A particular set of orthogonal cyclic latin squares of orders 21, 27, 33, 35, 39, 45, 51, 55 57, 63, and 65

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ABSTRACT

Using an AT&T 6300 to enumerate various possibilities, a particular set of cyclic latin squares of orders 21, 27, 33, 35, 39, 45, 51, 55, 57, 63, and 65 were investigated. The particular cyclic squares studied were generated by $ci + j$ where $c = 1,\cdots,n-1$, $i = 0,\cdots,n-1$, and $j = 0,\cdots,n-1$. The computer program was written to compare all possible pairs of the latin squares generated and to print the result in a table. It was found that only the smallest prime of n minus one was the largest value for t in a POLS(n,t) set produced by this method. Thus, no new values for t were obtained.

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1. Introduction

As a follow-up of the work in BU-853-M (1984), the present work was undertaken to ascertain if a particular permutation of rows of a cyclic latin square of order n would result in more pairwise orthogonal latin squares than the smallest prime in n minus one, i.e. POLS(n,p_1-1) where N = $p_1 p_2 p_3 \cdots p_1 \le p_2 \le p_3 \le \cdots$. In BU-853-M(1984) it was stated that four sets of POLS(21,3) were obtained by the method described below. There was an error in Table 3 which led to this erroneous conclusion. For c = 1 and d = 10, the O should be replaced by N. Hence, only pairs of orthogonal latin squares were found for n = 21 and the largest set found was POLS(21,2), not POLS(21,3).

2. The Method

Since the Commodore 64 and PCs such as the AT&T 6300 are limited in their computing ability, it was decided not to use all possible permutations of the last n-1 rows of a given latin square, i.e. (n-1)! permutations. Instead, the latin squares were generated using ci+j(mod n) where i = 0,···,n-1 are the row numbers and j = 0,···,n-1 are the column numbers of a given latin square. The computer program developed (see Appendix A) compared two latin squares constructed by ci+j and di+j, c<d, for orthogonality. Because the squares are cyclic, it was necessary to compare only the first element (zero) of the square ci+j with the elements of di+j superimposed on ci+j. If the pair was orthogonal an O (or zero for n = 57,63, and 65) was recorded and if not orthogonal an N (or one for 57, 63, and 65) was recorded.

3. The Results for n = 21, 27, 33, 35, 39, 45, 51, 55, 57, 63, and 65.

A computer program (see Appendix A) was written by the second author for the IBM PC and look alikes such as the AT&T 6300. This program allowed the tables to be printed directly whereas the program in BU-853-M did not. The latter program became extremely tedious and time consuming for n=25 on the Commodore 64, making investigation of larger n*s* rather impractical. the program in Appendix A ran for all n up to 55 but then was compiled by C. E. McCulloch, Cornell University, in order to handle n = 57, 63, and 65. Larger numbers were not possible to run on the AT&T 6300 even with the compiled version of the program. There was inadequate storage for n>65. Also, it required about 30 hours to run the compiled version of the program for n=65.

It should be pointed out that the erroneous finding of a POLS(21,3) set led to this investigation. It was expected that several new results for sets of orthogonal latin squares would be found but such was not the case. The method only produced the smallest prime in n minus one pairwise latin squares of order n. This result has been known since 1922 (see MacNeish).

The results of the computer search are presented in Appendix B for n=21, 27, 33, 35, 39, 45, 51, 55, 57, 63, and 65. The tables indicate which pairs of c and d produce orthogonal latin squares. Note that any value of c or d which has p_1, p_2, p_3, for $n = p_1p_2p_3$, $p_1 \le p_2 \le p_3$, as a multiple is not a latin square using ci+j as the generator for a latin square.

4. Literature Cited

Federer, W. T. (1984) Orthogonal-cyclic latin squares of orders 9, 15, 21, and 25. BU-853-M in the technical report series of the Biometrics Unit, Cornell University, Ithaca, New York, September.

MacNeish, H. F. (1922) Euler's squares. *Annals of Mathematics* **23**:221-227.

