Methodology

The given problem is an NP hard problem with no specific approach to solve it. We will be using genetic algorithm to solve the problem based on our previous study which highlighted the superiority of genetic algorithm over other algorithms.

The given application has four main steps:

1.Taking input from the user

* This indicated various constraints that would have to be considered for generating the timetable.
* The information would contain details about the students, teachers, classrooms, labs, days and lecture hours.
* The above information would be provided to the application through a user interface designed to do so.

2.Mapping the input to genetic algorithm.

* The input received from the user end will be stored in the form of objects.
* However, genetic algorithm cannot work on objects it needs the input to be in the form of chromosomes.
* This step will consist of converting all the inputs to chromosomes.

3.Generating the timetable

* The final deliverable of the project is the timetable with the best fitness.
* Genetic algorithm will perform the operations like selection, crossover and mutations iteratively on the chromosomes to generate the timetable.
* At each step the fitness of each timetable generated will be calculated.
* The application will return the timetable which has the highest fitness score.

4.Final timetable

* The final timetable is a 2D matrix which contains the schedule for the given institution which has the maximum fitness.
* The timetable has to be sent to the given organization in the format that they would approve.
* E.g. Xls, text, excel, etc.
* So the final step is returning the delivering the final timetable in any suitable format as requested by the given institution.