The program Equivalence in the software package QextNewEdition

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Definitions

Two linear q-ary codes $C1$ and $C2$ are said to be *equivalent* if the codewords of $C2$ can be obtained from the codewords of $C1$ via a sequence of transformations of the following types:

1. permutation of coordinates;

2. multiplication of the elements in a given coordinate by a nonzero element of Fq;

3. application of a field automorphism to the elements in all coordinates simultaneously.

An automorphism of a linear code C is a sequence of such transformations that maps each codeword of C onto a codeword of C. The automorphisms of a code C form a group, called the automorphism group of the code and denoted by Aut(C).

Definitions

A canonical representative map for this action is a function

$\rho : \Omega \rightarrow \Omega$ that satisfies the following two properties:

(1) for all $X \in \Omega$ it holds that $\rho(X) \sim X$;

(2) for all $X, Y \in \Omega$ it holds that $X \sim Y$ implies $\rho(X) = \rho(Y)$.

Definitions

Denition 3. Two matrices of the same size are isomorphic if the rows of the second one can be obtained from the rows of the rst one by a permutation of the columns.

This denition is based on the natural action of the symmetric group Sn on the set of columns.

Any permutation of the columns of A which maps the rows of A into rows of the same matrix,is called an automorphism of A. The set of all automorphisms of A is a subgroup of the symmetric group Sn and we denote it by Aut(A).

History

1. B.D. McKay. Practical graph isomorphism. Congressus Numerantium, 30: 1981

2. J. Leon, Computing automorphism groups of error-correcting codes, IEEE Trans, Info. Theory 28 (1982),

3. Ст. Капралов. Алгоритми за генериране и изследване на орбитни матрици. 100 години от рождението на академик Любомир Чакалов, Трудове на юбилейна научна сесия, Самоков, 14–15.02.1986, 114–121.

What is new?

Generating set

Alocation of dinamic nemory

Range - for GF(q) $q<64$: q prime and $q=4$

Binary representation of generating set of codewords

Experimental results

Parameters	Time in secinds	parameters	Time in seconds
[100,50]_2	2.8	[36,10]_2	0.0005
[90,30]_2	0.07	[36,10]_3	0.021
[90,30]_3	75.44	[36,10]_7	0.025
[1000,10]_4	0.5	[36,10]_17	6.759
[1000,12]_4	2.31	[30,10]_41 [36,10]_41	32.11 2119.75

```
          Program 'Equivalence'  from QextNewEdition  VER: 0.1
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Input file: RES_DIR0\EXAM   Output file RES_DIR0\EXAM_r

   1. Calculate inequivalent codes
   2. Calculate inequivalent matrices
   3. What to print in the output file for codes
   4. What to print in the output file for matrices
   5. Change the name of the input file
   6. Random codes - write in file with name 'RES_DIR0//EXAM.'
   7. Random codes with automorphism - write in file with name 'RES_DIR0//EXAM.'
   8. About QextNewEdition
   9. Exit
   Choose: _
```

```
What to print in the output file?

yes 1. Generator matrix
    2. Rank of the matrix
    3. Systematic coordinates
    4. Matrices with different systematic coordinates
    5. Minimum distance
    6. Spectrum (or partial spectrum)
    7. Generating set of codewords
yes 8. Order of automorphism group AUT
    9. Generators of AUT by coordinates
    10. Coordinates' orbits
    11. Additional information
yes 12. Elapsed time
    13. Noting
    14. All options
    15. Start
    16. Exit
       Choose:
```

```
What to print in the output file for matrices?

yes 1. Matrix
yes 2. Order of automorphism group AUT
    3. Generators of AUT by columns
    4. Generators of AUT by rows
    5. Orbits of columns
    6. Orbits of rows
    7. Additional information
yes 8. Elapsed time
    9. Noting
    10. All options
    11. Start
    12. Exit
       Choose:
```

D:\MDSpg06.11.2020\RES_DIR0\EXAM_r - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

