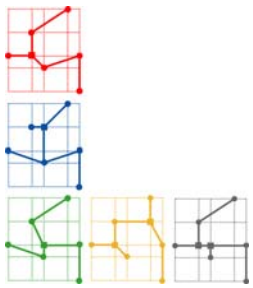
Sequence Pair Representation

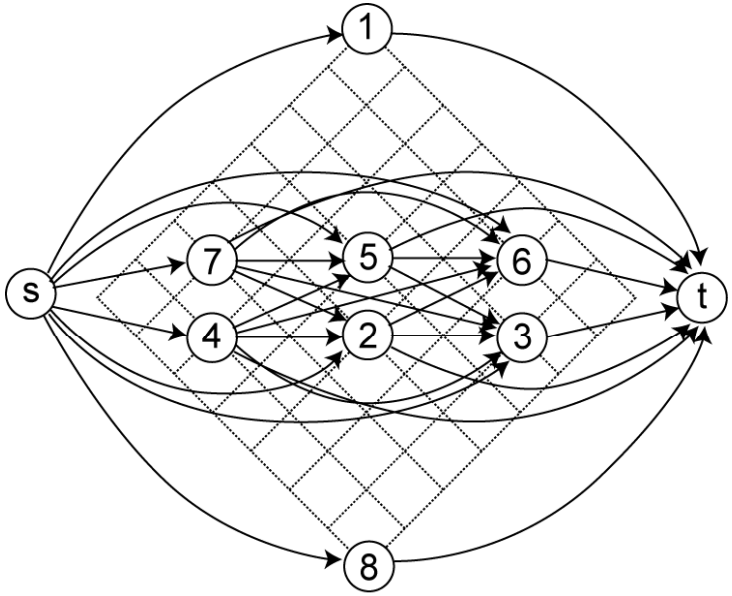
- Initial SP: SP_1 = (17452638, 84725361)
  - Dimensions: (2,4), (1,3), (3,3), (3,5), (3,2), (5,3), (1,2), (2,4)
  - Based on SP_1 we build the following table:

module	right-of	left-of	above	below
1	$\emptyset$	$\emptyset$	$\emptyset$	$\{2, 3, 4, 5, 6, 7, 8\}$
2	$\{3, 6\}$	$\{4, 7\}$	$\{1, 5\}$	$\{8\}$
3	$\emptyset$	$\{2, 4, 5, 7\}$	$\{1, 6\}$	$\{8\}$
4	$\{2, 3, 5, 6\}$	$\emptyset$	$\{1, 7\}$	$\{8\}$
5	$\{3, 6\}$	$\{4, 7\}$	$\{1\}$	$\{2, 8\}$
6	$\emptyset$	$\{2, 4, 5, 7\}$	$\{1\}$	$\{3, 8\}$
7	$\{2, 3, 5, 6\}$	$\emptyset$	$\{1\}$	$\{4, 8\}$
8	$\emptyset$	$\emptyset$	$\{1, 2, 3, 4, 5, 6, 7\}$	$\emptyset$