APPENDIX A

```
10 REM POLS(N,2)
20 INPUT "VALUE FOR N =";N
30 INPUT "FACTORS OF N =";O,P
40 DIM A(N,N), B(N,N), R(N), S$(N,N), X(N)
50 FOR C= 1 TO N
60 FOR D= 1 TO N
70 S$(C,D) =" "
80 NEXT D
90 NEXT C
100 FOR C= 1 TO N-2
105 IF C/O=INT(C/O) OR C/P=INT(C/P) THEN GOTO 560
110 FOR D = C+1 TO N-1
115 IF D/O=INT(D/O) OR D/P=INT(D/P) THEN GOTO 550
120 FOR I = 1 TO N
130 FOR J = 1 TO N
140 II = I-1 : JJ= J-1
150 A(I,J) = INT ((C*II+JJ)- N*INT((C*II+JJ)/N))
160 B(I,J)= INT ((D*II+JJ)-N*INT((D*II+JJ)/N))
170 NEXT J
180 NEXT I
190 :
200 REM CLOSE 3
210 REM OPEN 3,4 :CMD3
215 REM PRINT
220 REM ME PRINT "N=";N,"C=";C,"D=";D
230 Q = 0
240 REM ME PRINT:PRINT:PRINT
250 FOR I = 1 TO N
260 REM ME PRINT "A";
270 FOR J=1 TO N
280 REM ME PRINT A(I,J);
290 NEXT J
300 REM ME PRINT
310 REM ME PRINT "B";
320 FOR J= 1 TO N
330 REM ME PRINT B(I,J);
340 NEXT J
350 REM ME PRINT:PRINT
360 NEXT I
370 FOR I = 1 TO N
380 FOR J = 1 TO N
390 IF A(I,J)<>0 THEN GOTO 430
400 REM ME PRINT I, J,B(I,J)
410 Q=Q+1
420 R(Q) =B(I,J)
430 NEXT J
440 NEXT I
450 FOR I = 1 TO N
460 X(I) =0
470 NEXT I
```

```
480 FOR Q= 1 TO N
490 IF X(R(Q)+1) = 1 THEN GOTO 540
500 X(R(Q)+1) =1
510 NEXT Q
520  S$(C,D)="O"
530 GOTO 550
540 S$(C,D)="N"
550 NEXT D
560 NEXT C
570 IF C<N-1 GOTO 100
580 IF C>N-2 THEN GOTO 590
590 REM HEADER
600 PRINT "           D =          "
610 PRINT "C =  ¦";
620 FOR G= 2 TO N-1
625 IF (G/O) = INT (G/O) OR (G/P) = INT (G/P) THEN GOTO 640
630 PRINT USING"## ";G;
640 NEXT G
650 PRINT " "
660 PRINT "-----";
670 FOR G= 2 TO N-3
680 PRINT "---";
690 NEXT G
700 PRINT " "
710 REM LINES
720 FOR C = 1 TO N-2
725 IF C/O =INT(C/O) OR C/P = INT (C/P) THEN GOTO 780
730 IF C<10 THEN PRINT C;"  ¦ ";
735 IF C>9 THEN PRINT C;" ¦ ";
740 FOR D = 2 TO N-1
745 IF D/O = INT (D/O) OR D/P = INT (D/P) THEN GOTO 760
750 PRINT S$(C,D);"  ";
760 NEXT D
770 PRINT
780 NEXT C
Ok
```

APPENDIX B

VALUE FOR N =? 21
FACTORS OF N =? 3,7

C = \ D =	2	4	5	8	10	11	13	16	17	19	20
1	O	N	O	N	N	O	N	N	O	N	O
2		O	N	N	O	N	O	N	N	O	N
4			O	O	N	N	N	N	O	N	O
5				N	O	N	O	O	N	N	N
8					O	N	O	O	N	O	N
10						O	N	N	N	N	O
11							O	O	N	O	N
13								N	O	N	N
16									O	N	O
17										O	N
19											O

Ok

VALUE FOR N =? 27
FACTORS OF N =? 3,9

C = \ D =	2	4	5	7	8	10	11	13	14	16	17	19	20	22	23	25	26
1	O	N	O	N	O	N	O	N	O	N	O	N	O	N	O	N	O
2		O	N	O	N	O	N	O	N	O	N	O	N	O	N	O	N
4			O	N	O	N	O	N	O	N	O	N	O	N	O	N	O
5				O	N	O	N	O	N	O	N	O	N	O	N	O	N
7					O	N	O	N	O	N	O	N	O	N	O	N	O
8						O	N	O	N	O	N	O	N	O	N	O	N
10							O	N	O	N	O	N	O	N	O	N	O
11								O	N	O	N	O	N	O	N	O	N
13									O	N	O	N	O	N	O	N	O
14										O	N	O	N	O	N	O	N
16											O	N	O	N	O	N	O
17												O	N	O	N	O	N
19													O	N	O	N	O
20														O	N	O	N
22															O	N	O
23																O	N
25																	O

Ok

Value for N =? 33
Factors of N =? 3,11

D =

C =	2	4	5	7	8	10	13	14	16	17	19	20	23	25	26	28	29	31	32
1	O	N	O	N	O	N	N	O	N	O	N	O	N	N	O	N	O	N	O
2		O	N	O	N	O	N	N	O	N	O	N	N	O	N	O	N	O	N
4			O	N	O	N	N	O	N	O	N	O	O	N	N	N	O	N	O
5				O	N	O	O	N	N	N	O	N	N	O	N	O	N	O	N
7					O	N	N	O	N	O	N	O	O	N	O	N	N	N	O
8						O	O	N	O	N	N	N	N	O	N	O	N	O	N
10							N	O	N	O	N	O	O	N	O	N	O	N	N
13								O	N	O	N	O	O	N	O	N	O	N	O
14									O	N	O	N	N	N	N	O	N	O	N
16										O	N	O	O	N	O	N	O	N	O
17											O	N	N	O	N	N	N	O	N
19												O	O	N	O	N	O	N	O
20													N	O	N	O	N	N	N
23														O	N	O	N	O	N
25															O	N	O	N	O
26																O	N	O	N
28																	O	N	O
29																		O	N
31																			O

