Exam Scheduler — Assignment 1

The task of scheduling in our semester examinations can be posed as an AI problem. Automatic Exam Schedule Generation poses various problems such as:

- Clashes for a particular student
- The gap between exams for a particular student. (Conduction of back to back examination for a student)
- Assignment of coordination duties for the invigilators.
- Scheduling of additional exams over the stipulated capacity limit.
- Venue allotment and seating plan for the assigned exams in a particular slot.

Your home assignment is based on formalizing constraints for scheduling of semester examination time-table. The overall assignment has two parts. You will be working on the first part during your Mid-Semester break.

In the first part of the assignment, you are expected to come up with all the possible constraints associated with the scheduling of semester exams. The constraints should be laid down in proper natural language after identifying the naturally occurring atomic variables of the constraint space. This step is very essential for the next part of the overall assignment which includes converting these constraints into predicate logic using the identified atomic variables.

More formally, you have to do the following:

1. Come up with a problem statement for this AI problem.
    a. The problem statement should include what all you will have as inputs and what should be the expected output.
2. Identify all the constraints that you think should be considered while solving the problem statement defined by you.

    a. Identify the atomic variables for the various constraints you can think of.
    b. Lay down the constraints in proper natural language.
    c. For eg:
        - Atomic Variables: Day, Exam, Student
        - Constraint: A student should have no more than one exam in a day.
    d. You should do this task at the lowest level of granularity with respect to the constraints. What we mean is, you should identify as many constraints as possible for the problem.
3. Mention why is this an AI problem and not “just” an ML problem.
    a. You should describe the whole solution pipeline for the given problem and at each step, mention techniques that differentiate this as an AI problem and not an ML problem.
    b. If modelled as an ML problem, what "data" will you assume to have? What paradigm(s) and architecture(s) will form your models in the solution pipeline to solve the overall problem of automation?

We have provided details of the latest examination schedule to be automated by you. You are provided with a seating plan, the exam schedule, the invigilation schedule for a particular department, and the list of professors available for coordination. You can assume whatever you want while completing this part of the overall assignment so that your constraints maximally match the given files as the solution.

You should submit a Google doc containing your solution covering the points mentioned above. Answer all the above three points in separate sections.

All the best! Happy Prototyping! :)