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| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
|  | **Course:** | **Object Oriented Programming** | **Course Code:** | **CS-217** |
| **Program:** | **BS Computer Science** | **Semester:** | **Spring 2024** |
| **Duration:** | **30 minutes** | **Total Marks:** | **20** |
| **Date:** | **-** | **Weight:** | **-** |
| **Section:** | **D** | **Page(s):** | **1** |
| **Exam:** | **Quiz 1 (b)** | **Roll No.** |  |

**Q:** **Write C++ code to implement a “Car” class with the following requirements:**

* **Each car object stores information about its name, its top speed, and whether the car is an electric car or not. It also has a static data member: “totalCars” that contains the current number of cars. This should be initialized and updated accordingly. [2]**
* **Implement a parameterized constructor with default values of your choice. [2]**
* **Implement a destructor ~Car(). [1]**
* **Implement a copy constructor for shallow copy of the Car object:** Car(const Car& rhs). **[3]**
* **Implement an assignment operator that performs deep copy of the object passed to it:** Car& operator=(const Car& rhs). **[3]**
* **Overload the + operator to add the speed of two cars and return a new car with the other same attributes as the car on the right hand side of the operator. [3]**
* **Overload the unary ! operator to implement the functionality to check whether the current car is electric or not (return true if it is not electric). [2]**
* **Implement a function** upgradeCar(const Car& rhs) **that increases the current car’s top speed to the top speed of the passed car. Show error if the passed car is not faster. [2]**
* **Implement a function** printInfo() **that prints the information of the current car.  
  E.g: “This is a Honda, its top speed is 200km/h. It is not an electric car.” [2]**

**Note: Assume that there is a strlen function already implemented that returns the length of a string. (e.g strlen(“test”) returns 4)**