Lab Manual – Static Members in Class

You are given following in this manual:

1- “LabManualStatic.cpp” (code is given below)
2- “CarsData.txt” (Data is given below)
3- “RequiredOutput”

Partial definitions of classes **Car** and **Helper** are given in the cpp file. Your task is to update the classes’ definitions according to the RequiredOutput.

Important Instructions:

- Do not change Main and ReadDataFromFile functions.
- Your program should not leak any memory.
- Your program should not throw any exception.

LabManualStatic.cpp (Copy paste following code in your cpp file. Comment all the code. Uncomment main function line by line, uncomment related code to run that line successfully. Add new code if required.)

```
#include<iostream>
#include<fstream>
using namespace std;

class Helper
{
public:
	static int StringLenght( char* str )
	{
		//Write Yourself
		// This function should return lenght of str

	}
	static void StringCopy(char*& dest, char*& src){
//Deep Copies src into dest.
	}
	static char* GetStringFromBuffer(char* str)
	{
		//Write Yourself
		//This function should allocate required memory on heap,
		//copy string in this memory using StringCopy and return newly created 
cstring.

	}
};

class Car
{
private:
	static int totalCars;	// initialize it to zero yourself
	int model;
	char* make;
	char* name;
	char* color;
public:
	Car()
	{
		model = 0;
		color = make = name = 0;
		totalCars++;
	}
	//Write Getter of totalCars yourself

	void ReadDataFromFile(ifstream& fin)
	{
		char temp[20];

		fin>>model;
		fin>>temp;

		//This is how we call static functions without object
		make = Helper::GetStringFromBuffer(temp);

		//Set rest of the values yourself.
	}
	void PrintListView() {	//Write yourself	}
	void PrintDetailView()	{	//Write yourself	}
	~Car()
	{
		cout << "Destroying ";
		PrintListView();
		//Deallocate memory yourself
	}
	void Input()
	{
		//Do not consume one extra byte on heap
		//Use only one temp buffer
	}
};

Car* ReadDataFromFile(char* fileName)
{
	ifstream fin;
	int totalCars = 0;
	char buffer[80];

	fin.open()
	if (fin.is_open(fileName))
	{
		fin >> totalCars;
		//cout << totalCars;
		fin.getline(buffer, 80, '\n');	//We are not saving comment
		//cout << buffer << endl;
```

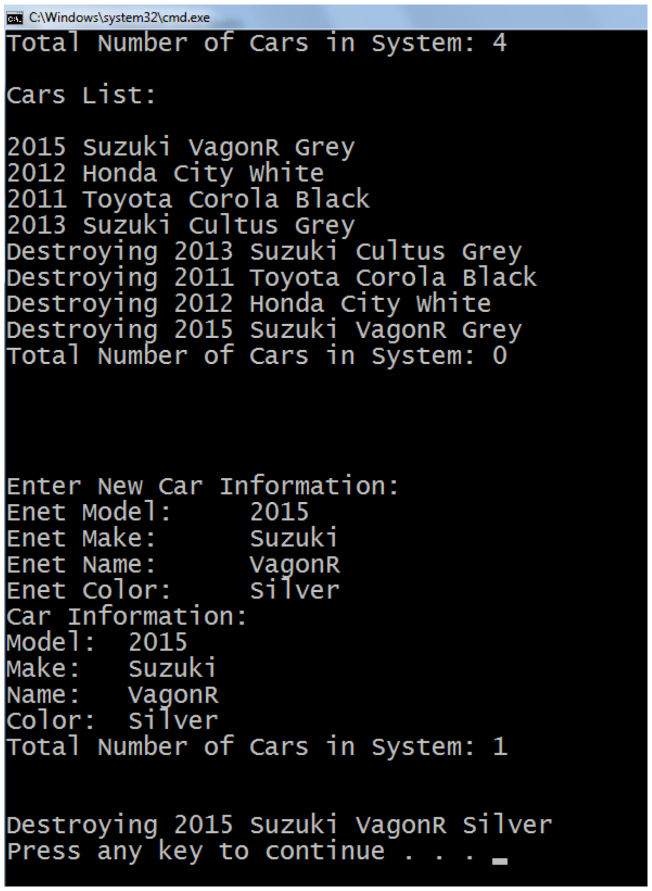
```
            Car* carsList = new Car[totalCars];
            int i = 0;
            while (!fin.eof())
            {
                   carsList[i].ReadDataFromFile(fin);
                   i++;
            }
            return carsList;
     }
     else
     {      return 0;     }
}
void main()
{
     //Comment all the code. Then uncomment it line by line.
     //Implement/add functionality for uncommented line.
     //Execute and verify result with output.
     Car* carsList = ReadDataFromFile("CarsData.txt”);
     int count = 0;
     if (carsList != 0)
     {
            count = Car::GetTotalCars();      //Calling static function
            cout << "Total Number of Cars in System:\t" << count << endl;

            //Test one Print at a time.
            cout << "\nCars List:\n\n";
            {
                   for (int i = 0; i < count ; i++)
                   {
                          carsList[i].PrintListView();
                   }
            }
            //Comment above printing and Test Printing 2
            cout << "\nCars List:\n\n";
            {
                   Car temp = carsList[0];
                   temp.PrintListView();

                   for (int i = 1; i < count ; i++)
                   {
                          temp = carsList[i];
                          temp.PrintListView();
                   }
            }
            if(carsList)
                   delete[] carsList;
     }

     cout << "Total Number of Cars in System:\t" << Car::GetTotalCars() << endl << endl
<< endl;
```

```
	Car testCar;
	testCar.Input(); // Take car data from user
	testCar.PrintDetailView();

	cout << "Total Number of Cars in System:\t" << testCar.GetTotalCars() << endl <<
endl << endl;

}
```

CarsData.txt (Copy paste following data in your "CarsData.txt" file. Follow the file name. You may remove the comments from file. Don't forget to submit your data file.)

```
4 //Total no. of cars
2015 Suzuki WagonR Grey
2012 Honda City White
2011 Toyota Corolla Black
2013 Suzuki Cultus Grey
```

Required Output:



```
Total Number of Cars in System: 4

Cars List:

2015 Suzuki VagonR Grey
2012 Honda City White
2011 Toyota Corola Black
2013 Suzuki Cultus Grey
Destroying 2013 Suzuki Cultus Grey
Destroying 2011 Toyota Corola Black
Destroying 2012 Honda City White
Destroying 2015 Suzuki VagonR Grey
Total Number of Cars in System: 0



Enter New Car Information:
Enet Model:     2015
Enet Make:      Suzuki
Enet Name:      VagonR
Enet Color:     Silver
Car Information:
Model:  2015
Make:   Suzuki
Name:   VagonR
Color:  Silver
Total Number of Cars in System: 1


Destroying 2015 Suzuki VagonR Silver
Press any key to continue . . .
```