Ok

VALUE FOR N =? 35
FACTORS OF N =? 5,7

D =

C =	2	3	4	6	8	9	11	12	13	16	17	18	19	22	23	24	26	27	29	31	32	33	34
1	O	O	O	N	N	O	N	O	O	N	O	O	O	N	O	O	N	O	N	N	O	O	O
2		O	O	O	O	N	O	N	O	N	N	O	O	N	N	O	O	N	O	O	N	O	O
3			O	O	N	O	O	O	N	O	N	N	O	O	N	N	O	O	O	N	O	N	O
4				O	O	N	N	O	O	O	O	N	N	O	O	N	O	O	N	O	N	O	N
6					O	O	N	O	N	N	O	O	O	O	O	O	N	N	O	N	O	O	N
8						O	O	O	N	O	O	N	O	N	N	O	O	O	N	O	O	N	O
9							O	O	O	N	O	O	N	O	N	N	O	O	N	O	O	O	N
11								O	O	N	O	N	O	O	O	O	N	O	O	N	N	O	O
12									O	O	N	O	N	N	O	O	N	N	O	O	N	N	O
13										O	O	N	O	O	N	O	O	N	O	O	O	N	N
16											O	O	O	O	N	O	N	O	O	N	O	O	O
17												O	O	N	O	N	O	N	O	N	N	O	O
18													O	O	N	O	O	O	O	O	N	N	O
19														O	O	N	N	O	N	O	O	N	N
22															O	O	O	N	N	O	N	O	O
23																O	O	O	O	O	O	N	O
24																	O	O	N	N	O	O	N
26																		O	O	N	O	N	O
27																			O	O	N	O	N
29																				O	O	O	N
31																					O	O	O
32																						O	O
33																							O

Ok

```
Ok
run
VALUE FOR N =? 39
FACTORS OF N =? 3,13
```

C = \ D =	2	4	5	7	8	10	11	14	16	17	19	20	22	23	25	28	29	31	32	34	35	37	38
1	O	N	O	N	O	N	O	N	N	O	N	O	N	O	N	N	O	N	O	N	O	N	O
2		O	N	O	N	O	N	N	O	N	O	N	O	N	O	N	N	O	N	O	N	O	N
4			O	N	O	N	O	O	N	N	N	O	N	O	N	N	O	N	O	N	O	N	O
5				O	N	O	N	N	O	N	O	N	O	N	O	O	N	N	N	O	N	O	N
7					O	N	O	O	N	O	N	N	N	O	N	N	O	N	O	N	O	N	O
8						O	N	N	O	N	O	N	O	N	O	O	N	O	N	N	N	O	N
10							O	O	N	O	N	O	N	N	N	N	O	N	O	N	O	N	O
11								N	O	N	O	N	O	N	O	O	N	O	N	O	N	N	N
14									O	N	O	N	O	N	O	O	N	O	N	O	N	O	N
16										O	N	O	N	O	N	N	N	N	O	N	O	N	O
17											O	N	O	N	O	O	N	O	N	O	N	O	N
19												O	N	O	N	N	O	N	N	N	O	N	O
20													O	N	O	O	N	O	N	O	N	O	N
22														O	N	N	O	N	O	N	N	N	O
23															O	O	N	O	N	O	N	O	N
25																N	O	N	O	N	O	N	N
28																	O	N	O	N	O	N	O
29																		O	N	O	N	O	N
31																			O	N	O	N	O
32																				O	N	O	N
34																					O	N	O
35																						O	N
37																							O

```
Ok
run
VALUE FOR N =? 45
FACTORS OF N =? 3,3,5
?Redo from start
FACTORS OF N =? 3,5
```

