```
P = 4, Q = 6, R = 8
precedes x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x preceded_by ->
Allen* relations : 3649 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = precedes [0,0,0,0] , Max = preceded_by [16,16,16,16]
----------------
precedes x start ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x started_by ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x finishes ->
Allen* relations : 129 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
start (1 elts)                Min = [1,2,5,6]               Max = [1,2,5,6][9,10,13,14]
meets (3 elts)                Min = [0,1,2,5]               Max = [0,1,4,5][8,9,12,13]
overlaps (3 elts)             Min = [0,2,2,6]               Max = [0,2,4,6][8,10,12,14]
during (1 elts)               Min = [2,2,6,6]               Max = [2,2,6,6][10,10,14,14]
Allen* Min = precedes [0,0,0,0] , Max = during [2,2,6,6] [10,10,14,14]
----------------
precedes x finished_by ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x meets ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x met_by ->
Allen* relations : 129 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
start (1 elts)                Min = [1,2,5,6]               Max = [1,2,5,6][9,10,13,14]
meets (3 elts)                Min = [0,1,2,5]               Max = [0,1,4,5][8,9,12,13]
overlaps (3 elts)             Min = [0,2,2,6]               Max = [0,2,4,6][8,10,12,14]
during (1 elts)               Min = [2,2,6,6]               Max = [2,2,6,6][10,10,14,14]
Allen* Min = precedes [0,0,0,0] , Max = during [2,2,6,6] [10,10,14,14]
----------------
precedes x overlaps ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x overlapped_by ->
```

```
Allen* relations : 129 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
start (1 elts)                Min = [1,2,5,6]               Max = [1,2,5,6][9,10,13,14]
meets (3 elts)                Min = [0,1,2,5]               Max = [0,1,4,5][8,9,12,13]
overlaps (3 elts)             Min = [0,2,2,6]               Max = [0,2,4,6][8,10,12,14]
during (1 elts)               Min = [2,2,6,6]               Max = [2,2,6,6][10,10,14,14]
Allen* Min = precedes [0,0,0,0] , Max = during [2,2,6,6] [10,10,14,14]
----------------
precedes x during ->
Allen* relations : 129 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
start (1 elts)                Min = [1,2,5,6]               Max = [1,2,5,6][9,10,13,14]
meets (3 elts)                Min = [0,1,2,5]               Max = [0,1,4,5][8,9,12,13]
overlaps (3 elts)             Min = [0,2,2,6]               Max = [0,2,4,6][8,10,12,14]
during (1 elts)               Min = [2,2,6,6]               Max = [2,2,6,6][10,10,14,14]
Allen* Min = precedes [0,0,0,0] , Max = during [2,2,6,6] [10,10,14,14]
----------------
precedes x contains ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
precedes x subset ->
Allen* relations : 41 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
preceded_by x precedes ->
Allen* relations : 3649 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = precedes [0,0,0,0] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x start ->
Allen* relations : 129 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
finishes (1 elts)             Min = [10,11,14,15][2,3,6,7]  Max = [10,11,14,15]
met_by (3 elts)               Min = [11,12,15,16][3,4,7,8]  Max = [11,14,15,16]
overlapped_by (3 elts)        Min = [10,12,14,16][2,4,6,8]  Max = [10,14,14,16]
during (1 elts)               Min = [10,10,14,14][2,2,6,6]  Max = [10,10,14,14]
Allen* Min = during [10,10,14,14] [2,2,6,6], Max = preceded_by [16,16,16,16]
----------------
preceded_by x started_by ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x finishes ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
```

```
----------------
preceded_by x finished_by ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x meets ->
Allen* relations : 129 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
finishes (1 elts)             Min = [10,11,14,15][2,3,6,7]  Max = [10,11,14,15]
met_by (3 elts)               Min = [11,12,15,16][3,4,7,8]  Max = [11,14,15,16]
overlapped_by (3 elts)        Min = [10,12,14,16][2,4,6,8]  Max = [10,14,14,16]
during (1 elts)               Min = [10,10,14,14][2,2,6,6]  Max = [10,10,14,14]
Allen* Min = during [10,10,14,14] [2,2,6,6], Max = preceded_by [16,16,16,16]
----------------
preceded_by x met_by ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x overlaps ->
Allen* relations : 129 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
finishes (1 elts)             Min = [10,11,14,15][2,3,6,7]  Max = [10,11,14,15]
met_by (3 elts)               Min = [11,12,15,16][3,4,7,8]  Max = [11,14,15,16]
overlapped_by (3 elts)        Min = [10,12,14,16][2,4,6,8]  Max = [10,14,14,16]
during (1 elts)               Min = [10,10,14,14][2,2,6,6]  Max = [10,10,14,14]
Allen* Min = during [10,10,14,14] [2,2,6,6], Max = preceded_by [16,16,16,16]
----------------
preceded_by x overlapped_by ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x during ->
Allen* relations : 129 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
finishes (1 elts)             Min = [10,11,14,15][2,3,6,7]  Max = [10,11,14,15]
met_by (3 elts)               Min = [11,12,15,16][3,4,7,8]  Max = [11,14,15,16]
overlapped_by (3 elts)        Min = [10,12,14,16][2,4,6,8]  Max = [10,14,14,16]
during (1 elts)               Min = [10,10,14,14][2,2,6,6]  Max = [10,10,14,14]
Allen* Min = during [10,10,14,14] [2,2,6,6], Max = preceded_by [16,16,16,16]
----------------
preceded_by x contains ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
preceded_by x subset ->
Allen* relations : 41 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
start x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
start x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
start x start ->
Allen* relations : 6 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
Allen* Min = start [1,2,5,6] , Max = start [9,10,13,14]
```

```
----------------
start x started_by ->
Allen* relations : 126 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (30 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = start [1,2,5,6] , Max = started_by [9,12,13,16]
----------------
start x finishes ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
start x finished_by ->
Allen* relations : 360 elts
meets (30 elts)               Min = [0,1,4,5][0,1,2,5]      Max = [8,9,12,13]
overlaps (30 elts)            Min = [0,2,4,6][0,2,2,6]      Max = [8,10,12,14]
Allen* Min = meets [0,1,4,5] [0,1,2,5], Max = overlaps [8,10,12,14]
----------------
start x meets ->
Allen* relations : 340 elts
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
met_by (11 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlapped_by (11 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
start x met_by ->
Allen* relations : 80 elts
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (80 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
start x overlaps ->
Allen* relations : 1136 elts
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
meets (80 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (51 elts)              Min = [3,4,7,8]               Max = [7,10,11,14][11,14,15,16]
overlaps (80 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (51 elts)       Min = [2,4,6,8]               Max = [6,10,10,14][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
Allen* Min = meets [0,1,2,5] , Max = overlaps [8,10,12,14]
----------------
start x overlapped_by ->
Allen* relations : 204 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (80 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
start x during ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
start x contains ->
Allen* relations : 888 elts
finished_by (30 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (34 elts)               Min = [0,1,4,5][0,1,2,5]      Max = [8,9,12,13]
overlaps (34 elts)            Min = [0,2,4,6][0,2,2,6]      Max = [8,10,12,14]
contains (56 elts)            Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = meets [0,1,4,5] [0,1,2,5], Max = contains [8,12,12,16]
----------------
start x subset ->
```

```
Allen* relations : 6 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
Allen* Min = start [1,2,5,6] , Max = start [9,10,13,14]
----------------
started_by x precedes ->
Allen* relations : 17 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
started_by x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
started_by x start ->
Allen* relations : 166 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (1 elts)          Min = [1,7,9,15][0,3,4,7]     Max = [1,7,9,15][8,11,12,15]
meets (1 elts)                Min = [1,5,9,13][0,1,2,5]     Max = [1,5,9,13][8,9,12,13]
overlaps (1 elts)             Min = [1,6,9,14][0,2,2,6]     Max = [1,6,9,14][8,10,12,14]
contains (1 elts)             Min = [1,8,9,16][0,4,4,8]     Max = [1,8,9,16][8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = start [1,2,5,6] , Max = started_by [9,12,13,16]
----------------
started_by x started_by ->
Allen* relations : 54 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (1 elts)          Min = [1,7,9,15][0,3,4,7]     Max = [1,7,9,15][8,11,12,15]
meets (1 elts)                Min = [1,5,9,13][0,1,2,5]     Max = [1,5,9,13][8,9,12,13]
overlaps (1 elts)             Min = [1,6,9,14][0,2,2,6]     Max = [1,6,9,14][8,10,12,14]
contains (1 elts)             Min = [1,8,9,16][0,4,4,8]     Max = [1,8,9,16][8,12,12,16]
Allen* Min = started_by [1,4,5,8] , Max = started_by [9,12,13,16]
----------------
started_by x finishes ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = overlapped_by [10,14,14,16]
----------------
started_by x finished_by ->
Allen* relations : 148 elts
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
contains (148 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
started_by x meets ->
Allen* relations : 734 elts
finished_by (53 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (97 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
started_by x met_by ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [3,7,11,15][0,3,4,7]    Max = [3,7,11,15][8,11,12,15]
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
```

```
contains (3 elts)             Min = [3,8,11,16][0,4,4,8]    Max = [3,10,11,16][8,12,12,16]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
started_by x overlaps ->
Allen* relations : 734 elts
finished_by (53 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (97 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
started_by x overlapped_by ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = overlapped_by [10,14,14,16]
----------------
started_by x during ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
started_by x contains ->
Allen* relations : 148 elts
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
contains (148 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
started_by x subset ->
Allen* relations : 54 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (1 elts)          Min = [1,7,9,15][0,3,4,7]     Max = [1,7,9,15][8,11,12,15]
meets (1 elts)                Min = [1,5,9,13][0,1,2,5]     Max = [1,5,9,13][8,9,12,13]
