Timetable Generation using Genetic Algorithm

Input

Input file is input-data-all.pkl and it contains 108 entries containing **Professors, Course, Section, Duration, Classrooms (allowed Classrooms array).**

Code Working

Constraints functions are **Con1(), Con2(), Con3(), Con4(), Con5(), Con6()**. These functions are to check the hard constraints and each constraint carry 10 scores. If fulfilled, then score is returned otherwise 0 is returned.

FirstGeneration(Timetable) populates the Timetable randomly in the timeslots between 08:30-05:30 and randomly in the allowed classrooms and then check all constraints and calculate fitness of each slot and returns the timetable

Crossover(Gen,Timetable) performs the crossover between a fittest slot and less fittest slot (these slots are taken randomly by using roulette wheel mechanism) and timeslot of less fittest slot is taken from the fittest slot (fittest slot remains unchanged).

Randomness(Timetable,Gen,P1,EClass) is called in Crossover(Gen, Timetable), In this function, new slot is allotted to less fittest slot and its fitness is checked using above constraint functions and new calculated fitness scores are assigned

- **To Run the Code:** This code will run on Colaboratory , put both files (A03-17I-0293.ipynb, A03-17I-0293.xslx, input-data-all.pkl) in /content/drive/My Drive/Colab Notebooks/ .
- **Stopping Condition:** stopping condition is set at iteration 5000 or if the clash free timetable is created
- **Week:** Timetable is created for the whole week and it is added in the excel sheet name A03-17I-0293.xlsx
- **Constraints Fulfilled:**
    - 6 hard constraints are checked
    - 1 soft constraint is checked