

Assignment day 1:

Objective:

This assignment will help you practice **collections, LINQ queries, and user interaction** in C#. You will:

Create a list of cars with the following information:

- Make (string) → The manufacturer (e.g., Tesla, Toyota).
- Model (string) → The specific model (e.g., Model S, Corolla).
- Year (int) → The production year.
- Type (enum) → Electric, Fuel

From the list above, write a console application to allow the user to:

1. Add a car
2. View all cars
3. Search car by Make
4. Filter car by Type
5. Remove a car by Model

Expected Console Interaction

```
Menu:
1. Add a Car
2. View All Cars
3. Search Car by Make
4. Filter Cars by Type
5. Remove a Car by Model
6. Exit
Enter your choice:
> 1
Enter car type (Fuel/Electric):
> Fuel
Enter Make:
> Toyota
Enter Model:
> Corolla
Enter Year:
> 2022
Car added successfully!
```

Assignment day 2:

Objective:

Implement an abstract class Car, create concrete classes FuelCar and ElectricCar, and use DateTime for tracking maintenance and fueling/charging history.

Requirements:

1. Abstract Class: Car

- Properties:
 - Make (string)
 - Model (string)
 - Year (int, must be valid)
 - LastMaintenanceDate (DateTime, must be valid)
- Methods:
 - ScheduleMaintenance() → Calculates the next maintenance date (e.g., after 6 months).
 - DisplayDetails() → Displays car details.

2. Concrete Classes:

- FuelCar
 - Implements IFuelable (Method: Refuel(DateTime timeOfRefuel))
- ElectricCar
 - Implements IChargable (Method: Charge(DateTime timeOfCharge))

3. Interfaces:

- IFuelable → Method Refuel(DateTime timeOfRefuel)
- IChargable → Method Charge(DateTime timeOfCharge)

4. Implementation:

- Users **must input valid** Year and LastMaintenanceDate.
- The program calculates **next maintenance date** from the last maintenance.
- Allows refueling/charging with **user-input date validation**.

Expected Console Interaction

```
Enter car make: Ford
Enter car model: Mustang

Enter car year (e.g., 2020): abc
Invalid year! Please enter a valid year between 1886 and the current year.
Enter car year (e.g., 2020): 1700
Invalid year! Please enter a valid year between 1886 and the current year.
Enter car year (e.g., 2020): 2022

Enter last maintenance date (yyyy-MM-dd): 2022-15-01
Invalid date format! Please enter a valid date.
Enter last maintenance date (yyyy-MM-dd): hello
Invalid date format! Please enter a valid date.
Enter last maintenance date (yyyy-MM-dd): 2022-06-10

Is this a FuelCar or ElectricCar? (F/E): G
Invalid input! Please enter 'F' for FuelCar or 'E' for ElectricCar.
Is this a FuelCar or ElectricCar? (F/E): fuel
Invalid input! Please enter 'F' for FuelCar or 'E' for ElectricCar.
Is this a FuelCar or ElectricCar? (F/E): F

Car: Ford Mustang (2022)
Last Maintenance: 2022-06-10
Next Maintenance: 2022-12-10

Do you want to refuel/charge? (Y/N): Y

Enter refuel/charge date and time (yyyy-MM-dd HH:mm): today
Invalid date format! Please enter a valid date.
Enter refuel/charge date and time (yyyy-MM-dd HH:mm): 2024-03-20 14:30
FuelCar Ford Mustang refueled on 2024-03-20 14:30
```