynomial

$$(9, 8, 6, 5, 0)$$

The MSRG associated with this polynomial is $[9, 8, 6, 5, 0]_{\text{MSRG}}$



The SSRG associated with this polynomial is $[9, 4, 3, 1, 0]_{\text{SSRG}}$

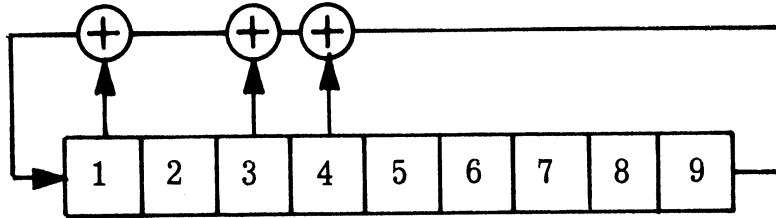


Table III. Distribution of primitive polynomials

		Equation Degree																	
Nonzero Coefficient	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
3	1	2	2	2	2	4	0	2	2	2	0	0	0	6	0	6	2	0	
5				4	4	10	12	16	20	44	18	66	42	82	52	152	72	158	
7						4	4	28	28	80	86	236	226	470	368	1050	718	1774	
9								2	10	50	36	264	338	720	812	2674	2296	6696	
11											4	60	140	450	648	2696	2910	10238	
13												4	10	66	156	1006	1470	6766	
15														6	12	122	284	1772	
17																4	24	190	
19																			
Totals	1	2	2	6	6	18	16	48	60	176	144	630	756	1800	2048	7710	7776	27594	

2ND DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

7

3RD DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

13

4TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

28

23

5TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

45

Table IV. Ordered primitive polynomials of degrees 2 through 19

5TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

57

67

5TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

103

6TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

133

147

7TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

203

211

7TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

217 235 247 253 313

7TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

277 357

THERE ARE NO 8TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

8TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

435 455 515 543 607

8TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

537 717

9TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

1021

9TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

1033 1055 1063 1131 1207 1225 1243 1423

9TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

31

1137 1157 1167 1175 1257 1267 1275 1317 1333 1437
1473 1517 1533 1617

9TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

1577

10TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

2011

10TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

2033 2047 2055 2145 2213 2305 2415 2443 2503 3023

10TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

2157 2327 2347 2363 2475 2527 2553 2617 2627 2707 3067 3117 3133 3427

10TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

2377 2767 2773 3177 3337

11TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

4005

11TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

4027	4053	4055	4107	4143	4145	4161	4215	4225	4251
4261	4415	4423	4445	4451	4505	4603	5007	5023	5025
5403	6013								

11TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

33

4173	4237	4317	4347	4353	4365	4473	4475	4533	4563
4565	4617	4653	4655	4671	4707	4745	5155	5235	5247
5253	5263	5265	5463	5513	5607	5613	5623	6037	6127
6153	6163	6227	6233	6263	6307	6417	6447	6507	7047

11TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

4577	4767	5177	5337	5357	5373	5477	5537	5557	5575
5657	5675	5675	5733	5747	6277	6367	6557	6637	6673
6727	6747	7137	7237	7317					

THERE ARE NO 11TH DEGREE POLYNOMIALS WITH 11 NONZERO COEFFICIENTS

THERE ARE NO 12TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

12TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

10123 10151 10231 10321 10407 10443 10605 11015 12007

12TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

10173 10353 10437 10473 10517 10527 10553 10663 10731
 11067 11147 11163 11271 11313 11417 11435 11471 11515
 11643 12117 12135 12147 12165 12247 12255 12323 12417
 12435 12515 13107 13503 14127 14227 14433 14513 15033
 15053 16027 16047

12TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

10737 11177 11477 12727 12735 12753 13275 13663 14357 14573
 14717 14747 15437 15527 15647 15237 16317 17057

12TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

13677 15677

THERE ARE NO 13TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

13TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

20033	20047	20065	20123	20145	20213	20215	20245	20303	20311
20341	20415	20425	20451	20503	20611	21031	21045	21103	21211
21405	22013	22023	22045	22051	22203	23003	23005	24007	24043
24105	25003	30007							35

13TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

20157	20237	20257	20273	20275	20363	20457	20473	20547	20553
20571	20627	20635	20707	20715	20743	20761	21067	21075	21133
21135	21171	21227	21233	21263	21315	21447	21453	21507	21525
21531	21561	21607	21615	21625	21643	21651	22037	22075	22127
22155	22233	22235	22265	22307	22313	22343	22427	22435	22455
22471	22523	22525	22543	22607	22613	22625	22631	22705	23055
23113	23123	23131	23207	23223	23303	23423	23503	24037	24073
24075	24147	24165	24253	24255	24315	24325	24343	24417	24433
24453	24465	24513	24525	24623	24703	25017	25035	25063	25065
25115	25443	25503	26017	26053	26055	26115	26213	26243	27007

27023	30057	30117	30147	30323	30417	30507	30543	31017	31047
21113	31123	31407	32033	32047	32207	34027	34047		

13TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

20677	20737	20773	21177	21277	21357	21367	21373	21557	21575
21667	21673	21755	21771	22177	22277	22567	22637	22657	22675
22717	22727	22753	23077	23167	23173	23267	23275	23353	23365
23473	23517	23527	23535	23553	23563	23571	23707	23713	24277
24337	24373	24477	24567	24575	24637	24657	24667	24675	24727
24763	24765	25157	25173	25175	25327	25333	25353	25363	25457
25467	25555	25627	25633	25655	25663	26077	26257	26275	26327
26347	26353	26457	26467	26473	26533	26547	26517	26547	26653
26743	27117	27133	27135	27153	27217	27227	27253	27263	27427
27513	30177	30277	30357	30537	30573	30667	30733	30753	30763

31237	31267	31273	31327	31333	31347	31457	31627	31633	31653
31707	32137	32167	32173	32333	32347	32437	32467	32517	33037
33057	33073	33133	33417	33507	34317	34517	34547	34627	35057
36037	36117								

3
6

13TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

23737	23757	25577	25775	26775	27377	27373	27375	27477	27537
27657	27717	27747	30777	31767	31773	32577	32757	33357	33567
33717	33727	34757	34767	35277	35337	35477	35557	35567	37077

13TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

27777 35777

THERE ARE NO 14TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

14TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

40053	40071	40123	40251	40415	40423	40503	41015	41141	41205
41411	42013	42103	44023	44031	44103	44203	50007	50045	52003
54003									

14TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

40137	40173	40257	40273	40275	40317	40353	40363	40473	40633
40635	40647	40655	40665	40725	40731	40761	41127	41235	41307
41313	41315	41343	41351	41607	41625	41711	42163	42323	42325
42343	42453	42471	42531	42631	42645	42705	43017	43035	43047
43065	43107	43131	43143	43161	43245	43305	44073	44133	44147
44343	44435	44455	44471	44551	44607	44651	45065	45145	45207
45213	45243	45605	46035	46107	46113	46125	46215	46245	46305
46505	47025	47103	47203	50037	50135	50325	50455	50523	50613
50645	51017	51055	51145	51213	51243	51303	52017	52027	52065
52107	52215	52603	53015	54063	54243	55103	56007	56013	56203

57003 60057 60147 60253 61063 61143 62027 62107
 62213 62413 63007

14TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

41177 41357 41477 41575 41657 41753 41755 42337 42373 42557
 42637 42667 42727 42747 42763 43173 43317 43333 43517 43647
 43745 43751 44177 44567 44717 45173 45335 45371 45467 45533
 45553 45555 45563 45571 45627 45653 45671 45713 45715 45725
 45077 46175 46275 46327 46355 46437 46517 46565 46655
 45663 47067 47153 47155 47233 47323 47345 47435 47525 50537
 50575 50733 50753 50755 50765 51347 51533 51633 51647 51647
 51707 52137 52173 52237 52273 52335 52457 52467 52655 52723
 53057 53233 53253 53255 53263 53307 53315 53453 53453 53543
 53623 54077 54257 54335 54347 54353 54617 54617 54627

54635 54647 55037 55073 55075 55323 55417 55427 55453 55543
 55703 56135 56313 56463 56643 57017 57033 57107 57407 57443
 57503 60637 60657 60673 61157 61237 61267 61327 61333 61363
 61467 61533 62237 62347 62467 62473 62533 63073 63153 63227
 63247 63253 63433 63513 64167 64237 64457 64553 64617 64653
 65057 65133 65147 65227 65227 65427 65507 66057 66127 66307
 65427 67047 67207 70317 70467 71037 71117 71147 72117

14TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

42777 43577 43757 45737 45773 46773 47357 47537 47557 47637
 47667 47673 47753 50777 51677 52577 52767 53477 53477 53575
 53657 53675 54377 54377 54577 54737 55567 56277 56557
 56673 56717 57175 57327 57333 57347 57553 57527 61677 61757
 62677 62767 62767 63337 63537 63567 64377 65357 65567
 65727 66673 67173 67257 67527 67707 70767 71337 71337
 71367 72337 72567 72717 73137 73237 73257 74357 75077

14TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

57737 67737 71777 75377 77177

15TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

100003 100021 100201

15TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

100027	100055	100207	100223	100245	100303	100425	100445	100541
100605	100641	101105	101211	102031	102043	102061	102203	102241
103011	103021	104203	104405	104411	110013	110031	110045	110103
110211	110405	120013	120043	120045	120103	120403	122003	140007
140023								

15TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

100137	100167	100317	100335	100347	100365	100527	100535	100555	100647
100671	100713	100715	101073	101217	101233	101313	101331	101427	101433
101453	101463	101507	101515	101543	101551	101561	101613	101631	101705
101721	102057	102067	102147	102155	102171	102227	102265	102435	102447
102463	102507	102513	102561	102615	102643	102661	102705	102711	103035
103053	103125	103131	103145	103251	103303	103413	103415	103425	103451
103461	103605	103611	104067	104135	104171	104217	104265	104307	104331
104427	104447	104545	104631	104721	105071	105125	105143	105145	105161
105207	105213	105261	105413	105415	105503	106047	106107	106125	106143
106151	106207	106223	106243	106251	106311	106407	106413	106445	106503

105605	106611	107013	110037	110067	110075	110127	110155	110165	110233
110255	110427	110433	110435	110515	110631	110643	110651	111033	111047
111063	111115	111123	111207	111225	111243	111311	111423	111505	111603
112017	112053	112065	112113	112123	112223	112231	112245	112251	112407
112425	112505	113023	113025	113103	114107	114225	114231	114305	114413
114445	114503	114505	115045	116025	116205	116403	117003	120057	120133
120135	120147	120153	120155	120265	120315	120417	120435	120447	120463
120465	120507	120705	121017	121107	121143	121305	121407	121415	121415
121443	122123	122213	122245	122303	122443	122603	123023	124053	124063
124113	124115	124125	124223	124243	124413	124423	125015	125103	125403
126007	126015	130017	130033	130055	130223	130303	130407	130413	131013
131023	131103	132103	134403	140037	140163	140227	140247	140313	140343
140463	140623	140703	141027	142063	142107	142113	142223	142413	144033
150207	150213	151007	160017	160107					

15TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

10737	100775	101177	101537	101657	101675	102337	102367	102375	102537
102573	102733	102755	102763	103175	103257	103267	103333	103553	103617
103653	103655	103663	103761	104657	104717	104735	104755	105173	105237
105257	105335	105473	105555	105563	105635	105713	105725	105745	105761
105273	106533	106633	106713	106715	106745	106751	107037	107073	107127
107163	107165	107217	107227	107233	107323	107345	107417	107447	107453
107471	107545	107645	107711	110573	110675	110717	111077	111173	111267
111335	111365	111371	111527	111563	111635	111665	111713	112175	112273
112327	112333	112347	112345	112475	112553	112633	112655	112751	113067
113075	113147	113171	113227	113255	113313	113453	113465	113515	113543
113625	113643	113645	114257	114273	114327	114335	114457	114467	114555
114633	114671	114713	114725	114743	115117	115127	115135	115135	115155
115171	115227	115235	115253	115271	115307	115343	115433	115463	115523
115613	115623	116057	116073	116135	116147	116165	116171	116325	116345
116525	116543	116613	116645	117027	117107	117125	117143	117243	117413
117423	117443	120337	120373	120557	120573	120637	120717	121157	121327
121333	121355	121553	121563	121617	121627	121663	121715	121725	122257
122275	122333	122355	122517	122647	122715	123057	123067	123163	123233
123235	123307	123433	123453	123615	124175	124237	124267	124317	124335
124565	124647	124655	125057	125117	125235	125255	125323	125417	125435

125465	125507	125543	125613	126067	126133	126155	126163	126217	126227
126367	126433	126643	127035	127055	127143	127215	127243	127423	127503
130077	130167	130257	130363	130475	130527	130535	130617	130627	130635
130707	131117	131233	131427	131447	131623	132127	132155	132247	132435
132507	132523	132703	133027	133033	133047	133063	133113	133213	133603
134117	134235	134323	134447	134453	134507	134703	135207	135223	135443
135503	135063	136213	136303	136423	136603	137043	137203	140373	140477
140527	140567	140573	140733	140747	141527	141533	141563	141633	141707
141743	142137	142157	142237	142267	142353	142457	142533	142633	142663
143153	143217	143227	143253	143307	143523	144137	144437	144467	144473

144533	144707	144713	145057	145147	145217	145427	145433	145453	145607
145233	145247	145263	146453	146607	147047	150077	150167	150327	150327
150457	150533	150633	151057	151127	151153	151217	151447	151447	152073
152153	152227	152253	152417	152447	152507	153047	154127	154217	154233
154247	154507	155027	155047	157007	160137	160267	160327	160517	160547
161117	161147	161417	162037	162227	162427	164057	164417	170037	170057

15TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

103377	103677	103737	104777	106577	106677	106757	107277	107373	107567
107575	111577	111737	111757	111773	112377	112737	113337	113373	113637
113733	113735	113763	114577	114677	115177	115373	115537	115557	115567
115667	115675	115753	116277	116367	116637	116675	117237	117355	117363
117457	117517	117547	117633	117655	117663	117665	117715	123375	123537
123673	123675	123717	123735	123747	124757	124767	125673	125727	125733
125763	126337	126375	126557	126657	126735	126747	126753	127077	127137
127167	127273	127327	127335	127347	127365	127437	127457	127473	127547
127617	127653	127723	127743	130737	131177	131337	131357	131367	131573
131657	131727	131733	131735	132177	132277	132357	132367	132477	132567

132573	132673	132727	132747	132753	133173	133257	133347	133353	133437
133527	133553	133635	133663	134277	134373	134567	134657	134673	134763
135267	135327	135475	135533	135547	135713	136173	136237	136457	136547
136723	137057	137127	137133	137153	137253	137447	137463	137643	137643
137703	141757	142377	142677	142737	142757	143567	143637	143727	143733
144377	145277	145357	145477	145573	145747	146177	146367	146373	146637
146717	146727	146753	147237	147273	147327	147363	147437	147457	147617
147707	150677	150757	151537	151567	151573	151747	152277	152667	152747
153267	153327	154537	154637	154727	155077	155437	155473	155517	155707
156157	156237	156257	156327	156527	156547	157057	157117	157427	160577

160757	161277	161567	161637	161657	161667	163077	163327	163617	164277
164537	164567	164717	164727	166267	166317	167037	167417	170277	170337
171157	171237	171457	173037	174077					

15TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

113777	115777	127775	133775	135677	136577	137177	137667	146777	147377
147767	153577	153677	153767	153773	155737	155757	156767	156773	157557
161777	163767	166377	166737	166757	167367	167637	171377	171737	172677
173357	173477	175337							

15TH DEGREE POLYNOMIALS, 15 NONZERO COEFFICIENTS

137777 173777 177377

THERE ARE NO 16TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

16TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

200055	200071	200123	200641	201025	201031	201045	201205	201221	201241
202051	202203	202211	202221	202301	204015	204141	210013	210103	210203
210205	212011	220405	241003	250003	300023				

16TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

200077	200275	200327	200457	200475	200517	200535	200627	200655	200707
201057	201135	201155	201345	201435	201513	201551	201561	201607	201615
201643	202127	202147	202463	202507	202551	202607	202703	203113	203123
203213	203303	203603	204325	204343	204361	204471	204613	204645	204703
204705	205305	205423	205425	205521	206017	206035	206151	206161	206215
205225	206243	206503	206603	207105	207205	207405	207411	210117	210135
210227	210435	210711	211123	211143	211213	211305	212033	212115	212207
212223	212311	212321	212407	213103	214215	214223	214251	214443	214445
215007	215211	215411	216051	216205	220075	220217	220233	220271	220307
220607	220625	220651	221047	221065	221123	221213	221223	221451	221505
222017	222055	222071	222113	222231	222425	223007	223025	223043	223203
224035	224251	224305	224413	224431	224503	224505	224603	225045	225205
230027	230047	230303	230407	230415	231405	232025	232045	232405	234015
240165	240235	240315	240513	240523	240523	241113	241413	241503	241603
242017	242107	242225	242243	242305	242413	244035	244065	244303	244413
244225	245023	245025	250017	250407	251013	252203	254007	260143	260413
260503	261023	262007	262103	264013	265003	300427	300453	301033	301213
301223	301407	302033	302063	302423	303013	304063	304143	310017	310033
310047	310107	314013	320407						

16TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

200577	201637	201735	201771	202277	202735	202753	203553	203555	203571
203761	204277	204337	204373	204575	204657	204747	204763	205175	205273
205535	205715	205723	205745	206173	206257	206363	206617	206723	206745
207247	207247	207433	207551	207607	207625	207661	210177	210557	210733
210763	211167	211257	211333	211355	211363	211473	211475	211565	211571
211635	212257	212355	212371	212617	212653	212725	213037	213067	213075
213233	213253	213331	213507	213523	213631	213643	213651	214157	214273
214371	214553	214565	214571	214663	214745	215127	215153	215343	215345
215453	215507	215513	215703	216235	216265	216313	216315	216351	216361
216427	216523	216531	216545	216607	217231	217303	217451	217503	221257
221527	221555	221743	222237	222347	222527	222535	222563	222571	222633
222745	223075	223471	223531	223543	223607	223645	223705	224173	224365
224635	224671	224707	224725	225073	225247	225315	225447	225447	225523
225631	226037	226073	226117	226135	226153	226163	226171	226271	226343
226455	226545	227017	227107	227113	227115	227305	227503	230167	230257
230335	230355	230365	230553	230647	230653	230715	230731	231057	231067
231075	231127	231133	231165	231235	231265	231331	231433	231471	231705
232233	232435	232513	232643	233033	233065	233303	233407	233413	233503
234037	234067	234135	234155	234307	234313	234515	234523	234545	235033
235125	235145	235505	236107	236113	236223	236407	236443	236443	236503

236663	237103	240477	240657	240673	240675	240747	240763	241317
241355	242237	242273	242457	242563	242617	242633	242635	242665
243135	243313	243325	243623	243703	244077	244333	244457	244745
245057	245155	245255	245265	245313	245515	245543	246037	246147
246163	246247	246307	246515	246613	246615	247113	247207	247243
250267	250273	250327	250535	250555	250647	250723	251135	251227
251647	251543	252127	252265	252447	252455	252513	252623	253053
253055	253187	254075	254323	254453	254513	254515	254615	254623
254643	254643	256407	257013	260237	260335	260475	260547	260655
260723	261073	261153	261217	261727	261455	261463	261523	262037
262073	262227	262233	262453	262623	263407	264037	264235	264313
264323	264427	264507	265443	266223	266503	270127	270133	270153
270235	270243	270703	271143	272207	272443	272503	273103	300367
300667	301237	301273	301527	302157	302257	302317	302467	302707
303067	303253	303417	303523	304137	304457	304633	304647	305147
305163	305543	306227	306447	307107	310347	310437	310553	310633
311247	311427	311447	312163	312247	312433	312453	312507	312613
314057	314417	314453	314613	315017	317007	320157	320173	320317
320467	321073	321433	322117	322147	322313	322427	322447	322453
324073	326047	330073	330233	330307	331207	332017	336007	340317
340467	341147	344067	350417	354017				

16TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

207557	207717	207733	213375	213477	213727	214377	214775	215657
215073	215675	215727	216477	216537	216567	217077	217137	217173
217237	217317	217347	217473	217527	217565	217633	217671	222377
223177	223373	223755	225573	225575	225733	226357	226373	226733
227371	227475	227533	227647	227723	231357	231637	231763	232375
232575	232727	233157	233715	233743	234337	234373	234477	234537
234657	234675	235167	235317	235363	235533	235635	235713	235723
235157	235475	236547	236663	236715	237127	237127	237323	237435
237645	237705	240777	241577	241757	241773	242767	242775	243337
243375	243575	244377	244773	245337	245367	245373	245575	245667
245717	245735	245763	246375	246537	246747	246753	246763	247157
247257	247353	247365	247533	247555	247617	247743	250737	251567
252177	252337	252657	253237	253365	253653	254337	254637	254717
254727	255175	255267	255517	255527	255653	255707	256353	256467
256473	256653	256707	257127	257147	257253	257615	260577	261573
261755	262367	262477	262763	263273	263327	263553	264557	264717
264727	265157	265347	265527	265617	265635	265653	265707	266157
266473	266473	266635	266663	267135	267227	267233	267507	270375
270537	271557	270735	271257	271317	271335	271633	272175	272267

274333	274353	274627	275037	275247	275253	275543	276067	276117	276313
275325	275507	276507	277053	277113	277213	277223	277413	301377	301677
301737	302577	302773	303367	303657	304577	304757	304773	305667	305733
305357	306747	307527	307723	311637	311733	311753	311763	313137	313167
313247	313333	313437	313553	315157	315327	315467	315533	315713	316617
317117	317127	317247	317307	321277	321717	322277	322667	322673	323267
323437	323547	323627	324337	324657	324747	325167	325237	325437	325527
325647	326127	326317	326517	326533	327227	327233	330177	330357	330567
330573	330747	331333	331517	331617	332157	332473	332707	333117	334347
334457	335127	335227	335447	336147	337027	341337	341637	341667	342567

342467	344337	344537	344557	345347	345437	346157	346467	346527	347127
350437	350727	352457	354437	354517	355417	356057	360177	360337	361137
363057	364157	365037	370137						

 16TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

215777	217677	227377	234777	235757	237337	237373	245777	254777	255737
256577	256775	257675	263677	263737	263757	265773	266677	267177	267375
267733	273337	273667	274577	274757	275357	275673	276277	276727	277257
277273	277457	277653	277707	277723	307757	314777	315577	315737	315757
316767	317337	317573	317667	323677	326773	327337	327657	331577	332677
333357	333557	333727	334767	335477	335557	335717	336367	336657	337137
337457	337467	337647	347277	351757	352677	352757	352767	353537	353667
354767	362737	363637	363657	365357	365637	371177	371337		

