Facility Location with BDDs: Status update 2

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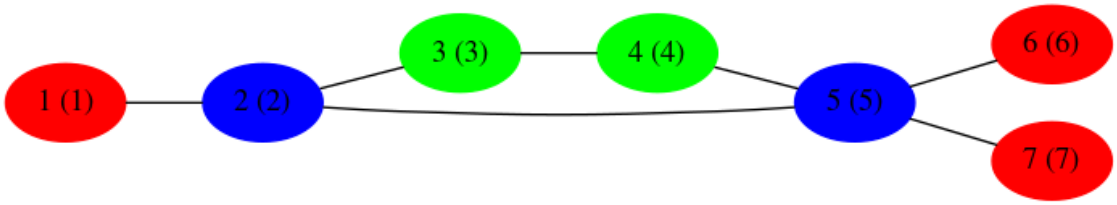
1 Status

- we are dealing with the Facility location problem in the following edition: every facility can "cover" all its neighbors, we have to cover every customer at least once, no overlap costs; we have "colored" facilities + budget for number of locations per color.
- I have implemented constructing BDDs for (1) **cover** constraints, and (2) **color** constraints.
- with this problem formulation, intersection BDD is still very large, but now we have at least something to discuss, as the process depends on *many* factors.

2 The problem.

First, let me re-introduce my "model" problem. Assume I have the following seven nodes:



Color limits are as follows: red (5), blue (1), green (3). (So, the point is I can't have two "central" blue nodes ② and ⑤ at the same time – other limits are not binding.)

3 Plan of attack

4 The algorithm

4.1 Covering DD

4.2 Color DD

5 Random instances generation

6 Some results of numerical modeling.

6.1 Diagram sizes (table)

6.2 Runtimes

7 Discussion

- sorting variables in `color` diagram.
- random graph generation (limit node degree?)
- next node selection in the (cover) BDD generation procedure.