RES | EXAM | TABLE2.TTT | exam_m | exam11_r | EXAM_r

```
? 10 30 2 1  1
1000000000001110011001001100111
0100000000001110011011001100110
0010000000000111001111100110011
0001000000100011100111111001100
0000100000110001110001111001100
0000010000011000111100011110011
0000001000001100011111001111001
0000000100100110001111001111100
0000000010110011000101100111110
0000000001111001100000110011111
 k=  10
 d=  8

 Weight spectrum:
  8^5   10^80   12^175   14^200   16^310   18^200   20^53  |AUT|=  10   TRANS 0
 =============
 |AUT|= 10 Generator of |AUT|
 - 1   (10,1,2,3,4,5,6,7,8,9)(20,11,12,13,14,15,16,17,18,19)(30,21,22,23,24,25,26,27,28,29) =============

 3 ORBITS by column
{  1, 10, 9, 8, 7, 6, 5, 4, 3, 2, },{  11, 20, 19, 18, 17, 16, 15, 14, 13, 12, },{  21, 30, 29, 28, 27, 26, 25, 24, 23, 22, },

 ==  Elapsed time: 0.00s

? 10 30 2 2  2
1000000000010001001011100000010
0100000000001000100101110000001
0010000000100100010010111000000
0001000000010010001001011100000
0000100000001001000100101110000
0000010000010010010000001011100
0000001000010010010000000101110
0000000100001001001000000010111
0000000010000100100110000001011
0000000001100010010011000000101
 k=  10
 d=  8

 Weight spectrum:
  8^10   10^50   12^170   14^280   16^305   18^130   20^58   22^20  |AUT|=  10   TRANS 0
 =============
 |AUT|= 10 Generator of |AUT|
 - 1   (10,1,2,3,4,5,6,7,8,9)(20,11,12,13,14,15,16,17,18,19)(30,21,22,23,24,25,26,27,28,29) =============
```


