# Program 2 – Genetic Algorithm

By Keven Zepeda

i) What were the challenges in writing the program? Or did it seem to go smoothly from the beginning?

* I had to figure out how to organize the data for the activities, rooms, timings, and facilitators in a way that made schedule evaluation simple, which made writing the software initially a little difficult. It took some trial and error to get the fitness function right, particularly in weighing the rewards and penalties to ensure that the evolutionary algorithm would develop beneficial schedules. It was also challenging to ensure that facilitators weren't scheduled for two activities at once or that rooms weren't double-booked. But as I had the fundamental framework, things began to fit together more easily.

ii) What do you think of the schedule your program produced? Is there anything that still looks odd or out of place?

* The majority of the programs are arranged in spaces that can accommodate the anticipated number of participants, and the final timetable appears to be rather sound overall. Typically, the facilitators assigned are among the most favored or acceptable. There are still sporadic weird pairings, such as using a facilitator who isn't even on the preferred list or something similar, most likely due to randomness or an insufficient penalty in the fitness function. Additionally, there are a few repetitions that might be better spaced out.

iii) How would you improve the program, or change the fitness function?

* Adding a harsher penalty for assigning wholly unqualified facilitators, such as those not listed for that activity, will likely enhance the fitness function. To prevent overloading some hours, I would also award a bonus for distributing activities more evenly among the time frames. Soft limitations, such as the preference for facilitators to avoid teaching consecutively without breaks, may also be beneficial. The algorithm may converge more effectively if elitism is added, maintaining the best solutions for each generation.

iv) Anything else you feel like discussing, asking about, bragging about, etc.

* The effectiveness of the evolutionary algorithm for this type of scheduling problem caught me off guard. Observing how a population of arbitrary assumptions gradually transforms into something sensible and practical is fascinating. Additionally, sharing and double-checking the schedule was much simpler when the results were exported as a CSV file using pandas. If I had more time, I would love to create a graphical user interface (GUI) allowing users to adjust options and see the timetable more clearly.

# Output:

A screenshot of a computer

AI-generated content may be incorrect.