Problem Solving and Search in AI
Practical Work

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Job Shop Scheduling
Given a number of jobs J and a number of machines M. Furthermore, for each job there is a list of machine numbers and operation time for each step of the job. For example $o_{i,j} = (2, 1)$ denotes that for job i the operation j needs to be performed by machine 2 with operation time 1.

A schedule is an allocation of operations (steps of the jobs) to the machines such that all jobs are completed. The operations of each job can only be performed in the given order, e.g. for job i, the operation $o_{i,j+1}$ can not be performed before operation $o_{i,j}$ is completed. Moreover, one job can only be processed by one machine at the same time.
Task A: Implement the job shop scheduling with one of the approaches introduced in the lecture. The goal is to minimize the total time to complete all jobs with the given resources.
Task B: Test your implementation with the benchmarks provided at:
`http://people.brunel.ac.uk/~mastjjb/jeb/orlib/files/jobshop1.txt` and
`http://people.brunel.ac.uk/~mastjjb/jeb/orlib/files/jobshop2.txt`

Upper and lower bounds are listed at:
`http://mistic.heig-vd.ch/taillard/problemes.dir/ordonnancement.dir/ordonnancement.html`

First steps:

- What is a solution to the problem?
- What are the constraints?
- Which representation to use?
- Evaluation function?
- Initial solution?
- Neighborhood of a solution?

Till May 15th you should register the teams.