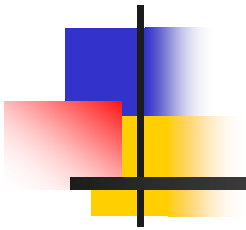

Problem Solving and Search in Artificial Intelligence

SS 2019: Assignment 2

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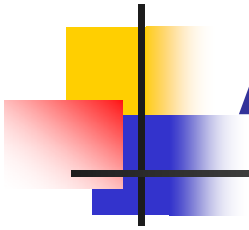


Assignment 2

- **Assignment II**: Implementation of a metaheuristic technique (or a hybrid technique) for Vertex Cover Problem

2-3 students can work together in a group

Assignment 2: Vertex Cover

PACE 2019 (Track Vertex Cover Exact)

Vertex Cover

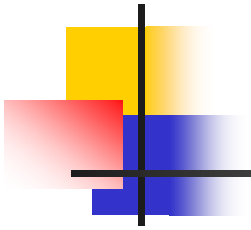
Given: A graph.

Task: Output a vertex cover of smallest size.

What is a vertex cover?

An undirected graph or simply a graph is a pair $G = (V, E)$ where $V \neq \emptyset$ is a set of vertices and $E \subseteq \{\{u, v\} \subseteq V : u \neq v\}$ is a set of edges.

A *vertex cover* of a graph $G = (V, E)$ is a set $S \subseteq V$ such that for every edge $\{u, v\} \in E$ we have $\{u, v\} \cap S \neq \emptyset$.

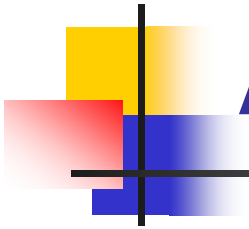


Instances

- For evaluation of your algorithms you should use 10-20 benchmark instances from the link below:

https://pacechallenge.org/2019/

PACE 2019 (Vertex Cover)



Assignment II

- Implement a metaheuristic technique for this problem
- You can implement one of these techniques:
  - simulated annealing, tabu search, min conflicts, iterated local search, genetic algorithm etc.
- Experiment with different parameters or apply an automated algorithm configurator (see lecture slides)

Phase II - Schedule

- Submission deadline: 23.06.2019
- You should submit in TUWEL a zip file with:
  - Your source code
  - Presentation slides that includes
    - Description of your algorithm
    - Experiments/Selection of parameters
    - Results for first 10-20 benchmark examples (average results and best result over 10 runs. Running time: 1 min per run)
    - Conclusions/lessons learned
    - Instructions how to run your program