C = \ D =	2	4	7	8	11	13	14	16	17	19	22	23	26	28	29	31	32	34	37	38	41	43	44
1	O	N	N	O	N	N	O	N	O	N	N	O	N	N	O	N	O	N	N	O	N	N	O
2		O	N	N	N	O	N	O	N	O	N	N	N	O	N	O	N	O	N	N	N	O	N
4			N	O	O	N	N	N	O	N	N	O	O	N	N	N	O	N	N	O	O	N	N
7				O	O	N	O	N	N	N	N	O	O	N	O	N	N	N	N	O	O	N	O
8					N	N	N	O	N	O	O	N	N	N	N	O	N	O	O	N	N	N	N
11						O	N	N	N	O	O	N	N	O	N	N	N	O	O	N	N	O	N
13							O	N	O	N	N	N	O	N	O	N	O	N	N	N	O	N	O
14								O	N	N	O	N	N	O	N	O	N	N	O	N	N	O	N
16									O	N	N	O	N	N	O	N	O	N	N	O	N	N	O
17										O	N	N	N	O	N	O	N	O	N	N	N	O	N
19											N	O	O	N	N	N	O	N	N	O	O	N	N
22												O	O	N	O	N	N	N	N	O	O	N	O
23													N	N	N	O	N	O	O	N	N	N	N
26														O	N	N	N	O	O	N	N	O	N
28															O	N	O	N	N	N	O	N	O
29																O	N	N	O	N	N	O	N
31																	O	N	N	O	N	N	O
32																		O	N	N	N	O	N
34																			N	O	O	N	N
37																				O	O	N	O
38																					N	N	N
41																						O	N
43																							O

```
Ok
run
VALUE FOR N =? 51
FACTORS OF N =? 3,17
         D =
C =   |  2  4  5  7  8 10 11 13 14 16 19 20 22 23 25 26 28 29 31 32 35 37 38 40 41
 43 44 46 47 49 50
--------------------------------------------------------------------------------
---------------------------------------------------------------------
 1    |  O  N  O  N  O  N  O  N  O  N  N  O  N  O  N  O  N  O  N  O  N  N  O  N  O
  N  O  N  O  N  O
 2    |     O  N  O  N  O  N  O  N  O  N  N  O  N  O  N  O  N  O  N  N  O  N  O  N
  O  N  O  N  O  N
 4    |        O  N  O  N  O  N  O  N  N  O  N  O  N  O  N  O  N  O  O  N  N  N  O
  N  O  N  O  N  O
 5    |           O  N  O  N  O  N  O  O  N  N  N  O  N  O  N  O  N  N  O  N  O  N
  O  N  O  N  O  N
 7    |              O  N  O  N  O  N  N  O  N  O  N  O  N  O  N  O  O  N  O  N  N
  N  O  N  O  N  O
 8    |                 O  N  O  N  O  O  N  O  N  N  N  O  N  O  N  N  O  N  O  N
  O  N  O  N  O  N
10    |                    O  N  O  N  N  O  N  O  N  O  N  O  N  O  O  N  O  N  O
  N  N  N  O  N  O
11    |                       O  N  O  O  N  O  N  O  N  N  N  O  N  N  O  N  O  N
  O  N  O  N  O  N
13    |                          O  N  N  O  N  O  N  O  N  O  N  O  O  N  O  N  O
  N  O  N  N  N  O
14    |                             O  O  N  O  N  O  N  O  N  N  N  N  O  N  O  N
  O  N  O  N  O  N
16    |                                N  O  N  O  N  O  N  O  N  O  O  N  O  N  O
  N  O  N  O  N  N
19    |                                   O  N  O  N  O  N  O  N  O  O  N  O  N  O
  N  O  N  O  N  O
20    |                                      O  N  O  N  O  N  O  N  N  N  N  O  N
  O  N  O  N  O  N
22    |                                         O  N  O  N  O  N  O  O  N  O  N  O
  N  O  N  O  N  O
23    |                                            O  N  O  N  O  N  N  O  N  N  N
  O  N  O  N  O  N
25    |                                               O  N  O  N  O  O  N  O  N  O
  N  O  N  O  N  O
26    |                                                  O  N  O  N  N  O  N  O  N
  N  N  O  N  O  N
28    |                                                     O  N  O  O  N  O  N  O
  N  O  N  O  N  O
29    |                                                        O  N  N  O  N  O  N
  O  N  N  N  O  N
31    |                                                           O  O  N  O  N  O
  N  O  N  O  N  O
32    |                                                              N  O  N  O  N
  O  N  O  N  N  N
35    |                                                                 O  N  O  N
  O  N  O  N  O  N
```

```
37  ¦                                      O  N  O
 N  O  N  O  N  O
38  ¦                                         O  N
 O  N  O  N  O  N
40  ¦                                            O
 N  O  N  O  N  O
41  ¦
 O  N  O  N  O  N
43  ¦
    O  N  O  N  O
44  ¦
       O  N  O  N
46  ¦
          O  N  O
47  ¦
             O  N
49  ¦
                O
```

```
Ok
run
VALUE FOR N =? 55
FACTORS OF N =? 5,11
         D =
C = ¦   2   3   4   6   7   8   9  12  13  14  16  17  18  19  21  23  24  26  27  28  29  31  32  34  36
     37  38  39  41  42  43  46  47  48  49  51  52  53  54
----------------------------------------------------------------------------------------------------------
----------------------------------------------------------------------------------------------------------
1   ¦   O   O   O   N   O   O   O   N   O   O   N   O   O   O   N   N   O   N   O   O   O   N   O   N   N
      O   O   O   N   O   O   N   O   O   O   N   O   O   O
2   ¦       O   O   O   N   O   O   N   N   O   O   N   O   O   O   O   N   O   N   O   O   O   N   O   O
      N   O   O   O   N   O   N   N   O   O   O   N   O   O
3   ¦           O   O   O   N   O   O   N   N   O   O   N   O   O   N   O   O   O   N   O   O   O   O   N
      O   N   O   O   O   N   O   N   N   O   O   O   N   O
4   ¦               O   O   O   N   O   O   N   O   O   O   N   O   O   N   N   O   O   N   O   O   N   O
      N   O   N   O   O   O   O   O   N   N   O   O   O   N
6   ¦                   O   O   O   O   O   O   N   N   O   O   N   O   O   N   O   N   O   N   O   O   N
      O   O   N   N   O   O   N   O   O   O   N   O   O   O
7   ¦                       O   O   N   O   O   O   N   N   O   O   O   O   O   N   O   N   O   N   O   O
      N   O   O   O   N   O   O   N   O   O   N   N   O   O
