KLE Society's
KLE Technological University

Open Ended Activity Report

On

VEHICLE SHOWROOM MANAGEMENT SYSTEM

Object Oriented Programming with C++ (19ECSC204)
Object Oriented Programming with C++ Lab (18ECSP203)

Submitted by

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1. Introduction

1.1 Overview of the problem statement

"ATSC Motors" is a car showroom where cars of "ABC company" are displayed for retail sale. It uses software product to serve customers in the form of a catalogue containing complete info, specifications, price of all available car models in the showroom categorized as different segments(i.e., SUV , Sedan, Hatchback). Once the Car is sold ,the software product also helps showroom to manage data regarding sales, profit and taxation for the current fiscal year.

1.2 Features of application

->Problem statement: design a program to maintain the data of the available car models in showroom , their features and Ex-showroom price.

->The program should also keep a record of the total number of cars sold, profit gained and tax paid.

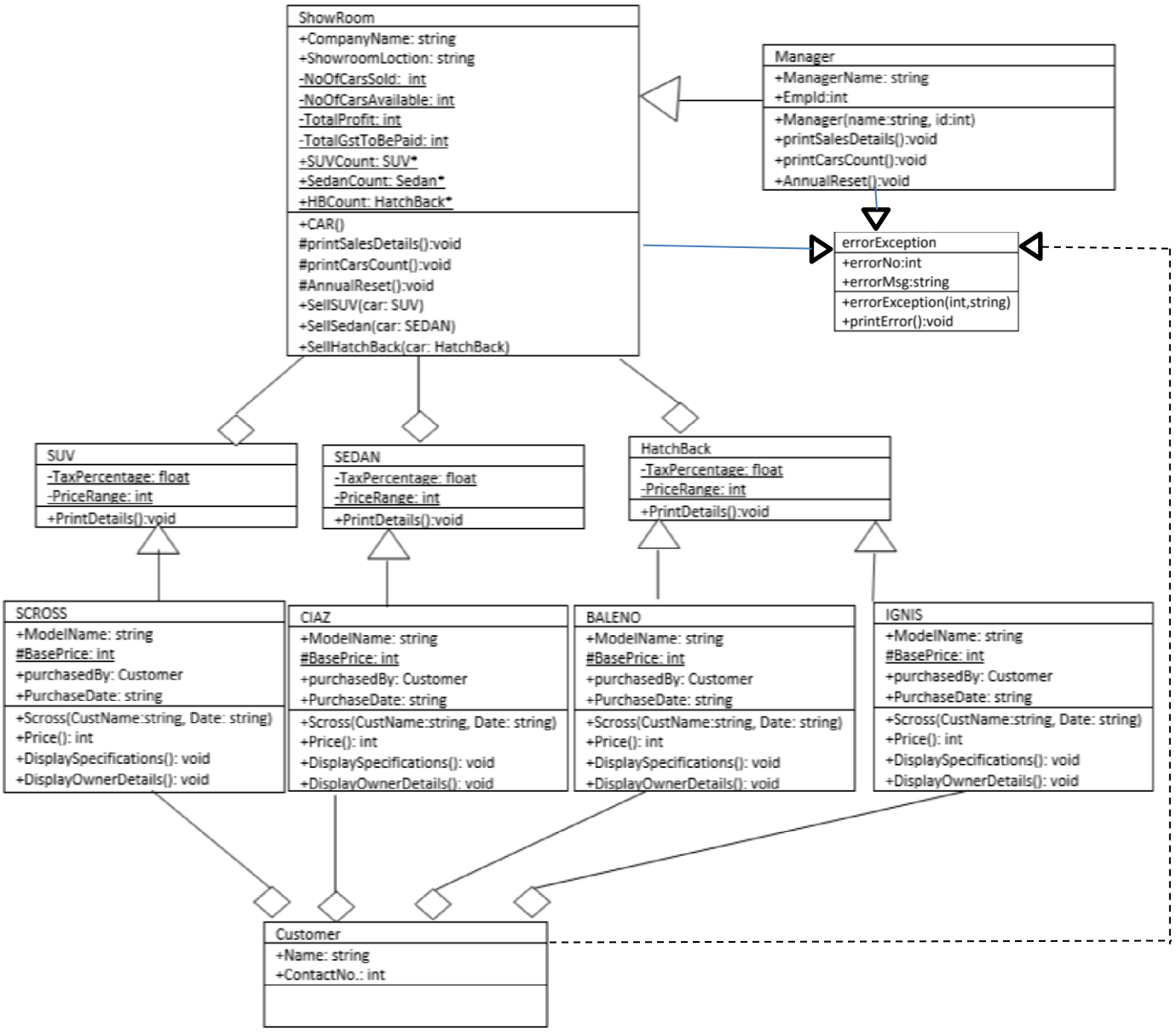
->The program should be able to display the available car models along with their features in the required segments separately(i.e., SUV, Sedan or Hatchback)

