BLT-sets of Q(4, 9)

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There are 3 BLT-sets.

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The BLT-Sets

3.1 Isomorphism Type 0

Stabilizer has order 28800
Plane intersection type is 10
Plane invariant is

$$\left[\ 10\ \right]$$

$\rightarrow$	1_1
10_0	1

$\downarrow$	1_1
10_0	10

$C_0 = \{0,1,2,3,4,5,6,7,8,9\}_{10}$
$C_1 = \{0\}_1$

$\rightarrow$	1_1
10_0	1

$\downarrow$	1_1
10_0	10

$C_0 = \{0,1,2,3,4,5,6,7,8,9\}_{10}$
$C_1 = \{0\}_1$
Column cell 1:
Order of the group that is induced on the object is 1440
Number of ancestors on 5-sets is 2.
Number of orbits on 5-sets is 2.
With 1 orbits on the object
Orbit lengths: 10
The points by ranks:

i	Rank
0	0
1	1
2	52

i	Rank
3	53
4	54
5	57

i	Rank
6	55
7	58
8	59

i	Rank
9	56

The points:

$$P_0 = (0,1,0,0,0)P_1 = (0,0,1,0,0)P_2 = (0,1,7,2,7)P_3 = (0,1,7,1,5)$$
$$P_4 = (0,1,3,7,4)P_5 = (0,1,3,5,8)P_6 = (0,1,5,4,3)P_7 = (0,1,6,3,1)$$
$$P_8 = (0,1,5,8,6)P_9 = (0,1,6,6,2)$$

Stabilizer of order 28800 is generated by:

$$g_1 = \begin{bmatrix} 20000 \\ 01000 \\ 00100 \\ 00010 \\ 00001 \end{bmatrix}_0$$

with 100 fixed points

$$g_2 = \begin{bmatrix} 60000 \\ 04000 \\ 00100 \\ 00040 \\ 00001 \end{bmatrix}_1$$

with 16 fixed points

$$g_3 = \begin{bmatrix} 40000 \\ 04000 \\ 00400 \\ 00080 \\ 00008 \end{bmatrix}_0$$

with 12 fixed points

$$g_4 = \begin{bmatrix} 50000 \\ 05000 \\ 00500 \\ 00020 \\ 00004 \end{bmatrix}_1$$

with 6 fixed points

$$g_5 = \begin{bmatrix} 50083 \\ 01000 \\ 00100 \\ 60042 \\ 40084 \end{bmatrix}_0$$

with 100 fixed points

$$g_6 = \begin{bmatrix} 30025 \\ 08000 \\ 00800 \\ 70075 \\ 10037 \end{bmatrix}_0$$

with 82 fixed points

$$g_7 = \begin{bmatrix} 10000 \\ 06000 \\ 04787 \\ 06008 \\ 08040 \end{bmatrix}_1$$

with 10 fixed points

$$g_8 = \begin{bmatrix} 50000 \\ 00800 \\ 01715 \\ 00804 \\ 00520 \end{bmatrix}_0$$

with 12 fixed points

3.2 Isomorphism Type 1

Stabilizer has order 5760
Plane intersection type is 4^{30}
Plane invariant is too big (30 planes)

$\rightarrow$	30_1
10_0	12

$\downarrow$	30_1
10_0	4

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}_{10}$
$C_1 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29\}_{30}$

$\rightarrow$	30_1
10_0	12

$\downarrow$	30_1
10_0	4

$C_0 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}_{10}$
$C_1 = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29\}_{30}$
Column cell 1:
Order of the group that is induced on the object is 1440
Number of ancestors on 5-sets is 3.
Number of orbits on 5-sets is 2.
With 1 orbits on the object

Orbit lengths: 10
The points by ranks:

i	Rank
0	0
1	1
2	52

i	Rank
3	53
4	72
5	79

i	Rank
6	83
7	89
8	74

i	Rank
9	86

The points:

$$P_0 = (0,1,0,0,0)P_1 = (0,0,1,0,0)P_2 = (0,1,7,2,7)P_3 = (0,1,7,1,5)$$
$$P_4 = (0,1,5,6,8)P_5 = (0,1,7,4,6)P_6 = (0,1,7,8,3)P_7 = (0,1,5,5,2)$$
$$P_8 = (0,1,5,3,4)P_9 = (0,1,5,7,1)$$