8   ¦                           O   O   N   O   O   O   N   N   O   N   O   O   O   N   O   O   O   O   O
      O   N   O   N   O   N   O   O   N   O   O   N   N   O
9   ¦                               O   O   N   O   O   O   N   O   O   N   O   O   O   N   N   O   N   O
      O   O   N   O   N   O   O   O   O   N   O   O   N   N
12  ¦                                   O   O   O   N   O   O   O   N   O   O   N   O   O   O   N   N   O
      N   O   O   O   N   O   O   N   O   O   O   N   O   O
13  ¦                                       O   O   O   N   O   O   N   N   O   O   N   O   O   O   O   O
      O   N   O   O   O   N   N   O   N   O   O   O   N   O
14  ¦                                           O   O   O   N   O   O   N   O   O   O   N   O   O   N   N
      O   O   N   O   O   O   O   N   O   N   O   O   O   N
16  ¦                                               O   O   O   N   O   O   N   N   O   O   N   O   O   N
      O   N   O   N   O   O   N   O   O   N   N   O   O   O
17  ¦                                                   O   O   O   O   O   O   N   N   O   O   N   O   O
      N   O   N   O   N   O   O   N   O   O   O   N   O   O
18  ¦                                                       O   O   N   O   O   O   N   N   O   O   O   O
      O   N   O   O   O   N   O   O   N   O   N   O   N   O
19  ¦                                                           O   O   N   O   O   O   N   O   O   N   O
      O   O   N   N   O   O   O   O   O   N   O   N   O   N
21  ¦                                                               O   O   N   O   O   O   N   N   O   N
      O   O   O   N   O   N   N   O   O   O   N   O   O   N
23  ¦                                                                   O   O   O   N   O   O   O   N   O
      O   N   O   O   O   N   O   O   N   O   O   O   N   O
24  ¦                                                                       O   O   O   N   O   O   N   O
      O   O   N   O   O   O   N   O   O   N   O   O   O   N
26  ¦                                                                           O   O   O   N   O   O   N
      N   O   O   N   O   O   N   O   N   O   N   O   O   O
27  ¦                                                                               O   O   O   N   O   O
      N   N   O   O   N   O   O   N   O   N   O   N   O   O
28  ¦                                                                                   O   O   O   O   O
      O   N   N   O   O   N   O   O   N   O   O   O   N   O
29  ¦                                                                                       O   O   N   O
      O   O   N   O   O   O   O   O   O   N   N   O   O   N
31  ¦                                                                                           O   O   N
      O   O   O   N   N   O   N   O   O   O   N   O   N   O
32  ¦                                                                                               O   O
      N   O   O   O   N   N   O   N   O   O   O   N   O   N
34  ¦                                                                                                   O
```

```
 O  O  N  O  O  O  O  O  O  N  O  O  O  N
36  |
 O  O  O  N  O  O  N  N  O  O  N  O  O  O
37  |
    O  O  O  N  O  O  N  N  O  O  N  O  O
38  |
       O  O  O  N  O  O  N  N  O  O  N  O
39  |
          O  O  O  O  O  O  N  O  O  O  N
41  |
             O  O  N  O  O  O  N  N  O  O
42  |
                O  O  N  O  O  O  N  N  O
43  |
                   O  O  N  O  O  O  N  N
46  |
                      O  O  O  N  O  O  O
47  |
                         O  O  O  N  O  O
48  |
                            O  O  O  N  O
49  |
                               O  O  O  N
51  |
                                  O  O  O
52  |
                                     O  O
53  |
                                        O
Ok
```

```
Value for N =? 57
Factors of N =? 3, 19
          D =
C =   | 2  4  5  7  8 10 11 13 14 16 17 20 22 23 25 26 28 29 31 32 34 35 37 40 41
 43 44 46 47 49 50 52 53 55 56
------------------------------------------------------------------------------------
------------------------------------------------------------------------------------
------
 1    |  0    1    0    1    0    1    0    1    0    1    0    1    1    0    1
   0     1    0    1    0    1    0    1    1    0    1    0    1    0    1    0
   1     0    1    0
 2    | -9    0    1    0    1    0    1    0    1    0    1    1    0    1    0
   1     0    1    0    1    0    1    0    1    1    0    1    0    1    0    1
   0     1    0    1
 4    | -9   -9    0    1    0    1    0    1    0    1    0    0    1    1    1
   0     1    0    1    0    1    0    1    1    0    1    0    1    0    1    0
   1     0    1    0
 5    | -9   -9   -9    0    1    0    1    0    1    0    1    1    0    1    0
   1     0    1    0    1    0    1    0    0    1    1    1    0    1    0    1
   0     1    0    1
 7    | -9   -9   -9   -9    0    1    0    1    0    1    0    0    1    0    1
   1     1    0    1    0    1    0    1    1    0    1    0    1    0    1    0
   1     0    1    0
 8    | -9   -9   -9   -9   -9    0    1    0    1    0    1    1    0    1    0
   1     0    1    0    1    0    1    0    0    1    0    1    1    1    0    1
   0     1    0    1
 10   | -9   -9   -9   -9   -9   -9    0    1    0    1    0    0    1    0    1
