AI Assignment 3 Report

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# Introduction

We were tasked to create a genetic algorithm to use as a scheduler for educational institutions’ exams. We had to keep in mind the number of days, rooms, room capacity per room, number of students, and number of subjects.

# Methodology

All work was done in a single continuous function. We first extracted data from the given files. We then created a chromosome which was based upon the 3 days. Each day was divided into 7 parts which was with respect to the 7 timeslots and in the timeslots the class numbers were used to indicate that the respective class was holding an exam in the specific rooms at that timeslot on that specific day. A value of -1 was placed to indicate that the room was empty at that day, and time.

Problems were counted based on number of clashes a specific student had in one day. Then a loop was run which modified the chromosome by swapping timeslots between days in a specific order. For example, the entire timeslot 7 of day 1 would be swapped with timeslot 7 of day 3. Mutation occurred randomly with a 5% chance. And when it did occur, we would choose 2 random subjects and swap their locations and timeslots.

# Results

Results depended heavily upon mutations and simply swapping entire timeslots did nothing to bring down number of problems, they, in fact, increased it. If mutation does not occur, then the algorithm will run for as long as possible. But as soon as mutation occurs, a solution can be reached. The running time without mutation is infinite but mutation can reduce it as much as 10s.

# Conclusion

It has managed to resolve clashes with a 100% success rate. But time of resolving will vary.