 16TH DEGREE POLYNOMIALS, 15 NONZERO COEFFICIENTS

267777	327777	337737	357757	367737	375577
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17TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

400011	400041	400101
400017	400055	400063
400415	400445	400541
401105	401221	401411
402205	402301	403041
403003	410015	410023
410405	410421	411005
420421	422011	430003
500105	500205	600013

17TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

400017	400055	400125	400151	400215	400231	400243	400305	400413
400415	400445	400541	400603	400701	401015	401043	401051	401061
401105	401221	401411	401421	402007	402025	402031	402103	402141
402205	402301	403041	404013	404015	404121	404221	404405	404501
403003	410015	410025	410051	410061	410105	410111	410203	410403
410405	410421	414221	420013	420043	420061	420211	420403	420411
420421	430003	430005	440051	440211	441003	450003	500023	500045
500105	600013	600043	600043	600103				

17TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

400077	400173	400257	400273	400365	400475	400527	400547	400555	400707
400713	400731	400761	401067	401153	401171	401265	401307	401343	401351
401427	401433	401447	401463	401465	401523	401661	401703	401721	402037
402057	402075	402127	402135	402147	402165	402217	402235	402253	402271
402315	402433	402447	402447	402465	402543	402545	402623	402645	403035
403063	403107	403113	403131	403215	403243	403341	403407	403461	403511
403521	403603	403605	404067	404075	404127	404165	404271	404323	404325
404331	404343	404433	404435	404455	404463	404525	404551	404561	404507
404643	404741	405123	405145	405151	405231	405303	405311	405321	405407
405415	405445	405461	405505	405503	405541	406047	406107	406145	406161
406215	406341	406407	406413	406425	406505	407013	407025	407103	407211
410067	410073	410117	410153	410217	410307	410325	410343	410351	410455
410463	410513	410523	410551	410613	410625	411053	411063	411071	411107
411125	411143	411225	411303	411321	411423	411431	411541	412017	412027
412035	412047	412063	412243	412251	412341	412431	412443	412511	412521
412611	413015	413105	413121	414047	414055	414113	414115	414123	414131
414207	414213	414245	414261	414303	414407	414443	414511	414541	415013
415023	415031	415121	415203	416025	416043	416061	416111	416221	416405
417011	420073	420075	420127	420135	420147	420163	420165	420235	420255
420263	420371	420307	420455	420545	420545	420703	420711	421017	421053

17TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

40577	401177	401337	401375	401567	401667	401733	401753	402367	402373
42247	402557	402673	402755	403327	403333	403371	403457	403517	403533
403555	403527	403655	403665	403751	404277	404367	404375	404573	404747
405157	405173	405267	405347	405353	405467	405473	405535	405571	405647
405713	405751	406077	406167	406267	406347	406355	406457	406535	406553
405565	406617	406533	406653	406655	406723	406743	406745	407075	407117
407135	407171	407227	407233	407247	407265	407351	407417	407453	407463
407471	407525	407561	407607	407623	407651	407711	410177	410657	410667
410733	410735	410747	410765	411077	411137	411167	411257	411257	411335
411347	411371	411473	411547	411555	411563	411565	411655	411731	412157
412237	412317	412327	412333	412533	412553	412571	412647	412655	412723
412731	412751	413073	413075	413117	413147	413227	413235	413255	413271
413417	413465	413471	413513	413525	413561	413615	413635	413635	414347
414353	414355	414473	414563	414635	414647	414663	414671	414715	414751
415127	415163	415165	415217	415233	415255	415323	415331	415361	415427
415433	415453	415471	415515	415543	415607	415625	415741	416057	416133
416171	416255	416313	416315	416345	416435	416447	416453	416463	416531
416623	416643	416711	416741	417047	417065	417131	417143	417213	417223
417305	417431	417461	417505	417521	417635	417611	420277	420367	420477
420567	420575	420657	420673	420727	420733	421173	421237	421273	421335
421353	421355	421363	421457	421517	421533	421535	421553	421713	421723
421745	421751	422237	422273	422317	422347	422371	422457	422547	422617
422635	422713	423037	423127	423135	423155	423171	423263	423271	423313
423315	423325	423331	423433	423455	423455	423613	423623	423661	424077
424167	424175	424257	424267	424457	424473	424475	424547	424617	424723
424751	424761	425057	425117	425135	425227	425255	425345	425447	425463
425531	425543	425623	425625	425643	425651	426127	426147	426217	426235
426247	426325	426361	426417	426433	426453	426507	426515	426523	426545
426551	426631	426643	427027	427065	427113	427123	427225	427243	427261
427311	427415	427425	427461	427505	430157	430173	430273	430317	430327
430333	430371	430647	430665	430713	430745	430751	431127	431163	431227
431255	431263	431307	431323	431361	431435	431447	431455	431465	431471
431523	431531	431623	431645	432163	432227	432235	432265	432307	432313
432331	432351	432433	432513	432515	432545	432607	432625	432631	432711
433017	433071	433115	433161	433213	433231	433251	433413	433423	433503
433511	434067	434117	434135	434155	434255	434265	434345	434465	434471
434607	434651	434711	435017	435047	435053	435065	435125	435131	435145
435223	435251	435443	435451	436033	436063	436113	436243	436243	436407
436423	436505	436603	436605	437203	437211	440357	440375	440567	440675
440753	440763	441137	441333	441353	441371	441553	441571	441671	441715

442157 442167 442175 442237 442275 442347 442365 442475 442517 442527
 442565 442571 442743 443075 443233 443263 443315 443331 443351 443427
 443447 443465 443507 443515 443543 443607 443623 443625 443651 443705
 443711 444167 444257 444353 444363 444365 444371 444475 444533 444533
 444547 444635 444725 444731 445037 445067 445073 445127 445135 445155
 445307 445351 445433 445447 445455 445513 445551 445613 445645 445645
 445703 445711 446037 446073 446117 446135 446165 446351 446417 446417
 446453 446471 446523 446513 446705 447027 447125 447207 447223 447223
 447407 447421 447503 450267 450275 450335 450347 450353 450517 450553
 450617 450627 450635 450663 450713 450731 450743 451133 451147 451155

451313 451325 451345 451417 451455 451523 451543 451545 451613 451631
 451703 452075 452117 452153 452165 452247 452263 452265 452313 452331
 452435 452453 452507 452515 452525 452525 452705 453033 453053 453055
 453065 453125 453213 453215 453303 453305 454067 454155 454163 454163
 454227 454225 454271 454433 454447 454515 454607 454623 454643 454643
 455017 455033 455071 455107 455207 455243 455305 455505 455603 456027
 456115 456143 456215 456413 456423 456431 457015 457105 457105 457105
 459077 459157 460327 460347 460363 460365 460457 460473 460527 460565
 460627 460653 460671 460725 460723 460745 461067 461153 461233 461233
 461313 461331 461435 461463 461471 461507 461515 461507 461615 461625

461545 462067 462075 462147 462217 462217 462255 462307 462417 462427
 462435 462463 462625 462631 463065 463065 463113 463115 463131 463213
 463303 463407 463415 463505 464075 464075 464127 464135 464171 464171
 464255 464271 464315 464345 464523 464523 464545 464703 465047 465047
 465053 465071 465143 465223 465245 465413 465425 465503 465603 465603
 465017 466033 466055 466115 466207 466213 466243 466445 467105 467105
 467403 467405 470147 470155 470233 470315 470465 470471 470543 470615
 470623 470643 470705 471047 471055 471123 471143 471245 471305 471305
 471425 471605 472027 472055 472063 472123 472123 472443 472503 472503
 473045 473103 473105 474027 474113 474223 474243 474245 474413 474425

474503 475007 475015 475043 475403 476007 476015 476043 476205 500177
 500337 500477 500755 501167 501237 501275 501335 501353 501363 501555
 501655 501707 502355 502355 502457 502467 502475 502517 502533 502547
 502553 502647 502715 503057 503117 503163 503227 503233 503255 503307
 503323 503325 503523 503543 503615 504157 504175 504317 504467 504533
 504555 504653 504743 505037 505067 505073 505127 505147 505155 505163
 505165 505247 505265 505313 505345 505433 505435 505463 505545 505615
 505643 506067 506075 506117 506135 506147 506255 506263 506265 506265
 506315 506453 506465 506513 506515 506623 506643 506705 507017 507125
 507145 507213 507223 507303 507407 507425 507443 510257 510347 510437

620237	620273	620317	620353	620457	620467	620527	620617	620633	620653
620713	620723	521037	621073	621117	521127	621133	621227	621247	621447
521463	621507	622057	622153	622227	622233	622307	622447	622453	622507
623137	624057	624147	624163	624247	624453	624507	625727	625113	626213
625413	627013	630073	630153	630163	630227	630247	630263	630307	630453
530513	631033	631207	632017	632047	632053	632113	632413	634047	634207
640237	640237	640437	640517	640553	640617	640627	640533	641057	641067
641147	641313	641417	641453	642133	642307	642433	642507	643047	644037
644117	644127	644147	644233	644433	644447	645027	645047	645207	646033
645207	650037	650233	650417	650453	650507	651017	651107	652047	654107

654207	655007	660073	660147	660247	660607	662107	665007	670027	670207
700157	700517	700647	701057	701217	701417	702117	702217	702227	702247
703027	704057	704227	704417	704447	704507	705047	710117	710147	711017
711027	720067	720217	722017	730017	740117	740417			

17TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

403377	403773	405773	406737	407177	407337	407373	407557	407733	407735
407755	407753	411577	411775	412377	412577	412775	413477	413557	413575
413657	413673	413673	413733	413747	413763	415567	415657	415717	415763
415765	416337	416357	416375	416537	416557	416717	417167	417175	417273
417333	417457	417527	417707	417723	417745	421377	421737	421757	423357
423373	423477	423537	423573	423575	423667	423747	424677	425357	425373
425375	425537	425573	425637	425733	425735	425755	426177	426277	426477
426637	426727	426735	426753	426763	427157	427173	427333	427355	427365
427437	427467	427527	427647	427653	427663	427671	427731	427751	430577
430757	430773	431277	431337	431575	431727	431747	431763	432537	432657

432667	432735	433137	433257	433317	433327	433335	433437	433533	433547
433633	433635	433647	433655	433745	434337	434373	434557	434673	434753
434763	435157	435175	435267	435333	435355	435365	435527	435547	435553
435033	435655	435715	436137	436157	436257	436317	436355	436437	436475
435473	436533	436535	436553	436555	436635	436725	437037	437067	437075
437163	437233	437253	437265	437271	437307	437325	437417	437453	437471
437515	437523	437545	437607	437631	437643	441773	441775	442677	442767
443357	443573	443575	443637	443717	443735	443753	443755	444677	445557
445573	445747	445765	446277	446337	446367	446373	446567	446673	446733
446765	447137	447355	447363	447467	447533	447535	447547	447627	447655