->The showroom should be able to update the price of car models using a method.

->Every sale of car should be registered and gross turn-over, net profit and GST should be updated accordingly and a proper printable log need to be recorded.

->Every Customer will have a account created (object) in which all his data will be maintained.(Array of customers will be maintained).

2. Design


ShowRoom
+CompanyName: string
+ShowroomLoction: string
-NoOfCarsSold: int
-NoOfCarsAvailable: int
-TotalProfit: int
-TotalGstToBePaid: int
+SUVCount: SUV*
+SedanCount: Sedan*
+HBCount: HatchBack*
+CAR()
#printSalesDetails():void
#printCarsCount():void
#AnnualReset():void
+SellSUV(car: SUV)
+SellSedan(car: SEDAN)
+SellHatchBack(car: HatchBack)
Manager
+ManagerName: string
+EmpId:int
+Manager(name:string, id:int)
+printSalesDetails():void
+printCarsCount():void
+AnnualReset():void
errorException
+errorNo:int
+errorMsg:string
+errorException(int,string)
+printError():void
SUV
-TaxPercentage: float
-PriceRange: int
+PrintDetails():void
SEDAN
-TaxPercentage: float
-PriceRange: int
+PrintDetails():void
HatchBack
-TaxPercentage: float
-PriceRange: int
+PrintDetails():void
SCROSS
+ModelName: string
#BasePrice: int
+purchasedBy: Customer
+PurchaseDate: string
+Scross(CustName:string, Date: string)
+Price(): int
+DisplaySpecifications(): void
+DisplayOwnerDetails(): void
CIAZ
+ModelName: string
#BasePrice: int
+purchasedBy: Customer
+PurchaseDate: string
+Scross(CustName:string, Date: string)
+Price(): int
+DisplaySpecifications(): void
+DisplayOwnerDetails(): void
BALENO
+ModelName: string
#BasePrice: int
+purchasedBy: Customer
+PurchaseDate: string
+Scross(CustName:string, Date: string)
+Price(): int
+DisplaySpecifications(): void
+DisplayOwnerDetails(): void
IGNIS
+ModelName: string
#BasePrice: int
+purchasedBy: Customer
+PurchaseDate: string
+Scross(CustName:string, Date: string)
+Price(): int
+DisplaySpecifications(): void
+DisplayOwnerDetails(): void
Customer
+Name: string
+ContactNo.: int

3. Description of the Classes:

1)Manager: Manager manages the showroom and is the only person authorized to access the financial data of the showroom. using the following methods: printSalesDetails, printCarsCount, AnnualReset. Here ENCAPSULATION property of OOP is used to achieve this.

2) ShowRoom: It is the Principal class which will be used to Perform all the sales and manage all the data regarding the available cars as well as financial data.

Showroom has static member which keep count of the available cars and the financial data.

Showroom has arrays of objects of all the types of cars to maintain their sales history.

Showroom has public methods: SellSUV, SellSedan, SellHatchBack which will be used to sell the cars in their Respective segments.

One a car is sold the array of car of that particular segment will be updated with the new object of that particular car model.

3)SUV, SEDAN, HatchBack : These are the class that have information of that particular segment of cars. These class act as the parent class to all the classes of car models which fall under that particular segment. This helps in keeping track of the sales of cars of each type.

4)SCROSS, CIAZ, BALENO, IGNIS: These are the class of car models which contain detailed information about that particular car model.

Whenever a customer buys a car of this model a new object of this class will be created and added to the array in the showroom class.

It keep record of a customer object containing all the information of the customer who has brought that particular car.

5)Customer : This class maintains all the information about the customer.

Every time a customer buys a car, this object will be add to the particular car model's class, which in turn will be added to showroom class, to keep the track of purchase history.

Relations

->Manager class inherits ShowRoom : For data encapsulation such that only authorized person can access financial data.

->SUV, SEDAN, HatchBack is a part of ShowRoom (Aggregation) : to store the data in arrays

->SUV, SEDAN, HatchBack are inherited by the classes of respective car models.

->customer is a part of all the classes of car models (Aggregation) :To store the customer history of each sold car.

Error exception : This class is used to handle all the errors generated for gentle termination

of the program.

Main function (Flow of object creation an function call)

Main function basically runs in a infinite loop from the start of the Showroom. On selection of an option to either create a manager class or a customer class , respective class will be created using new key word and these class will respectively create the necessary classes. Text files can be used for data store

The Data regarding Car models information, Financial statistics of the showroom, customer data is intended to store in a text file for time being, which later can be stored in a database.

4. Unit Test plan

4.1 Class/Method1 Test paln

```
ShowRoom::SellSUV(SUV* car)          // method to Register the transaction of
  {                                      car of SUV segment
    if(scross<1)
      throw "SUVs all SOLD out!";

    suvsold++;
    NoOfCarsSold++;
    NoOfCarsAvailable--;
    scross--;
    SUVCount.push_back(car);
    TotalProfit+=car->Price();
    TotalGstToBePaid+=(car->Price()*car->Tax_percentage)/100;

  }
```

Here parameter is a pointer of datatype SUV which is the base class of all the car classes of SUV segment. We can send obj of any car of suv segment. That obj will then be added to the SUVCount vector which stores all the transaction of SUVs. All other related data will be update. We have similar methods for all segments

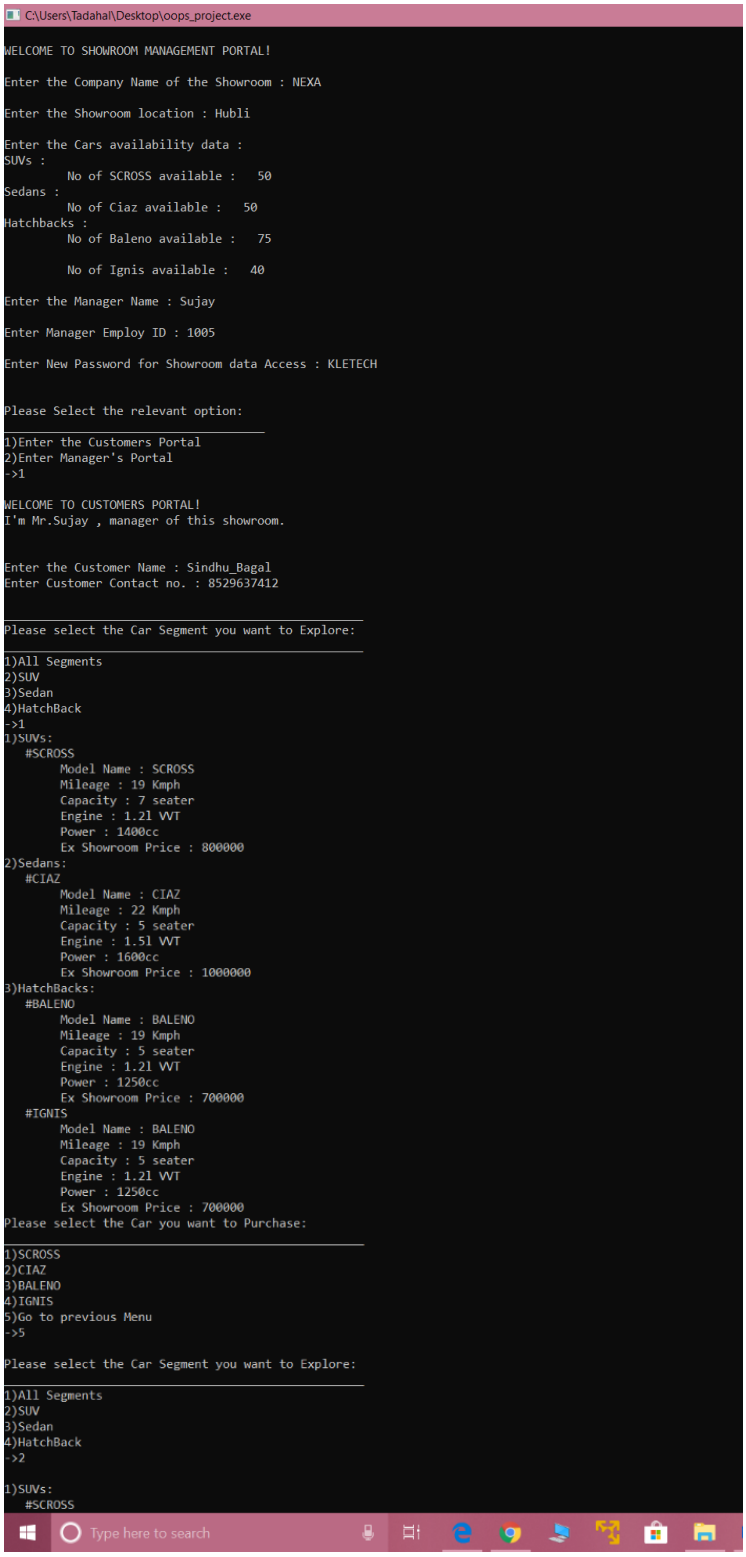
4.2

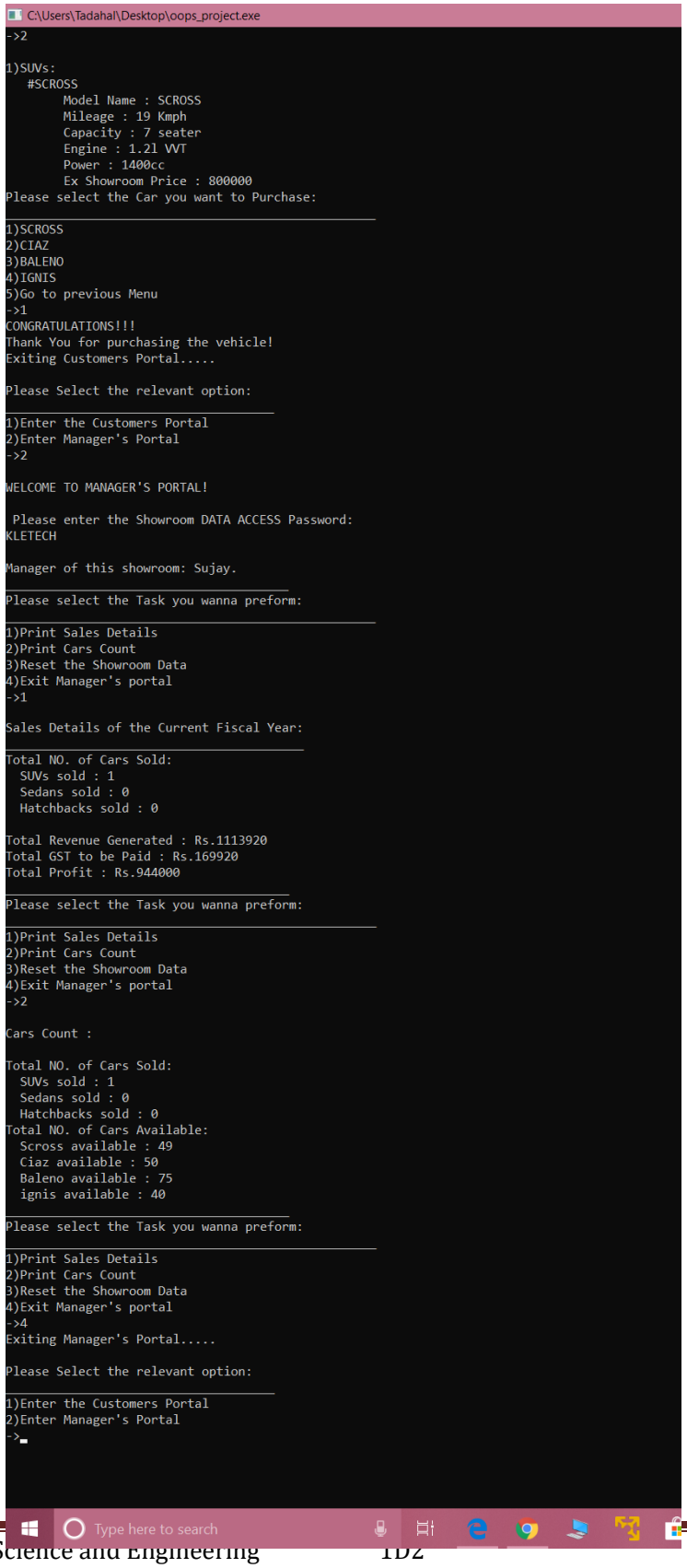
```
class Manager:public ShowRoom
{
  public:
      string ManagerName;
      string EmpID;
      string Password;
  Manager():ShowRoom(){
    cout<<"\nEnter the Manager Name : ";
    scanf("%s",ManagerName);
    cout<<"\nEnter Manager Employ ID : ";
    cin>>EmpID;
    cout<<"\nEnter New Password for Showroom data Access : ";
    cin>>Password;
  }

  void PrintSalesInfo(){
  ShowRoom::print_Sales_details();
  }
  void printCarsCount(){
  ShowRoom::print_cars_count();
  }
  void reset(){
  ShowRoom::AnnualReset();
  }
  void MSUV(SUV* car){
  ShowRoom::SellSUV(car);
  }
  void MSedan(SEDAN* car){
  ShowRoom::SellSedan(car);
  }
  void MHatchBAck(HatchBack* car){
  ShowRoom::SellHatchBack(car);
  }

};
```

This is the manager Class which has complete access to most of the data available in the system. Data Encapsulation is very Efficiently used here. All the transaction need to take place through this class object only.

5. Implementation

5.1. Results




C:\Users\Tadahal\Desktop\oops_project.exe
->2
1)SUVs:
#SCROSS
Model Name : SCROSS
Mileage : 19 Kmph
Capacity : 7 seater
Engine : 1.2l VVT
Power : 1400cc
Ex Showroom Price : 800000
Please select the Car you want to Purchase:
1)SCROSS
2)CIAZ
3)BALENO
4)IGNIS
5)Go to previous Menu
->1
CONGRATULATIONS!!!
Thank You for purchasing the vehicle!
Exiting Customers Portal.....
Please Select the relevant option:
1)Enter the Customers Portal
2)Enter Manager's Portal
->2
WELCOME TO MANAGER'S PORTAL!
Please enter the Showroom DATA ACCESS Password:
KLETECH
Manager of this showroom: Sujay.
Please select the Task you wanna preform:
1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal
->1
Sales Details of the Current Fiscal Year:
Total NO. of Cars Sold:
SUVs sold : 1
Sedans sold : 0
Hatchbacks sold : 0
Total Revenue Generated : Rs.1113920
Total GST to be Paid : Rs.169920
Total Profit : Rs.944000
Please select the Task you wanna preform:
1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal
->2
Cars Count :
Total NO. of Cars Sold:
SUVs sold : 1
Sedans sold : 0
Hatchbacks sold : 0
Total NO. of Cars Available:
Scross available : 49
Ciaz available : 50
Baleno available : 75
ignis available : 40
Please select the Task you wanna preform:
1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal
->4
Exiting Manager's Portal.....
Please Select the relevant option:
1)Enter the Customers Portal
2)Enter Manager's Portal
->
Type here to search

