953411 AI for SE Semester: 1/2024

**Lab05-2 – Genetic Algorithm**

***Objective:*** Students will learn how to

* Get understand how the algorithm of genetic algorithm works.

**Instruction**

* Access **assignment** under on CMU Mango.
* Download the **HW\_GeneticAlgorithm.docx** and save the file to be **“SE411\_studentID \_Lab05-2\_GeneticAlgorithm.docx”**(for example, *SE411\_6421150xx\_Lab05\_GeneticAlgorithm.docx*)
* Once finished all task:
  + - * Upload your file “**SE411\_studentID** \_GAresult.txt” and **“SE411\_studentID \_Lab05-2\_GeneticAlgorithm.docx”** to MsTeam assignment
* This assignment is worth for **18 points**.
* For students who submit the file late for 1 day, 2 day and more, you will get 50% of your score, 25% of your score and Zero respectively.

**Tasks**

1. Study the GA code from the following website:

<https://algodaily.com/lessons/introduction-to-genetic-algorithms-in-python>

1. Get the code from the website under the topic “**Implementation of GA using Python**” to run on your VScode and save the result as “**SE411\_studentID** \_GAresult.txt”
2. Based on your result, answer the questions in the next page

**Questions**

**Question-1**: What is the purpose of this Genetic Algorithm search? What does it want to find?

[2 points]

**Answer**:

**Question-2**: What is the purpose of fitness function? [2 points]

**Answer**:

Question-3: In which situations the fitness function is calculated? [4 points]

**Answer**:

**Question-4**: Based on the **result of your generation- 3** , [10 points]

4.1 show the result of generation-3 population list

4.2 show the fitness value of each chromosome

4.3 show how parents are selected

4.4 show one pair of parents crossover to be a pair of offspring

4.5 show how's the mutation is applied to the offspring in the 4.4

**Answer**: