1 BLT set 6 over GF(27)

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

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

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

$P_3 = (0, 1, 1, 2, 1)$

$P_4 = (0, 1, 1, 1, 2)$

$P_5 = (0, 1, 9, 10, 22)$

$P_6 = (1, 9, 25, 1, 1)$

$P_7 = (1, 14, 24, 9, 1)$

$P_8 = (1, 19, 10, 16, 1)$

$P_9 = (1, 9, 22, 20, 26)$

$P_{10} = (1, 7, 25, 24, 13)$

$P_{11} = (1, 17, 14, 16, 9)$

$P_{12} = (1, 14, 2, 17, 19)$

$P_{13} = (1, 22, 20, 21, 21)$

$P_{14} = (1, 2, 26, 3, 24)$

$P_{15} = (1, 23, 14, 24, 11)$

$P_{16} = (1, 12, 8, 11, 11)$

$P_{17} = (1, 1, 12, 7, 5)$

$P_{18} = (1, 21, 17, 5, 5)$

$P_{19} = (1, 26, 17, 8, 15)$

$P_{20} = (1, 8, 13, 15, 15)$

$P_{21} = (1, 26, 21, 20, 14)$

$P_{22} = (1, 23, 10, 19, 3)$

$P_{23} = (1, 1, 25, 3, 23)$

$P_{24} = (1, 12, 15, 18, 6)$

$P_{25} = (1, 18, 26, 6, 6)$

$P_{26} = (1, 2, 10, 8, 13)$

$P_{27} = (1, 14, 23, 18, 22)$

$P_{28} = (1, 6, 13, 25, 22)$

Stabilizer of order 6 is generated by:

$$g_1 = \begin{pmatrix} 13 & 0 & 0 & 15 & 15 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 15 & 0 & 0 & 24 & 25 \\ 15 & 0 & 0 & 25 & 24 \end{pmatrix}, 2$$

$$g_2 = \begin{pmatrix} 26 & 0 & 0 & 21 & 21 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 15 & 0 & 0 & 25 & 24 \\ 15 & 0 & 0 & 24 & 25 \end{pmatrix}, 1$$

Induced action on the BLT-set:

The induced group has order 6 and is generated by:

g_1 =(5, 9, 14)(6, 18, 13)(7, 11, 17)(8, 22, 19)(10, 24, 21)(12, 28, 15)(16, 25, 20)(23, 26, 27)

g_2 =(1, 2)(5, 27, 9, 23, 14, 26)(6, 16, 18, 25, 13, 20)(7, 22, 11, 19, 17, 8)(10, 12, 24, 28, 21, 15)

Kernel has order 1 and is generated by:

There are 7 orbits on the BLT set.

The orbit length are $[6^4, 2, 1^2]$

The orbits are:

$O_0 = \{1, 2\}$ (length 2)

$O_1 = \{3\}$ (length 1)

$O_2 = \{4\}$ (length 1)

$O_3 = \{5, 9, 14, 23, 26, 27\}$ (length 6)

$O_4 = \{6, 13, 16, 18, 20, 25\}$ (length 6)

$O_5 = \{7, 8, 11, 17, 19, 22\}$ (length 6)

$O_6 = \{10, 12, 15, 21, 24, 28\}$ (length 6)

The actions induced on the orbits are:

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

The induced group has order 2 and is generated by:

g_1 =id

g_2 =(1, 2)

Kernel has order 3 and is generated by:

$$b_1 = \begin{pmatrix} 13 & 0 & 0 & 15 & 15 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 15 & 0 & 0 & 24 & 25 \\ 15 & 0 & 0 & 25 & 24 \end{pmatrix}, 2$$

The kernel has 6840 orbits on the quadric.