Normal text file | length : 694 464 lines : 17 396 | Ln : 1 365 Col : 58 Pos : 47 231 | Windows (CR LF) | UTF-8 | INS

```
0000000010000101001001100111110
0000000001000010100100110011111
 k=  10
 d=  8

 Weight spectrum:
  8^15   10^40   12^165   14^300   16^300   18^120   20^63   22^20  |AUT|=  10   TRANS 0
 =============
 |AUT|= 10 Generator of |AUT|
 - 1   (10,1,2,3,4,5,6,7,8,9)(20,11,12,13,14,15,16,17,18,19)(30,21,22,23,24,25,26,27,28,29) =============

 3 ORBITS by column
{  1, 10, 9, 8, 7, 6, 5, 4, 3, 2, },{  11, 20, 19, 18, 17, 16, 15, 14, 13, 12, },{  21, 30, 29, 28, 27, 26, 25, 24, 23, 22, },

 ==  Elapsed time: 0.00s

 67 from input file  equivalent to ->> 37 from output file TR -0
 PERM COL
 1 -> 11 ; 2 -> 14 ; 3 -> 17 ; 4 -> 20 ; 5 -> 13 ; 6 -> 16 ; 7 -> 19 ; 8 -> 12 ; 9 -> 15 ; 10 -> 18 ; 11 -> 1 ; 12 -> 4 ; 13 -> 7 ; 14 -> 10 ; 15 -> 3 ; 16 -> 6 ; 1

? 10 30 2 63  68
1000000000100101111111100000001
0100000000110010111111110000000
0010000000111001011101110000000
0001000000111100101100111000000
0000100000111110010100011100000
0000010000111111001000001110000
0000001000011111100100000011100
0000000100101111110000000001110
0000000010010111111000000000111
0000000001001011111110000000011
 k=  10
 d=  8

 Weight spectrum:
  8^10   9^20   10^20   11^40   12^60   13^140   14^165   15^112   16^165   17^140   18^60   19^40   20^20   21^20   22^10   30^1  |AUT|=  10   TRANS 0
 -------------
```

```
? 10 30 5 1  1
100000000030411330011130134104
010000000013041133004113013410
001000000001304113300411301341
000100000000130411331041130134
000010000030013041134104113013
000001000033001304113410411301
000000100013300130411341041130
000000010011330013040134104113
000000001041133001303013410411
000000000104113300131301341041
 k:  10
 information sets:
  1: 3 4 5 6 7 8 9 10 29 30
 2: 11 12 13 14 15 16 17 18 19 20
 3: 1 2 21 22 23 24 25 26 27 28
 Generetor matrices with different information sets:

? 10 30 5 1  matrix N 1
111000000044201021310104443300
420100000041201342323132022300
340010000012200303113331442400
100001000013412134124040040400
020000100034332341414012012400
340000010043022320024311433000
140000001013003203310030031100
110000000142010213141044433000
010000000013041133004113013410
400000000020144220044420421401

? 10 30 5 2  matrix N 2
444413423210000000002242342333
244441342301000000003224234233
324444134200100000003322423423
232444413400010000003332242342
423244441300001000002333224234
342324444100000100004233322423
134232444400000010003423332242
413423244400000001002342333224
441342324400000000104234233322
444134232400000000012423423332

? 10 30 5 3  matrix N 3
104224013342240133100000000000
013310422433104224010000000000
003211111323113430241000000012
002342410130020244340100000032
