

## Project 3

**Due Date: March 22**

You are to write a program that will examine information about TAs and courses and compute TA assignments. The program will take into account constraints imposed by the schedule and TA skills. The data file will contain the following tables of information:

1. Time each course is taking place: Course name followed by list of days and times. Example:  
CSE101, Tue, 11:30, Th, 10:00
2. Course recitations: Course name followed by list of days and times of recitations (as above)  
Assume each recitation takes 90 minutes.
3. Course details: Course name followed by number of students enrolled and Boolean value indicating if TA has to attend lectures. Example:  
CSE101, 44, yes
4. Course requirements: skills required from a TA of the course: course name followed by a list of skills. Example:  
CSE101, Java, C#, Awesome Hacking Skills
5. TA responsibilities: TA name followed by list of days and times of classes TA is taking (no class names). Example:  
Mrs. Lauren Smith, Wed, 11:30
6. TA skills: skills possessed by each TA: name followed by list of skills.  
Example:  
Mrs. Lauren Smith, Quick Basic

The following constraints should be accounted for:

1. TA should have free time during recitation
2. TA should have free time during class IF table 3 indicates TA has to attend lectures
3. Number of TAs needed for each class is determined by number of students.
  - a)  $25 \leq \text{students} < 40 \implies 0.5 \text{ TA}$
  - b)  $40 \leq \text{students} < 60 \implies 1.5 \text{ TAs}$
  - c)  $60 \leq \text{students} \implies 2 \text{ TAs}$
4. TA must have all the skills required by the course
5. Assume all class recitations are 90 min. long

All tokens in the tables are separated by commas. All the tables must be provided in a single file, in the order given here. Tables are separated by empty line. No additional formatting should be present in the file. Your program should take a single argument - the name of the data file, and return a list of assignments. Example:

Mrs. Lauren Smith, CSE101, 0.5, CSE102, 0.5  
Mr. John Doe, CSE101, 0.5

Follow this list with list sorted by class:

CSE101, Mr. John Doe, 0.5, Mr. Lauren Smith, 0.5

CSE102, Mrs. Lauren Smith 0.5, needed 0.5 //CSE 102 needs 0.5 additional TAs

You should write a program to solve the TA assignment problem using CSP techniques discussed in the class. Specifically you will use the following 3 techniques separately:

1. Plain Backtracking search (BS)
2. BS + Forward Checking (FC)
3. BS+FC + Constraint propagation

Make sure you can read the format specified here.

You may work in teams of two for this project assignment.

You will be given sample test cases to test out your program

Submission:

1. Sign up for a demo.
2. Submit a report which will be a critical analysis of the techniques.
3. Submit the source code with good documentation and traces of your test runs.