overlaps (1 elts)             Min = [1,6,9,14][0,2,2,6]     Max = [1,6,9,14][8,10,12,14]
contains (1 elts)             Min = [1,8,9,16][0,4,4,8]     Max = [1,8,9,16][8,12,12,16]
Allen* Min = started_by [1,4,5,8] , Max = started_by [9,12,13,16]
----------------
finishes x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
finishes x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
finishes x start ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
finishes x started_by ->
Allen* relations : 360 elts
```

```
met_by (30 elts)              Min = [3,4,7,8]               Max = [11,12,15,16][11,14,15,16]
overlapped_by (30 elts)       Min = [2,4,6,8]               Max = [10,12,14,16][10,14,14,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = met_by [11,12,15,16] [11,14,15,16]
----------------
finishes x finishes ->
Allen* relations : 6 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
Allen* Min = finishes [2,3,6,7] , Max = finishes [10,11,14,15]
----------------
finishes x finished_by ->
Allen* relations : 126 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (30 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = finished_by [0,3,4,7] , Max = finishes [10,11,14,15]
----------------
finishes x meets ->
Allen* relations : 80 elts
meets (80 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
finishes x met_by ->
Allen* relations : 340 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
meets (11 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (11 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = during [10,10,14,14]
----------------
finishes x overlaps ->
Allen* relations : 204 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (80 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
finishes x overlapped_by ->
Allen* relations : 1136 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
meets (51 elts)               Min = [2,5,6,9][0,1,2,5]      Max = [8,9,12,13]
met_by (80 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (51 elts)            Min = [2,6,6,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (80 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
Allen* Min = overlapped_by [2,4,6,8] , Max = met_by [11,14,15,16]
----------------
finishes x during ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
finishes x contains ->
Allen* relations : 888 elts
started_by (30 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
met_by (34 elts)              Min = [3,4,7,8]               Max = [11,12,15,16][11,14,15,16]
overlapped_by (34 elts)       Min = [2,4,6,8]               Max = [10,12,14,16][10,14,14,16]
contains (56 elts)            Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = met_by [11,12,15,16] [11,14,15,16]
----------------
finishes x subset ->
Allen* relations : 6 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
Allen* Min = finishes [2,3,6,7] , Max = finishes [10,11,14,15]
```

```
----------------
finished_by x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
finished_by x preceded_by ->
Allen* relations : 17 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
finished_by x start ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = overlaps [8,10,12,14]
----------------
finished_by x started_by ->
Allen* relations : 148 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (148 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
finished_by x finishes ->
Allen* relations : 166 elts
started_by (1 elts)           Min = [1,7,9,15][1,4,5,8]     Max = [1,7,9,15][9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
met_by (1 elts)               Min = [3,7,11,15][3,4,7,8]    Max = [3,7,11,15][11,14,15,16]
overlapped_by (1 elts)        Min = [2,7,10,15][2,4,6,8]    Max = [2,7,10,15][10,14,14,16]
contains (1 elts)             Min = [0,7,8,15][0,4,4,8]     Max = [0,7,8,15][8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = finished_by [0,3,4,7] , Max = finishes [10,11,14,15]
----------------
finished_by x finished_by ->
Allen* relations : 54 elts
started_by (1 elts)           Min = [1,7,9,15][1,4,5,8]     Max = [1,7,9,15][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
met_by (1 elts)               Min = [3,7,11,15][3,4,7,8]    Max = [3,7,11,15][11,14,15,16]
overlapped_by (1 elts)        Min = [2,7,10,15][2,4,6,8]    Max = [2,7,10,15][10,14,14,16]
contains (1 elts)             Min = [0,7,8,15][0,4,4,8]     Max = [0,7,8,15][8,12,12,16]
Allen* Min = finished_by [0,3,4,7] , Max = finished_by [8,11,12,15]
----------------
finished_by x meets ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,5,9,13][1,4,5,8]     Max = [1,5,9,13][9,12,13,16]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
contains (3 elts)             Min = [0,5,6,13][0,4,4,8]     Max = [0,5,8,13][8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
finished_by x met_by ->
Allen* relations : 734 elts
started_by (53 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (97 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
```

```
finished_by x overlaps ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = overlaps [8,10,12,14]
----------------
finished_by x overlapped_by ->
Allen* relations : 734 elts
started_by (53 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (97 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
finished_by x during ->
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
finished_by x contains ->
Allen* relations : 148 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (148 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
finished_by x subset ->
Allen* relations : 54 elts
