Fagdag

Combinatorial Optimization

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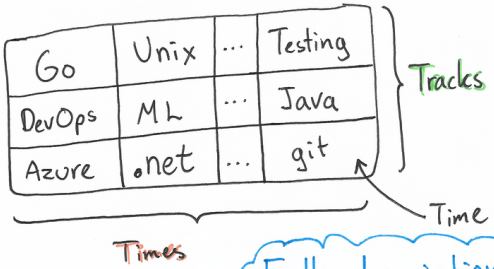
Plan for today

1. You get a problem. (30 min)
2. You compete to solve it. (3-4 hours)
3. We discuss our solutions and I talk about theory. (1-2 hours)

Problem description

A conference planner (e.g. JavaZone) has asked us to help set up a conference schedule:



Tracks 1, 2, ..., i, ..., I

Times 1, 2, ..., j, ..., J

Presentations 1, ..., p, ..., P

People 1, 2, ..., k, ..., K

Full description in repo.

Input data

- Schedule requirements (e.g. # tracks, # times)
- A list of presentations which the people attending are interested in.
- There are 2 problem instances:
  - small
    3 tracks, 15 times, 100 people
  - large
    8 tracks, 15 times, 4000 people

Minimal example

Tracks : 2

Times : 2

Presentations : 4

People : 2

Presentations = {1, 2, 3, 4}

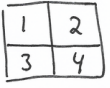
Preferences :

Person	Preference
1	{1, 2}
2	{2, 3}

Solutions

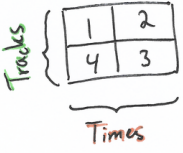
Person	Score
1	1 + 0
2	1 + 1

3



Person	Score
1	1 + 1
2	1 + 1

4



Person	Score
1	1+1
2	0+1

3

Comments

- To calculate score:

  for every time, you get 1 point for every person that has at least one interesting presentation to watch.

- Any programming language and resource allowed.
- How many schedules are there?

$$\frac{(tracks \cdot times)!}{(tracks!)^{times} \cdot times!}$$

small $\frac{(3 \cdot 15)!}{(15!)^3 \cdot 3!} \approx 10^{32}$

large $\frac{(8 \cdot 15)!}{(15!)^8 \cdot 8!} \approx 10^{117}$


Good luck!
I should look at repo now.