United International University (UIU)

Department of CSE

Trimester: Summer 2021

Course Name: CSI 424 | Simulation & Modeling Laboratory (Section B)

Submission Guideline:

- Please solve the problem in a **colab notebook/python file**.
- In case of using a notebook, **download the python file** as instructed in the class. (File -> Download -> Download .py)
- Rename the file with your 9 digit student ID.
- **Submit the python file**.

Please do not copy codes from others/the internet. Each of the offline assignments will be evaluated with a viva. You must be able to explain your code. Also, we will run a copy checker on the submissions. Any plagiarism will be severely penalised.

Offline assignment 3

Task 1: [10 marks]

Suppose there are 4 cars, A, B, C, and D.

1. D is chased by B
2. C is chased by A
3. B is chased by C
4. A is chased by D

Initial positions of A, B, C, and D are (10,0), (0,10), (10,10) and (0,0).

Velocities of A, B, C, and D are 3, 5, 7, and 2 m/s. Now Simulate this Chase Problem for t=20 unit time.

Required outputs:

1. Print the x and y coordinate value of each vehicle at every time step.
   [Sample output format for each time step: t=5: A=(2,4), B=(10,3), C=(4,5), D=(1,2)] (Sample coordinates shown here are chosen arbitrarily.)

2. If the distance between any two vehicles (target-pursuer pair) is less than 5m then a car will shoot its target [not destroy]. Print all the shootings and finally print the number of times each car got shot during the simulation.

[Sample output format for each shooting: B shoots D at t = x sec, dist = d m]
[Sample output format at the end: A got shot p times, B got shot q times etc..]

3. Draw the graph showing the path of each car.