



## Programming in Python

### Assignment 2

#### Weather Analyser

##### Question 1)

The following code creates a list of size 30 with random integers between 0 and 35 using the **randint()** function from the **random** library. The list represents daily temperatures between 0°C and 35°C for a month (30 days).

```
import random
daily_temperatures = [random.randint(0, 35) for _ in range(30)]
```

Create a Python file called **weather\_analysis.py** and copy this code into your program.

- Find the following values in the daily temperatures list:
  - Hottest temperature of the month
  - Coldest temperature of the month
  - The average temperature of the month

(25 Marks)

##### Question 2)

Now generate another list for rainfall values between 0mm and 10mm for a month (30 days).

```
daily_rainfall = [random.randint(0, 10) for _ in range(30)]
```

- Extend your program to traverse through the daily temperatures and daily rainfall and find:
  - The worst weather conditions of the month (highest rainfall and lowest temperature) **on a specific day**.

Print the worst day and its weather conditions.

(20 Marks)

### Question 3)

The following code generates a 2-Dimensional list (4x7) where the first dimension is each week of a month (4 weeks in total) and the second dimension is the **daily temperatures** of each week (7 days per week, 28 days in total).

```
weekly_temperatures = [[random.randint(-1,10) for _ in range(7)] for _ in range(4)]
```

Using this list:

- Find the **weeks** in which the temperature is freezing (drops below 0°C)

(20 Marks)

### Question 4)

Using your code for questions 1 and 2, create the following functions:

- **def hottest\_coldest\_average(temperatures)** which takes a list of temperatures as a parameter and returns the hottest temperature, the coldest temperature and the monthly average temperature. (As in Question 1).
- **def worst\_day\_record(temperatures, rainfall)** which takes a list of temperatures and a list of rainfall and returns the worst day and the worst day weather conditions. (As in Question 2).

(15 Marks)

### Question 5)

Create a dictionary called **international\_weather** that represents weather for data for three countries: "Ireland", "France" and "Spain".

For each country, there are two key-value pairs:

- **"Temperatures"**: A list of 30 random temperature values (ranging from 0 to 30 degrees Celsius) for the respective country.
- **"Rainfall"**: A list of 30 random rainfall values (ranging from 0 to 10) for the respective country.
- Use the same random generator code from questions 1 and 2.

(10 Marks)

### Question 6)

Extend your program to ask the user to enter a country name (either Ireland, France or Spain) and given this input:

- Get the countries Temperature and Rainfall values for the month by using the input as a key to the dictionary defined in question 5.
- Find the country's hottest, coldest and average temperature of the month. Call the function **hottest\_coldest\_average**
- Find the country's worst day of the month. Call the function **worst\_day\_record**

Repeatedly ask the user for input until the user enters 'Done', then end the program.

(10 Marks)

Submit your Python file **weather\_analysis.py** on Moodle to complete the assignment. Cooperation for this assignment is permissible but copying is not tolerated. You must understand each line of your code upon submission.