

Foundations of Logic Programming

Tutorial 6 (on January 26th)

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Exercise 6.1:

Model and solve the *peer-review procedure* with ASP. For scientific conferences, researchers submit their papers which are reviewed by other researchers. The problem of assigning referees for submissions to a conference is typical for the area of computer science.

Part A:

Construct a program `check.lp` which checks, given an assignment of submissions to members of the *program committee (PC)*, where the following conditions hold:

1. each PC-member is assigned with at most five submissions;
2. no PC-member is assigned more than three papers that he or she rated with "I don't want to review this paper";
3. no PC-member can rate a submission with different bids;
4. no PC-member is assigned a paper that he or she rated with "I cannot review this paper";
5. each submission is assigned to at least one PC-member who rated the paper with "I am willing to review this paper" or higher;
6. If a PC-member does not bid on a certain paper, by default "I don't want to review this paper" is assumed as the PC-member's bid on this paper.

The bids on the papers range from 0 to 3 with the following meanings:

- 0: "I cannot review this paper",
- 1: "I don't want to review this paper",
- 2: "I am willing to review this paper",
- 3: "I really want to review this paper".

The given assignment of submissions to referees is assumed to be stored in some input files containing:

- $pc(M)$: M is a member of the PC;
- $paper(P)$: P is a submitted paper;
- $bid(M,P,B)$: PC-member M's bid on paper P, where B is a constant from $\{0, 1, 2, 3\}$;
- $assigned(P,M)$: the submission P is assigned to PC-member M.

The program `check.lp` should satisfy the following condition:

- `check.lp`, together with the input data, possesses an answer set precisely when Conditions 1.-6. are met.

Important: Do not use any aggregate functions for constructing the program `check.lp`!

Part B:

Now construct a program `guess.lp` which assigns, given a collection of submissions and a given PC, the submissions to the members of the P in such a way that the following condition is satisfied:

- (*) each submission is assigned to exactly three members to the PC.

Use the above defined predicates $pc(M)$, $paper(P)$ and $assigned(P,M)$.