   0     1    1    1    0    1    0    1    1    0    1    0    1    0    1    0
   1     0    1    0
 11   | -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1    0    1    0
   1     0    1    0    1    0    1    0    0    1    0    1    0    1    1    1
   0     1    0    1
 13   | -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    0    1    0    1
   0     1    0    1    1    1    0    1    1    0    1    0    1    0    1    0
   1     0    1    0
 14   | -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    1    0    1    0
   1     0    1    0    1    0    1    0    0    1    0    1    0    1    0    1
   1     1    0    1
 16   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    1    0    1
   0     1    0    1    0    1    1    1    1    0    1    0    1    0    1    0
   1     0    1    0
 17   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    1    0    1    0
   1     0    1    0    1    0    1    0    0    1    0    1    0    1    0    1
   0     1    1    1
 20   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0
   1     0    1    0    1    0    1    0    0    1    0    1    0    1    0    1
   0     1    0    1
 22   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1
   0     1    0    1    0    1    0    1    1    1    1    0    1    0    1    0
   1     0    1    0
 23   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0
   1     0    1    0    1    0    1    0    0    1    0    1    0    1    0    1
   0     1    0    1
 25   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
   0     1    0    1    0    1    0    1    1    0    1    1    1    0    1    0
   1     0    1    0
 26   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9     0    1    0    1    0    1    0    0    1    0    1    0    1    0    1
   0     1    0    1
 28   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9    -9    0    1    0    1    0    1    1    0    1    0    1    1    1    0
   1     0    1    0
```

```
29  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9   0   1   0   1   0   0   1   0   1   0   1   0   1
  0   1   0   1
31  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9   0   1   0   1   1   0   1   0   1   0   1   1
  1   0   1   0
32  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9   0   1   0   0   1   0   1   0   1   0   1
  0   1   0   1
34  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9   0   1   1   0   1   0   1   0   1   0
  1   1   1   0
35  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9   0   0   1   0   1   0   1   0   1
  0   1   0   1
37  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9   1   0   1   0   1   0   1   0
  1   0   1   1
40  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1   0   1   0   1   0
  1   0   1   0
41  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1   0   1   0   1
  0   1   0   1
43  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1   0   1   0
  1   0   1   0
44  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1   0   1
  0   1   0   1
46  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1   0
  1   0   1   0
47  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0   1
  0   1   0   1
49  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9   0
  1   0   1   0
50  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
  0   1   0   1
52  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9   0   1   0
53  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9   0   1
55  ¦ -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9  -9
 -9  -9  -9   0
```

```
Ok
RUN
VALUE FOR N =? 63
FACTORS OF N =? 3,7
         D =
C =   ¦ 2   4   5   8 10 11 13 16 17 19 20 22 23 25 26 29 31 32 34 37 38 40 41 43 44
 46 47 50 52 53 55 58 59 61 62
--------------------------------------------------------------------------------
--------------------------------------------------------------------------------
--------------------------
 1    ¦  0    1    0    1    1    0    1    1    0    1    0    1    0    1    0
   1     1    0    1    1    0    1    0    1    0    1    0    1    1    0    1
   1     0    1    0
 2    ¦ -9    0    1    1    0    1    0    1    1    0    1    0    1    0    1
   1     0    1    0    1    1    0    1    0    1    0    1    1    0    1    0
   1     1    0    1
 4    ¦ -9   -9    0    0    1    1    1    1    0    1    0    1    0    1    0
   0     1    1    1    1    0    1    0    1    0    1    0    0    1    1    1
   1     0    1    0
 5    ¦ -9   -9   -9    1    0    1    0    0    1    1    1    0    1    0    1
   1     0    1    0    0    1    1    1    0    1    0    1    1    0    1    0
   0     1    1    1
 8    ¦ -9   -9   -9   -9    0    1    0    0    1    0    1    1    1    0    1
   1     0    1    0    0    1    0    1    1    1    0    1    1    0    1    0
   0     1    0    1
 10   ¦ -9   -9   -9   -9   -9    0    1    1    1    1    0    1    0    1    0
   0     1    0    1    1    1    1    0    1    0    1    0    0    1    0    1
   1     1    1    0
 11   ¦ -9   -9   -9   -9   -9   -9    0    0    1    0    1    0    1    1    1
   1     0    1    0    0    1    0    1    0    1    1    1    1    0    1    0
   0     1    0    1
 13   ¦ -9   -9   -9   -9   -9   -9   -9    1    0    1    1    1    0    1    0
