# Advanced Procedural Programming Laboratory

# Lab Exam 25th April 2022

# Duration: 1Hour & 45minutes

## Lab Exam Conditions

- Comments expected.
- Good programming practice is expected
- Source Code to be submitted to Moddle by the end of the lab exam.
- Plagiarism is not acceptable.
- You are permitted access to all the Advanced Procedural Programming module's materials during the lab exam, but no other sources should be used during the lab exam. I would ask you to self-police this rule during the exam.
- You may be asked to present your code/application.

**Problem Statement**

Auto Sales Ltd hired you to develop a software application keep track of all their car details for their stock control records.

Write a program to maintains a car database, **using a linked list**, of car records as entered by the program user.

The car record details structure contains the following members:

- Car Reg No (Character Array) – Must be unique

- Manufacturer Name (Character Array)

- Model Name (Character Array)

- Fuel Type

    o Diesel

    o Petrol

    o Hybrid

- Sales Price (Float)

- Quantity in Stock (Integer)

The program should include the following menu which allows the user to manipulate the database of cars:

1. **Add a new car**

This will add a new car record into the linked list. The same car reg number must **NOT** be entered into the list more than once.

2. **Display the cars in the database that match a fuel type**

Allows the user to display the car in the car database which match a given fuel type.

3. **Edit an existing car record**

A function should be written to allow the following parameters to be edited in car record of a specified car reg number:

    a. Fuel Type

        b.    Sales Price

4. **Query the Car Valuation Breakdown**

A function should be written to output the number of cars in the following sales price valuation brackets:

        c.    Less than €10,000
        d.    Less than €20,000
        e.    Less than €30,000
        f.    Less than €40,000
        g.    More than €40,000

5. **Exit on "-1"**

At the end of the program the contents of the database should be outputted to Car.txt

**Car.txt should have the following format:**

221G10 Ford Focus Diesel 25000 3

221G11 Toyota RAV4 Hybrid 33000 1

221G12 BMW 420i Hybrid 60000 2

**Sample Program Output**

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

1

Please enter regno, make and model

221G10 Ford Focus

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

1

Please enter the quantity in stock

3

Please enter the price

25000

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

1

Please enter regno, make and model

221G11 Toyota RAV4

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

3

Please enter the quantity in stock

1

Please enter the price

33000

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

1

Please enter regno, make and model

221G12 BBMW 420i

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

3

Please enter the quantity in stock

2

Please enter the price

60000

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

2

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

1

221G10 Ford Focus 25000.000000 3

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

4

There are 0% car less than 10,000

There are 0% car less than 20,000

There are 33.3% car less than 30,000

There are 33.3% car less than 40,000

There are 33.3% car less than 40,000

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

3

Please enter the car reg you need to update

221G10

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

2

Please enter the price

31000

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

2

Please enter 1 for Diesel 2 for Petrol or 3 for Hybrid

2

221G10 Ford Focus 31000.000000 3

Please enter 1 to add a car

Please enter 2 to search for cars of a certain fuel type

Please enter 3 to edit a car

Please enter 4 to retrieve the car stats

Please enter -1 to exit

-1