

**Fundamentals of Computing II**  
**CSCE110101/02**  
**Assignment 1**  
**OOP Revision**

## Part A:

- Create a class called Car with the following Variables:
  - 1- Car\_Brand (string)
  - 2- Car\_Type (string) (e.g: Bus, Private, motorcycle, truck)
  - 3- Car\_Plate (String) (e.g ABC123))
  - 4- Speed (int)
  - 5- Year\_Model (int)
- The following functions:
- Constructor()
- Constructor(String Car\_Brand, int Max\_Speed, int Year\_Model)
- Create a setter and a getter for every variable.

## Part B:

- Create a class called Road with the following variables:
  - 1- Road\_Type (character) (Can only be A,B, or C)
  - 2- Speed\_Limit (int)
- The following functions:
- Constructor()
- Constructor(Char Road\_Type , int Speed\_Limit, int Year\_Model)

- Bool Radar(int car\_speed): Return true if the car speed is more than 100, false if below than 100. In your main function check the return value of the function radar and if it's true, output the car's information (Plate, type, speed, etc) and output a message stating that "This car will be fined".
- Void allow(String Car\_type): Road A: Allow only Private and motorcycle vehicles.  
Road B: Allow all vehicles  
Road C: Allow only trucks.
- Int age (int Year\_Model): Calculate the age of the car and return it.

## Part C:

- Write a main function that has a queue to be filled with several car objects. You can then dequeue it and pass it on the Radar, allow, and age functions of the road class.
- You are also required to output the number of cars passed by each road. Then calculate the efficiency of each road based on the one that has the highest number of cars. (e.g if road A had 4 cars, road B had 6 cars, and road C had 8 cars, then we calculate the efficiency of the roads according to the highest number, which is 8 cars in road C. the efficiency is calculated as follows (number of cars in your target road/ number of cars in the highest road \* 100. In our example, Road C efficiency is 100% (as it has the highest number, Road B efficiency is 75% and Road A is 50%.

**Submission Instructions:**

- Submit a zip file containing a report and all the cpp and .h files.
- Submit a pdf report file with screenshots of your outputs, any errors you still have, or any remarks you want to add.

**Grade Distribution:**

- 70% code correctness.
- 30% Report.

*By submitting this assignment, I affirm that I have followed AUC's Code of Academic Ethics and the work submitted is my own. I have not consulted unauthorized resources or materials nor collaborated with other individuals unless allowed.*