   0     1    0    1    1    0    1    1    1    0    1    0    0    1    0    1
   1     0    1    1
 16   ¦ -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1    1    0
   0     1    0    1    1    0    1    0    1    1    1    0    0    1    0    1
   1     0    1    0
 17   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1    0    1
   1     1    1    0    0    1    0    1    0    1    0    1    1    1    1    0
   0     1    0    1
 19   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1
   0     1    0    1    1    0    1    0    1    0    1    1    0    1    0    1
   1     0    1    0
 20   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1
   1     0    1    1    0    1    0    1    0    1    0    1    1    0    1    1
   0     1    0    1
 22   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0
   1     1    0    1    1    0    1    0    1    0    1    0    1    1    0    1
   1     0    1    0
 23   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1
   1     0    1    0    1    1    0    1    0    1    0    1    1    0    1    0
   1     1    0    1
 25   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0
   0     1    1    1    1    0    1    0    1    0    1    0    0    1    1    1
   1     0    1    0
 26   ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
   1     0    1    0    0    1    1    1    0    1    0    1    1    0    1    0
   0     1    1    1
```

```
29 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9    0    1    0    0    1    0    1    1    1    0    1    1    0    1    0
   0    1    0    1
31 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9    0    1    1    1    1    0    1    0    1    0    0    1    0    1
   1    1    1    0
32 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9    0    0    1    0    1    0    1    1    1    1    0    1    0
   0    1    0    1
34 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9    1    0    1    1    1    0    1    0    0    1    0    1
   1    0    1    1
37 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9    0    1    0    1    1    1    0    0    1    0    1
   1    0    1    0
38 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9    0    1    0    1    0    1    1    1    1    0
   0    1    0    1
40 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1    0    1    0    1
   1    0    1    0
41 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1    0    1    1
   0    1    0    1
43 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0    1    1    0    1
   1    0    1    0
44 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    1    0    1    0
   1    1    0    1
46 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    1    1    1
   1    0    1    0
47 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    1    0    1    0
   0    1    1    1
50 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1    0
   0    1    0    1
52 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    1
   1    1    1    0
53 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0
   0    1    0    1
55 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
   1    0    1    1
58 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9    0    1    0
59 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9    0    1
61 ¦ -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9
  -9   -9   -9    0
```

```
Value for N =? 65
Factors of N =? 5,13
C =   |  2   3   4   6   7   8   9  11  12  14  16  17  18  19  21  22  23  24  27  28  29  31  32  33  34
  36  37  38  41  42  43  44  46  47  48  49  51  53  54  56  57  58  59  61  62  63  64
--------------------------------------------------------------------------------------------------------

 1    |  0    0    0    1    0    0    0    1    0    1    1    0    0    0    1
   0     0    0    1    0    0    1    0    0    0    1    0    0    1    0    0
   0     1    0    0    0    1    1    0    1    0    0    0    1    0    0    0

 2    | -9    0    0    0    1    0    0    0    1    0    0    1    0    0    0
   1     0    0    1    1    0    0    1    0    0    0    1    0    1    1    0
   0     0    1    0    0    0    0    1    0    1    0    0    0    1    0    0

 3    | -9   -9    0    0    0    1    0    0    0    0    1    0    1    0    0
   0     1    0    0    1    1    0    0    1    0    0    0    1    0    1    1
   0     0    0    1    0    0    1    0    0    0    1    0    0    0    1    0

 4    | -9   -9   -9    0    0    0    1    0    0    1    0    1    0    1    0
   0     0    1    0    0    1    0    0    0    1    0    0    0    0    0    1
   1     0    0    0    1    0    0    1    1    0    0    1    0    0    0    1

 6    | -9   -9   -9   -9    0    0    0    1    0    0    1    0    0    1    1
   0     0    0    0    0    0    1    1    0    0    1    0    0    1    0    0
   0     1    0    0    0    1    0    0    1    0    1    0    1    0    0    0

 7    | -9   -9   -9   -9   -9    0    0    0    1    0    0    1    0    0    0
   1     0    0    1    0    0    0    1    1    0    0    1    0    0    1    0
   0     1    1    0    0    0    0    0    0    1    0    1    0    1    0    0

 8    | -9   -9   -9   -9   -9   -9    0    0    0    0    0    0    1    0    1
   0     1    0    0    1    0    0    0    1    1    0    0    1    0    0    1