447715	447731	450377	450737	450775	451277	451367	451717	451765
451771	452277	452357	452375	452667	452673	452755	453355	453363
453457	453473	453527	453553	453535	453553	453707	453745	454357
454373	454477	454557	454657	454733	454755	454765	455273	455275
455335	455477	455555	455563	455647	455655	455671	455725	455743
455745	456137	456173	456175	456237	456333	456517	456655	456663
456713	456751	457147	457165	457171	457217	457233	457263	457323
457343	457435	457471	457523	457615	457645	457705	460677	461177
461277	461337	461367	461537	461573	461753	462367	462477	462673
462717	462735	462771	463167	463257	463333	463353	463635	463647
463665	464277	464657	464673	464763	465137	465157	465267	465317
465333	465335	465353	465363	465517	465571	465627	465665	465715
465745	466173	466273	466275	466365	466371	466467	466533	466555
466617	466633	466647	466671	466725	466745	467037	467155	467217
467247	467307	467313	467343	467513	467523	467613	470277	470337
470357	470373	470557	470573	470637	470727	470735	471237	471327
471355	471457	471475	471517	471527	471553	471563	471671	472077
472137	472157	472175	472275	472333	472347	472467	472517	472665
472671	472707	472713	472725	473057	473073	473133	473155	473247
473253	473255	473313	473427	473435	473507	473525	473545	473615
473703	474137	474173	474317	474355	474457	474535	474553	474627
474655	474665	474723	475057	475075	475163	475165	475235	475253
475263	475307	475343	475345	475433	475453	475455	475525	475613
475615	475705	476073	476117	476127	476235	476247	476325	476427
476447	476463	476523	476607	476625	476645	477053	477145	477225
477415	477423	477603	501577	501677	501767	501775	502775	503373
503477	503575	503667	503675	503765	505177	505537	505637	505753
506357	506375	506537	506573	506637	506673	506717	507175	507267
507275	507327	507475	507547	507655	510767	511337	511373	511657
511675	511747	511755	512477	512557	512575	512727	512765	513273
513333	513355	513555	513633	513647	513745	514357	514477	514537
514573	514675	514675	514675	515137	515257	515267	515317	515527
515533	515535	515553	516157	516175	516257	516267	516355	516363
516437	516447	516543	516617	516633	516655	516663	516743	517155
517165	517227	517247	517263	517265	517315	517447	517453	517515
520577	521337	521367	521673	521747	522373	522537	522567	522575
522657	523173	523275	523275	523317	523327	523347	523533	523633
523665	524277	524375	524537	524557	524753	525167	525327	525333
525265	525473	525535	525565	525627	525635	525653	525725	526077
526157	526167	526175	526275	526317	526335	526353	526473	526553

526665 527037 527073 527235 527313 527323
527427 527453 527523 527607 527607 530277
530637 530733 530755 530777 531173 531317 531335 531467 531533
531565 531663 532077 532173 532257 532335 532347 532467 532563
532565 532653 532743 533037 533235 533255 533447 533455 533513
533793 534157 534237 534457 534517 534535 534617 534627 534627
534653 534653 534707 535133 535155 535263 535315 535417 535417
535447 535507 535623 535623 536057 536075 536155 536163 536163
536247 536313 536453 536463 536515 536543 536615 536703 536703
537155 537207 537213 540757 541477 541567 541637 541717 541717

541747 542277 542367 542573 542637 542667 542717 542727 542727
542735 542755 542763 543175 543257 543373 543347 543347 543347
543355 543473 543517 543553 543563 543715 543715 543723 543723
544373 544575 544717 544753 544753 545327 545457 545457 545457
545527 545565 545617 545713 545723 546267 546335 546353 546353
546467 546547 546553 546527 547037 547057 547153 547153 547153
547217 547253 547255 547433 547455 547513 550177 550367 550367
550567 550573 550637 550657 550735 550735 551157 551157 551257 551257
551533 551555 551563 551627 551743 551743 552167 552237 552237
552275 552333 552437 552475 552633 552633 552723 552723 552743 552743

553133 553147 553155 553247 553313 553417 553453 553513 553513 554137
554173 554237 554347 554353 554617 554723 555067 555117 555117 555117
555133 555313 555343 555433 555513 555523 556073 556127 556135 556135
556217 556263 556307 556323 556613 557017 557047 557223 557413 557413 53
557603 560337 560357 560673 560717 560727 560733 560763 561077 561175 561175
561273 561327 561475 561517 561563 561627 561627 561723 562077 562175 562175
562333 562335 562467 562553 562563 562563 563067 563217 563247 563247 563247
563307 563323 563453 563507 564137 564363 564457 564533 564535 564535
564633 564663 565057 565073 565307 565343 565417 565453 566037 566037
565067 566163 566253 566433 566607 566623 567027 567053 567107 567107

567213 567243 567413 567603 570237 570275 570327 570437 570473 570473
570517 570617 570633 570707 571153 571247 571313 571463 571513 571513
571643 572217 572253 572343 572427 572433 572453 573207 573207 573207
573213 573423 574073 574163 574233 574447 574513 574623 575017 575017 575017
575063 575107 575143 575207 575223 575243 575443 576017 576503 577023 577023
577203 577403 600777 601577 601757 603477 603537 604773 605177 605367 605367
605573 605673 605717 605753 606357 606537 606567 606763 607173 607173
607517 607617 607627 607653 607743 610677 610757 611367 611477 611477 611477
611567 611727 612537 612557 612657 612747 613077 613173 613237 613237
613327 613437 613473 613707 613723 614177 614367 614537 614637 614667 614667

435377 435737 435767 437771 463577 464777 465767 467537 467575
 467771 471377 472577 473567 473573 473573 473747 473747 475277
 475717 477217 477633 477633 515737 526577 527735 527735 532775
 533373 533477 533573 533717 535375 535375 535375 535375 537347
 537467 537533 540577 552737 553733 555375 555375 555375 556337
 556477 556727 557175 557237 557327 557467 557547 557553 563675
 563727 565337 565337 565573 565573 566567 566567 566747 567273 567437
 567633 567647 571373 571373 571567 573173 573173 573333 573527 574567
 575137 576167 576363 576707 605777 614717 614753 615273 615273
 615327 615347 615473 615533 615663 615737 615767 616157 616173

616333 616347 616437 616553 616627 616647 616653 616743 617127
 617133 617217 617433 617507 517513 620767 621177 621537 621667
 621733 621753 622477 622557 623173 623237 623317 623457 623663
 623713 624357 624573 624717 624727 625157 625167 625257 625347
 625627 625713 626273 626327 626553 626563 626653 626663 627117
 627147 627233 627357 627367 627507 627607 627637 627717 630357
 630557 630567 630573 631077 631437 631527 631563 631677 632173
 632267 632333 632353 632457 632517 632547 632627 632647 632663
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635507 635573 635747 636133 636153 636233 636337 636417 636417
 635427 635453 636537 637107 637167 637213 637257 637407 637473
 640767 641177 641357 641573 641753 641777 642357 642573 642657
 643157 643267 643347 643437 643527 644373 644477 644567 644727
 644747 645333 645333 64547 64553 645647 646137 646273 646437
 645457 646457 646533 646617 647067 647253 647427 650367 650367
 650573 650733 651167 651257 65133 651617 651707 652167 652167
 652317 652437 652527 652553 652617 652707 652757 653127 653233
 653537 653607 654157 654327 654467 654517 654577 654627 654627
 654647 655117 655507 655567 656117 656133 656247 656307 656427

656477 656573 656733 657033 660177 660277 660367 660537 660673
 660747 661157 661167 661173 661347 661627 661647 662237 662257
 662267 662377 662527 662547 662633 663067 663117 663427 663447
 664257 664273 664437 664473 664527 664547 665127 665337 665447
 665477 665657 665747 665757 666127 666147 666227 666227 666427

17TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

435377 435767 437771 463577 464777 467537 467575
 467771 472577 473537 473567 473573 475477 475727
 476717 477633 517573 522777 526577 527763 532775
 533373 533573 533717 535367 536675 537347 537353
 537467 546577 552767 553763 555375 555733 556337
 556477 557175 557267 557327 557547 563573 563675
 563727 565373 565557 566567 566747 567317 567437
 567633 567647 571373 571667 573173 573527 574657
 575137 575167 576707 577313 614717 614753 615273
 615327 615347 615633 615737 615767 616157 616173

616333 616437 616533 616627 616647 616653 616743 617127
 617133 617217 617463 617613 620767 621177 621537 621667
 621733 622477 622557 623173 623237 623317 623457 623663
 623713 624357 624673 624717 625157 625167 625257 625347
 625627 625713 626327 626363 626553 626563 626563 627117
 627147 627233 627357 627367 627607 627637 627717 630357
 630557 630567 630573 630657 631437 631527 631677 632173
 632267 632333 632457 632517 632547 632627 632647 632663
 633073 633163 633227 633233 633397 633417 633453 634257
 634333 634467 634737 635037 635127 635253 635433

635507 635573 635747 636117 636133 636153 636233 636417
 636427 636453 636507 636507 637107 637157 637213 637407 637473
 640767 641177 641357 641557 641573 641777 642367 642657
 643157 643267 643347 643437 643527 643713 644373 644727
 644747 645333 645333 645447 645553 645647 646137 646437
 646457 646467 646533 646567 647067 647253 647427 650367
 650573 650733 651167 651267 651273 651517 651617 652167
 652317 652437 652527 652553 652617 652647 652707 653233
 653537 653627 654157 654327 654333 654467 654517 654627
 654647 655117 655507 655557 656117 656133 656247 656427

656477 656733 657033 657257 660177 660277 660367 660673
 660747 661167 661173 661347 661457 661627 661647 662257
 662267 662377 662527 662547 662533 663067 663427 663447
 664257 664273 664437 664473 664527 664547 665127 665427
 665477 665747 666057 666073 666127 666147 666447 667157
 667237 670377 670473 670647 670707 671037 671067
 671147 671247 671307 671357 671417 671477 671637 672117
 672277 673077 673107 673547 674227 675107 676207 676207
 677037 700577 700677 700737 701727 702567 702667
 702717 703167 703237 703467 703527 703547 704357 704727

705077	705157	705347	705457	705517	705767	706077	706347	706517	706647
707357	707417	707427	707637	707717	710277	710337	710557	710637	710727
711267	711317	711457	711627	712237	712327	712347	712437	713037	713477
713717	714237	714527	714647	714617	714627	715417	715427	716057	716217
717317	720357	720477	721167	721257	721327	721457	721527	723037	723637
724077	724257	724317	724377	724517	724617	725057	725217	725277	725477
725337	726367	726417	727017	727157	730237	730437	730457	731117	731717
732027	732117	732337	732417	733237	734177	734217	734557	734717	736017
736077	736617	740177	741157	741257	741457	742077	742257	742517	743357
743477	743657	744517	745037	745557	750077	750257	750457	750677	752037

753157 754037 760437

17TH DEGREE POLYNOMIALS • 15 NONZERO COEFFICIENTS

477757	477767	537377	537737	537773	553777	557577	557773	567577	567677
567757	573775	575377	576577	576677	576757	576767	577357	577573	577657
577667	637377	637677	637773	647777	656777	657757	667757	672777	675577
676737	675757	677337	677557	677567	677637	677747	717577	726777	735737
736737	736767	737277	737357	737537	737557	737637	745777	746777	747577
753377	753757	754777	756577	757177	757337	762777	766577	767277	767477
774577									

17TH DEGREE POLYNOMIALS • 17 NONZERO COEFFICIENTS

757777 767777

18TH DEGREE POLYNOMIALS, 3 NONZERO COEFFICIENTS

1002201

18TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

1002247	1000115	1000407	1000621	1001013	1001023	1001141	1002031	1002061	1002211
1002241	1002441	1003011	1004205	1004405	1010045	1010051	1010211	1011041	1012003
1002007	1000061	1020121	1020241	1021011	1022005	1040043	1040051	1040205	1041011
1000005	1100045	1101005	1104005	1200403	1400043				

18TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

1000077	1000173	1000333	1000347	1000355	1000517	1000743	1000751	1001165	1001253
1001361	1001427	1001453	1001455	1001607	1001625	1001631	1001651	1001705	1001705
1001741	1002075	1002133	1002171	1002623	1002705	1002741	1003035	1003053	1003215
1003451	1003451	1003521	1004073	1004153	1004313	1004447	1004455	1004545	1004623
1004643	1004645	1004711	1005035	1005213	1005225	1005305	1005341	1005431	1005451
1005521	1005503	1006113	1006161	1006605	1007031	1007121	1007501	1010133	1010163
1010313	1010463	1010551	1010613	1010615	1010741	1011055	1011245	1011261	1011423
1011505	1011605	1011621	1012047	1012131	1012303	1012407	1013007	1013301	1013403
1013421	1014017	1014027	1014035	1014231	1014251	1014503	1014511	1015043	1015441
1016007	1016141	1016241	1016403	1017021	1020171	1020255	1020315	1020471	1020507

1020513	1020615	1021113	1021143	1021231	1021425	1021611	1022027	1022055	1022131
1022145	1022225	1022311	1022443	1022461	1022541	1022621	1023045	1023103	1023111
1023221	1023405	1024017	1024027	1024063	1024065	1024305	1025051	1025105	1025141
1025023	1026042	1026061	1030145	1030161	1030215	1030303	1030311	1030321	1030341
1030407	1034013	1034051	1034105	1035021	1040117	1040247	1040351	1040361	1040463
1040465	1040545	1040645	1040721	1041035	1041207	1041225	1041423	1041445	1041451
1041505	1042107	1042451	1042603	1042605	1043031	1043043	1044047	1044225	1044231
1044445	1044605	1045015	1045121	1045411	1046013	1046025	1050115	1050145	1050215
1050321	1051007	1051111	1054045	1054211	1060065	1060151	1060423	1060431	1062203
1062205	1064013	1064045	1064103	1070007	1070025	1070043	1100233	1100253	1100265

1100107	1100343	1100455	1100515	1100551	1100615	1100703	1101055	1101063
1101115	1101223	1101511	1102065	1102123	1102213	1102245	1102251	1103031
1103045	1104027	1104143	1104145	1104213	1104503	1105007	1105025	1105203
1106103	1110027	1110311	1110451	1111015	1111023	1111045	1111051	1112203
1112425	1114015	1120107	1120113	1120145	1120407	1120413	1120451	1121423
1122105	1124013	1124007	1130007	1130205	1131003	1132003	1140017	1141007
1141405	1142013	1144005	1146003	1150205	1154003	1160403	1161005	1200057
1200133	1200165	1200255	1200507	1200625	1201113	1201425	1203105	1204113
1204207	1204243	1204423	1204505	1205023	1206043	1210047	1210065	1210143
1210413	1210443	1211045	1212013	1212023	1212045	1213003	1214015	1214103
1220063	1220065	1220225	1220245	1221203	1224023	1240065	1240225	1240243
1240413	1240423	1242023	1242043	1245003	1250007	1251003	1260403	1262003
1300213	1300443	1301023	1302103	1320013	1320203	1340103	1340103	1341003
1400067	1400127	1400253	1400307	1400523	1400613	1401503	1401603	1402143
1402423	1402603	1404213	1404243	1405013	1406007	1410123	1410207	1412013
1414023	1420107	1420207	1430013	1440047	1440113	1440213	1500033	

18TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

1000757	1001567	1001727	1002637	1002733	1003175	1003715	1004337	1004357
1004375	1004573	1004717	1005317	1005327	1005355	1005473	1005707	1005731
1005741	1006173	1006355	1006627	1006533	1006663	1007037	1007171	1007263
1007315	1007417	1007543	1007705	1010727	1011267	1011333	1011347	1011533
1011571	1011647	1011663	1012363	1012527	1012547	1012633	1012745	1011553
1013263	1013323	1013331	1013471	1013525	1013551	1013607	1014365	1014475
1014555	1014723	1015037	1015155	1015253	1015271	1015325	1015531	1016435
1015551	1015705	1017071	1017161	1017215	1017243	1017261	1017503	1017511
1017511	1020277	1020753	1020771	1021237	1021273	1021355	1021365	1021473
1021475	1021553	1021635	1021745	1021751	1022533	1022617	1023165	1023325
1023345	1023427	1023551	1023613	1024157	1024317	1024535	1024553	1025075
1025217	1025253	1025271	1025307	1025315	1025447	1025465	1025531	1025711
1026117	1026163	1026253	1026307	1026315	1026325	1026331	1026523	1026613
1026625	1027423	1027431	1027521	1027541	1027603	1027621	1030167	1030275
1030355	1030457	1030527	1030671	1030723	1031075	1031233	1031427	1031471
1031561	1031615	1031623	1031643	1031651	1032057	1032057	1032235	1032345
1032361	1032417	1032435	1032525	1032543	1032551	1032625	1033027	1033207
1033451	1033457	1033457	1033477	1034307	1034711	1034741	1035161	1035223
1035423	1036017	1036053	1036063	1036123	1036161	1036231	1037025	1040337
1040657	1040675	1040747	1041077	1041173	1041273	1041347	1041617	1041653

1041655	1041761	1042237	1042333	1042353	1042533	1042715
1043235	1043455	1043613	1043703	1044175	1044317	1044527
1044571	1044635	1045561	1046227	1046233	1046263	1046471
1046643	1047047	1047415	1047611	1050173	1050723	1050745
1051073	1051171	1051247	1051343	1051351	1051465	1051721
1052073	1052217	1052255	1052343	1052361	1052437	1052513
1053243	1053245	1053431	1053443	1053611	1054037	1054265
1054271	1054313	1054453	1054523	1054525	1054551	1054613
1054525	1054631	1054703	1055033	1055113	1055151	1055511
1055033	1055047	1055071	10556131	1056251	1056305	1057007

1057023	1057043	1057205	1057211	1060535	1060571	1060745
1060751	1061057	1061153	1061165	1061453	1061507	1061531
1062127	1062153	1062551	1062631	1063017	1063125	1063261
1063303	1063423	1064147	1064227	1064345	1064543	1065107
1065303	1065443	1065505	1065547	1066603	1067023	1070235
1070271	1070307	1070455	1070525	1070561	1071013	1071053
1071151	1071215	1072107	1072123	1072305	1072505	1072603
1074017	1074055	1074231	1074425	1075025	1075211	1075403
1076045	1076103	1076405	1077011	1101173	1101355	1101527
1101533	1102175	1102273	1102347	1102517	1102563	1102627

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1104335	1104371	1104723	1105135	1105265	1105307	1105515
1105631	1106037	1106253	1106433	1106455	1106651	1106703
1107063	1107151	1107251	1107443	1109173	1109317	1110535
1110707	1110715	1111133	1111235	1111331	1111417	1111525
1111607	1111651	1112075	1112135	1112417	1112435	1113033
1113113	1113231	1114171	1114235	1114433	1114513	1115035
1115125	1115151	1115243	1115445	1116063	1116115	1116143
1116215	1116245	1117025	1117403	1120275	1120333	1120475
1120751	1121171	1121331	1121515	1122075	1122165	1122253

1122255	1122345	1122507	1122543	1123113	1123243	1124165
1124217	1124227	1124343	1124433	1124471	1124507	1124645
1125017	1125053	1125243	1125407	1125605	1126115	1126145
1126213	1126423	1130135	1130147	1130165	1130247	1130531
1132047	1132063	1132693	1132695	1134027	1134125	1134223
1134305	1134431	1140353	1140437	1141227	1141253	1141607
1141523	1141642	1142073	1142127	1142325	1142471	1142525
1143017	1143035	1143305	1143425	1143445	1143503	1144417
1144463	1144471	1144703	1145033	1145445	1146065	1146413
1147103	1150155	1150313	1150427	1150545	1151035	1151107

1151143 1152053 1152215 1154213 1154445 1155203
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 1163043 1163045 1163205 1164065 1164143 1164245 1164415
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 1301135 1301233 1301323 1301543 1302155 1302233 1302523 1303055 1303243
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1410237	1410347	1410647	1411313	1411703	1412307	1412343	1412453	1412613	1413017
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1514327	1514407	1520147	1520217	1520233	1520417	1520507	1521107	1521407	1522107
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18TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

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1025755	1026477	1026537	1026575	1026657	1026575	1026755	1026765	1027077	1027167
1027273	1027275	1027457	1027563	1027653	1030377	1031375	1031777	1032177	1032753
1033157	1033335	1033527	1033553	1033555	1033653	1033715	1034657	1034667	1034667
1035327	1035475	1035517	1035571	1036317	1036353	1036365	1036565	1036647	1036647
1036723	1037067	1037171	1037227	1037235	1037271	1037433	1037513	1037631	1037661
1042767	1043337	1043773	1043747	1044577	1045177	1045477	1045735	1046177	1046177
1046277	1046337	1046357	1046375	1046637	1046755	1046771	1047077	1047333	1047457

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1066563	1066715	1066725	1066731	1067147	1067155	1067163	1067331	1067417	1067435
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1107555	1107571	1107655	1110757	1111177	1111367	1112337	1112667	1112717	1112753
1112771	1113257	1113257	1113273	1113527	1113547	1113553	1113433	1113663	1113671
1114177	1114477	1114575	1114733	1114755	1115137	1115371	1115437	1115527	1115633
1115635	1115725	1115745	1116517	1116535	1115633	1116665	1117117	1117135	1117227
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1124657	1125273	1125327	1125355	1125633	1125663	1125745	1125745	1126257	1126365
1126371	1126457	1126533	1126565	1126665	1126713	1127135	1127235	1127315	1127351
1127455	1127455	1127523	1127643	1130557	1130573	1130717	1130755	1130763	1130771
1131275	1131437	1131473	1131517	1131535	1132347	1132365	1132437	1132473	1132553
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1133507	1133543	1133631	1134335	1134535	1134565	1134627	1135147	1135263	1135307
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1137225	1140677	1140775	1141337	1141375	1141557	1141657	1141765	1142477	1142567
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1160673	1160765	1161547	1161555	1161565	1162173	1162365	1162475	1162633	1162707
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1167223	1167245	1167415	1167443	1167505	1167425	1170157	1170317	1170327	1170533
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1173053	1173055	1173303	1173305	1173503	1173505	1174075	1174233	1175035	1175055
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1365263	1365423	1366123	1367013	1367103	1367403	1370117	1370163	1370227	1370313
1370343	1371063	1371207	1372053	1372207	1372243	1372443	1373013	1374053	1374297
1374213	1374423	1375203	1376203	1401577	1402377	1403667	1403727	1403733	1405177
1406337	1406373	1407327	1407547	1407707	1411667	1411717	1411753	1412277	1413267
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1424373	1424717	1425457	1425517	1425617	1425663	1425723	1426157	1426467	1426527
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1430367	1430557	1430657	1430667	1430733	1431173	1431467	1432137	1432167	1432363
1432457	1432547	1433217	1434267	1434273	1434517	1434627	1434633	1434653	1435067
1435133	1435463	1436057	1436507	1437113	1437223	1437407	1437423	1440377	1440577
1442177	1442667	1442673	1442733	1442763	1443157	1443273	1443347	1443353	1444357
1444747	1445077	1445137	1445457	1445467	1445563	1446273	1446333	1446633	1447057
1447073	1447117	1447127	1447507	1447523	1450357	1450537	1450573	1450717	1451167
1451267	1451317	1451473	1451627	1451707	1451713	1452077	1452723	1452723	1453427
1454317	1454363	1454653	1454707	1455163	1455227	1455313	1456153	1457027	1460667
1460733	1461267	1461273	1461347	1461363	1461517	1461707	1462077	1462347	1462353
1462437	1462527	1462617	1462653	1463057	1463127	1463163	1463307	1463507	1464173
1464273	1464553	1466067	1466117	1466227	1466513	1467413	1470267	1470347	1470563
1470633	1471067	1471133	1471227	1472073	1472233	1472247	1472417	1472607	1474037
1474147	1474417	1474453	1475413	1476017	1501337	1501667	1501747	1501753	1502367
1502477	1502747	1503157	1503517	1503647	1504177	1505173	1505617	1505707	1506237
1507133	1510567	1510573	1510667	1511077	1511257	1511273	1511707	1512267	1512547
1512627	1512713	1513117	1513153	1513453	1513507	1514333	1514353	1514473	1515133
1515217	1515433	1516117	1516133	1516247	1517033	1520337	1520747	1521137	1521317
1522327	1522653	1523037	1523153	1523253	1524527	1524633	1525067	1525427	1525607
1526073	1526147	1526217	1526247	1526307	1530157	1530237	1530517	1531147	1531507
1532073	1532133	1532227	1532433	1534507	1535033	1535407	1536027	1540357	1540367
1542727	1541617	1541707	1542267	1542517	1543057	1543133	1543427	1544457	1544633
1545133	1545247	1546227	1547017	1547207	1547407	1550077	1550137	1550437	1550467
1550517	1550557	1551417	1551607	1552147	1552507	1553017	1554057	1554073	1554127
1555027	1555207	1560547	1561057	1561417	1561427	1562247	1564447	1564507	1565107
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1582477	1602557	1603077	1603167	1603257	1603457	1603467	1603617	1604717	1606077
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1612457	1612467	1612617	1613067	1613127	1613307	1613427	1614077	1614517	1614527

