

## **Laboratory Sessions 8 and 9**

### **Introduction**

Please note that only one submission at the end of session 9 is required.

### **Task 1: Car Registration (40%)**

The file “indata.txt” contains a series of 6 lines, each containing pieces of information about a car, separated by space. In each case, the first number denotes the year of fabrication, the second text the car’s number in Irish format (year, county, number), the third piece of information is the color and the fourth – car’s engine volume in litres. You are required to develop a program which will read the data from this file into an array of structures of type `car_type` (see below), and for each of the cars calculate and output the corresponding tax to be paid using the following algorithm:

For cars no older than 5 years, the tax is Euro 150/year, if the engine is less and equal to 1.6 litres and Euro 300/year otherwise. For older cars there are three levels: less than 1.4 litres, less than 1.6 litres but greater than 1.4 litres and greater or equal to 1.6 litres. The tax is Euro 200 for the smallest engine cars, Euro 400 for the average engine size cars and Euro 600 for the highest engine size cars, respectively.

Test the program and record the test results.

### **Task 2: Car Taxation (40%)**

Update the `car_type` structure to store the tax as well computed as above and write the output both on the screen and on a file using file-related functions. Use a user menu. Test the program by adding new lines to the “indata.txt” file and record the test results.

**typedef struct car**

```
{  
    int year;  
    char number[9];  
    char colour[10];  
    float engine;  
} car_type;
```

**“indata.txt”**

```
1991 91D2134 red 1.8  
1999 99D2939 blue 1.5  
2003 03C2334 red 1.2
```

**2006 06G1123 white 1.0**

**1998 98D5564 blue 1.6**

**2005 05D1354 green 1.3**

### **Task 3: Personalized Materials about Structure and a Quiz (20%)**

This task includes view/interact with personalized materials on the topic “structure”, which are presented in the “DCU EM108 2019 Week 9&10 (personalized)” course on the NEWTELP platform based on your media presentation preference choices. Take the quiz which follows the materials.