Pre-Leaving Certificate Examination, 2022

Computer Science

Section C

Ordinary Level

Time: 1 hour

80 marks

Instructions

There is one section of the examination paper in this booklet.

Section C	Programming	One question	80 marks
		Answer all question parts	

Answer all parts of the question on your digital device.

Calculators may be used during this section of the examination.

Ensure that you save your work regularly and when you complete each question part.

Do not change the file names or save your work under different file names.

If you are unable to get some code to work correctly, you can comment out the code so that you can proceed. The code that has been commented out will be reviewed by the examiner.

Rough work pages are provided at the end of this booklet. Please note that this work will **not** be reviewed by an examiner.

At the end of the examination it is your responsibilty to ensure that you have saved all of your files onto your external media.

Answer all question parts.

Question 16

(a) Open the program called **Question16_A.py** from your device.
Enter your name in the space provided on **Line 2.**

This is a simple program that can find the perimeter and area of a quadrilateral. When this program is run, it prompts the user to select either perimeter or area.
The user enters the letter "p" if they wish to find the perimeter or enters the letter "a" if they wish to find the area.

```
 1   # Question 16(a)
 2   # Student name:
 3
 4   length = 6
 5   width = 4
 6
 7
 8   choice = input("Do you want to find the (p)erimeter or (a)rea? ")
 9
10   if choice == "p":
11      print(length + length + width + width)
12   elif choice == "a":
13      print(length*width)
```

(i) Modify the program to output a message to the user describing what the program does. This message should be displayed at the start of the program.
When the program is run the output may look as follows:

```
This program can find the perimeter or area of a quadrilateral
Do you want to find the (p)erimeter or (a)rea? p
20
```

(ii) Modify the program to prompt the user to enter their name. A suitable variable should be used to store the name. The program should output a suitable message using the user name when the program ends.
When the program is run the output may look as follows:

```
This program can find the perimeter or area of a quadrilateral
Please enter your user name: John
Do you want to find the (p) erimeter or (a) rea? a
24
Thank you for using the program John
```

(iii) Currently the variables length and width are hard coded to the values of 6 and 4 respectively. Modify the code so that the user will be asked to enter the values as floating-point numbers for these variables.
When the program is run the output may look as follows:

```
This program can find the perimeter or area of a quadrilateral
Please enter the length: 7.5
Please enter the width: 4.7
Please enter your user name: John
Do you want to find the (p) erimeter or (a) rea? a
35.25
Thank you for using the program John
```

(iv) Modify the code so that the output of both the area and perimeter will be rounded to two decimal places.
When the program is run the output may look as follows:

```
This program can find the perimeter or area of a quadrilateral
Please enter the length: 7.52367
Please enter the width: 4.457249
Please enter your user name: John
Do you want to find the (p) erimeter or (a) rea? a
33.53
Thank you for using the program John
```

(v) Modify the program so that when the program is run the output will be more informative to the user. The output will look as follows:

```
This program can find the perimeter or area of a quadrilateral Q
Please enter the length: 7.532
Please enter the width: 4.674
Please enter your user name: John
Do you want to find the (p) erimeter or (a) rea? p
A quadrilateral with a length of 7.532 and a width of 4.674 h
as a perimiter of: 24.41
Thank you for using the program John
```

```
This program can find the perimeter or area of a quadrilateral Q
Please enter the length: 7.542
Please enter the width: 4.876
Please enter your user name: John
Do you want to find the (p) erimeter or (a)rea? a
A quadrilateral with a length of 7.542 and a width of 4.876 h
as an area of: 36.77
Thank you for using the program John
```

(vi) In the perimeter calculator part of the code, change the code so that instead of using the formula: Perimeter = `length + length + width + width`, the perimeter will be found using the formula: Perimeter = `(2 X length) + (2 X width)`. You can test the functionality of your code by using the data in the following table.

Length	Width	Perimeter	Area
3.7	7.4	22.2	27.38
2.6	10.5	27.3	26.7
8.8	11.4	100.32	40.4

Save and close your file before moving on to the next part.

(b) Open the program called **Question16_B.py** from your device.
Enter your name in the space provided on **Line 2**.

In this code, the player will play a game of Rock Paper Scissors against the computer.
The rules of the game are described below:
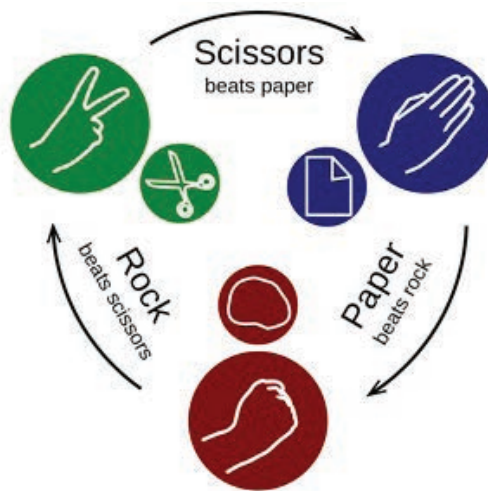
If both the player and computer pick the same, the game ends in draw.

```
1   # Question 16(b)
2   # Student name:
3
4   import random
5
6   computer_options = ["rock", "paper", "scissors"]
7
8
9   computer_choice = computer_options (random.randint(0,2)]
```

(i) Modify the program so that:
  • The user should be prompted to enter their choice of rock, paper or scissors when the program starts.
  • A suitable variable should be used to store the user input.
  • The user's choice should be printed out with an appropriate message.
  • The computer's choice should be printed out with an appropriate message. When the program is run the output may look as follows:

```
Enter rock, paper or scissors: rock
Player chose: rock
Computer chose: paper
```

(ii) Modify the program so that it will tell the user who won the game. Use the rules of the game above to help.
When the program is run the output may look as follows:

```
Enter rock, paper or scissors: rock
Player chose: rock
Computer chose: paper
Computer wins
```

```
Enter rock, paper or scissors: paper
Player chose: paper
Computer chose: rock
Player wins
```

```
Enter rock, paper or scissors: paper
Player chose: paper
Computer chose: paper
Draw!
```

Save your file.

Ensure that you have saved and closed all files before you finish the examination.

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