Stabilizer of order 5760 is generated by:

$$g_1 = \begin{bmatrix} 10000 \\ 02000 \\ 00200 \\ 00020 \\ 00002 \end{bmatrix}_0$$

with 100 fixed points

$$g_2 = \begin{bmatrix} 80000 \\ 07000 \\ 00300 \\ 00070 \\ 00003 \end{bmatrix}_1$$

with 16 fixed points

$$g_3 = \begin{bmatrix} 60000 \\ 04000 \\ 00100 \\ 00080 \\ 00002 \end{bmatrix}_1$$

with 16 fixed points

$$g_4 = \begin{bmatrix} 30000 \\ 04000 \\ 00100 \\ 00010 \\ 00004 \end{bmatrix}_1$$

with 16 fixed points

$$g_5 = \begin{bmatrix} 10000 \\ 05000 \\ 00300 \\ 00040 \\ 00008 \end{bmatrix}_1$$

with 6 fixed points

$$g_6 = \begin{bmatrix} 70000 \\ 02000 \\ 00400 \\ 00003 \\ 00060 \end{bmatrix}_1$$

with 10 fixed points

$$g_7 = \begin{bmatrix} 30000 \\ 04000 \\ 05152 \\ 08080 \\ 05002 \end{bmatrix}_1$$

with 16 fixed points

$$g_8 = \begin{bmatrix} 50000 \\ 02000 \\ 03464 \\ 01003 \\ 03060 \end{bmatrix}_1$$

with 1 fixed points

$$g_9 = \begin{bmatrix} 50000 \\ 01000 \\ 03886 \\ 06040 \\ 01002 \end{bmatrix}_1$$

with 16 fixed points

$$g_{10} = \begin{bmatrix} 10000 \\ 00400 \\ 08000 \\ 00004 \\ 00080 \end{bmatrix}_1$$

with 16 fixed points

$$g_{11} = \begin{bmatrix} 60000 \\ 01654 \\ 00400 \\ 00530 \\ 00203 \end{bmatrix}_1$$

with 6 fixed points

3.3 Isomorphism Type 2

Stabilizer has order 400
Plane intersection type is $5^2\ 3^{100}$
Plane invariant is

$$\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$$

$\rightarrow$	2_1
10_0	1

$\downarrow$	2_1
10_0	5

$C_0 = \{0,1,2,3,4,5,6,7,8,9\}_{10}$
$C_1 = \{0,1\}_2$

$\rightarrow$	2_1
10_0	1

$\downarrow$	2_1
10_0	5

$C_0 = \{0,1,2,3,4,5,6,7,8,9\}_{10}$
$C_1 = \{0,1\}_2$
Column cell 1:
Order of the group that is induced on the object is 400
Number of ancestors on 5-sets is 4.
Number of orbits on 5-sets is 4.
With 1 orbits on the object
Orbit lengths: 10
The points by ranks:

i	Rank
0	0
1	1
2	52

i	Rank
3	54
4	55
5	417

i	Rank
6	728
7	392
8	585

i	Rank
9	773

The points:

$$P_0 = (0,1,0,0,0)P_1 = (0,0,1,0,0)P_2 = (0,1,7,2,7)P_3 = (0,1,3,7,4)$$
$$P_4 = (0,1,5,4,3)P_5 = (1,4,7,5,1)P_6 = (1,1,3,3,6)P_7 = (1,1,3,8,1)$$
$$P_8 = (1,4,7,3,8)P_9 = (1,7,2,7,4)$$

Stabilizer of order 400 is generated by:

$$g_1 = \begin{bmatrix} 60061 \\ 02000 \\ 00200 \\ 20073 \\ 30077 \end{bmatrix}_0$$

with 82 fixed points

$$g_2 = \begin{bmatrix} 30061 \\ 01000 \\ 00100 \\ 10088 \\ 60018 \end{bmatrix}_0$$

with 10 fixed points

$$g_3 = \begin{bmatrix} 60085 \\ 02000 \\ 07252 \\ 26056 \\ 38036 \end{bmatrix}_1$$

with 6 fixed points

$$g_4 = \begin{bmatrix} 30000 \\ 07462 \\ 01000 \\ 07002 \\ 02080 \end{bmatrix}_0$$

