The Cone 3HMET6

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1 The intrisic informations concerning the graph of extreme rays of 3HMET6.ext

The graph considered is made of 287 elements.
The group acting on 3HMET6.ext is Group3hmet6
Under the group action we have in fact only 5 orbits to consider.
The diameter of the graph is 3.
The list of orbits is with adjacency and Size info:

E1:	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	136	20
E2:	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	94	45
E3:	0	0	0	0	0	1	0	1	0	1	0	1	1	0	0	70	72
E4:	0	0	0	0	1	1	1	0	1	0	1	1	0	0	0	54	60
E5:	0	0	1	0	1	1	1	0	0	0	1	0	0	2	1	26	90

The representation matrix is:

	E1	E2	E3	E4	E5	Adj.	Size
E1	19	36	36	18	27	136	20
E2	16	18	24	20	16	94	45
E3	10	15	20	15	10	70	72
E4	6	15	18	9	6	54	60
E5	6	8	8	4	0	26	90
Size	20	45	72	60	90		287

No complemented local graph of size inferior to 20.

1.1 scalar product between elements of orbits

This subsection made sense only if the representation is orthogonal which is the usual case Considering Orbit 1

1. Orbit Size is 20.
2. Norm of elements is 3.
3. Possible scalar product : 0, 1

Considering Orbit 2

1. Orbit Size is 45.
2. Norm of elements is 4.
3. Possible scalar product : 0, 1, 2

Considering Orbit 3

1. Orbit Size is 72.

2. Norm of elements is 5.
3. Possible scalar product : 0, 1, 2, 3

Considering Orbit 4

1. Orbit Size is 60.
2. Norm of elements is 6.
3. Possible scalar product : 0, 1, 2, 3, 4

Considering Orbit 5

1. Orbit Size is 90.
2. Norm of elements is 10.
3. Possible scalar product : 2, 4, 6

1.2 invariant group of Orbits

The invariant group of x is the set of g such that $g(x) = x$ denoted by G_x.
If x and y are in the same orbit then the groups G_x and G_y are conjuguate.
For any element x we denote O_x its Orbit, we have $|O_x| \times |G_x| = |G|$ We print only nontrivial groups
Invariant group of Orbit 1:

1. Group Size is 36.
2. Elements are : (3 2 1 6 5 4), (3 1 2 6 5 4), (2 3 1 6 5 4), (1 3 2 6 5 4), (2 1 3 6 5 4), (1 2 3 6 5 4), (3 2 1 6 4 5), (3 1 2 6 4 5), (2 3 1 6 4 5), (1 3 2 6 4 5), (2 1 3 6 4 5), (1 2 3 6 4 5), (3 2 1 5 6 4), (3 1 2 5 6 4), (2 3 1 5 6 4), (1 3 2 5 6 4), (2 1 3 5 6 4), (1 2 3 5 6 4), (3 2 1 4 6 5), (3 1 2 4 6 5), (2 3 1 4 6 5), (1 3 2 4 6 5), (2 1 3 4 6 5), (1 2 3 4 6 5), (3 2 1 5 4 6), (3 1 2 5 4 6), (2 3 1 5 4 6), (1 3 2 5 4 6), (2 1 3 5 4 6), (1 2 3 5 4 6), (3 2 1 4 5 6), (3 1 2 4 5 6), (2 3 1 4 5 6), (1 3 2 4 5 6), (2 1 3 4 5 6), (1 2 3 4 5 6)

Invariant group of Orbit 2:

1. Group Size is 16.
2. Elements are : (4 3 2 1 6 5), (4 3 1 2 6 5), (3 4 2 1 6 5), (3 4 1 2 6 5), (2 1 4 3 6 5), (1 2 4 3 6 5), (2 1 3 4 6 5), (1 2 3 4 6 5), (4 3 2 1 5 6), (4 3 1 2 5 6), (3 4 2 1 5 6), (3 4 1 2 5 6), (2 1 4 3 5 6), (1 2 4 3 5 6), (2 1 3 4 5 6), (1 2 3 4 5 6)

Invariant group of Orbit 3:

1. Group Size is 10.
2. Elements are : (5 4 3 2 1 6), (5 3 4 1 2 6), (4 5 2 3 1 6), (3 5 1 4 2 6), (4 2 5 1 3 6), (3 1 5 2 4 6), (2 4 1 5 3 6), (1 3 2 5 4 6), (2 1 4 3 5 6), (1 2 3 4 5 6)

Invariant group of Orbit 4:

1. Group Size is 12.
2. Elements are : (6 5 4 3 2 1), (6 4 5 3 1 2), (5 6 4 2 3 1), (4 6 5 1 3 2), (5 4 6 2 1 3), (4 5 6 1 2 3), (3 2 1 6 5 4), (3 1 2 6 4 5), (2 3 1 5 6 4), (1 3 2 4 6 5), (2 1 3 5 4 6), (1 2 3 4 5 6)

Invariant group of Orbit 5:

1. Group Size is 8.
2. Elements are : (1 6 3 5 4 2), (1 6 3 4 5 2), (3 5 1 6 2 4), (3 4 1 6 2 5), (3 5 1 2 6 4), (3 4 1 2 6 5), (1 2 3 5 4 6), (1 2 3 4 5 6)

2 The intrisic informations concerning the graph of facet rays of 3HMET6.ine

The graph considered is made of 45 elements.
The group acting on 3HMET6.ine is Group3hmet6
Under the group action we have in fact only 2 orbits to consider.
The diameter of the graph is 2.
The list of orbits is with adjacency and Size info:

F1:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	42	15
F2:	-1	0	1	0	1	0	0	1	0	0	0	1	0	0	0	39	30

The representation matrix is:

	F1	F2	Adj.	Size
F1	14	28	42	15
F2	14	25	39	30
Size	15	30		45

No complemented local graph of size inferior to 20.

2.1 scalar product between elements of orbits

This subsection made sense only if the representation is orthogonal which is the usual case Considering Orbit 1

1. Orbit Size is 15.
2. Norm of elements is 1.
3. Possible scalar product : 0

Considering Orbit 2

1. Orbit Size is 30.
2. Norm of elements is 5.
3. Possible scalar product : -1, 1

2.2 invariant group of Orbits

The invariant group of x is the set of g such that $g(x) = x$ denoted by G_x.
If x and y are in the same orbit then the groups G_x and G_y are conjuguate.
For any element x we denote O_x its Orbit, we have $|O_x| \times |G_x| = |G|$ We print only nontrivial groups Invariant group of Orbit 1:

1. Group Size is 48.
2. Elements are : (2 1 6 5 4 3), (1 2 6 5 4 3), (2 1 6 5 3 4), (1 2 6 5 3 4), (2 1 6 4 5 3), (1 2 6 4 5 3), (2 1 6 3 5 4), (1 2 6 3 5 4), (2 1 6 4 3 5), (1 2 6 4 3 5), (2 1 6 3 4 5), (1 2 6 3 4 5), (2 1 5 6 4 3), (1 2 5 6 4 3), (2 1 5 6 3 4), (1 2 5 6 3 4), (2 1 4 6 5 3), (1 2 4 6 5 3), (2 1 3 6 5 4), (1 2 3 6 5 4), (2 1 4 6 3 5), (1 2 4 6 3 5), (2 1 3 6 4 5), (1 2 3 6 4 5), (2 1 5 4 6 3), (1 2 5 4 6 3), (2 1 5 3 6 4), (1 2 5 3 6 4), (2 1 4 5 6 3), (1 2 4 5 6 3), (2 1 3 5 6 4), (1 2 3 5 6 4), (2 1 4 3 6 5), (1 2 4 3 6 5), (2 1 3 4 6 5), (1 2 3 4 6 5), (2 1 5 4 3 6), (1 2 5 4 3 6), (2 1 5 3 4 6), (1 2 5 3 4 6), (2 1 4 5 3 6), (1 2 4 5 3 6), (2 1 3 5 4 6), (1 2 3 5 4 6), (2 1 4 3 5 6), (1 2 4 3 5 6), (2 1 3 4 5 6), (1 2 3 4 5 6)

Invariant group of Orbit 2:

1. Group Size is 24.

2. Elements are : (4 3 2 1 5 6), (4 3 1 2 5 6), (4 2 3 1 5 6), (4 1 3 2 5 6), (4 2 1 3 5 6), (4 1 2 3 5 6), (3 4 2 1 5 6), (3 4 1 2 5 6), (2 4 3 1 5 6), (1 4 3 2 5 6), (2 4 1 3 5 6), (1 4 2 3 5 6), (3 2 4 1 5 6), (3 1 4 2 5 6), (2 3 4 1 5 6), (1 3 4 2 5 6), (2 1 4 3 5 6), (1 2 4 3 5 6), (3 2 1 4 5 6), (3 1 2 4 5 6), (2 3 1 4 5 6), (1 3 2 4 5 6), (2 1 3 4 5 6), (1 2 3 4 5 6)

3 The two incidence matrix

Incidence between Orbit of Extreme rays and Orbits of Facets

	$F1$	$F2$	Inc
$E1$	12	21	33
$E2$	11	18	29
$E3$	10	15	25
$E4$	9	12	21
$E5$	8	10	18

Incidence between Orbits of Facets and Orbits of Extreme Rays

	$E1$	$E2$	$E3$	$E4$	$E5$	Inc
$F1$	16	33	48	36	48	181
$F2$	14	27	36	24	30	131