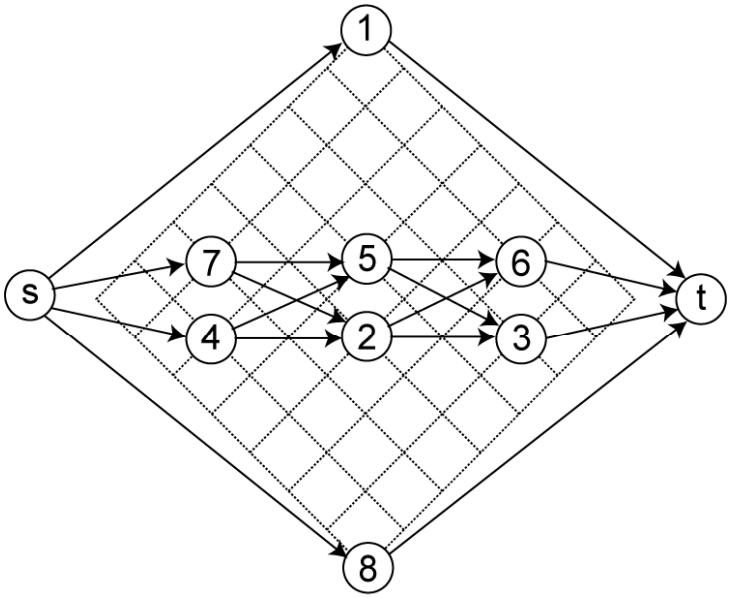


Constraint Graphs

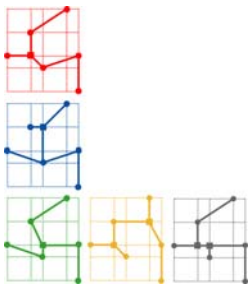
- Horizontal constraint graph (HCG)
  - Before and after removing transitive edges



(a)

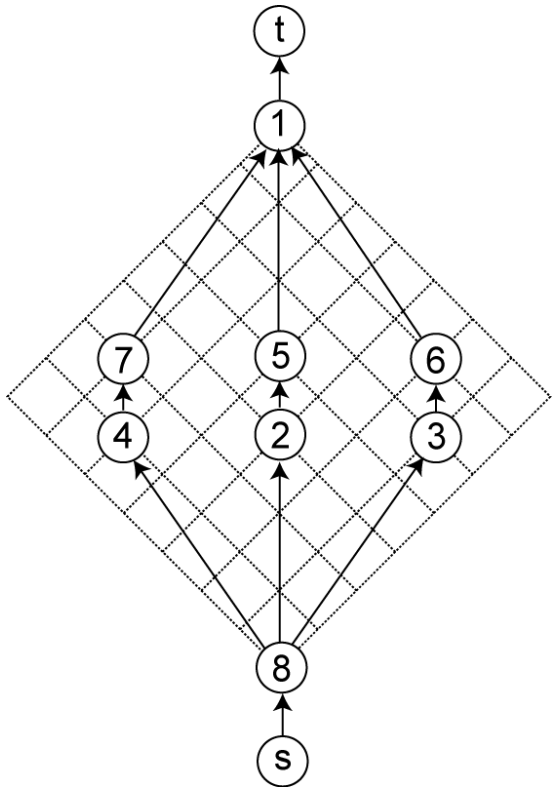


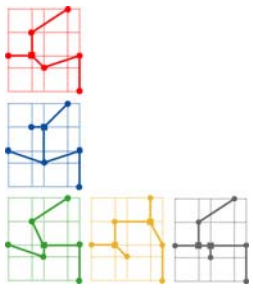
(b)



Constraint Graphs (cont)

