1 BLT set 7 over GF(31)

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

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

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

$P_3 = (0, 1, 10, 30, 10)$

$P_4 = (0, 1, 18, 15, 5)$

$P_5 = (0, 1, 4, 10, 12)$

$P_6 = (0, 1, 19, 17, 8)$

$P_7 = (1, 17, 26, 22, 1)$

$P_8 = (1, 18, 28, 28, 3)$

$P_9 = (1, 9, 4, 19, 16)$

$P_{10} = (1, 7, 5, 7, 17)$

$P_{11} = (1, 8, 1, 13, 16)$

$P_{12} = (1, 29, 11, 17, 14)$

$P_{13} = (1, 10, 19, 14, 24)$

$P_{14} = (1, 10, 16, 13, 21)$

$P_{15} = (1, 2, 7, 26, 3)$

$P_{16} = (1, 24, 29, 14, 10)$

$P_{17} = (1, 16, 28, 14, 10)$

$P_{18} = (1, 17, 23, 2, 21)$

$P_{19} = (1, 24, 15, 12, 19)$

$P_{20} = (1, 4, 8, 13, 7)$

$P_{21} = (1, 22, 3, 14, 24)$

$P_{22} = (1, 4, 14, 17, 24)$

$P_{23} = (1, 28, 9, 12, 28)$

$P_{24} = (1, 29, 27, 14, 6)$

$P_{25} = (1, 20, 1, 19, 25)$

$P_{26} = (1, 24, 30, 20, 12)$

$P_{27} = (1, 15, 15, 30, 9)$

$P_{28} = (1, 17, 23, 12, 19)$

$P_{29} = (1, 12, 23, 17, 22)$

$P_{30} = (1, 26, 23, 16, 11)$

$P_{31} = (1, 14, 8, 10, 29)$

$P_{32} = (1, 15, 26, 6, 2)$

Stabilizer of order 10 is generated by:

$$g_1 = \begin{pmatrix} 16 & 23 & 20 & 28 & 11 \\ 10 & 15 & 12 & 3 & 10 \\ 27 & 26 & 15 & 17 & 29 \\ 21 & 29 & 10 & 23 & 10 \\ 14 & 17 & 3 & 27 & 23 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 19 & 1 & 0 & 9 & 22 \\ 0 & 15 & 0 & 0 & 0 \\ 23 & 12 & 29 & 13 & 16 \\ 29 & 6 & 0 & 27 & 1 \\ 14 & 10 & 0 & 7 & 3 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 10 and is generated by:

g_1 =(1, 7)(2, 9)(3, 25)(4, 11)(5, 6)(8, 19)(10, 22)(12, 15)(13, 24)(16, 17)(18, 30)(20, 31)(21, 26)(23, 27)(28, 29)

g_2 =(2, 31, 4, 28, 26)(3, 6, 16, 19, 12)(5, 25, 15, 8, 17)(9, 21, 29, 11, 20)(10, 22, 13, 32, 24)(14, 30, 23, 27, 18)

Kernel has order 1 and is generated by:

There are 5 orbits on the BLT set.

The orbit length are $[10^2, 5^2, 2]$

The orbits are:

$O_0 = \{1, 7\}$ (length 2)

$O_1 = \{2, 4, 9, 11, 20, 21, 26, 28, 29, 31\}$ (length 10)

$O_2 = \{3, 5, 6, 8, 12, 15, 16, 17, 19, 25\}$ (length 10)

$O_3 = \{10, 13, 22, 24, 32\}$ (length 5)

$O_4 = \{14, 18, 23, 27, 30\}$ (length 5)

The actions induced on the orbits are:

Induced action on orbit $O_0 = \{1, 7\}$ (length 2)

The induced group has order 2 and is generated by:

g_1 =(1, 2)

g_2 =id

Kernel has order 5 and is generated by:

$$b_1 = \begin{pmatrix} 19 & 1 & 0 & 9 & 22 \\ 0 & 15 & 0 & 0 & 0 \\ 23 & 12 & 29 & 13 & 16 \\ 29 & 6 & 0 & 27 & 1 \\ 14 & 10 & 0 & 7 & 3 \end{pmatrix}$$

The kernel has 6160 orbits on the quadric.

The orbit length are $[5^{6156}, 1^4]$

Induced action on orbit $O_1 = \{2, 186, 15334, 17408, 20041\}$ (length 5)

The induced group has order 5 and is generated by:

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

Kernel has order 1 and is generated by:

Induced action on orbit $O_1 = \{2, 4, 9, 11, 20, 21, 26, 28, 29, 31\}$ (length 10)

The induced group has order 10 and is generated by:

g_1 =(1, 3)(2, 4)(5, 10)(6, 7)(8, 9)

g_2 =(1, 10, 2, 8, 7)(3, 6, 9, 4, 5)

Kernel has order 1 and is generated by:

Induced action on orbit $O_2 = \{3, 5, 6, 8, 12, 15, 16, 17, 19, 25\}$ (length 10)

The induced group has order 10 and is generated by:

g_1 =(1, 10)(2, 3)(4, 9)(5, 6)(7, 8)

g_2 =(1, 3, 7, 9, 5)(2, 10, 6, 4, 8)

Kernel has order 1 and is generated by:

Induced action on orbit $O_3 = \{10, 13, 22, 24, 32\}$ (length 5)

The induced group has order 10 and is generated by:

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

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

Kernel has order 1 and is generated by:

Induced action on orbit $O_4 = \{14, 18, 23, 27, 30\}$ (length 5)

The induced group has order 10 and is generated by:

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

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

Kernel has order 1 and is generated by: