Assignment 1

Report

Created 2 classes: Road and Car with default and parameterized constructors alongside their setters and getters for easy setting and accessing of the class members. Car had validation checks to ensure that the type of car can only be Bus, private , motorcycle, or truck and that the license plate would form of 3 letters and 3 numbers and cannot exceed the length of 6.

While Road had validation checks to ensure that the road type can only be one of 3: A, B, or C. Road class has a function called radar that takes in the car's speed as a parameter and compares it to the road's speed limit. As well as an allow function that ensure only private and motorcycle vehicles can pass road A, only trucks in road C, and all cars were allowed in road B. Counters are incremented every time a car passes its respective road. Finally, an age function that decreases the car's year model from our current year and returns its age. 3 static variables are made and initialized on the Road class to act as counters for the number of cars that pass each road.

In the main function I create 3 Road objects and a queue for Car class. Then I use a generate Cars function that generates 10 Car objects and sets their values randomly from arrays. Using a for loop I fill the queue with the generated objects. Then through another for loop I go through each object in the queue and pass the cars on each road: A, B, and C. Testing the radar, allow, and age functions respectively. If the radar function returns true, I use a carPrint function that logs the car's information and states that the car is getting fined for going past the speed limit. At the very end the efficiency of each road is logged depending on how many cars crossed each road.

```
Car 1:
Road A
Bus is not allowed only Private and Motorcycle vechiles can be on this road.
----------------------------------------------------------
Car 1:
Road B
Bus is allowed on road B and under the speed limit
----------------------------------------------------------
Car 1:
Road C
Bus is not allowed only Truck vechiles can be on this road.
----------------------------------------------------------
Car 2:
Road A
Private is allowed on road A and under the speed limit
----------------------------------------------------------
Car 2:
Road B
Private is allowed on road B and under the speed limit
----------------------------------------------------------
Car 2:
Road C
Car Brand: Nissan
Car Type: Private
Car Plate: PQR678
Car Speed: 80
Car Year Model: 2015
Car Age: 7
Car would get fined for going past the speed limit: 60
Private is not allowed only Truck vechiles can be on this road.
----------------------------------------------------------
Car 3:
Road A
Car Brand: Honda
Car Type: Truck
Car Plate: DEF456
Car Speed: 130
Car Year Model: 2015
Car Age: 7
Car would get fined for going past the speed limit: 120
Truck is not allowed only Private and Motorcycle vechiles can be on this road.
----------------------------------------------------------
Car 3:
Road B
Car Brand: Honda
Car Type: Truck
Car Plate: DEF456
Car Speed: 130
Car Year Model: 2015
Car Age: 7
Car would get fined for going past the speed limit: 80
Truck is allowed on road B and under the speed limit
----------------------------------------------------------
Car 3:
Road C
Car Brand: Honda
Car Type: Truck
Car Plate: DEF456
Car Speed: 130
Car Year Model: 2015
```

```
Car Age: 7
Car would get fined for going past the speed limit: 60
Truck is allowed on road C and under the speed limit
--------------------------------------------------------
Car 4:
Road A
Truck is not allowed only Private and Motorcycle vechiles can be on this road.
--------------------------------------------------------
Car 4:
Road B
Car Brand: Nissan
Car Type: Truck
Car Plate: JKL012
Car Speed: 110
Car Year Model: 2019
Car Age: 3
Car would get fined for going past the speed limit: 80
Truck is allowed on road B and under the speed limit
--------------------------------------------------------
Car 4:
Road C
Car Brand: Nissan
Car Type: Truck
Car Plate: JKL012
Car Speed: 110
Car Year Model: 2019
Car Age: 3
Car would get fined for going past the speed limit: 60
Truck is allowed on road C and under the speed limit
--------------------------------------------------------
--------------------------------------------------------
Car 5:
Road A
Bus is not allowed only Private and Motorcycle vechiles can be on this road.
--------------------------------------------------------
Car 5:
Road B
Bus is allowed on road B and under the speed limit
--------------------------------------------------------
Car 5:
Road C
Bus is not allowed only Truck vechiles can be on this road.
--------------------------------------------------------
--------------------------------------------------------
Road A: 1 cars allowed
Road B: 5 cars allowed
Road C: 2 cars allowed
--------------------------------------------------------
The effeciency of Road A is: 20%
The effeciency of Road B is: 100%
The effeciency of Road C is: 40%

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