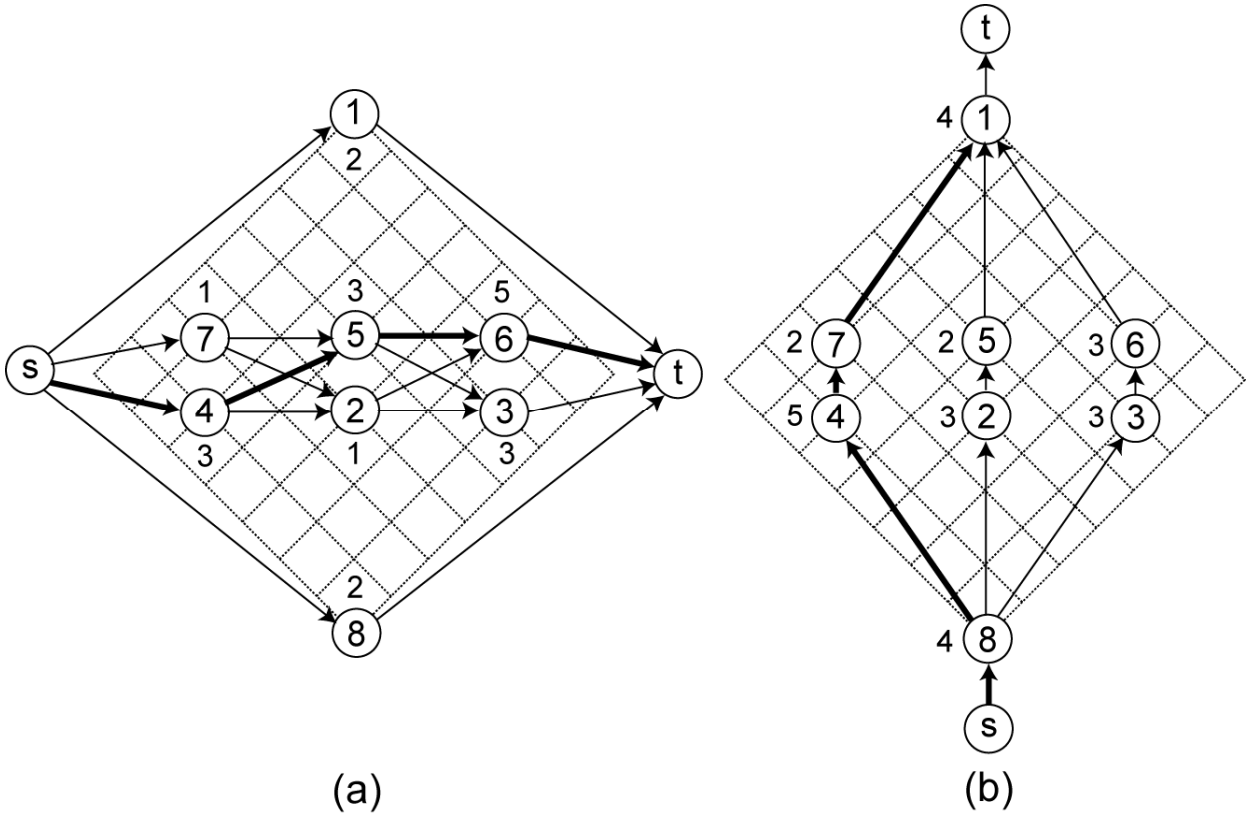
- Vertical constraint graph (VCG)





Computing Chip Width and Height

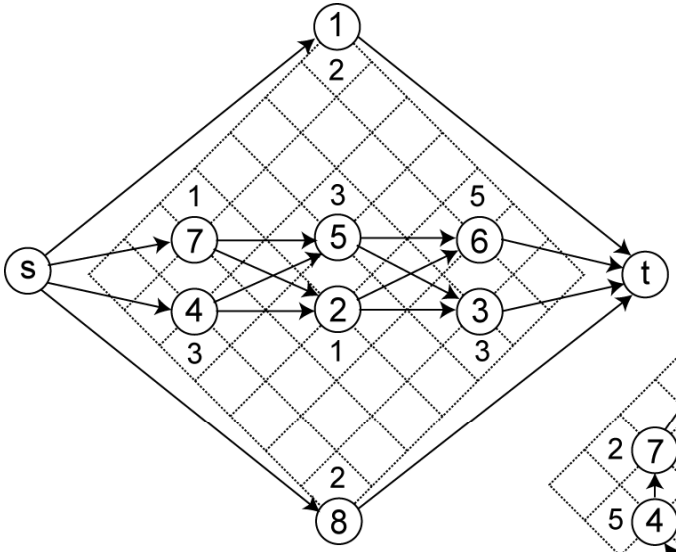
- Longest source-sink path length in:
  - HCG = chip width, VCG = chip height
  - Node weight = module width/height