The orbit length are $[3^{6800}, 1^{40}]$

Induced action on orbit $O_2 = \{3, 2587, 3488\}$ (length 3)

The induced group has order 3 and is generated by:

g_1 =(1, 2, 3)

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{3\}$ (length 1)

The induced group has order 1 and is generated by:

g_1 =id

g_2 =id

Kernel has order 6 and is generated by:

$$b_1 = \begin{pmatrix} 23 & 0 & 0 & 19 & 19 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 11 & 0 & 0 & 22 & 21 \\ 11 & 0 & 0 & 21 & 22 \end{pmatrix}, 2$$

$$b_2 = \begin{pmatrix} 9 & 0 & 0 & 24 & 24 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 24 & 0 & 0 & 19 & 20 \\ 24 & 0 & 0 & 20 & 19 \end{pmatrix}, 1$$

The kernel has 3427 orbits on the quadric.

The orbit length are $[6^{3396}, 3^8, 2^{17}, 1^6]$

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

The induced group has order 2 and is generated by:

g_1 =(1, 2)

g_2 =id

Kernel has order 3 and is generated by:

$$b_1 = \begin{pmatrix} 9 & 0 & 0 & 24 & 24 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 24 & 0 & 0 & 19 & 20 \\ 24 & 0 & 0 & 20 & 19 \end{pmatrix}, 1$$

The kernel has 6840 orbits on the quadric.

The orbit length are $[3^{6800}, 1^{40}]$

Induced action on orbit $O_2 = \{3, 2587, 3488\}$ (length 3)

The induced group has order 3 and is generated by:

g_1 =(1, 3, 2)

Kernel has order 1 and is generated by:

Induced action on orbit $O_2 = \{4\}$ (length 1)

The induced group has order 1 and is generated by:

g_1 =id

g_2 =id

Kernel has order 6 and is generated by:

$$b_1 = \begin{pmatrix} 13 & 0 & 0 & 15 & 15 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 15 & 0 & 0 & 24 & 25 \\ 15 & 0 & 0 & 25 & 24 \end{pmatrix}, 2$$

$$b_2 = \begin{pmatrix} 23 & 0 & 0 & 19 & 19 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 11 & 0 & 0 & 22 & 21 \\ 11 & 0 & 0 & 21 & 22 \end{pmatrix}, 2$$

The kernel has 3427 orbits on the quadric.

The orbit length are $[6^{3396}, 3^8, 2^{17}, 1^6]$

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

The induced group has order 2 and is generated by:

g_1 =id

g_2 =(1, 2)

Kernel has order 3 and is generated by:

$$b_1 = \begin{pmatrix} 9 & 0 & 0 & 24 & 24 \\ 0 & 2 & 0 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 \\ 24 & 0 & 0 & 19 & 20 \\ 24 & 0 & 0 & 20 & 19 \end{pmatrix}, 1$$

The kernel has 6840 orbits on the quadric.

The orbit length are $[3^{6800}, 1^{40}]$

Induced action on orbit $O_2 = \{3, 2587, 3488\}$ (length 3)

The induced group has order 3 and is generated by:

g_1 =(1, 3, 2)

Kernel has order 1 and is generated by:

Induced action on orbit $O_3 = \{5, 9, 14, 23, 26, 27\}$ (length 6)

The induced group has order 6 and is generated by:

g_1 =(1, 2, 3)(4, 5, 6)

g_2 =(1, 6, 2, 4, 3, 5)

Kernel has order 1 and is generated by:

Induced action on orbit $O_4 = \{6, 13, 16, 18, 20, 25\}$ (length 6)

The induced group has order 6 and is generated by:

g_1 =(1, 4, 2)(3, 6, 5)

g_2 =(1, 3, 4, 6, 2, 5)

Kernel has order 1 and is generated by:

Induced action on orbit $O_5 = \{7, 8, 11, 17, 19, 22\}$ (length 6)

The induced group has order 6 and is generated by:

g_1 =(1, 3, 4)(2, 6, 5)

g_2 =(1, 6, 3, 5, 4, 2)

Kernel has order 1 and is generated by:

Induced action on orbit $O_6 = \{10, 12, 15, 21, 24, 28\}$ (length 6)

The induced group has order 6 and is generated by:

g_1 =(1, 5, 4)(2, 6, 3)

g_2 =(1, 2, 5, 6, 4, 3)

Kernel has order 1 and is generated by: