The Cone 33SMET6

13th January 2002

1 The intrisic informations concerning the graph of extreme rays of 33SMET6.ext

The graph considered is made of 1138 elements.
The group acting on 33SMET6.ext is Group3hmet6
Under the group action we have in fact only 12 orbits to consider.
The diameter of the graph is 3.
The list of orbits is with adjacency and Size info:

E1:	0	0	1	0	1	1	0	1	1	1	0	1	1	1	1	650	6
E2:	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	449	15
E3:	0	3	3	3	3	0	3	3	3	3	3	3	3	3	4	93	45
E4:	1	1	1	2	2	2	2	2	2	1	2	2	2	1	1	57	10
E5:	0	2	2	2	2	1	2	2	1	1	2	2	2	2	2	56	60
E6:	1	1	3	2	2	2	2	3	3	1	2	3	3	1	3	51	90
E7:	1	1	2	2	1	2	2	2	1	1	2	2	2	2	2	30	72
E8:	0	3	3	3	3	2	3	3	2	4	3	3	2	4	4	27	60
E9:	0	4	4	4	4	2	4	4	2	5	4	4	4	5	5	23	180
E10:	1	2	4	3	3	2	3	4	4	1	3	4	4	3	4	18	360
E11:	1	3	3	4	4	4	4	4	5	2	4	4	5	2	5	18	180
E12:	3	3	3	6	6	6	6	6	6	3	6	6	6	3	7	14	60

The representation matrix is:

	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	Adj.	Size
E1	5	15	30	10	50	90	60	30	90	180	60	30	650	6
E2	6	14	39	6	36	48	24	36	72	72	72	24	449	15
E3	4	13	2	2	4	16	8	4	8	24	8	0	93	45
E4	6	9	9	0	6	9	0	0	0	0	18	0	57	10
E5	5	9	3	1	0	6	6	0	6	12	6	2	56	60
E6	6	8	8	1	4	4	0	4	4	8	4	0	51	90
E7	5	5	5	0	5	0	0	0	5	5	0	0	30	72
E8	3	9	3	0	0	6	0	0	3	0	3	0	27	60
E9	3	6	2	0	2	2	2	1	0	4	1	0	23	180
E10	3	3	3	0	2	2	1	0	2	2	0	0	18	360
E11	2	6	2	1	2	2	0	1	1	0	0	1	18	180
E12	3	6	0	0	2	0	0	0	0	0	3	0	14	60
Size	6	15	45	10	60	90	72	60	180	360	180	60		1138

1.1 The local graphs

The complemented local graph are:
We consider graph with cardinal inferior or equal to 20

The complemented local graph for orbit 10 is:

```
 1   4  :   3 4 5 6
 2   8  :   3 4 5 6 7 10 11 15
 3   8  :   1 2 5 8 13 14 15 17
 4   6  :   1 2 6 8 14 15
 5   4  :   1 2 3 7
 6   5  :   1 2 4 13 14
 7   4  :   2 5 8 13
 8   6  :   3 4 7 11 13 15
 9   0  :
10   1  :   2
11   5  :   2 8 12 13 14
12   3  :   11 14 15
13   5  :   3 6 7 8 11
14   5  :   3 4 6 11 12
15   5  :   2 3 4 8 12
16   0  :
17   1  :   3
18   0  :
```

The complemented local graph for orbit 11 is:

```
 1   0  :
 2   7  :   6 7 8 9 10 12 13
 3   4  :   5 6 8 12
 4   0  :
 5   4  :   3 6 8 13
 6   4  :   2 3 5 10
 7   2  :   2 9
 8   4  :   2 3 5 10
 9   2  :   2 7
10   3  :   2 6 8
11   0  :
12   3  :   2 3 13
13   3  :   2 5 12
14   0  :
15   0  :
16   0  :
17   0  :
18   0  :
```

The complemented local graph for orbit 12 is:

```
 1  0  :
 2  1  :  7
 3  3  :  4 6 10
 4  3  :  3 6 13
 5  0  :
 6  3  :  3 4 14
 7  1  :  2
 8  0  :
 9  0  :
10  1  :  3
11  0  :
12  0  :
13  1  :  4
14  1  :  6
```

1.2 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 6.
2. Norm of elements is 10.
3. Possible scalar product : 6

Considering Orbit 2

1. Orbit Size is 15.
2. Norm of elements is 12.
3. Possible scalar product : 9, 10

Considering Orbit 3

1. Orbit Size is 45.
2. Norm of elements is 124.
3. Possible scalar product : 102, 105, 106, 108, 114

Considering Orbit 4

1. Orbit Size is 10.
2. Norm of elements is 42.
3. Possible scalar product : 38

Considering Orbit 5

1. Orbit Size is 60.
2. Norm of elements is 47.
3. Possible scalar product : 40, 41, 42, 43, 44, 45

Considering Orbit 6

1. Orbit Size is 90.
2. Norm of elements is 78.
3. Possible scalar product : 65, 66, 67, 68, 69, 71, 72, 74, 76

Considering Orbit 7

1. Orbit Size is 72.
2. Norm of elements is 45.
3. Possible scalar product : 40, 41, 42, 43

Considering Orbit 8

1. Orbit Size is 60.
2. Norm of elements is 132.
3. Possible scalar product : 112, 116, 120, 124

Considering Orbit 9

1. Orbit Size is 180.
2. Norm of elements is 227.
3. Possible scalar product : 192, 194, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 209, 211, 217, 223

Considering Orbit 10

1. Orbit Size is 360.
2. Norm of elements is 151.
3. Possible scalar product : 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 147, 149

Considering Orbit 11

1. Orbit Size is 180.
2. Norm of elements is 214.
3. Possible scalar product : 182, 184, 188, 190, 191, 192, 194, 195, 196, 199, 200, 202, 203, 204, 207, 208

Considering Orbit 12

1. Orbit Size is 60.
2. Norm of elements is 418.
3. Possible scalar product : 366, 378, 382, 390, 402

1.3 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 120.

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

Invariant group of Orbit 2:

1. Group Size is 48.

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

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 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 3 6 5), (1 2 4 3 6 5), (2 1 3 4 6 5), (1 2 3 4 6 5), (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 4:

1. Group Size is 72.

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

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

Invariant group of Orbit 6:

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

Invariant group of Orbit 7:

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

Invariant group of Orbit 8:

1. Group Size is 12.
2. Elements are : (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 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 9:

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

Invariant group of Orbit 10:

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

Invariant group of Orbit 11:

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

Invariant group of Orbit 12:

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

2 The intrisic informations concerning the graph of facet rays of 33SMET6.ine

The graph considered is made of 30 elements.
The group acting on 33SMET6.ine is Group3hmet6
Under the group action we have in fact only 1 orbits to consider.
The diameter of the graph is 1.
The list of orbits is with adjacency and Size info:

F1: -3 0 1 0 1 0 0 1 0 0 0 1 0 0 0 | 29 | 30

The representation matrix is:

	F1	Adj.	Size
F1	29	29	30
Size	30		30

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 30.
2. Norm of elements is 13.
3. Possible scalar product : -3, 1, 9

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 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

	$F1$	Inc
$E1$	25	25
$E2$	24	24
$E3$	18	18
$E4$	18	18
$E5$	17	17
$E6$	18	18
$E7$	15	15
$E8$	16	16
$E9$	15	15
$E10$	15	15
$E11$	15	15
$E12$	14	14

Incidence between Orbits of Facets and Orbits of Extreme Rays

	$E1$	$E2$	$E3$	$E4$	$E5$	$E6$	$E7$	$E8$	$E9$	$E10$	$E11$	$E12$	Inc
$F1$	5	12	27	6	34	54	36	32	90	180	90	28	594