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1624077	1624137	1624267	1624317	1625037	1625127	1626227	1627017	1630077	1630437
1631127	1631217	1632117	1640727	1641437	1642467	1643067	1644237	1644327	1644327
1644627	1645057	1645127	1645417	1645117	1650437	1651117	1652067	1660167	1660437
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18TH DEGREE POLYNOMIALS, 13 NONZERO COEFFICIENTS

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1062777	1063757	1066737	1066775	1071577	1072757	1073477	1073537	1073733	1074677
1074737	1075277	1075733	1076763	1077175	1077535	1077555	1077647	1077663	1077671
1077713	1077677	1107767	1116577	1117277	1117763	1121777	1123757	1125677	1125773
1125775	1126677	1127357	1127753	1130777	1131677	1132377	1133657	1133771	1134577
1134757	1135337	1135367	1135373	1135727	1136477	1136557	1136667	1137275	1137363
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1152767	1153567	1153575	1153673	1154775	1155375	1155673	1155735	1155753	1156337
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1167437	1167535	1167617	1167647	1167725	1171367	1171575	1171747	1172667	1173137
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 1343273 1343575 1343777 1344767 1345537 1345717 1346177
 1346357 1346747 1347137 1347167 1347707 1347743 1351477
 1352567 1352675 1353257 1353275 1353347 1353475 1353713
 1353743 1354337 1354763 1355077 1355175 1355563 1355717
 1355827 1356173 1356267 1356437 1357323 1357417 1357523
 1360677 1361375 1361557 1362733 1363457 1363553 1363663

1364375 1364657 1366077 1366267 1366743 1367067 1367447
 1370337 1370657 1370717 1371167 1371457 1371647 1371743
 1372173 1372333 1372457 1372627 1373307 1373323 1373507
 1373613 1374317 1374437 1374467 1374713 1375067 1375147
 1375427 1375643 1376247 1376543 1377017 1377123 1415773
 1417337 1417357 1417373 1417727 1423757 1425767 1426737
 1427277 1427717 1431757 1433373 1435177 1435717 1435753
 1436537 1437077 1437267 1437317 1437533 1443377 1444777
 1446767 1447763 1452737 1452773 1453177 1456667 1457157
 1457327 1461677 1462757 1463753 1464377 1464767 1465277 1465373

1465477 1466667 1467327 1467467 1467633 1470737 1471733
 1472367 1472567 1472753 1473317 1473617 1474567 1475157
 1475273 1475353 1475527 1476347 1476633 1477247 1477607
 1505577 1505773 1507177 1507367 1511677 1511757 1514377
 1515657 1516573 1516537 1517157 1517327 1517473 1521377
 1523657 1524773 1525637 1526177 1526277 1526747 1527333
 1527553 1530377 1530773 1532717 1533137 1533347 1533547
 1533647 1534367 1535167 1535627 1536267 1537247 1543357
 1543367 1543537 1545357 1545537 1546747 1552337 1552637
 1552637 1553473 1553707 1554567 1554667 1554747 1556157 1556457

1557057 1557147 1560677 1561373 1561717 1562277 1563167
 1563317 1564567 1564567 1565317 1566077 1566327 1566457 1566617
 1570573 1571517 1571527 1572077 1572157 1572647 1573507 1573607
 1574267 1574467 1575057 1575147 1575227 1575307 1577027 1605737
 1607277 1607537 1607727 1613747 1615667 1615717 1616357 1623367
 1623637 1624737 1624757 1625177 1625537 1625637 1626357 1627157
 1627437 1627527 1627547 1632667 1634657 1634727 1635077 1636437
 1636457 1637417 1644757 1647137 1647437 1650377 1651277 1652567
 1653137 1653267 1654277 1654357 1655237 1655317 1656317 1656437
 1660577 1661477 1662557 1663167 1663437 1663517 1664337 1665257

165317	1665457	1667117	1670277	1670567	1672517	1674257	1675217	1703177	1703337
1703537	1705177	1706477	1707137	1707517	1710377	1711277	1714637	1715437	1716077
1721477	1721537	1722657	1723157	1724637	1726437	1730477	1731137	1734437	1735037
1743137	1744477	1750177	1760177	1769277					

18TH DEGREE POLYNOMIALS, 15 NONZERO COEFFICIENTS

1377775	1137677	1137757	1147777	1157767	1172777	1173577	1173757	1174777	1175677
1175775	1177537	1236777	1237767	1263777	1267767	1273757	1277337	1277357	1277573
1277717	1277735	1315777	1317775	1323777	1326777	1333377	1333737	1336377	1336577
1336737	1337277	1343777	1347577	1347773	1353757	1355767	1356737	1357177	1357367
1357763	1357757	1365377	1365777	1366737	1366773	1367337	1367367	1367557	1367573
1367717	1371577	1371677	1372775	1373637	1373667	1374775	1375367	1375537	1375717
1376357	1376467	1376727	1377077	1377527	1377577	1377677	1457737	1457757	1471777
1476577	1477337	1517737	1535377	1537367	1537537	1537567	1537573	1537657	1537717
1547677	1547757	1553767	1556757	1557557	1557727	1563577	1563773	1567177	1567373
1575737	1567667	1570777	1573357	1573477	1573657	1573747	1575477	1575557	1575727

1576337	1576557	1576717	1576747	1577257	1577547	1617737	1617757	1632777	1635577
1535757	1637277	1637337	1637637	1653377	1653737	1655677	1657537	1665677	1666377
1565677	1667477	1667657	1673277	1674577	1676637	1677137	1677157	1707377	1707737
1713677	1717477	1717637	1725577	1727557	1734737	1735277	1736337	1736637	1754677
1762677	1770377								

18TH DEGREE POLYNOMIALS, 17 NONZERO COEFFICIENTS

1373777	1377773	1577677	1637777	1676777	1677577	1677737	1737377	1755777	1757577
1757677	1766777								

THERE ARE NO 19TH DEGREE POLYNOMIALS WITH 3 NONZERO COEFFICIENTS

19TH DEGREE POLYNOMIALS, 5 NONZERO COEFFICIENTS

2000047	2000197	2000123	2000131	2000143	2000223	2000341	2000593	2000541	2000605
2000541	2001013	2001023	2001031	2001045	2001061	2001121	2001203	2001241	2001241
2001441	2002121	2002211	2002221	2002501	2003011	2003021	2003101	2004025	2004103
2004105	2004121	2004501	2005021	2012011	2012021	2012041	2014003	2020015	2020031
2020051	2020405	2021003	2021005	2021011	2021021	2022003	2024011	2030011	2030041
2040007	2040013	2040051	2040105	2040211	2040241	2042011	2044011	2050003	2060005
2100061	2100205	2101011	2102003	2120011	2140005	2200023	2200045	2200103	2200111
2200203	2201005	2210003	2210005	2401003	2404003	2440003	3000043	3000103	

19TH DEGREE POLYNOMIALS, 7 NONZERO COEFFICIENTS

2000077	2000157	2000175	2000257	2000553	2000565	2000635	2000655	2000663	2000707
2000715	2001117	2001153	2001155	2001227	2001507	2001551	2001645	2001651	2001711
2002067	2002165	2002265	2002271	2002323	2002331	2002435	2002453	2002471	2002523
2002561	2002651	2002721	2003063	2003113	2003115	2003145	2003207	2003213	2003303
2003321	2003425	2003505	2003511	2003605	2003621	2004037	2004153	2004163	2004227
2004233	2004271	2004343	2004345	2004453	2004465	2004523	2004525	2004613	2004705
2004711	2004741	2005053	2005065	2005115	2005131	2005223	2005245	2005261	2005341
2005521	2006017	2006071	2006143	2006145	2006207	2006423	2006521	2006603	2006621
2006701	2007045	2007051	2007105	2007111	2007205	2007403	2007421	2007601	2010057
2010075	2010117	2010135	2010171	2010247	2010263	2010323	2010345	2010447	2010465
2010471	2010525	2010531	2010551	2010615	2010623	2010643	2011035	2011071	2011107
2011113	2011123	2011245	2011311	2011321	2011425	2011451	2011505	2011605	2011641
2012033	2012055	2012113	2012261	2012415	2012425	2012603	2013015	2013031	2013105
2013121	2013203	2013211	2013301	2014027	2014115	2014151	2014243	2014251	2014261
2014341	2014413	2014511	2014503	2015061	2015301	2016061	2016205	2016221	2016411
2017101	2020163	2020233	2020235	2020255	2020313	2020323	2020331	2020345	2020471
2020543	2020607	2020625	2020661	2020721	2021047	2021113	2021145	2021145	2021213
2021245	2021245	2021423	2021425	2021451	2021461	2021541	2022033	2022065	2022107
2022161	2022223	2022231	2022311	2022321	2022415	2022431	2022451	2022503	2022701
2023013	2023111	2023121	2024027	2024053	2024055	2024071	2024125	2024143	2024151