000143011110141131400010000034
004001404132432410230001000010
001231132141003113420000100001
003243044114302303000000010043
002022013200411412130000001023
003231402342332240440000000121
 d:  13
```

```
 d:  13

  13^40
 ==  Generating set of codewords:

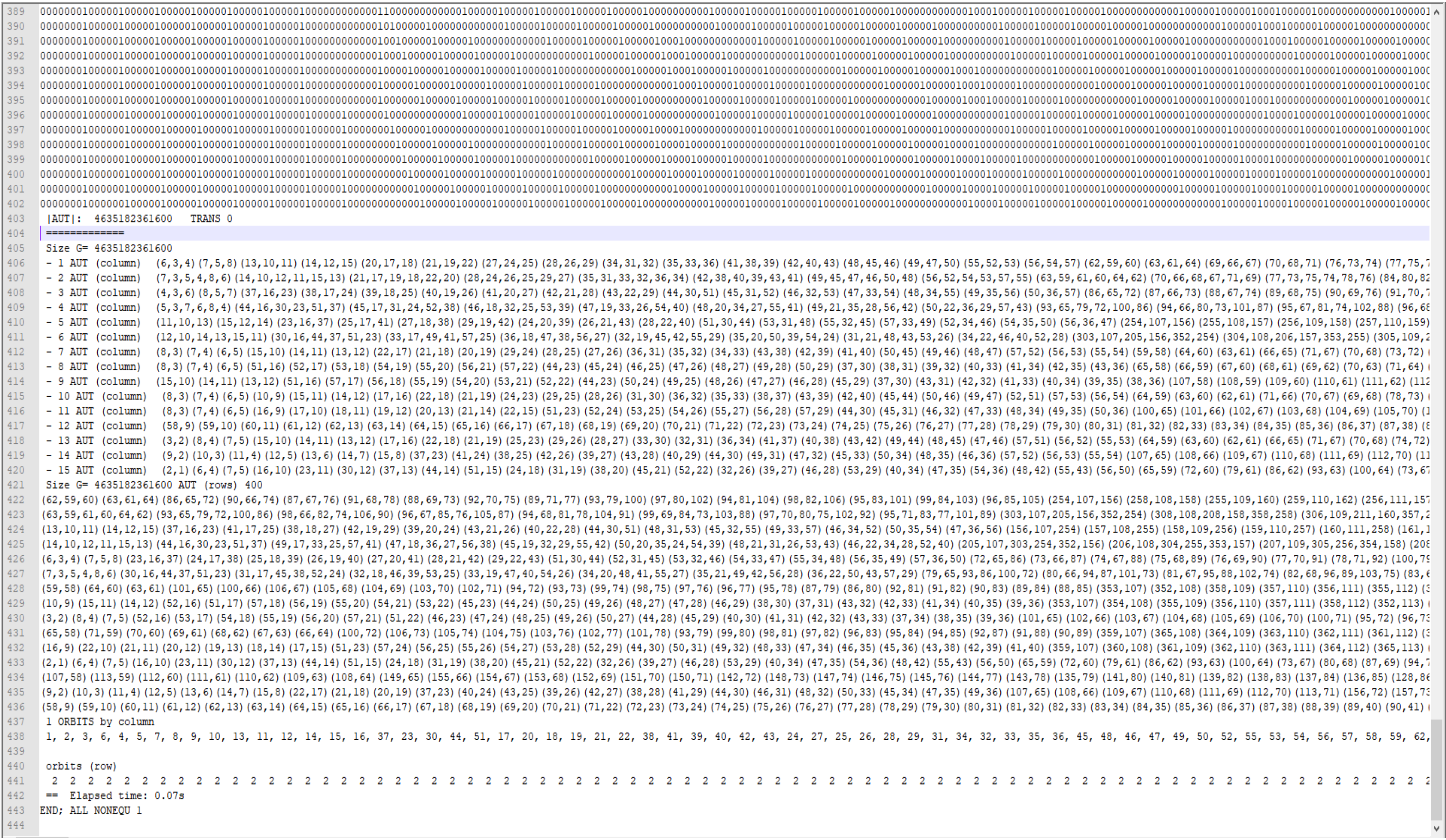
? 10 30 5 0
40103200022014000401400040030 0
04100012032000203103020040020 0
24010320001201400040040004003 0
41000120300002031032200400200 0
10001203040020310320004002000 2
10320002401400040120004003004 0
01203041000310320002002000200 4
00430201403024023000100300030 0
00043020140302402300010030003 0
 |AUT|:  40   TRANS 1
 =============
 Size G= 40
 - 1 AUT (column)   (4,1,2,3) (8,5,6,7) (12,9,10,11) (16,13,14,15) (20,17,18,19) (24,21,22,23) (28,25,26,27) (32,29,30,31) (36,33,34,35) (40,37,38,39) (44,41,42,43) (48,45,46,47) (52,49,50,51) (56,53,54,55) (60,57,58,59) (64,61,62,63) (68,65,66,67)
 - 2 AUT (column)   (65,1,9,76,20,41,33,50,60,28,67,3,11,74,18,43,35,52,58,26) (66,2,10,73,17,42,34,51,57,25,68,4,12,75,19,44,36,49,59,27) (69,5,13,80,24,45,37,54,64,32,71,7,15,78,22,47,39,56,62,30) (70,6,14,77,21,46,38,55,61,29,72,8,1
 Size G= 40 AUT (rows) 200
(4,1,2,3) (8,5,6,7) (12,9,10,11) (16,13,14,15) (20,17,18,19) (24,21,22,23) (28,25,26,27) (32,29,30,31) (36,33,34,35) (40,37,38,39) (44,41,42,43) (48,45,46,47) (52,49,50,51) (56,53,54,55) (60,57,58,59) (64,61,62,63) (68,65,66,67) (72,69,70,71) (76,73
(16,1,30,19,8,33,22,11,40,25,14,3,32,17,6,35,24,9,38,27) (13,2,31,20,5,34,23,12,37,26,15,4,29,18,7,36,21,10,39,28) (56,41,70,59,48,73,62,51,80,65,54,43,72,57,46,75,64,49,78,67) (53,42,71,60,45,74,63,52,77,66,55,44,69,58,47,76,61,50,79
 2 ORBITS by column
 1, 4, 3, 2, 65, 68, 67, 66, 25, 28, 27, 26, 57, 60, 59, 58, 49, 52, 51, 50, 33, 36, 35, 34, 41, 44, 43, 42, 17, 20, 19, 18, 73, 76, 75, 74, 9, 12, 11, 10,|| 5, 8, 7, 6, 69, 72, 71, 70, 29, 32, 31, 30, 61, 64, 63, 62, 53, 56, 55, 5

 orbits (row)
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
 ==  Elapsed time: 0.00s

? 10 30 5 2  2
10000000002131430102103320040 3
01000000002213143010310332004 0
00100000000221314301031033200 4
00010000000102213143040310332 0
00001000000010221314304031033 2
00000100000301022131400403103 3
00000010004301022131200403103 3
00000001001430102213320040310 3
00000000103143010221332004031
00000000011314301022033200403 1
 k:  10
 information sets:
  1: 1 2 3 4 5 6 7 8 9 10
 2: 11 12 13 14 15 16 17 18 19 20
 3: 21 22 23 24 25 26 27 28 29 30
 Generetor matrices with different information sets:

? 10 30 5 1  matrix N 1
10000000002131430102103320040 3
01000000002213143010310332004 0
00100000000221314301031033200 4
00010000000102213143040310332 0
00001000000010221314304031033 2
00000100000301022131400403103 3
```