with 10 fixed points

$$g_5 = \begin{bmatrix} 08316 \\ 67846 \\ 44624 \\ 44421 \\ 71863 \end{bmatrix}_1$$

with 6 fixed points

Chapter 4

The BLT-Sets in Numeric Form

0, 1, 52, 53, 54, 57, 55, 58, 59, 56
0, 1, 52, 53, 72, 79, 83, 89, 74, 86
0, 1, 52, 54, 55, 417, 728, 392, 585, 773

```
INT BLT_9_size = 10;
INT BLT_9_nb_reps = 3;
INT BLT_9_reps[] = {
0, 1, 52, 53, 54, 57, 55, 58, 59, 56,
0, 1, 52, 53, 72, 79, 83, 89, 74, 86,
0, 1, 52, 54, 55, 417, 728, 392, 585, 773,
};
const BYTE *BLT_9_stab_order[] = {
"28800",
"5760",
"400",
};
INT BLT_9_stab_gens[] = {
2, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0,
6, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 1, 1,
4, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 8, 0, 0, 0, 0, 0, 8, 0,
5, 0, 0, 0, 0, 0, 5, 0, 0, 0, 0, 0, 5, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 4, 1,
5, 0, 0, 8, 3, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 6, 0, 0, 4, 2, 4, 0, 0, 8, 4, 0,
3, 0, 0, 2, 5, 0, 8, 0, 0, 0, 0, 0, 8, 0, 0, 7, 0, 0, 7, 5, 1, 0, 0, 3, 7, 0,
1, 0, 0, 0, 0, 0, 6, 0, 0, 0, 0, 4, 7, 8, 7, 0, 6, 0, 0, 8, 0, 8, 0, 4, 0, 1,
5, 0, 0, 0, 0, 0, 0, 8, 0, 0, 0, 1, 7, 1, 5, 0, 0, 8, 0, 4, 0, 0, 5, 2, 0, 0,
1, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 2, 0,
8, 0, 0, 0, 0, 0, 7, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 7, 0, 0, 0, 0, 0, 3, 1,
6, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 8, 0, 0, 0, 0, 0, 2, 1,
3, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 0, 4, 1,
1, 0, 0, 0, 0, 0, 5, 0, 0, 0, 0, 0, 3, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 8, 1,
7, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 0, 0, 3, 0, 0, 0, 6, 0, 1,
3, 0, 0, 0, 0, 0, 4, 0, 0, 0, 0, 5, 1, 5, 2, 0, 8, 0, 8, 0, 0, 5, 0, 0, 2, 1,
5, 0, 0, 0, 0, 0, 2, 0, 0, 0, 0, 3, 4, 6, 4, 0, 1, 0, 0, 3, 0, 3, 0, 6, 0, 1,
5, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 3, 8, 8, 6, 0, 6, 0, 4, 0, 0, 1, 0, 0, 2, 1,
1, 0, 0, 0, 0, 0, 0, 4, 0, 0, 0, 8, 0, 0, 0, 0, 0, 0, 0, 4, 0, 0, 0, 8, 0, 1,
6, 0, 0, 0, 0, 0, 1, 6, 5, 4, 0, 0, 4, 0, 0, 0, 0, 5, 3, 0, 0, 0, 2, 0, 3, 1,
6, 0, 0, 6, 1, 0, 2, 0, 0, 0, 0, 0, 2, 0, 0, 2, 0, 0, 7, 3, 3, 0, 0, 7, 7, 0,
3, 0, 0, 6, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 8, 8, 6, 0, 0, 1, 8, 0,
6, 0, 0, 8, 5, 0, 2, 0, 0, 0, 0, 7, 2, 5, 2, 2, 6, 0, 5, 6, 3, 8, 0, 3, 6, 1,
3, 0, 0, 0, 0, 0, 7, 4, 6, 2, 0, 1, 0, 0, 0, 0, 7, 0, 0, 2, 0, 2, 0, 8, 0, 0,
0, 8, 3, 1, 6, 6, 7, 8, 4, 6, 4, 4, 6, 2, 4, 4, 4, 4, 2, 1, 7, 1, 8, 6, 3, 1,
};
INT BLT_9_stab_gens_fst[] = { 0, 8, 19};
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INT BLT_9_stab_gens_len[] = { 8, 11, 5};
INT BLT_9_make_element_size = 0;
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