2024161	2024207	2024413	2024445	2024505	2024603	2025023	2025043	2025141
2025241	2025501	2026015	2026105	2026141	2026301	2026403	2026411	2027005
2027021	2028027	2030033	2030055	2030131	2030145	2030151	2030225	2030261
2030303	2030425	2030445	2030621	2031103	2031411	2031441	2032007	2032013
2032205	2033007	2033405	2033406	2033421	2033441	2033600	2033602	2040057
2040075	2040127	2040271	2040323	2040531	2040543	2040515	2040631	2040741
2041027	2041047	2041071	2041125	2041243	2041245	2041431	2041503	2041521
2041621	2042107	2042115	2042207	2042215	2042251	2042261	2042305	2042415
2042422	2042451	2042505	2042521	2042521	2043015	2043025	2043043	2043051
2043111	2043321	2043311	2043341	2044055	2044065	2044145	2044213	2044215
2044413	2044505	2044541	2044611	2044641	2045007	2045013	2045023	2045025
2045045	2045111	2045221	2045103	2046111	2046203	2045405	2046411	2047005
2050047	2050071	2050115	2050125	2050207	2050223	2050225	2050245	2050311
2050413	2050445	2050511	2051015	2051025	2051121	2051141	2052007	2052015
2052051	2052111	2052403	2054023	2054025	2054103	2054121	2054211	2054221
2055011	2056021	2060017	2060063	2060107	2060123	2060161	2060215	2060231
2060341	2060423	2060451	2060541	2060621	2061051	2061141	2061411	2062007
2062015	2062031	2062043	2062121	2062205	2064103	2064111	2064203	2065011
2065021	2070015	2072005	2074003	2100133	2100153	2100171	2100247	2100323
2100427	2100453	2100471	2100507	2100543	2100551	2101017	2101035	2101047
2101071	2101107	2101145	2101231	2101251	2101503	2101505	2102065	2102113
2102145	2102225	2102231	2102243	2102245	2103031	2103111	2103405	2104027
2104035	2104047	2104131	2104215	2104225	2104305	2104443	2104603	2105043
2105061	2105105	2105421	2106007	2106023	2106203	2107005	2107011	2110035
2110113	2110145	2110245	2110251	2110321	2110425	2110451	2110605	2111043
2111121	2111403	2111405	2112023	2112103	2112203	2112211	2112411	2113011
2114013	2114025	2114121	2114403	2120055	2120065	2120113	2120115	2120131
2120207	2120223	2120321	2120407	2120423	2120451	2120505	2120511	2121015
2121023	2121103	2121203	2122013	2122023	2122043	2122403	2123011	2124105
2124111	2124205	2125005	2130031	2130103	2130105	2134005	2140047	2140115
2140125	2140143	2140225	2140305	2140311	2140443	2140445	2140461	2141031
2141043	2141051	2142023	2142043	2142105	2142203	2144013	2144025	2144031
2144043	2145005	2151005	2152005	2154003	2160007	2160015	2164003	2164005
2200037	2200073	2200155	2200331	2200463	2200471	2200545	2200625	2200643
2201033	2201063	2201131	2201151	2201243	2201245	2201407	2201443	2202113
2202223	2202245	2202503	2202605	2203007	2203111	2203211	2203405	2204033
2204053	2204063	2204125	2204251	2204305	2204415	2204445	2205015	2205105
2205405	2206007	2206031	2206051	2206205	2206403	2207003	2210027	2210033
2210115	2210151	2210213	2210407	2210425	2210451	2210505	2211023	2211045
2211051	2212025	2212203	2214007	2214051	2215005	2216003	2220017	2220047

2220131	2220145	2220231	2220245	2220251	2220425	2220503	2221007	2221013	2221111
2221205	2222031	2222105	2224205	2224403	2225003	2230013	2230023	2230033	2232005
2240255	2240123	2240125	2240145	2240213	2240215	2240303	2241043	2241403	2242043
2244013	2244015	2244045	2244405	2244903	2244903	2250015	2250205	2250405	2252003
2252005	2260013	2260063	2300123	2300207	2300245	2300605	2301015	2301105	2301203
2302013	2302103	2303003	2304043	2304403	2305005	2306005	2310123	2311003	2320007
2320013	2320023	2320203	2320405	2321003	2322003	2340007	2340015	2400057	2400073
2400075	2400135	2400147	2400153	2400233	2400253	2400307	2400325	2400417	2400453
2400465	2400507	2400523	2400613	2400615	2400623	2400645	2401063	2401065	2401125
2401503	2401605	2402027	2402035	2402063	2402107	2402115	2402123	2402125	2402207
2402413	2402505	2402603	2403023	2403043	2403403	2404047	2404055	2404123	2404125
2404145	2404213	2404245	2404303	2404407	2404443	2405013	2405025	2405203	2406013
2406103	2406203	2410107	2410113	2410125	2410207	2410215	2410225	2410243	2410425
2410443	2410605	2411015	2411025	2411043	2411205	2412025	2412045	2414007	2414043
2415003	2416003	2420017	2420033	2420107	2420115	2420215	2420243	2420415	2420423
2421007	2421025	2421043	2421105	2421203	2422007	2422403	2423003	2424015	2424023
2424045	2424203	2430023	2430025	2430045	2430403	2432003	2434003	2440017	2440053
2440107	2440143	2440223	2441103	2444007	2450007	2450013	2450025	2450403	2452003
2460103	2500027	2500065	2500107	2500143	2500243	2500423	2500503	2500603	2501013
2501403	2502007	2502015	2502043	2502203	2504023	2504403	2510013	2520007	2540013
2540043	2542003	2600027	2600055	2600063	2600107	2600115	2600143	2600213	2600303
2601015	2601203	2601403	2602013	2602103	2604203	2606003	2610023	2610203	2620043
2621003	2630003	2640013	2640203	2641003	2642003	2660003	2700007	2700403	3000057
3000067	3000147	3000153	3000263	3000453	3000463	3000513	3000623	3002027	3002213
3002407	3002423	3002603	3004027	3004113	3004207	3004243	3004413	3004603	3005013
3005043	3005203	3010107	3010143	3010223	3011013	3012103	3014007	3020047	3020113
3020207	3020423	3021103	3022043	3024043	3030023	3040063	3040107	3040143	3040207
3040203	3040423	3040103	3040203	3044007	3044013	3060007	3100033	3100107	3100123
3100223	3120013	3200033	3200207	3202007	3220007	3400027			
2000677	2000737	2001557	2001637	2001727	2001733	2001735	2001763	2002177	2002537
2002567	2002673	2002727	2002735	2002753	2002765	2002771	2003137	2003275	2003347
2003355	2003473	2003527	2003635	2004373	2004557	2004575	2004763	2005173	2005267
2005517	2005533	2005565	2005665	2005751	2006237	2006275	2006317	2006327	2006347
2006363	2006457	2006533	2006633	2006653	2006707	2006713	2006725	2006761	2007163
2007235	2007265	2007313	2007331	2007343	2007351	2007447	2007513	2007531	2007643
2007703	2010357	2010537	2010557	2010573	2010717	2011077	2011157	2011167	2011257
2011273	2011275	2011327	2011473	2011535	2011547	2011553	2011565	2011671	2011743
2011761	2012157	2012173	2012347	2012467	2012527	2012553	2012617	2012671	2012665
2012707	2012713	2013133	2013155	2013165	2013247	2013255	2013307	2013525	2013545

19TH DEGREE POLYNOMIALS, 9 NONZERO COEFFICIENTS

2013661 2013705 2013721 2014137 2014175 2014333 2014353 2014457 2014475 2014533
 2014571 2014633 2014655 2014665 2014715 2014745 2015057 2015117 2015135 2015163
 2015233 2015255 2015255 2015343 2015325 2015361 2015417 2015471 2015543 2015705
 2015711 2016037 2016155 2016163 2016171 2016263 2016307 2016313 2016351 2016433
 2016447 2016455 2016463 2016515 2016551 2016623 2016625 2016643 2017035
 2017053 2017063 2017125 2017151 2017161 2017225 2017231 2017321 2017341
 2017535 2020277 2020375 2020477 2020537 2020567 2020573 2020747 2020753
 2020763 2021077 2021137 2021173 2021317 2021473 2021635 2021663 2021663
 2021671 2022175 2022273 2022475 2022517 2022571 2022743 2022743
 2022745 2023153 2023255 2023313 2023315 2023323 2023345 2023351 2023417
 2023435

2023447 2023507 2023513 2023525 2023551 2023561 2023623 2023645 2023741 2024077
 2024275 2024317 2024327 2024437 2024457 2024533 2024547 2024555 2024723 2024731
 2024743 2025135 2025153 2025155 2025155 2025433 2025513 2025543 2025515 2025523 2025643
 2025711 2025721 2025721 2026037 2026127 2026227 2026235 2026253 2026255 2026345
 2026417 2026435 2026507 2026523 2026543 2026645 2026711 2027027 2027107 2027131
 2027243 2027251 2027341 2027407 2027445 2027503 2027511 2027605 2030137 2030167
 2030257 2030347 2030353 2030437 2030527 2030535 2030553 2030555 2030647 2030647
 2030665 2030713 2030761 2030761 2031163 2031233 2031345 2031455 2031507 2031525
 2031561 2031525 2031561 2031703 2031705 2032227 2032255 2032265 2032313
 2032315 2032447 2032463 2032525 2032661 2032711 2032741 2033033 2033065

2033143 2033215 2033231 2033251 2033311 2033425 2033431 2033443 2033451 2033605
 2033701 2034153 2034171 2034217 2034253 2034331 2034331 2034463 2034523
 2034631 2034645 2035027 2035143 2035207 2035213 2035251 2035251 2035415
 2035445 2035521 2036017 2036027 2036113 2036207 2036223 2036305 2036311 2036423
 2036425 2036431 2036605 2036611 2037013 2037241 2037403 2037421 2040477
 2040557 2040575 2040667 2040765 2041173 2041237 2041267 2041273 2041371
 2041553 2041555 2041565 2041647 2041663 2041665 2041715 2042137 2042237
 2042347 2042353 2042363 2042617 2042635 2042707 2042713 2042745 2043037
 2043313 2043315 2043343 2043361 2043455 2043453 2043531 2043623 2043711
 2044237 2044327 2044355 2044457 2044475 2044547 2044547 2044635 2044751

2045067 2045165 2045171 2045253 2045427 2045435 2045447 2045453 2045463 2045513
 2045515 2045531 2045543 2045551 2045645 2045705 2046037 2046067 2046073 2046127
 2046165 2046217 2046247 2046255 2046343 2046435 2046507 2046525 2046543 2046643
 2046703 2046721 2047033 2047123 2047151 2047213 2047223 2047407 2047425 2047461
 2047505 2047621 2050267 2050335 2050633 2050647 2050713 2050751 2051057 2051073
 2051117 2051127 2051153 2051163 2051171 2051307 2051323 2051455 2051471 2051471
 2051513 2051631 2052217 2052227 2052307 2052307 2051323 2052455 2052465 2052465
 2052531 2052545 2052643 2053017 2053035 2053063 2053107 2053123 2053225 2053225
 2053243 2053261 2053451 2053503 2053503 2053611 2053621 2054117 2054227 2054227
 2054323 2054417 2054465 2054507 2054515 2054531 2054551 2054623 2054705

2054741	2055033	2055107	2055125	2055131	2055143	2055145	2055213	2055223
2055202	2055311	2055407	2055541	2055511	2055641	2056027	2056131	2056151
2056213	2056231	2056321	2056407	2056423	2056445	2056603	2056605	2057015
2057141	2060273	2060327	2060475	2060547	2060563	2060617	2060653	2060707
2060713	2060725	2061155	2061171	2061217	2061227	2061271	2061313	2061361
2061455	2061623	2062117	2062235	2062315	2062253	2062315	2062323	2062417
2062435	2062447	2062613	2062623	2063035	2063063	2063071	2063225	2063245
2063261	2063311	2063461	2063521	2064037	2064073	2064075	2064133	2064155
2064233	2064253	2064271	2064331	2064351	2064455	2064451	2064613	2064661
2064705	2065033	2065311	2065521	2065407	2065443	2065505	2065511	2066017
2066047	2066055	2066071	2066145	2066223	2066303	2066305	2066321	2066341
2066425	2066451	2067007	2067023	2067043	2067103	2067211	2067221	2067403
2070037	2070067	2070153	2070263	2070271	2070447	2070455	2070463	2070513
2070523	2070545	2070631	2070643	2070703	2070721	2071033	2071053	2071107
2071125	2071143	2071303	2071423	2071503	2071611	2072027	2072107	2072113
2072131	2072143	2072407	2072621	2073007	2073031	2073051	2073105	2073121
2073205	2073421	2074213	2074243	2074261	2074311	2074423	2074451	2074605
2075031	2075051	2075105	2075211	2075213	2076023	2076025	2076031	2076043
2076045	2076111	2076203	2076221	2076405	2077003	2100277	2100357	2100557
2100575	2100735	2100753	2100755	2100763	2101363	2101437	2101475	2101517
2101527	2101563	2101571	2101633	2101671	2102137	2102167	2102317	2102333
2102335	2102347	2102437	2102533	2102553	2102647	2102655	2102725	2102743
2103057	2103073	2103127	2103147	2103155	2103235	2103255	2103313	2103433
2103453	2103455	2103507	2103515	2103625	2103661	2103703	2104137	2104317
2104327	2104363	2104555	2104571	2104627	2104713	2104745	2105037	2105057
2105217	2105227	2105263	2105307	2105315	2105351	2105433	2105447	2105453
2105525	2105531	2105615	2105623	2105651	2105705	2105711	2105721	2106127
2106155	2106163	2106171	2106235	2106253	2106315	2106351	2106361	2106427
2106455	2106531	2106613	2106623	2106645	2107027	2107033	2107071	2107161
2107243	2107321	2107445	2107505	2107511	2110167	2110327	2110363	2110437
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19TH DEGREE POLYNOMIALS, 11 NONZERO COEFFICIENTS