started_by (1 elts)           Min = [1,7,9,15][1,4,5,8]     Max = [1,7,9,15][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
met_by (1 elts)               Min = [3,7,11,15][3,4,7,8]    Max = [3,7,11,15][11,14,15,16]
overlapped_by (1 elts)        Min = [2,7,10,15][2,4,6,8]    Max = [2,7,10,15][10,14,14,16]
contains (1 elts)             Min = [0,7,8,15][0,4,4,8]     Max = [0,7,8,15][8,12,12,16]
Allen* Min = finished_by [0,3,4,7] , Max = finished_by [8,11,12,15]
----------------
meets x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
meets x preceded_by ->
Allen* relations : 17 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
meets x start ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,5,9,13][1,4,5,8]     Max = [1,5,9,13][9,12,13,16]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
contains (3 elts)             Min = [0,5,6,13][0,4,4,8]     Max = [0,5,8,13][8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
meets x started_by ->
```

```
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,5,9,13][1,4,5,8]     Max = [1,5,9,13][9,12,13,16]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
contains (3 elts)             Min = [0,5,6,13][0,4,4,8]     Max = [0,5,8,13][8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
meets x finishes ->
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
meets x finished_by ->
Allen* relations : 520 elts
started_by (11 elts)          Min = [1,4,5,8]               Max = [5,8,9,12][9,12,13,16]
met_by (13 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlapped_by (13 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
contains (21 elts)            Min = [0,4,4,8]               Max = [4,8,8,12][8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
meets x meets ->
Allen* relations : 980 elts
start (3 elts)                Min = [1,2,5,6]               Max = [5,6,9,10][9,10,13,14]
started_by (11 elts)          Min = [1,4,5,8]               Max = [5,8,9,12][9,12,13,16]
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
finished_by (11 elts)         Min = [0,3,4,7]               Max = [4,7,8,11][8,11,12,15]
met_by (17 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlaps (25 elts)            Min = [0,2,2,6]               Max = [4,6,8,10][8,10,12,14]
overlapped_by (17 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
contains (21 elts)            Min = [0,4,4,8]               Max = [4,8,8,12][8,12,12,16]
subset (3 elts)               Min = [1,3,5,7]               Max = [5,7,9,11][9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
meets x met_by ->
Allen* relations : 166 elts
started_by (1 elts)           Min = [1,7,9,15][1,4,5,8]     Max = [1,7,9,15][9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
met_by (1 elts)               Min = [3,7,11,15][3,4,7,8]    Max = [3,7,11,15][11,14,15,16]
overlapped_by (1 elts)        Min = [2,7,10,15][2,4,6,8]    Max = [2,7,10,15][10,14,14,16]
contains (1 elts)             Min = [0,7,8,15][0,4,4,8]     Max = [0,7,8,15][8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = finished_by [0,3,4,7] , Max = finishes [10,11,14,15]
----------------
meets x overlaps ->
Allen* relations : 980 elts
start (3 elts)                Min = [1,2,5,6]               Max = [5,6,9,10][9,10,13,14]
started_by (11 elts)          Min = [1,4,5,8]               Max = [5,8,9,12][9,12,13,16]
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
finished_by (11 elts)         Min = [0,3,4,7]               Max = [4,7,8,11][8,11,12,15]
met_by (17 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlaps (25 elts)            Min = [0,2,2,6]               Max = [4,6,8,10][8,10,12,14]
overlapped_by (17 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
contains (21 elts)            Min = [0,4,4,8]               Max = [4,8,8,12][8,12,12,16]
subset (3 elts)               Min = [1,3,5,7]               Max = [5,7,9,11][9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
meets x overlapped_by ->
```

```
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
meets x during ->
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
meets x contains ->
Allen* relations : 520 elts
started_by (11 elts)          Min = [1,4,5,8]               Max = [5,8,9,12][9,12,13,16]
met_by (13 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlapped_by (13 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
contains (21 elts)            Min = [0,4,4,8]               Max = [4,8,8,12][8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
meets x subset ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,5,9,13][1,4,5,8]     Max = [1,5,9,13][9,12,13,16]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
contains (3 elts)             Min = [0,5,6,13][0,4,4,8]     Max = [0,5,8,13][8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
met_by x precedes ->
Allen* relations : 17 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
met_by x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
met_by x start ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
met_by x started_by ->
Allen* relations : 520 elts
finished_by (11 elts)         Min = [4,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (13 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (13 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
contains (21 elts)            Min = [4,8,8,12][0,4,4,8]     Max = [8,12,12,16]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = contains [8,12,12,16]
----------------
```

```
met_by x finishes ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [3,7,11,15][0,3,4,7]    Max = [3,7,11,15][8,11,12,15]
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