PG3_7 400X400



```
000000010000010000010000010000010000010000010000000000000110000000000000100000100000100000100000100000100000000001000001000001000001000001000001000001000000000000010001000001000001000001000000000000010000010000010001000001000000000000100000
000000010000010000010000010000010000010000010000000000000101000001000000000000010000010000010000010000000000100000100100000100000100000100000100000100000000000100000100000100000100000000000001000001000100000100000100000000000
000000010000010000010000010000010000010000010000000000001001000001000001000000000000010000010000010001000000000000100000000000100000100000100000100000100000000001000001000001000001000001000000000000010001000001000001000001000000
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000000010000010000010000010000010000010000010000000000000010000010000010000010000010000010000010000000000000100010000010000000100000100000100000100000000000001000001000001000100000100000000000001000001000001000001000000000001000001000001000010
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000000010000001000001000001000001000001000001000001000000000100000100000100000000000001000001000001000100000100000000000000100000000000001000001000001000001000100000000000001000001000001000001000001000000000000100000100000100000100
000000010000001000001000001000001000001000001000001000000000100000100000100000000000001000001000001000100000100000110000010000010000000000000100000100000100001000001000000000000010000010000010000010001000000000000010000010000010
000000010000001000001000001000001000001000001000001000000000010000010000010000010000000000000100000100010000010000000100000100000100000100000000000001000001000001000100000100000100000000000001000001000001000100000100000000000001000001
000000010000001000001000001000001000001000001000001000000000000010000010000010000010000010000000000000100001000001000000100000100000100000100000000000001000001000100000100000100000100000000000001000001000010000010000010000000000
0000000100000010000010000010000010000010000010000010000000000000100000100000100000100000100000100000000000001000001000100000100000100000100000100000100000000000000100010000010000010000010000010000000000000100000100010000010000010000010000
 |AUT|:  4635182361600   TRANS 0
 =============
 Size G= 4635182361600
 - 1 AUT (column)  (6,3,4) (7,5,8) (13,10,11) (14,12,15) (20,17,18) (21,19,22) (27,24,25) (28,26,29) (34,31,32) (35,33,36) (41,38,39) (42,40,43) (48,45,46) (49,47,50) (55,52,53) (56,54,57) (62,59,60) (63,61,64) (69,66,67) (70,68,71) (76,73,74) (77,75,7
 - 2 AUT (column)  (7,3,5,4,8,6) (14,10,12,11,15,13) (21,17,19,18,22,20) (28,24,26,25,29,27) (35,31,33,32,36,34) (42,38,40,39,43,41) (49,45,47,46,50,48) (56,52,54,53,57,55) (63,59,61,60,64,62) (70,66,68,67,71,69) (77,73,75,74,78,76) (84,80,82