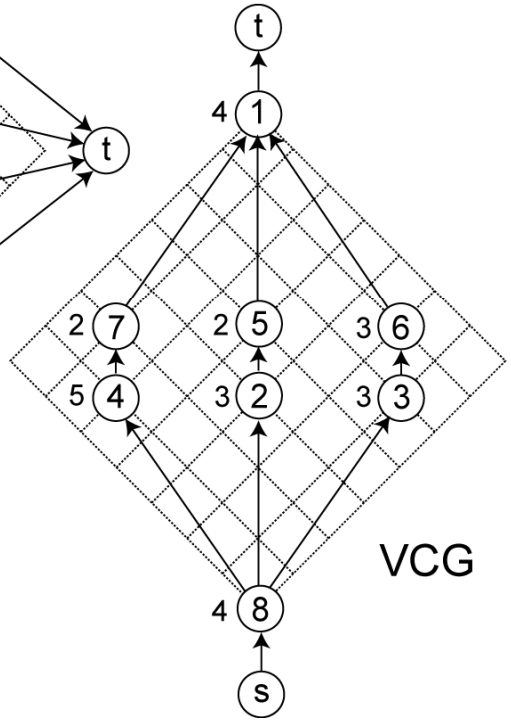
Computing Module Location

- Use longest source-module path length in HCG/VCG
  - Lower-left corner location = source to module input path length

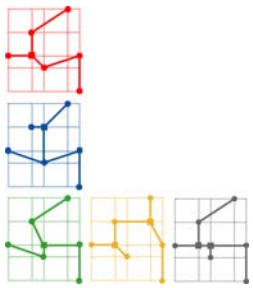
module	HCV	VCG
1	0	11
2	3	4
3	6	4
4	0	4
5	3	7
6	6	7
7	0	9
8	0	0



HCG

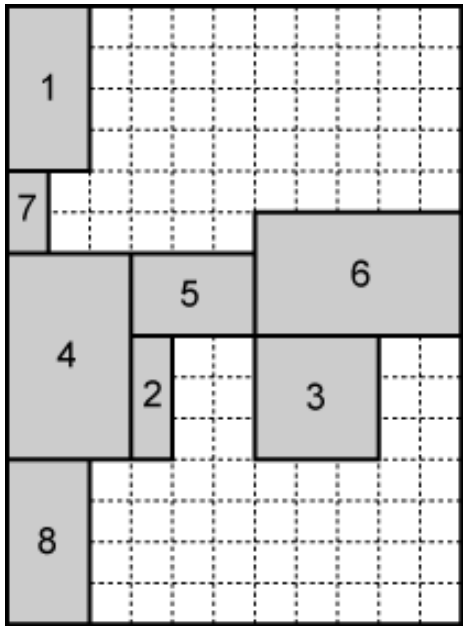


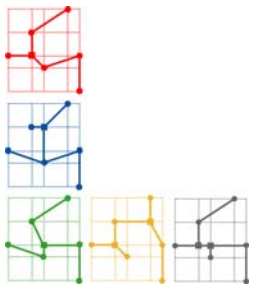
VCG



Final Floorplan

- Dimension: 11 × 15

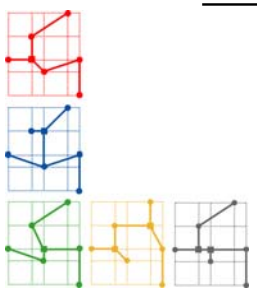




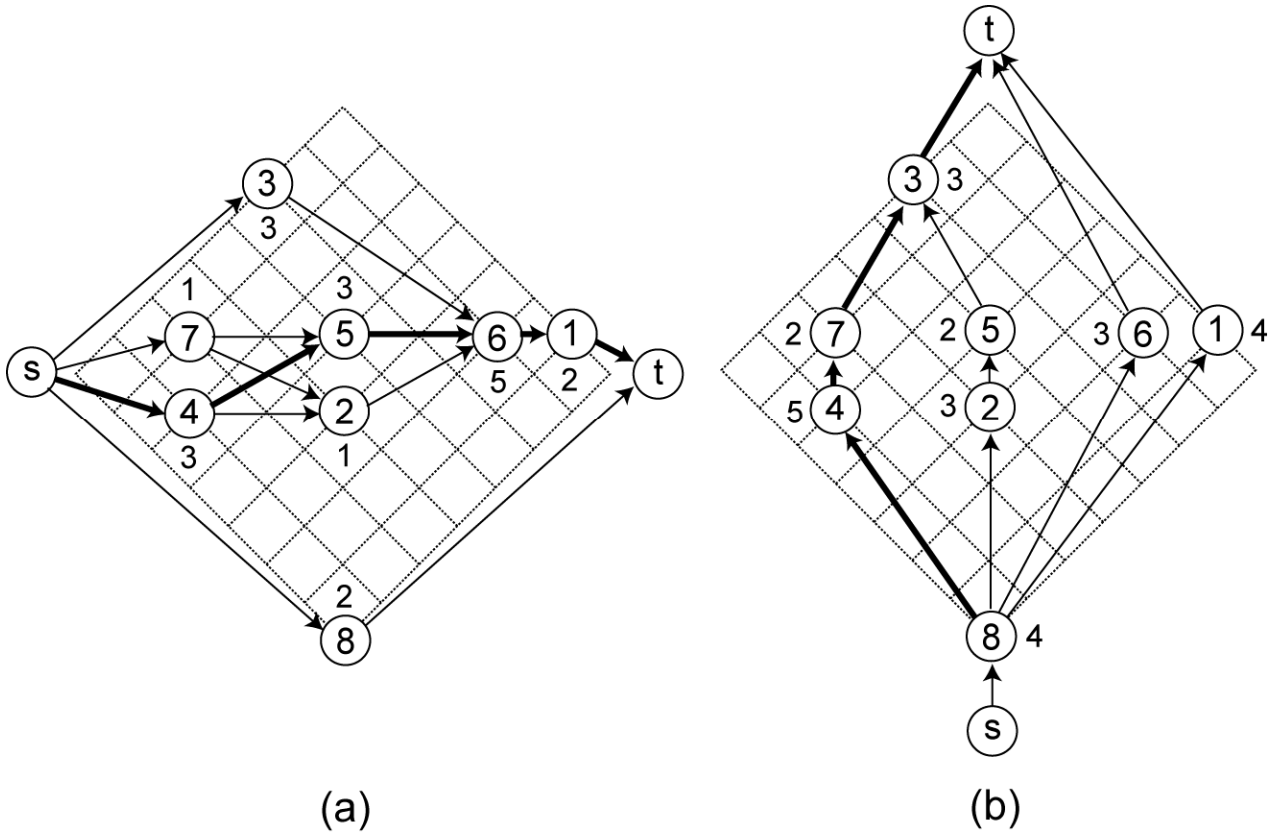
Move I

- Swap 1 and 3 in positive sequence of SP_1
  - SP_1 = (17452638, 84725361)
  - SP_2 = (37452618, 84725361)

module	right-of	left-of	above	below
1	$\emptyset$	$\{2,3,4,5,6,7\}$	$\emptyset$	$\{8\}$
2	$\{1,6\}$	$\{4,7\}$	$\{3,5\}$	$\{8\}$
3	$\{1,6\}$	$\emptyset$	$\emptyset$	$\{2,4,5,7,8\}$
4	$\{1,2,5,6\}$	$\emptyset$	$\{3,7\}$	$\{8\}$
5	$\{1,6\}$	$\{4,7\}$	$\{3\}$	$\{2,8\}$
6	$\{1\}$	$\{2,3,4,5,7\}$	$\emptyset$	$\{8\}$
7	$\{1,2,5,6\}$	$\emptyset$	$\{3\}$	$\{4,8\}$
8	$\emptyset$	$\emptyset$	$\{1,2,3,4,5,6,7\}$	$\emptyset$



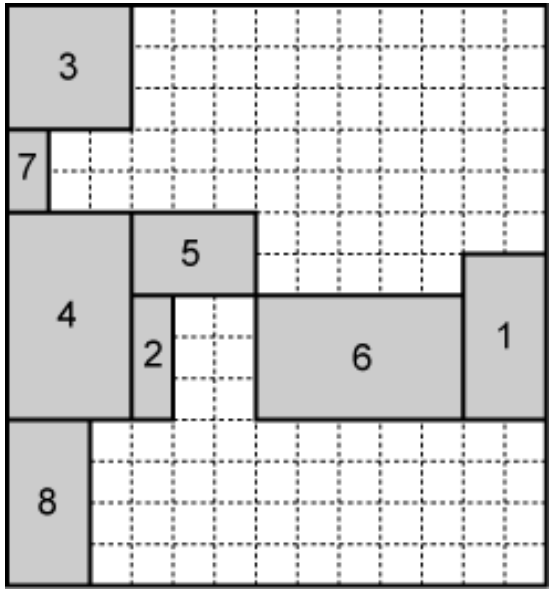
Constraint Graphs

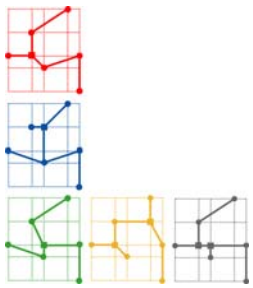


Constructing Floorplan

- Dimension: 13 × 14

module	HCV	VCG
1	11	4
2	3	4
3	0	11
4	0	4
5	3	7
6	6	4
7	0	9
8	0	0

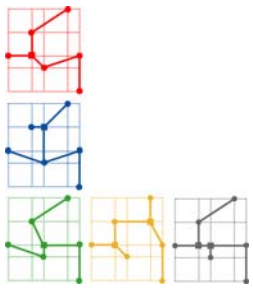




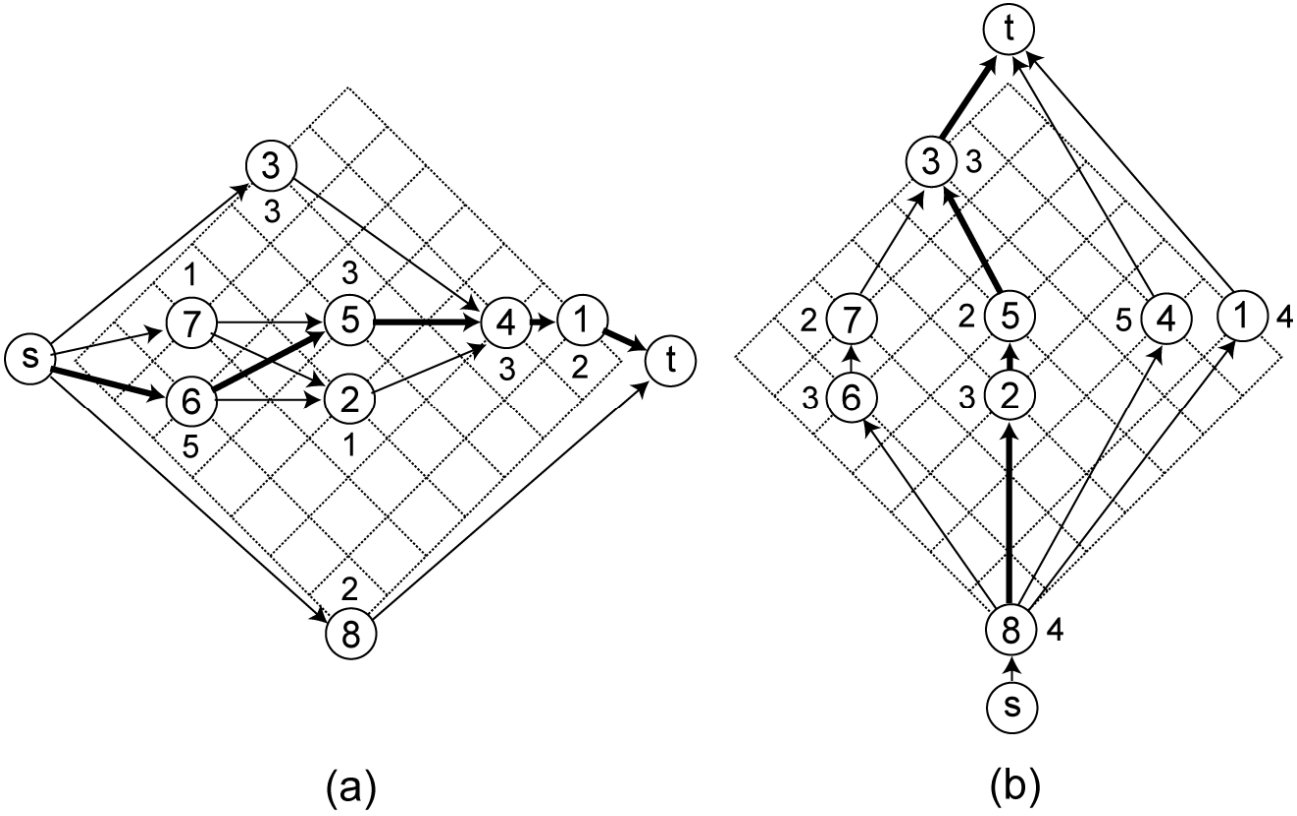
Move II

- Swap 4 and 6 in both sequences of SP_2
  - SP_2 = (37452618, 84725361)
  - SP_3 = (37652418, 86725341)

module	right-of	left-of	above	below
1	$\emptyset$	$\{2,3,4,5,6,7\}$	$\emptyset$	$\{8\}$
2	$\{1,4\}$	$\{6,7\}$	$\{3,5\}$	$\{8\}$
3	$\{1,4\}$	$\emptyset$	$\emptyset$	$\{2,5,6,7,8\}$