contains (3 elts)             Min = [3,8,11,16][0,4,4,8]    Max = [3,10,11,16][8,12,12,16]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
met_by x finished_by ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [3,7,11,15][0,3,4,7]    Max = [3,7,11,15][8,11,12,15]
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
contains (3 elts)             Min = [3,8,11,16][0,4,4,8]    Max = [3,10,11,16][8,12,12,16]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
met_by x meets ->
Allen* relations : 166 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (1 elts)          Min = [1,7,9,15][0,3,4,7]     Max = [1,7,9,15][8,11,12,15]
meets (1 elts)                Min = [1,5,9,13][0,1,2,5]     Max = [1,5,9,13][8,9,12,13]
overlaps (1 elts)             Min = [1,6,9,14][0,2,2,6]     Max = [1,6,9,14][8,10,12,14]
contains (1 elts)             Min = [1,8,9,16][0,4,4,8]     Max = [1,8,9,16][8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = start [1,2,5,6] , Max = started_by [9,12,13,16]
----------------
met_by x met_by ->
Allen* relations : 980 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
started_by (11 elts)          Min = [5,8,9,12][1,4,5,8]     Max = [9,12,13,16]
finishes (3 elts)             Min = [6,7,10,11][2,3,6,7]    Max = [10,11,14,15]
finished_by (11 elts)         Min = [4,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (17 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (17 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [6,8,10,12][2,4,6,8]    Max = [10,14,14,16]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
contains (21 elts)            Min = [4,8,8,12][0,4,4,8]     Max = [8,12,12,16]
subset (3 elts)               Min = [5,7,9,11][1,3,5,7]     Max = [9,11,13,15]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = overlapped_by [10,14,14,16]
----------------
met_by x overlaps ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
met_by x overlapped_by ->
Allen* relations : 980 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
started_by (11 elts)          Min = [5,8,9,12][1,4,5,8]     Max = [9,12,13,16]
finishes (3 elts)             Min = [6,7,10,11][2,3,6,7]    Max = [10,11,14,15]
finished_by (11 elts)         Min = [4,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (17 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (17 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [6,8,10,12][2,4,6,8]    Max = [10,14,14,16]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
contains (21 elts)            Min = [4,8,8,12][0,4,4,8]     Max = [8,12,12,16]
subset (3 elts)               Min = [5,7,9,11][1,3,5,7]     Max = [9,11,13,15]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = overlapped_by [10,14,14,16]
```

```
----------------
met_by x during ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
met_by x contains ->
Allen* relations : 520 elts
finished_by (11 elts)         Min = [4,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (13 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (13 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
contains (21 elts)            Min = [4,8,8,12][0,4,4,8]     Max = [8,12,12,16]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = contains [8,12,12,16]
----------------
met_by x subset ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [3,7,11,15][0,3,4,7]    Max = [3,7,11,15][8,11,12,15]
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
contains (3 elts)             Min = [3,8,11,16][0,4,4,8]    Max = [3,10,11,16][8,12,12,16]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
overlaps x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
overlaps x preceded_by ->
Allen* relations : 17 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
overlaps x start ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = overlaps [8,10,12,14]
----------------
overlaps x started_by ->
Allen* relations : 740 elts
started_by (9 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (166 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
overlaps x finishes ->
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
```

```
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
overlaps x finished_by ->
Allen* relations : 1568 elts
started_by (25 elts)          Min = [1,4,5,8]               Max = [5,8,9,14][9,12,13,16]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (51 elts)              Min = [3,4,7,8]               Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (51 elts)       Min = [2,4,6,8]               Max = [6,10,10,14][10,14,14,16]
contains (55 elts)            Min = [0,4,4,8]               Max = [4,8,8,14][8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = overlaps [8,10,12,14]
----------------
overlaps x meets ->
Allen* relations : 980 elts
start (3 elts)                Min = [1,2,5,6]               Max = [5,6,9,10][9,10,13,14]
started_by (11 elts)          Min = [1,4,5,8]               Max = [5,8,9,12][9,12,13,16]
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
finished_by (11 elts)         Min = [0,3,4,7]               Max = [4,7,8,11][8,11,12,15]
met_by (17 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlaps (25 elts)            Min = [0,2,2,6]               Max = [4,6,8,10][8,10,12,14]
overlapped_by (17 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
contains (21 elts)            Min = [0,4,4,8]               Max = [4,8,8,12][8,12,12,16]
subset (3 elts)               Min = [1,3,5,7]               Max = [5,7,9,11][9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
overlaps x met_by ->
Allen* relations : 734 elts