 - 3 AUT (column)  (4,3,6) (8,5,7) (37,16,23) (38,17,24) (39,18,25) (40,19,26) (41,20,27) (42,21,28) (43,22,29) (44,30,51) (45,31,52) (46,32,53) (47,33,54) (48,34,55) (49,35,56) (50,36,57) (86,65,72) (87,66,73) (88,67,74) (89,68,75) (90,69,76) (91,70,7
 - 4 AUT (column)  (5,3,7,6,8,4) (44,16,30,23,51,37) (45,17,31,24,52,38) (46,18,32,25,53,39) (47,19,33,26,54,40) (48,20,34,27,55,41) (49,21,35,28,56,42) (50,22,36,29,57,43) (93,65,79,72,100,86) (94,66,80,73,101,87) (95,67,81,74,102,88) (96,68
 - 5 AUT (column)  (11,10,13) (15,12,14) (23,16,37) (25,17,41) (27,18,38) (29,19,42) (24,20,39) (26,21,43) (28,22,40) (51,30,44) (53,31,48) (55,32,45) (57,33,49) (52,34,46) (54,35,50) (56,36,47) (254,107,156) (255,108,157) (256,109,158) (257,110,159)
 - 6 AUT (column)  (12,10,14,13,15,11) (30,16,44,37,51,23) (33,17,49,41,57,25) (36,18,47,38,56,27) (32,19,45,42,55,29) (35,20,50,39,54,24) (31,21,48,43,53,26) (34,22,46,40,52,28) (303,107,205,156,352,254) (304,108,206,157,353,255) (305,109,2
 - 7 AUT (column)  (8,3) (7,4) (6,5) (15,10) (14,11) (13,12) (22,17) (21,18) (20,19) (29,24) (28,25) (27,26) (36,31) (35,32) (34,33) (43,38) (42,39) (41,40) (50,45) (49,46) (48,47) (57,52) (56,53) (55,54) (59,58) (64,60) (63,61) (66,65) (71,67) (70,68) (73,72) (
 - 8 AUT (column)  (8,3) (7,4) (6,5) (51,16) (52,17) (53,18) (54,19) (55,20) (56,21) (57,22) (44,23) (45,24) (46,25) (47,26) (48,27) (49,28) (50,29) (37,30) (38,31) (39,32) (40,33) (41,34) (42,35) (43,36) (65,58) (66,59) (67,60) (68,61) (69,62) (70,63) (71,64) (
 - 9 AUT (column)  (15,10) (14,11) (13,12) (51,16) (57,17) (56,18) (55,19) (54,20) (53,21) (52,22) (44,23) (50,24) (49,25) (48,26) (47,27) (46,28) (45,29) (37,30) (43,31) (42,32) (41,33) (40,34) (39,35) (38,36) (107,58) (108,59) (109,60) (110,61) (111,62) (112
 - 10 AUT (column)  (8,3) (7,4) (6,5) (10,9) (15,11) (14,12) (17,16) (22,18) (21,19) (24,23) (29,25) (28,26) (31,30) (36,32) (35,33) (38,37) (43,39) (42,40) (45,44) (50,46) (49,47) (52,51) (57,53) (56,54) (64,59) (63,60) (62,61) (71,66) (70,67) (69,68) (78,73) (
 - 11 AUT (column)  (8,3) (7,4) (6,5) (16,9) (17,10) (18,11) (19,12) (20,13) (21,14) (22,15) (51,23) (52,24) (53,25) (54,26) (55,27) (56,28) (57,29) (44,30) (45,31) (46,32) (47,33) (48,34) (49,35) (50,36) (100,65) (101,66) (102,67) (103,68) (104,69) (105,70) (1
 - 12 AUT (column)  (58,9) (59,10) (60,11) (61,12) (62,13) (63,14) (64,15) (65,16) (66,17) (67,18) (68,19) (69,20) (70,21) (71,22) (72,23) (73,24) (74,25) (75,26) (76,27) (77,28) (78,29) (79,30) (80,31) (81,32) (82,33) (83,34) (84,35) (85,36) (86,37) (87,38) (8
 - 13 AUT (column)  (3,2) (8,4) (7,5) (15,10) (14,11) (13,12) (17,16) (22,18) (21,19) (25,23) (29,26) (28,27) (33,30) (32,31) (36,34) (41,37) (40,38) (43,42) (49,44) (48,45) (47,46) (57,51) (56,52) (55,53) (64,59) (63,60) (62,61) (66,65) (71,67) (70,68) (74,72)
 - 14 AUT (column)  (9,2) (10,3) (11,4) (12,5) (13,6) (14,7) (15,8) (37,23) (41,24) (38,25) (42,26) (39,27) (43,28) (40,29) (44,30) (49,31) (47,32) (45,33) (50,34) (48,35) (46,36) (57,52) (56,53) (55,54) (107,65) (108,66) (109,67) (110,68) (111,69) (112,70) (11
