The Cone OMCUT4

17th September 2003

1 The intrisic informations concerning the graph of extreme rays of OMCUT4.ext

The graph considered is made of 74 elements.
The group acting on OMCUT4.ext is ReprS4revers
Under the group action we have in fact only 5 orbits to consider.
The diameter of the graph is 2.
The list of orbits is with adjacency and Size info:

E1:	0	0	0	0	0	0	0	0	0	1	1	1	61	8
E2:	0	0	0	0	0	0	1	1	0	1	1	0	53	6
E3:	0	0	0	0	0	0	1	1	0	1	1	1	44	24
E4:	0	0	0	1	0	0	1	0	0	1	1	1	40	12
E5:	0	0	0	1	0	0	1	1	0	1	1	1	34	24

The representation matrix is:

	E1	E2	E3	E4	E5	Adj.	Size
E1	7	6	21	9	18	61	8
E2	8	5	20	12	8	53	6
E3	7	5	15	7	10	44	24
E4	6	6	14	6	8	40	12
E5	6	2	10	4	12	34	24
Size	8	6	24	12	24		74

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 8.
2. Norm of elements is 3.
3. Possible scalar product : 0, 1

Considering Orbit 2

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

Considering Orbit 3

1. Orbit Size is 24.

2. Norm of elements is 5.

3. Possible scalar product : 0, 1, 2, 3, 4

Considering Orbit 4

1. Orbit Size is 12.

2. Norm of elements is 5.

3. Possible scalar product : 0, 1, 2, 3

Considering Orbit 5

1. Orbit Size is 24.

2. Norm of elements is 6.

3. Possible scalar product : 0, 1, 2, 3, 4, 5

1.2 invariant group of Orbits

The invariant group of x is the set of g such that g(x)=x denoted b G_x.
If x and y are in the same orbit then the groups G_x and G_x are conjuguate.
Invariant group of Orbit 1

1. Group Size is 6.

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

Invariant group of Orbit 2

1. Group Size is 8.

2. Elements are : (4 3 2 1 reversal), (4 3 1 2 reversal), (3 4 2 1 reversal), (3 4 1 2 reversal), (2 1 4 3), (1 2 4 3), (2 1 3 4), (1 2 3 4),

Invariant group of Orbit 3

1. Group Size is 2.

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

Invariant group of Orbit 4

1. Group Size is 4.

2. Elements are : (4 3 2 1 reversal), (4 2 3 1 reversal), (1 3 2 4), (1 2 3 4),

Invariant group of Orbit 5

1. Group Size is 2.

2. Elements are : (4 3 2 1 reversal), (1 2 3 4),

2 The intrisic informations concerning the graph of facet rays of OMCUT4.ine

The graph considered is made of 72 elements.
The group acting on OMCUT4.ine is ReprS4revers
Under the group action we have in fact only 4 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	1	48	12
F2:	-1	0	1	0	0	0	0	0	0	0	1	0	41	24
F3:	-1	0	1	-1	0	1	1	1	-1	0	0	1	24	12
F4:	-1	0	1	-1	0	1	1	1	-1	1	1	0	16	24

The representation matrix is:

	F1	F2	F3	F4	Adj.	Size
F1	6	22	12	8	48	12
F2	11	17	5	8	41	24
F3	12	10	0	2	24	12
F4	4	8	1	3	16	24
Size	12	24	12	24		72

2.1 The local graphs

The complemented local graph are:
We consider graph with cardinal inferior or equal to 20
The complemented local graph for orbit 4 is:

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

2.2 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 12.

2. Norm of elements is 1.

3. Possible scalar product : 0

Considering Orbit 2

1. Orbit Size is 24.
2. Norm of elements is 3.
3. Possible scalar product : -2, -1, 0, 1

Considering Orbit 3

1. Orbit Size is 12.
2. Norm of elements is 8.
3. Possible scalar product : -3, 0, 1, 2

Considering Orbit 4

1. Orbit Size is 24.
2. Norm of elements is 9.
3. Possible scalar product : -3, -2, -1, 6, 7

2.3 invariant group of Orbits

The invariant group of x is the set of g such that g(x)=x denoted b G_x.
If x and y are in the same orbit then the groups G_x and G_x are conjuguate.
Invariant group of Orbit 1

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

Invariant group of Orbit 2

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

Invariant group of Orbit 3

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

Invariant group of Orbit 4

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

3 The two incidence matrix

Incidence between Orbit of Extreme rays and Orbits of Facets

	$F1$	$F2$	$F3$	$F4$	Inc
$E1$	9	18	6	9	42
$E2$	8	16	8	16	48
$E3$	7	14	4	4	29
$E4$	7	14	4	8	33
$E5$	6	12	4	2	24

Incidence between Orbits of Facets and Orbits of Extreme Rays

	$E1$	$E2$	$E3$	$E4$	$E5$	Inc
$F1$	6	4	14	7	12	43
$F2$	6	4	14	7	12	43
$F3$	4	4	8	4	8	28
$F4$	3	4	4	4	2	17