started_by (53 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (97 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
overlaps x overlaps ->
Allen* relations : 1867 elts
start (3 elts)                Min = [1,2,5,6]               Max = [5,6,9,10][9,10,13,14]
started_by (25 elts)          Min = [1,4,5,8]               Max = [5,8,9,14][9,12,13,16]
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
finished_by (11 elts)         Min = [0,3,4,7]               Max = [4,7,8,11][8,11,12,15]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (51 elts)              Min = [3,4,7,8]               Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (51 elts)       Min = [2,4,6,8]               Max = [6,10,10,14][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
contains (55 elts)            Min = [0,4,4,8]               Max = [4,8,8,14][8,12,12,16]
subset (3 elts)               Min = [1,3,5,7]               Max = [5,7,9,11][9,11,13,15]
Allen* Min = meets [0,1,2,5] , Max = overlaps [8,10,12,14]
----------------
overlaps x overlapped_by ->
Allen* relations : 2269 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = overlapped_by [10,14,14,16]
----------------
overlaps x during ->
```

```
Allen* relations : 234 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = during [10,10,14,14]
----------------
overlaps x contains ->
Allen* relations : 2505 elts
started_by (39 elts)          Min = [1,4,5,8]               Max = [5,8,9,16][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (98 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (77 elts)              Min = [3,4,7,8]               Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (77 elts)       Min = [2,4,6,8]               Max = [6,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = meets [0,1,2,5] , Max = contains [8,12,12,16]
----------------
overlaps x subset ->
Allen* relations : 98 elts
started_by (1 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,6,9,14][9,12,13,16]
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
contains (3 elts)             Min = [0,6,6,14][0,4,4,8]     Max = [0,6,8,14][8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = overlaps [8,10,12,14]
----------------
overlapped_by x precedes ->
Allen* relations : 17 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
overlapped_by x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
overlapped_by x start ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x started_by ->
Allen* relations : 1568 elts
finished_by (25 elts)         Min = [2,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (51 elts)               Min = [2,5,6,9][0,1,2,5]      Max = [8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (51 elts)            Min = [2,6,6,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (55 elts)            Min = [2,8,8,12][0,4,4,8]     Max = [8,12,12,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = met_by [11,14,15,16]
----------------
overlapped_by x finishes ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
```

```
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x finished_by ->
Allen* relations : 740 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (9 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [2,7,10,15][8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (166 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x meets ->
Allen* relations : 734 elts
finished_by (53 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (97 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (168 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
overlapped_by x met_by ->
Allen* relations : 980 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
started_by (11 elts)          Min = [5,8,9,12][1,4,5,8]     Max = [9,12,13,16]
finishes (3 elts)             Min = [6,7,10,11][2,3,6,7]    Max = [10,11,14,15]
finished_by (11 elts)         Min = [4,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (17 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (17 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [6,8,10,12][2,4,6,8]    Max = [10,14,14,16]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
contains (21 elts)            Min = [4,8,8,12][0,4,4,8]     Max = [8,12,12,16]
subset (3 elts)               Min = [5,7,9,11][1,3,5,7]     Max = [9,11,13,15]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x overlaps ->
Allen* relations : 2269 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x overlapped_by ->
Allen* relations : 1867 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
started_by (11 elts)          Min = [5,8,9,12][1,4,5,8]     Max = [9,12,13,16]
finishes (3 elts)             Min = [6,7,10,11][2,3,6,7]    Max = [10,11,14,15]
finished_by (25 elts)         Min = [2,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (51 elts)               Min = [2,5,6,9][0,1,2,5]      Max = [8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (51 elts)            Min = [2,6,6,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
contains (55 elts)            Min = [2,8,8,12][0,4,4,8]     Max = [8,12,12,16]
subset (3 elts)               Min = [5,7,9,11][1,3,5,7]     Max = [9,11,13,15]
Allen* Min = overlapped_by [2,4,6,8] , Max = met_by [11,14,15,16]
----------------
```

```
overlapped_by x during ->
Allen* relations : 234 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = during [2,2,6,6] , Max = overlapped_by [10,14,14,16]
----------------
overlapped_by x contains ->
Allen* relations : 2505 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (39 elts)         Min = [0,7,8,11][0,3,4,7]     Max = [8,11,12,15]
