**Nature-Inspired Computation Meeting Minutes:**

17/11/23 - 2:00-2:30 PM

* Python was chosen as the coding language
* The task for the week: Research nature-inspired methods and determine representations and fitness functions for each method for discussion next week.

**All 6 Members were in attendance.**

24/11/23 - 2:30-3:30 PM

* Ursula began the meeting by discussing the agenda, namely the research we had done that week and the functions we needed to implement next week
* Ursula, Jack and Nafees discussed potential algorithms, including evolutionary algorithms (EA), particle swarms, Hillclimb and ant colony optimisation.
* Kanchan suggested ant colony but did not share research beyond what was taught in class to contribute.
* There was a discussion of likely representations and fitness functions for each method.
* Jack proposed EA, showing some research he conducted.
* Decided to go with EA due to their use in the problem previously, the groups’ familiarity with them and their lower complexity based on other methods.
* Reviewed a function specification made by Jack.
* Clarifications for the problem specification for members by Jack & Ursula
* Reviewed code converting the .txt files from the competition to a data structure from Kaiyuan.
* Broke down the EA into functions and talked through the difficulty of each of the functions.
* Members assigned themselves functions based on what they thought they could complete. Each member was assigned at least one function.
* Additional functions were assigned to Ursula, Jack, Kaiyuan and Nafees.
* Quick overview of how to use GitHub with VS code by Jack and Ursula.
* Checked every member was happy they knew what to do and what to work on for the rest of the week.
* Scheduled a meeting for next Friday at 2:30 PM

**All 6 Members were in attendance.**

1/12/23 – 3:30-4:30 PM

* Ursula began the meeting by discussing the agenda, namely the functions we had implemented that week and the work that needed to be assigned for next week
* Jack began talking through a number of functions he implemented: read\_TTP\_instance\_data, random\_tour, pack\_one, repair\_packing\_plan, pack\_random, generate\_initial\_population, knapsack\_cost, get\_pdist\_distance, tour\_cost\_pdist, evaluate\_candidate\_solution\_cost\_pdist, packing\_plan\_crossover and derive\_tour\_from\_packing\_plan
* All functions had comments and had been tested in a separate file.
* Kaiyuan stated that he had implemented some code to extract the data from files, but since it did not work on the testing data due to its size, Jack implemented some of the above functions instead.
* Ursula explained the get\_ranks, get\_crowding\_distance and get\_pareto\_front functions, showing the graphical representations of the Pareto front and their ranks and explaining the logic behind it and the tests conducted.
* Swaroop talked about his function tournament\_selection. This function had been tested and returned the expected results.
* Kanchan explained her function: OX1\_tour\_crossover. However, it did not work with the input or output discussed previously and commented on in the doc string, so it needed further work.
* Nafees talked about his function packing\_plan\_mutation; however, this also didn’t have the correct input or output, so needed adjusting and testing.
* Ursula did a demonstration with code to explain the data structures used in the project and how they could be called and altered
* Jack offered to fix functions from other team members with the wrong inputs and outputs.
* Kanchan chose to update her own, but all other members allowed Jack to do the fixes due to his familiarity with the data structures used.
* The two remaining functions were assigned to Ursula.
* There was a discussion between Ursula and Jack about reducing time complexity within the functions, and a couple of suggestions were made and commented on in the code.
* Ursula went through the project specification and the requirements for the group report, splitting the task into three sections that we could write about so far.
* All members were offered to take one of the sections of the report.
* Jack was assigned to talk about the details of the developed algorithm.
* Ursula was assigned to the division of the larger problem into tasks.
* Nafees offered to complete the research undertaken section.
* Ursula and Jack demonstrated Latex, including how to cite papers and create sections.
* Ursula set up a group report on Overleaf.
* Decided as a group deadline to finish the coding by Sunday evening so the experimentation and report could be written the next week.
* Scheduled another meeting on Monday at 11:30 to review the code and assign experiments to members.

**All 6 Members were in attendance.**

4/12/23 - 11:30-12:30 PM

* Began by checking the code was finished
* Jack had written experiments, so each team member was assigned a dataset and was told to change the file input and output and run the file
* Each member was assigned one dataset, and Ursula was assigned the three biggest
* A demonstration of how to change all instances of a name was given
* Swaroop and Kanchan volunteered to write up the results section of the group report
* It was collectively decided that all experiments should be started that evening so they could run overnight
* Members agreed to have the results finished by Wednesday and uploaded to GitHub

**All 6 Members were in attendance**

6/12/23 – 4:00-4:30 PM

* Group members confirmed everyone had submitted the results of their run-through
* It was discussed that experiments were only conducted on the smallest dataset, and then the optimal set was the only set run on all other datasets due to large run times associated with the larger files
* Kanchan has to rerun her file as she did not change the name of the input name of the dataset, so we do not have a set of solutions for the file she was assigned. She was asked to complete this as soon as possible
* Discussed that each file took 20 hours to complete, with the larger files taking 20 hours to complete 20 generations.
* Re-read the specification and clarified points. Jack added to the latex file to create a template of what each section needs to cover
* Realised that experimentation goes in the individual reports, so reassigned just Kanchan to the results section of the group report based on her request
* Jack went through some figures he created and offered to make another for the final set of results for the report
* Checked everyone was happy and knew what they had to do

**Ursula, Jack, Nafees, Swaroop and Kanchan were in attendance**

**Please Print or Sign your signature here:**

**Ursula Mennear:** u mennear

**Jack French:**  j french

**Nafees Naushad Posharkar:** nafees posharkar

**Kanchan Dhansing Chavan:** Kanchan Chavan

**Kaiyuan Li:**



**Swaroop Dattatraya Patil: Swaroop Patil**