4	$\{1\}$	$\{2,3,5,6,7\}$	$\emptyset$	$\{8\}$
5	$\{1,4\}$	$\{6,7\}$	$\{3\}$	$\{2,8\}$
6	$\{1,2,4,5\}$	$\emptyset$	$\{3,7\}$	$\{8\}$
7	$\{1,2,4,5\}$	$\emptyset$	$\{3\}$	$\{6,8\}$
8	$\emptyset$	$\emptyset$	$\{1,2,3,4,5,6,7\}$	$\emptyset$



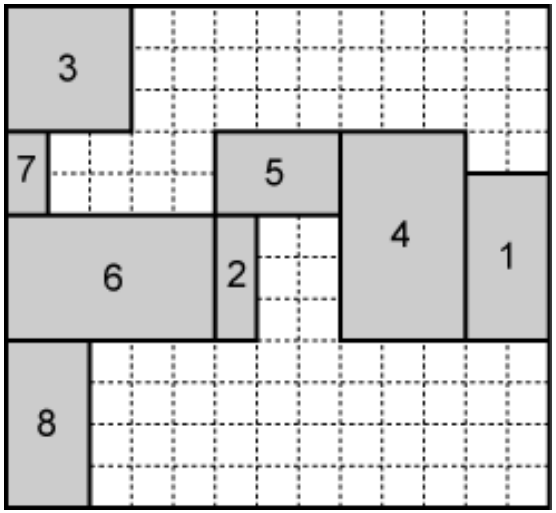
Constraint Graphs

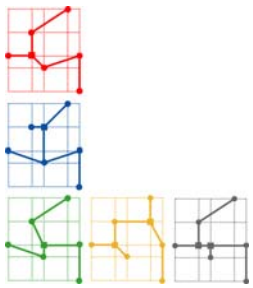


Constructing Floorplan

- Dimension: 13 × 12

module	HCV	VCG
1	11	4
2	3	4
3	0	11
4	0	4
5	3	7
6	6	4
7	0	9
8	0	0





Summary

- Impact of the moves:
  - Floorplan dimension changes from 11 × 15 to 13 × 14 to 13 × 12