meets (77 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [8,9,12,13]
met_by (98 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (77 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = met_by [11,14,15,16]
----------------
overlapped_by x subset ->
Allen* relations : 98 elts
finished_by (1 elts)          Min = [2,7,10,15][0,3,4,7]    Max = [2,7,10,15][8,11,12,15]
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (3 elts)             Min = [2,8,10,16][0,4,4,8]    Max = [2,10,10,16][8,12,12,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = overlapped_by [10,14,14,16]
----------------
during x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
during x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
during x start ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
during x started_by ->
Allen* relations : 600 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
met_by (30 elts)              Min = [3,4,7,8]               Max = [11,12,15,16][11,14,15,16]
overlapped_by (30 elts)       Min = [2,4,6,8]               Max = [10,12,14,16][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = met_by [11,12,15,16] [11,14,15,16]
----------------
during x finishes ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
during x finished_by ->
Allen* relations : 600 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
meets (30 elts)               Min = [0,1,4,5][0,1,2,5]      Max = [8,9,12,13]
overlaps (30 elts)            Min = [0,2,4,6][0,2,2,6]      Max = [8,10,12,14]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = meets [0,1,4,5] [0,1,2,5], Max = during [10,10,14,14]
----------------
```

```
during x meets ->
Allen* relations : 340 elts
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
met_by (11 elts)              Min = [3,4,7,8]               Max = [7,8,11,12][11,14,15,16]
overlapped_by (11 elts)       Min = [2,4,6,8]               Max = [6,8,10,12][10,14,14,16]
during (3 elts)               Min = [2,2,6,6]               Max = [6,6,10,10][10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = met_by [7,8,11,12] [11,14,15,16]
----------------
during x met_by ->
Allen* relations : 340 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
meets (11 elts)               Min = [4,5,8,9][0,1,2,5]      Max = [8,9,12,13]
overlaps (11 elts)            Min = [4,6,8,10][0,2,2,6]     Max = [8,10,12,14]
during (3 elts)               Min = [6,6,10,10][2,2,6,6]    Max = [10,10,14,14]
Allen* Min = meets [4,5,8,9] [0,1,2,5], Max = during [10,10,14,14]
----------------
during x overlaps ->
Allen* relations : 1401 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
finishes (3 elts)             Min = [2,3,6,7]               Max = [6,7,10,11][10,11,14,15]
meets (80 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (51 elts)              Min = [3,4,7,8]               Max = [7,10,11,14][11,14,15,16]
overlaps (80 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (51 elts)       Min = [2,4,6,8]               Max = [6,10,10,14][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = meets [0,1,2,5] , Max = during [10,10,14,14]
----------------
during x overlapped_by ->
Allen* relations : 1401 elts
start (3 elts)                Min = [5,6,9,10][1,2,5,6]     Max = [9,10,13,14]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
meets (51 elts)               Min = [2,5,6,9][0,1,2,5]      Max = [8,9,12,13]
met_by (80 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (51 elts)            Min = [2,6,6,10][0,2,2,6]     Max = [8,10,12,14]
overlapped_by (80 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = met_by [11,14,15,16]
----------------
during x during ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
during x contains ->
Allen* relations : 2441 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (30 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (30 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (50 elts)               Min = [0,1,4,5][0,1,2,5]      Max = [8,9,12,13]
met_by (50 elts)              Min = [3,4,7,8]               Max = [11,12,15,16][11,14,15,16]
overlaps (50 elts)            Min = [0,2,4,6][0,2,2,6]      Max = [8,10,12,14]
overlapped_by (50 elts)       Min = [2,4,6,8]               Max = [10,12,14,16][10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (56 elts)            Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = meets [0,1,4,5] [0,1,2,5], Max = met_by [11,12,15,16] [11,14,15,16]
----------------
during x subset ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
contains x precedes ->
Allen* relations : 17 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
```

```
----------------
contains x preceded_by ->
Allen* relations : 17 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
contains x start ->
Allen* relations : 743 elts
started_by (9 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
contains x started_by ->
Allen* relations : 169 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
contains x finishes ->
Allen* relations : 743 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (9 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [2,7,10,15][8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
contains x finished_by ->
Allen* relations : 169 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
contains x meets ->
Allen* relations : 743 elts
started_by (9 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
contains x met_by ->
Allen* relations : 743 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (9 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [2,7,10,15][8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
