Section C	Coding Questions	65 Marks

Attempt both questions

Question 15 **(40 marks)**

Open the program titled **'Q15 Starter** and put your name at the top.

```
# Question 15
# Name:

user_pay = 36800   # User pay is set at 30000
standard_tax = .2  # Income tax set to 20%...0.2 as a decimal

if user_pay <= 36800:
    print('The user will pay 20% tax')
```

Tax is charged as a percentage of your income. The percentage that you pay depends on the amount of your income. The first part of your income, up to €36,800, is taxed at 20%. This is known as the *standard rate of tax* and the amount that it applies to is known as the *standard rate tax band*.

The remainder of your income is taxed at the *higher rate of tax*, 40%.

To calculate how much tax you pay : ***user pay* X *tax rate***

(a) Insert a *print* statement at the start of the program saying '*Welcome to the income tax calculator*'.

```
Welcome to the income tax calcualtor
```

(b) Currently the *user_pay* variable is hard coded as €36,800, modify the program so the user can enter their own *user_pay* value. The input should be an integer value.

```
Welcome to the income tax calcualtor

Please enter your yearly pay:
```

(c) Currently the only tax accounted for in the program is a standard tax rate of 20%, modify the program to include a second tax rate variable called *higher_tax* and set it equal to 40% (0.4 as a decimal)

	2022	
	20%	40%
Single person	€36,800	Balance
Married couple/civil partners, one income	€45,800	Balance

In current tax brackets a single person pays 20% on the first €36,800 and 40% on any remaining sum. For example, if a person earned €50,000 they would pay 20% tax on €36,800 and 40% on the remaining €13,200.

(d) Modify the program so it tells the user a value for how much tax they will pay. The tax is calculated by finding 20% of the first 36,800 and 40% of any remainder and adding the two values together. See the test cases in the images below.

```
Welcome to the income tax calcualtor

Please enter your yearly pay: 36800
The user will pay 20% tax
Your tax is 7360.0 euros
```

```
Welcome to the income tax calcualtor


Please enter your yearly pay: 50000

The user will pay 40% tax on any value over 36800
Your tax is 12640.0 euros
```

(e) The program currently only works for a single person, modify the program so it asks the user if they are a single person or a married couple and gives the correct tax output depending on the users marital status based on the table above. In your solution use appropriate variable names.

```
Welcome to the income tax calcualtor

Are you (s)ingle or (m)arried: m

Please enter your yearly pay: 60000

The user will pay 40% tax on any value over 45800
Your tax is 14840.0 euros
```

Question 16 **(25 marks)**

```
1  # Question 16
2  # Name:
3
4  squares = []
5
```

(a) Using a loop, write a program that will calculate the square of the values between 1 and 20.

(b) Append each square value calculated in part (a) to the list *squares*.

(c) Output to the user the list of all the square values in the list *squares*.

```
The squared of values of 1-20 is [1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400]
```

(d) Calculate the sum of the square of values between 1-20 using any method and output the total to the user using an appropriate message.

```
The squared of values of 1-20 is [1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225, 256, 289, 324, 361, 400]
The sum of squared of values of 1-20 is 2870
```

(e) Calculate the mean of the square of values between 1-20 using any method and output the mean to the user using an appropriate message.

```
The sum of squared of values of 1-20 is 2870

The mean of squared of values of 1-20 is 143.5
```