5.2. Test Cases

TEST CASE 1

We are trying to enter the Manager Portal
Please Select the relevant option:

_____

1)Enter the Customers Portal
2)Enter Manager's Portal
Input :2
WELCOME TO MANAGER'S PORTAL!

Please enter the Showroom DATA ACCESS Password:
Input:Hello
INNCORRECT PASSWORD!

ACCESS DENIED!
Exiting Manager's Portal.....

Now try to input the correct password which we already have given the inputs

Input:Helloworld
Expected output is to enter the manager portal
Output:
Manager of this showroom: SampleName.

_____

Please select the Task you wanna preform:

_____

1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal

TESTCASE 2

Now were a customer trying to look at the available cars in the showroom.
Please select the Car Segment you want to Explore:

_____

1)All Segments
2)SUV
3)Sedan
4)HatchBack

Input: 6
Expected output is to say enter a relevant option
Output:Please Enter a relevant option
And it goes back to the catalogue asking options to display the car the customer want.
Now enter a relevant option.
Input :2
Expected output Shows the car specification of 2nd option
Actual Output:
1)SUVs:
  #SCROSS
    Model Name : SCROSS
    Mileage : 19 Kmph
    Capacity : 7 seater
    Engine : 1.2l VVT
    Power : 1400cc
    Ex Showroom Price : 800000

TESTCASE 3
Now the Customer is purchasing a car of model name Ignis
Please select the Car you want to Purchase:
_____
1)SCROSS
2)CIAZ
3)BALENO
4)IGNIS
5)Go to previous Menu

Input: 7
Expected output is to say enter a relevant option.
Output:
Please Enter a relevant option

Now try purchasing the car by entering the relevant option
input: 4
Expected ouptut to successfully buy a car
Actual output:
CONGRATULATIONS!!!
Thank You for purchasing the vehicle!
Exiting Customers Portal.....

TESTCASE 4

The Manager Mr.Samplename is willing to see the sales details at the moment.
He has entered into the manager portal and has also entered the right password .
Please select the Task you wanna preform:

_____

1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal

Input:5
Expected output is to say enter a relevant option.
Output:Please Enter a relevant option

Input:1
Expected output will be the displaying the details of sales of cars which has taken place.
Output:
Total NO. of Cars Sold:
SUVs sold : 0
Sedans sold : 1
Hatchbacks sold : 1

Total Revenue Generated : Rs.2088600
Total GST to be Paid : Rs.318600
Total Profit : Rs.1770000

TESTCASE 5

Now the Manager wants to reset the shroomdata.
Please select the Task you wanna preform:

_____

1)Print Sales Details
2)Print Cars Count
3)Reset the Showroom Data
4)Exit Manager's portal

Input: 8
expected output is to say enter a relevant option.
Input :3
Expected output is the showroomdata gets reset
Actual Output:Annual Reset Complete!

But still the manager wants to confirm whether the data is reset!
To confirm this the manager press option 1 to see the sales details.
Input :1
Expected output is the display of data of the showroom which has been reset.
Output:
Sales Details of the Current Fiscal Year:

_____

Total NO. of Cars Sold:
  SUVs sold : 0
  Sedans sold : 0
  Hatchbacks sold : 0

Total Revenue Generated : Rs.0
Total GST to be Paid : Rs.0
Total Profit : Rs.0

THANK YOU