```

```
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
contains x overlaps ->
Allen* relations : 743 elts
started_by (9 elts)           Min = [1,6,9,14][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (25 elts)       Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = overlaps [0,2,2,6] , Max = contains [8,12,12,16]
----------------
contains x overlapped_by ->
Allen* relations : 743 elts
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finished_by (9 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [2,7,10,15][8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (25 elts)            Min = [0,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = overlapped_by [10,14,14,16]
----------------
contains x during ->
Allen* relations : 2269 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
started_by (54 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
finished_by (54 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
meets (25 elts)               Min = [0,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
met_by (25 elts)              Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,16][11,14,15,16]
overlaps (98 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (98 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
subset (6 elts)               Min = [1,3,5,7]               Max = [9,11,13,15]
Allen* Min = overlaps [0,2,2,6] , Max = overlapped_by [10,14,14,16]
----------------
contains x contains ->
Allen* relations : 169 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
contains x subset ->
Allen* relations : 169 elts
started_by (1 elts)           Min = [1,8,9,16][1,4,5,8]     Max = [1,8,9,16][9,12,13,16]
finished_by (1 elts)          Min = [0,7,8,15][0,3,4,7]     Max = [0,7,8,15][8,11,12,15]
meets (3 elts)                Min = [0,5,6,13][0,1,2,5]     Max = [0,5,8,13][8,9,12,13]
met_by (3 elts)               Min = [3,8,11,16][3,4,7,8]    Max = [3,10,11,16][11,14,15,16]
overlaps (3 elts)             Min = [0,6,6,14][0,2,2,6]     Max = [0,6,8,14][8,10,12,14]
overlapped_by (3 elts)        Min = [2,8,10,16][2,4,6,8]    Max = [2,10,10,16][10,14,14,16]
contains (169 elts)           Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
subset x precedes ->
Allen* relations : 1 elts
precedes (1 elts)             Min = [0,0,0,0]               Max = [0,0,0,0]
```

```
Allen* Min = precedes [0,0,0,0] , Max = precedes [0,0,0,0]
----------------
subset x preceded_by ->
Allen* relations : 1 elts
preceded_by (1 elts)          Min = [16,16,16,16]           Max = [16,16,16,16]
Allen* Min = preceded_by [16,16,16,16] , Max = preceded_by [16,16,16,16]
----------------
subset x start ->
Allen* relations : 6 elts
start (6 elts)                Min = [1,2,5,6]               Max = [9,10,13,14]
Allen* Min = start [1,2,5,6] , Max = start [9,10,13,14]
----------------
subset x started_by ->
Allen* relations : 30 elts
started_by (30 elts)          Min = [1,4,5,8]               Max = [9,12,13,16]
Allen* Min = started_by [1,4,5,8] , Max = started_by [9,12,13,16]
----------------
subset x finishes ->
Allen* relations : 6 elts
finishes (6 elts)             Min = [2,3,6,7]               Max = [10,11,14,15]
Allen* Min = finishes [2,3,6,7] , Max = finishes [10,11,14,15]
----------------
subset x finished_by ->
Allen* relations : 30 elts
finished_by (30 elts)         Min = [0,3,4,7]               Max = [8,11,12,15]
Allen* Min = finished_by [0,3,4,7] , Max = finished_by [8,11,12,15]
----------------
subset x meets ->
Allen* relations : 80 elts
meets (80 elts)               Min = [0,1,2,5]               Max = [8,9,12,13]
met_by (5 elts)               Min = [3,5,7,9][3,4,7,8]      Max = [7,9,11,13][11,14,15,16]
overlapped_by (5 elts)        Min = [2,5,6,9][2,4,6,8]      Max = [6,9,10,13][10,14,14,16]
Allen* Min = meets [0,1,2,5] , Max = meets [8,9,12,13]
----------------
subset x met_by ->
Allen* relations : 80 elts
meets (5 elts)                Min = [3,5,7,9][0,1,2,5]      Max = [7,9,11,13][8,9,12,13]
met_by (80 elts)              Min = [3,4,7,8]               Max = [11,14,15,16]
overlaps (5 elts)             Min = [3,6,7,10][0,2,2,6]     Max = [7,10,11,14][8,10,12,14]
Allen* Min = met_by [3,4,7,8] , Max = met_by [11,14,15,16]
----------------
subset x overlaps ->
Allen* relations : 80 elts
met_by (5 elts)               Min = [3,6,7,10][3,4,7,8]     Max = [7,10,11,14][11,14,15,16]
overlaps (80 elts)            Min = [0,2,2,6]               Max = [8,10,12,14]
overlapped_by (5 elts)        Min = [2,6,6,10][2,4,6,8]     Max = [6,10,10,14][10,14,14,16]
Allen* Min = overlaps [0,2,2,6] , Max = overlaps [8,10,12,14]
----------------
subset x overlapped_by ->
Allen* relations : 80 elts
meets (5 elts)                Min = [2,5,6,9][0,1,2,5]      Max = [6,9,10,13][8,9,12,13]
overlaps (5 elts)             Min = [2,6,6,10][0,2,2,6]     Max = [6,10,10,14][8,10,12,14]
overlapped_by (80 elts)       Min = [2,4,6,8]               Max = [10,14,14,16]
Allen* Min = overlapped_by [2,4,6,8] , Max = overlapped_by [10,14,14,16]
----------------
subset x during ->
Allen* relations : 6 elts
during (6 elts)               Min = [2,2,6,6]               Max = [10,10,14,14]
Allen* Min = during [2,2,6,6] , Max = during [10,10,14,14]
----------------
subset x contains ->
Allen* relations : 56 elts
contains (56 elts)            Min = [0,4,4,8]               Max = [8,12,12,16]
Allen* Min = contains [0,4,4,8] , Max = contains [8,12,12,16]
----------------
subset x subset ->
Allen* relations : 6 elts
```

subset (6 elts) Min = [1,3,5,7] Max = [9,11,13,15]
Allen* Min = subset [1,3,5,7] , Max = subset [9,11,13,15]
