National University of Computer & Emerging Sciences, Karachi
Spring-2026 School of Computing (BSCS, BSSE, BSCY, BSAI)

Assignment # 1

Subject: Object Oriented Programming-CS1004	**Post Date: 8/2/2026**
Total Marks: 40	**Due Date: 1/3/2026, 11:59 PM**

Course Instructors: Ms Sumaiyah Zahid, Ms. Sobia Iftikhar, Ms. Abeeha Sattar, Ms. Abeer Gauher, Mr. Basit Ali, Mr Ghulam Qadir, Mr Ubaidullah, Mr Talha Shahid, Mr Aashir Mehboob, Mr Saif Ur Rehman, Mr Syed Ahmed Khan

Instructions to be strictly followed.

- Each student should submit these files:
    - **A zip of all source files (including header files if any) named as "A1-[StudentID].rar".**
    - **A DOC file where you copy website screenshots and code snippets for the part you are replicating from the website and the reasoning for it.**

- It should be clear that your assignment would not get any credit if the assignment is submitted after the due date.
- Marks will be awarded based on the uniqueness and originality of your submission.
- Half marks will be awarded on your code and half marks will be awarded on your documentation with proper reasoning.
- Zero grade for plagiarism (copy/ cheating) and late submissions.

Design and implement a Car Marketplace System similar to PakWheels (www.pakwheels.com) using Object-Oriented Programming principles. The assignment is intended to assess your understanding and application of classes, polymorphism, aggregation, composition, constructors, constants, static members, and arrays of objects.

Requirements

1. **Classes:**   **5 marks**
   - Identify at least 10 classes
   - Each class must have 5–6 data members
   - Each class must have 4 member functions other than getters and setters
2. **Constructors, setters and getters:**   **3 marks**
   - Use default, parameterized, and copy constructors wherever it makes sense
   - Explain why you used a particular constructor for that class
   - You may use constructor overloading if necessary with proper reasoning
   - Use setters and getters wherever necessary, for private data members.
3. **Constants & Constant Functions:**   **2 marks**
   - Use at least five constant data members, constant pointer, and constant function in your program
4. **Static Members:**   **2 marks**
   - Use at least two static data member and static member function
   - Explain why you made it static
5. **Composition & Aggregation:**   **5 marks**
   - You must identify and implement at least 2 composition and 2 aggregation relationship
6. **Array of Objects:**   **5 marks**
   - Use array of objects for at least two classes
7. **Functionality:**   **12 marks**
   Your program should at least do the following:
   - Add, update, delete vehicle listings.
   - Search and filter vehicles by attributes (brand, model, price, year, mileage).
   - Buyer can save favorites.
   - Buyer can send messages to Seller.
   - Admin can approve/remove listings.
8. **Class Diagram:**   **6 marks**
   - Draw a proper class diagram showing:
     - Classes with their attributes & methods.
     - aggregation, and composition relationships.