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19TH DEGREE POLYNOMIALS. 13. NONZERO COEFFICIENTS

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3174517	3174707	3175073	3175247	3175307	3175433	3175507	3176313	3176507
3177017	3177033	3203767	3206377	3206757	3207337	3207657	3207727	3211757
3213177	3213277	3213557	3213717	3214677	3214767	3215357	3215717	3215747
3215667	3217173	3217547	3221377	3222737	3223657	3223673	3223753	3224473
3224757	3224773	3225747	3226337	3226557	3226573	3227167	3227327	3227617
3227653	3230377	3231357	3231367	3231373	3231573	3231717	3231753	3232367
3232477	3232673	3232727	3233167	3233333	3233457	3233533	3233627	3233713
3234277	3234477	3234727	3234733	3235173	3235547	3235553	3236137	3236273
3236457	3236467	3236533	3236617	3237037	3237227	3237307	3240777	3242677
3242767	3243277	3243367	3243477	3243657	3244773	3245177	3245277	3245567
3245637	3245673	3245717	3246177	3246277	3246733	3247237	3247333	3247347
3247517	3247527	3247617	3247707	3250757	3251733	3252327	3252327	3253333
3253633	3254177	3254357	3254477	3254557	3254673	3254717	3255077	3255257

3447237	3447317	3447437	3447527	3447647	3450377	3450677	3450767	3451557	3452177
3452277	3452367	3452557	3452747	3453257	3453437	3453527	3453617	3454557	3454567
3454727	3454747	3455137	3455317	3455237	3455327	3456437	3457117	3457127	3457427
3460737	3461177	3461357	3461567	3461637	3462177	3462717	3463527	3463627	3464557
3464567	3464667	3464717	3464827	3465257	3465437	3465457	3465527	3465547	3465617
3466137	3466157	3466267	3466427	3467037	3467057	3467227	3470177	3470277	3470367
3470537	3470657	3470747	3471157	3471527	3472167	3472237	3472267	3472527	3474327
3474437	3474457	3475067	3475217	3475037	3475057	3476117	3476217	3476417	3477017
3501377	3501577	3502577	3503377	3505277	3505337	3505537	3505637	3505727	3506357
3506367	3507077	3507257	3507437	3507517	3507627	3510767	3512337	3512477	3512567

3512667	3512717	3513137	3513257	3513327	3514337	3514357	3514537	3515257	3515267
3515517	3515617	3516077	3516137	3516157	3517217	3521177	3521477	3521557	3521657
3521717	3522367	3523267	3523327	3523457	3524277	3524537	3524567	3525157	3525257
3526257	3526267	3526457	3527417	3530477	3530557	3530657	3531167	3531237	3531257
3531317	3531327	3531437	3532237	3532317	3532517	3533117	3534077	3534167	3534257
3534437	3534517	3535417	3536057	3540737	3540767	3541177	3541337	3541557	3542357
3542537	3542657	3543437	3543517	3544667	3545267	3545317	3546077	3546237	3546317
3546437	3546617	3547037	3550277	3550357	3550637	3551077	3551617	3552317	3552617
3553217	3554457	3555117	3555217	3560537	3560567	3560637	3560657	3561617	3562157
3562257	3562437	3562457	3564237	3565117	3566037	3566057	3566217	3570317	3570617

3571037	3572117	3574037	3576017	3602677	3603337	3604737	3605477	3605657	3606337
3606357	3606537	3607077	3607157	3607257	3611557	3611717	3612477	3612637	3613237
3614177	3614637	3615077	3616407	3616517	3617117	3621557	3621637	3621657	3622337
3622477	3622537	3622577	3623317	3623457	3624177	3624337	3624557	3625517	3626257
3633037	3634077	3634457	3636037	3641477	3641657	3642177	3642357	3642537	3643077
3643157	3643457	3644337	3644357	3644557	3644557	3646137	3651157	3651257	3652077
3654077	3654237	3654277	3660357	3661237	3662077	3663037	3664137	3665037	3670437
3672037	3701337	3702277	3702637	3704477	3705437	3706077	3710177	3712137	3720337

19TH DEGREE POLYNOMIALS, 15 NONZERO COEFFICIENTS

2067777	2077677	2133777	2137767	2137775	2155777	2157737	2166777	2167677	2173737
2173773	2175677	2177177	2177277	2177367	2177537	2177557	2177573	2177575	2177637
2271767	2277357	2277753	2277771	2277777	2277777	2277777	2267577	2267737	2267775
2271777	2273677	2274777	2275377	2275767	2275777	2275777	2277357	2277575	2277735
2277765	2313777	2317377	2317757	2325777	2327577	2334777	2335577	2334767	2337375
2337537	2337567	2337667	2337747	2347767	2347773	2352777	2353577	2353737	2353775
2353377	2355773	2356377	2356767	2356773	2357357	2357777	2357537	2357717	2357727
2357733	2361777	2363677	2363775	2365577	2366577	2367357	2367673	2367747	2367747
2371767	2372577	2372767	2373477	2373557	2373573	2373657	2373747	2375357	2375537
2375557	2375667	2375673	2375727	2376367	2376537	2376747	2376753	2377137	2377175

3175573 3175657 3175753 3175763 3176557 3176637 3177077 3177273 3177333
 3177473 3177547 3177627 3177627 3207777 3217767 3217773 3226777 3227577
 3227677 3227757 3233737 3233737 3233773 3235677 3235677 3236767 3236767
 3237357 3237537 3237537 3237537 3237537 3247577 3253773 3253773 3255577
 3255737 3257177 3257277 3257357 3257373 3257637 3257753 3263577 3265737
 3265767 3265773 3266377 3266577 3266773 3267277 3267357 3267567 3267573
 3267727 3267753 3270777 3272577 3272577 3273337 3273537 3273717 3274577
 3275337 3275357 3275373 3275537 3275567 3275733 3276747 3277157 3277167
 3277173 3277317 3277333 3277347 3277473 3277627 3307577 3314777 3316677
 3316767 3317373 3317657 3317747 3323377 3323577 3325377 3325677

3327567 3327573 3327667 3327717 3327733 3331737 3332737 3332757 3332773
 3333177 3333277 3333567 3334757 3335373 3335557 3335747 3336337 3336567
 3336667 3337257 3337317 3337317 3342777 3345377 3346677 3347537 3352767
 3352773 3353373 3353557 3353657 3353727 3354757 3355477 3355537 3355567
 3355573 3355637 3355673 3356177 3356717 3357237 3357347 3357457 3361577
 3363373 3363567 3364567 3364737 3364767 3365337 3365717 3365727 3365727
 3366177 3366357 3367157 3367267 3371477 3371557 3371637 3371727 3372537
 3372557 3372567 3372717 3372747 3373077 3373257 3373457 3374727 3375347
 3375437 3375627 3376137 3376267 3376317 3376517 3376647 3377057 3377057
 3377067 3377427 3415777 3431777 3433377 3435737 3436377 3437727 3455577

3456757 3457337 3457357 3457477 3457567 3457747 3463767 3465757 3466677
 3466737 3467337 3467567 3467567 3471577 3473177 3473357 3473717 3473727
 3474767 3475177 3475477 3475537 3475657 3475747 3476727 3507577 3512777
 3513677 3514777 3515377 3515677 3515737 3516757 3517277 3517477 3517657
 3522777 3523677 3523767 3525757 3527177 3527357 3527537 3527717 3527717
 3532737 3532767 3533357 3533477 3533727 3534757 3535357 3535367 3536337
 3535657 3537157 3537267 3537617 3541777 3543377 3543757 3547337 3547557
 3547557 3547667 3551377 3552377 3552577 3553357 3553477 3553717 3554677
 3554757 3555567 3555637 3556337 3556717 3557167 3557257 3561757 3561757
 3562737 3563277 3563337 3563357 3563537 3564757 3565557 3565657 3566277

3566557 3567457 3571277 3571367 3572357 3572557 3572717 3574477 3574557 3574717
 3575517 3613377 3613737 3615377 3615757 3617337 3617637 3617637 3623677 3623757
 3630777 3631677 3631737 3632577 3633557 3634377 3634737 3635177 3635357 3635557
 3635717 3636477 3636477 3637157 3645737 3647277 3647637 3653277 3653337 3655557
 3657137 3657237 3657377 3657577 3662757 3663277 3663637 3663637 3664757 3665277
 3665337 3665477 3665477 3665537 3667137 3667437 3670377 3670377 3671337 3673437
 3675237 3676237 3702777 3703377 3703677 3705377 3706737 3707277 3674277
 3714737 3720777 3722677 3723477 3723537 3723537 3731277 3731337 3731337 3731337
 3734277 3742377 3746277 3746277 3754177 3754177 3761177 3761177 3761177 3761177

19TH DEGREE POLYNOMIALS, 17 NONZERO COEFFICIENTS

2357777	2377577	2377775	2576777	2577577	2577677	2577773	2577773	2676777	2677775
2733777	2737737	2737773	2756777	2757773	2757777	2757773	2757773	2771777	2773377
2773737	2775737	2775767	2775775	2776677	2776757	2776773	2776773	2777477	2777537
2777577	2777717	2777747	3137777	3177677	3275777	3177677	3277737	3317777	3335777
3337677	3356777	3357737	3357737	3363777	3367773	3363777	3371777	3373577	3373757
3375737	3377357	3377637	3377657	3473777	3477677	3473777	3533777	3537377	3557677
3557767	3572777	3573677	3574777	3576577	3576737	3576577	3577277	3577377	3637577
3655777	3657737	3666777	3667577	3673377	3675737	3673377	3675757	3675777	3677337
3677477	3713777	3717737	3727377	3727737	3731777	3727737	3736377	3736577	3737177
3745777	3746777	3747577	3765377						

THERE ARE NO 19TH DEGREE POLYNOMIALS WITH 19 NONZERO COEFFICIENTS

12
11
10
9
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4
3

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13. ABSTRACT This memorandum contains a brief discussion of the practical aspects of generating binary linear maximal sequences. Included is a table of all primitive polynomials over GF(2) of degrees 2 through 19, not including reverses. These polynomials are ordered by the number of nonzero coefficients as well as by degree. This table is felt to complement other available tables.			

14.

KEY WORDS

LINK A

LINK B

LINK C

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Primitive polynomials
Linear maximal sequences
Sequence generators
Binary sequences
Table

