1 BLT set 4 over GF(23)

Points on the quadric $x_0^2 + x_1x_2 + x_3x_4$:

$P_1 = (0, 1, 0, 0, 0)$

$P_2 = (0, 0, 1, 0, 0)$

$P_3 = (0, 1, 9, 22, 9)$

$P_4 = (0, 1, 8, 11, 16)$

$P_5 = (0, 1, 12, 13, 15)$

$P_6 = (0, 1, 6, 2, 20)$

$P_7 = (1, 6, 4, 2, 22)$

$P_8 = (1, 9, 6, 16, 21)$

$P_9 = (1, 10, 22, 6, 13)$

$P_{10} = (1, 11, 19, 13, 21)$

$P_{11} = (1, 14, 17, 14, 1)$

$P_{12} = (1, 1, 16, 6, 1)$

$P_{13} = (1, 11, 11, 1, 16)$

$P_{14} = (1, 4, 18, 12, 15)$

$P_{15} = (1, 20, 15, 8, 17)$

$P_{16} = (1, 11, 21, 8, 17)$

$P_{17} = (1, 4, 18, 14, 3)$

$P_{18} = (1, 2, 18, 13, 6)$

$P_{19} = (1, 4, 9, 13, 6)$

$P_{20} = (1, 13, 1, 1, 9)$

$P_{21} = (1, 5, 15, 1, 16)$

$P_{22} = (1, 2, 9, 20, 14)$

$P_{23} = (1, 17, 15, 13, 21)$

$P_{24} = (1, 8, 13, 9, 19)$

Stabilizer of order 16 is generated by:

$$g_1 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 0 & 7 & 0 & 0 \\ 0 & 10 & 0 & 0 & 0 \\ 0 & 0 & 0 & 22 & 0 \\ 0 & 0 & 0 & 0 & 22 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 4 & 0 & 0 & 6 & 9 \\ 0 & 22 & 0 & 0 & 0 \\ 0 & 0 & 22 & 0 & 0 \\ 16 & 0 & 0 & 9 & 15 \\ 3 & 0 & 0 & 22 & 9 \end{pmatrix}$$

$$g_3 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 19 & 21 & 17 & 9 \\ 0 & 7 & 19 & 14 & 2 \\ 0 & 2 & 9 & 3 & 17 \\ 0 & 14 & 17 & 5 & 3 \end{pmatrix}$$

$$g_4 = \begin{pmatrix} 1 & 20 & 22 & 13 & 21 \\ 22 & 22 & 7 & 17 & 22 \\ 5 & 10 & 22 & 8 & 1 \\ 22 & 10 & 16 & 0 & 17 \\ 18 & 14 & 13 & 3 & 0 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 16 and is generated by:

g_1 =(1, 2)(3, 4)(5, 6)(10, 23)(13, 21)(15, 16)(18, 19)

g_2 =(3, 18)(4, 19)(7, 17)(8, 11)(9, 20)(12, 22)(14, 24)

g_3 =(1, 5)(2, 6)(8, 20)(9, 11)(10, 21)(12, 14)(13, 23)(22, 24)

g_4 =(1, 12, 2, 22)(3, 4, 19, 18)(5, 14, 6, 24)(7, 16, 17, 15)(8, 23, 11, 10)(9, 21, 20, 13)

Kernel has order 1 and is generated by:

There are 4 orbits on the BLT set.

The orbit length are $[8^2, 4^2]$

The orbits are:

$O_0 = \{1, 2, 5, 6, 12, 14, 22, 24\}$ (length 8)

$O_1 = \{3, 4, 18, 19\}$ (length 4)

$O_2 = \{7, 15, 16, 17\}$ (length 4)

$O_3 = \{8, 9, 10, 11, 13, 20, 21, 23\}$ (length 8)

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 2, 5, 6, 12, 14, 22, 24\}$ (length 8)

The induced group has order 16 and is generated by:

g_1 =(1, 2)(3, 4)

g_2 =(5, 7)(6, 8)

g_3 =(1, 3)(2, 4)(5, 6)(7, 8)

g_4 =(1, 5, 2, 7)(3, 6, 4, 8)

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{3, 4, 18, 19\}$ (length 4)

The induced group has order 8 and is generated by:

g_1 =(1, 2)(3, 4)

g_2 =(1, 3)(2, 4)

g_3 =id

g_4 =(1, 2, 4, 3)

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 19 & 21 & 17 & 9 \\ 0 & 7 & 19 & 14 & 2 \\ 0 & 2 & 9 & 3 & 17 \\ 0 & 14 & 17 & 5 & 3 \end{pmatrix}$$

The kernel has 6625 orbits on the quadric.

The orbit length are $[2^{6095}, 1^{530}]$

Induced action on orbit $O_0 = \{1, 231\}$ (length 2)

The induced group has order 2 and is generated by:

g_1 =(1, 2)

Kernel has order 1 and is generated by:

Induced action on orbit $O_2 = \{7, 15, 16, 17\}$ (length 4)

The induced group has order 8 and is generated by:

g_1 =(2, 3)

g_2 =(1, 4)

g_3 =id

g_4 =(1, 3, 4, 2)

Kernel has order 2 and is generated by:

$$b_1 = \begin{pmatrix} 22 & 0 & 0 & 0 & 0 \\ 0 & 19 & 21 & 17 & 9 \\ 0 & 7 & 19 & 14 & 2 \\ 0 & 2 & 9 & 3 & 17 \\ 0 & 14 & 17 & 5 & 3 \end{pmatrix}$$

The kernel has 6625 orbits on the quadric.

The orbit length are $[2^{6095}, 1^{530}]$

Induced action on orbit $O_0 = \{1, 231\}$ (length 2)

The induced group has order 2 and is generated by:

g_1 =(1, 2)

Kernel has order 1 and is generated by:

Induced action on orbit $O_3 = \{8, 9, 10, 11, 13, 20, 21, 23\}$ (length 8)

The induced group has order 16 and is generated by:

g_1 =(3, 8)(5, 7)

g_2 =(1, 4)(2, 6)

g_3 =(1, 6)(2, 4)(3, 7)(5, 8)

g_4 =(1, 8, 4, 3)(2, 7, 6, 5)

Kernel has order 1 and is generated by: