

Assignment (based on CSE 1203) 2022 Series

Instructions:

- i) It an individual assignment*
- ii) Write Code in C++*
- iii) Submit it before the last class of this semester*
- iv) Ensure that all work is original.*
- v) Naming the File: Use a clear and descriptive filename, such as
Assignment_<Roll>_CSE1204.cpp/java*
- vi) Submit your assignment in printed form as well as in Google classroom*
- vii) Cover Page: Include your name, student ID, course title, assignment title, and submission date.*

Background Scenario:

The toll plazas in Bangladesh are an integral part of the country's transportation infrastructure, primarily found on major highways and bridges. They are designed to collect fees from vehicles using these roads and structures to fund maintenance and development. Notable examples include the toll plazas on the Dhaka-Chattogram Highway, Lalonshah Bridge, Megna Bridge and the Padma Bridge. These toll systems help in managing traffic flow and generating revenue for ongoing infrastructure projects. In recent years, there have been efforts to modernize toll collection, including introducing electronic toll collection (ETC) systems to improve efficiency and reduce congestion.



Problem Statement:

Write a C++ menu program to automate the toll management system of a newly established bridge in Bangladesh. Assume for the simplicity consider three types of vehicles namely as Bus, Truck and Car.

Information for the Assignment

a) Design C++ classes as follows

Class Name	Data Members	Toll Price in Tk	
Vehicle	Reg_No, Date, Time, Operator_ID		
Bus	Seats	500	
Truck	Weight, Height	400	
Car	Owner	150	

- Reg_No: Registration plate number of vehicle
- Date: Date when a vehicle passing the bridge
- Time: Time when a vehicle passing the bridge
- ID: ID of the operator
- Seats: No of seats for vehicle
- Weight: Weight of the loaded truck (Max. 2000 Kg)
- Height: Height of the loaded truck (Max. 15')
- Owner: Name of the owner

b) Methods:

- getInput(): a overridden method to take toll for each vehicle from keyboard.
- tollCalculate(): calculates toll for each vehicle
- searchVehicle(): searches a particular vehicle
- searchDataToDate(): search vehicle between two dates

- searchOperator: search vehicle data for specific operator
- tollStatistics(): calculate statistics on daily-basis
- tollSettings(): set/change the toll values

c) **Other Data Members and Methods:** Declare data members and methods if necessary.

d) **Menu:** When the program runs login menu comes at first. It asks for login or registration. If login successful then Toll Plaza Menu appears. The functionality of each menu item is given as follows

Menu Item	Functionality
Bus	Input toll for Bus
Truck	Input toll for Truck
Car	Input toll for Car
Search	Search for specific vehicle or between date to date or for specific operator
Statistics	Shows the toll statistics on daily basis
Settings	Set/Change the toll for the vechiles

The login look like :

* Toll Plaza: Operator *

1. Login
2. Register
3. Exit

Enter Your Option:

***** Toll Plaza Menu *****

1. Bus
2. Truck
3. Car
4. Search
5. Statistics
6. Toll Settings (admin)
7. Save and Logout

Enter Your Option (1-7):_

*** Toll Plaza: Search ***

1. Vehicle
2. Date to Date
3. Operator
4. Back

Enter Your Option (1-4):_

e. Few Snapshots:

1. Register a new operator

```
Enter your option(1-3):2 Username: kamal <enter>
Password: *****<enter>
Reconfirm Password: *****
Registration is Successful
Press any key go to main menu.....
```

2. Login Form

```
Enter your option(1-3):1
Enter username: kamal
Enter password: *****
Login is Successful
```

3. Toll for Bus

```
Enter your option(1-7):1
Enter Bus Registration No: KA2023DHA
Enter Amount (Tk. 500): 1000
Return Amount: 500
Toll Collection is Successful
Press any key go to main menu.....
```

4. Search a Car

```
Enter your option(1-7):4
Enter your option(1-4):1
Enter Vehicle Registration No: KA2023DHA
```

Date	Time	Amount	Operator
24/5/2024	14:05	150	Kamal
27/8/2024	10:25	150	Arman

```
Press any key go to main menu.....
```

5. Search Date to Date

```
Enter your option(1-7):4
Enter your option(1-4):2
Enter Start Date: 01/01/2024
Enter End Date: 30/8/2024
```

Date	Time	Vehicle	Amount	Operator
01/01/2024	00:05	Car	150	Kamal
01/01/2024	00:06	Bus	500	Kamal
01/01/2024	00:07	Bus	500	Kamal
01/01/2024	00:09	Truck	400	Kamal

```
01/01/2024 00:10 Truck 400 Kamal
01/01/2024 00:13 Bus 150 Kamal
.....
Press any key go to main menu.....
```

6. Statistics

```
Enter your option(1-7):5
Enter Date:20/09/2024

Vehicle Number Amount
Bus 435 217500
Track 352 140800
Car 258 38700
Total Amount: 397000

Press any key go to main menu.....
```

7. Settings

```
Enter your option(1-7):6
Enter Admin username: admin
Enter Admin password: *****
Enter Toll for Bus: 550
Enter Toll for Track: 400
Enter Toll for Car: 180

Toll Change is Successful
Press any key go to main menu.....
```

Table: (Sample message)

	Message to be Displayed
1	Operator already exists
2	Operator NOT exists
3	Vehicle NOT Found
4	Invalid Username
5	Invalid Password
6	Invalid Date
7	Invalid Option
8

***** Best of Luck *****