 - 15 AUT (column)  (2,1) (6,4) (7,5) (16,10) (23,11) (30,12) (37,13) (44,14) (51,15) (24,18) (31,19) (38,20) (45,21) (52,22) (32,26) (39,27) (46,28) (53,29) (40,34) (47,35) (54,36) (48,42) (55,43) (56,50) (65,59) (72,60) (79,61) (86,62) (93,63) (100,64) (73,67
 Size G= 4635182361600 AUT (rows) 400
(62,59,60) (63,61,64) (86,65,72) (90,66,74) (87,67,76) (91,68,78) (88,69,73) (92,70,75) (89,71,77) (93,79,100) (97,80,102) (94,81,104) (98,82,106) (95,83,101) (99,84,103) (96,85,105) (254,107,156) (258,108,158) (255,109,160) (259,110,162) (256,111,157
(63,59,61,60,64,62) (93,65,79,72,100,86) (98,66,82,74,106,90) (96,67,85,76,105,87) (94,68,81,78,104,91) (99,69,84,73,103,88) (97,70,80,75,102,92) (95,71,83,77,101,89) (303,107,205,156,352,254) (308,108,208,158,358,258) (306,109,211,160,357,2
(13,10,11) (14,12,15) (37,16,23) (41,17,25) (38,18,27) (42,19,29) (39,20,24) (43,21,26) (40,22,28) (44,30,51) (48,31,53) (45,32,55) (49,33,57) (46,34,52) (50,35,54) (47,36,56) (156,107,254) (157,108,255) (158,109,256) (159,110,257) (160,111,258) (161,1
(14,10,12,11,15,13) (44,16,30,23,51,37) (49,17,33,25,57,41) (47,18,36,27,56,38) (45,19,32,29,55,42) (50,20,35,24,54,39) (48,21,31,26,53,43) (46,22,34,28,52,40) (205,107,303,254,352,156) (206,108,304,255,353,157) (207,109,305,256,354,158) (208
(6,3,4) (7,5,8) (23,16,37) (24,17,38) (25,18,39) (26,19,40) (27,20,41) (28,21,42) (29,22,43) (51,30,44) (52,31,45) (53,32,46) (54,33,47) (55,34,48) (56,35,49) (57,36,50) (72,65,86) (73,66,87) (74,67,88) (75,68,89) (76,69,90) (77,70,91) (78,71,92) (100,79
(7,3,5,4,8,6) (30,16,44,37,51,23) (31,17,45,38,52,24) (32,18,46,39,53,25) (33,19,47,40,54,26) (34,20,48,41,55,27) (35,21,49,42,56,28) (36,22,50,43,57,29) (79,65,93,86,100,72) (80,66,94,87,101,73) (81,67,95,88,102,74) (82,68,96,89,103,75) (83,6
(59,58) (64,60) (63,61) (101,65) (100,66) (106,67) (105,68) (104,69) (103,70) (102,71) (94,72) (93,73) (99,74) (98,75) (97,76) (96,77) (95,78) (87,79) (86,80) (92,81) (91,82) (90,83) (89,84) (88,85) (353,107) (352,108) (358,109) (357,110) (356,111) (355,112) (3
(10,9) (15,11) (14,12) (52,16) (51,17) (57,18) (56,19) (55,20) (54,21) (53,22) (45,23) (44,24) (50,25) (49,26) (48,27) (47,28) (46,29) (38,30) (37,31) (43,32) (42,33) (41,34) (40,35) (39,36) (353,107) (354,108) (355,109) (356,110) (357,111) (358,112) (352,113) (
(3,2) (8,4) (7,5) (52,16) (53,17) (54,18) (55,19) (56,20) (57,21) (51,22) (46,23) (47,24) (48,25) (49,26) (50,27) (44,28) (45,29) (40,30) (41,31) (42,32) (43,33) (37,34) (38,35) (39,36) (101,65) (102,66) (103,67) (104,68) (105,69) (106,70) (100,71) (95,72) (96,73
(65,58) (71,59) (70,60) (69,61) (68,62) (67,63) (66,64) (100,72) (106,73) (105,74) (104,75) (103,76) (102,77) (101,78) (93,79) (99,80) (98,81) (97,82) (96,83) (95,84) (94,85) (92,87) (91,88) (90,89) (359,107) (365,108) (364,109) (363,110) (362,111) (361,112) (3
(16,9) (22,10) (21,11) (20,12) (19,13) (18,14) (17,15) (51,23) (57,24) (56,25) (55,26) (54,27) (53,28) (52,29) (44,30) (50,31) (49,32) (48,33) (47,34) (46,35) (45,36) (43,38) (42,39) (41,40) (359,107) (360,108) (361,109) (362,110) (363,111) (364,112) (365,113) (
(2,1) (6,4) (7,5) (16,10) (23,11) (30,12) (37,13) (44,14) (51,15) (24,18) (31,19) (38,20) (45,21) (52,22) (32,26) (39,27) (46,28) (53,29) (40,34) (47,35) (54,36) (48,42) (55,43) (56,50) (65,59) (72,60) (79,61) (86,62) (93,63) (100,64) (73,67) (80,68) (87,69) (94,7
(107,58) (113,59) (112,60) (111,61) (110,62) (109,63) (108,64) (149,65) (155,66) (154,67) (153,68) (152,69) (151,70) (150,71) (142,72) (148,73) (147,74) (146,75) (145,76) (144,77) (143,78) (135,79) (141,80) (140,81) (139,82) (138,83) (137,84) (136,85) (128,86
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(58,9) (59,10) (60,11) (61,12) (62,13) (63,14) (64,15) (65,16) (66,17) (67,18) (68,19) (69,20) (70,21) (71,22) (72,23) (73,24) (74,25) (75,26) (76,27) (77,28) (78,29) (79,30) (80,31) (81,32) (82,33) (83,34) (84,35) (85,36) (86,37) (87,38) (88,39) (89,40) (90,41) (
 1 ORBITS by column
 1, 2, 3, 6, 4, 5, 7, 8, 9, 10, 13, 11, 12, 14, 15, 16, 37, 23, 30, 44, 51, 17, 20, 18, 19, 21, 22, 38, 41, 39, 40, 42, 43, 24, 27, 25, 26, 28, 29, 31, 34, 32, 33, 35, 36, 45, 48, 46, 47, 49, 50, 52, 55, 53, 54, 56, 57, 58, 59, 62,

 orbits (row)
  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2  2
 ==  Elapsed time: 0.07s
END; ALL NONEQU 1

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Time:	Monday 7.12	Tuesday 8.12
15:00 - 15:20	Opening	**N.Yankov**, Софтуер за Линкус и Уидоус от гледната точка на математика
15:20 - 15:40	**S.Bouyuklieva**, On-Line Encyclopedia of Integer Sequences and Coding Theory	**Dushan Bikov**, Parallel primitive Histogram and use in Cryptography
15:40 - 16:00	**Mariya Dzhumalieva-Stoeva**, Software for generating and classification of combinatorial designs and Hadamard matrices	**Valentin Bakoev**, The Combinatorial Algorithms in my Practice
16:00 - 16:20	**P.Boyvalenkov**, **M. Stoyanova**, Some LP bounds for covering radius of spherical designs	**I.Bouyukliev**, The program 'Equivalence' in the software package QextNewEdition
Break		
16:40 - 17:00	**S.Topalova**, **S.Zhelezova**, Finding putative automorphism groups of a parallelism of PG(3,q) by GAP	**Z.Varbanov**
17:00 - 17:20	**S.Topalova**, **S.Zhelezova**, Invariants of resolutions of Steiner 2-designs.	**P. Piperkov**, Implementation through the Mathematica package of butterfly algorithms for determining the parameters of a linear code
17:20 - 17:40	**V. Monev**	**P. Kazakov**
17:40 - 18:00	Object oriented programming and mathematical software - disadvantages and advantages Compilers and Hardware — discussion	Good practices in the organization of experimental software for parallel and sequential implementation — discussion