   0     0    1    1    0    0    1    0    0    0    1    0    0    0    1    0

 9    | -9   -9   -9   -9   -9   -9   -9    0    0    1    0    0    0    1    0
   1     0    1    0    0    1    0    0    0    1    0    0    0    0    0    0
   1     0    0    1    1    0    0    1    0    0    0    1    1    0    0    1

 11   | -9   -9   -9   -9   -9   -9   -9   -9    0    0    1    0    0    0    1
   0     0    1    0    0    0    1    0    0    0    1    1    0    1    0    0
   0     1    0    0    0    1    0    0    1    0    0    0    1    0    1    0

 12   | -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    1    0    0    0
   1     0    0    1    0    0    0    1    0    0    0    1    1    0    1    0
   0     0    1    0    0    1    0    0    0    1    0    0    0    1    0    1

 14   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    0    1    0
   0     0    1    1    0    1    0    0    0    1    0    0    0    0    0    0
   1     0    0    0    1    0    1    1    0    0    0    1    0    0    0    1

 16   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    0    1
   0     0    0    0    0    1    1    0    0    0    1    0    0    1    1    0
   0     1    0    0    0    1    0    0    1    0    0    0    1    0    0    0

 17   | -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9   -9    0    0    0
   1     0    0    1    0    0    0    1    0    0    0    1    0    0    1    1
   0     0    1    0    0    0    0    0    1    1    0    0    0    1    0    0
```

```
18 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9  0  0
 0    1  0  0  1  0  1  0  1  0  0  0  1  0  0  1
 1    0  0  1  0  0  1  0  0  1  1  0  0  0  1  0

19 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9  0
 0    0  1  0  0  1  0  1  0  1  0  0  0  0  0  0
 1    0  0  0  1  0  0  1  0  0  1  1  0  0  0  1

21 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
 0    0  0  0  0  0  1  0  0  1  1  0  0  1  0  0
 0    1  1  0  0  1  0  0  1  0  0  0  1  0  0  0

22 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9    0  0  1  0  0  0  1  0  0  0  1  0  0  1  0
 0    0  1  1  0  0  0  0  0  1  0  0  1  1  0  0

23 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9  0  0  1  0  0  0  1  0  1  0  1  0  0  1
 0    0  0  1  1  0  1  0  0  0  1  0  0  1  1  0

24 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9  0  0  1  0  0  0  1  0  1  0  0  0  0
 1    0  0  0  1  0  0  1  0  0  0  1  0  0  1  1

27 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9  0  0  0  1  0  0  0  1  0  0  1  0
 0    0  1  0  0  0  1  0  0  1  0  0  0  1  0  0

28 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9  0  0  0  1  0  0  0  1  1  0  1
 0    0  0  1  0  0  1  1  0  0  1  0  0  0  1  0

29 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9  0  0  0  1  0  0  0  0  1  0
 1    0  0  0  1  0  0  1  0  0  0  1  0  0  0  1

31 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9 -9  0  0  0  1  0  0  1  0  0
 1    1  0  0  0  1  0  0  1  1  0  0  1  0  0  0

32 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9 -9 -9  0  0  0  1  0  0  1  0
 0    0  1  0  0  0  0  0  0  1  1  0  0  1  0  0

33 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9 -9 -9 -9  0  0  0  1  0  0  1
 0    1  0  1  0  0  1  0  0  0  1  1  0  0  1  0

34 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9 -9 -9 -9 -9  0  0  0  0  0  0
 1    0  1  0  1  0  0  1  0  0  0  1  0  0  0  1

36 | -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 -9
-9   -9 -9 -9 -9 -9 -9 -9 -9 -9 -9  0  0  1  0  0
 0    1  0  0  1  1  0  0  1  0  0  0  1  1  0  0
```

37	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	1	0
0	0	1	0	0	0	0	0	0	1	0	0	0	1	1	0
38	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	1
0	0	0	1	0	1	1	0	0	0	1	0	0	0	1	1
41	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0
0	1	0	0	0	1	0	1	1	0	0	0	1	0	0	0
42	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0
0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0
43	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
0	0	0	1	0	0	1	0	1	0	1	0	0	0	1	0
44	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	0	0	0	1	0	0	1	0	1	0	1	0	0	0	1
46	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	0	0	0	1	0	0	1	0	0	1	1	0	0	0
47	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	0	0	0	0	0	0	1	0	0	0	1	0	0
48	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	0	0	1	0	0	0	1	0	1	0	1	0
49	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	0	0	1	0	0	0	1	0	1	0	1
51	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	0	0	1	0	0	0	1	0	0	1
53	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
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-9	-9	-9	-9	-9	-9	-9	0	0	0	1	0	0	0	1	0
54	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
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56	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	0	1	0	0	0

57 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	0	1	0	0
58 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	0	1	0
59 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	0	1
61 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0	0
62 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0	0
63 ¦	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	0

Ok