Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

LOCATION: LONDON | **LLEOLIAD: LLUNDAIN**

LEVEL 4 | **LEFEL 4**

EXAMINATION PERIOD | **CYFNOD ARHOLIADAU**

JUNE 2022 | **MEHEFIN 2022**

MODULE CODE: ACCB4017
SOFTWARE DEVELOPMENT

TIME: 2 HOURS

ANSWER ALL QUESTIONS

NOTE: IN-CLASS TEST, TIME/DATE TO BE ARRANGED BY LECTURER

Equipment or materials required – Computers with code editor installed

Adnoddau neu ddefnyddiau sydd eu hangen – Cyfrifiaduron gyda code editor

ANSWER ALL QUESTIONS

NOTE: Student will answer the questions below using the programming language they have studied during the module. The questions/solutions shown below refer to the Python language, but some groups may be studying the module using other programming languages (such as C). Therefore the paper will be adapted to reflect this if required.

Additionally, where delivered online (eg via Moodle) questions may be drawn from a random pool, but will be in the style and of a similar difficulty level to those listed below.

1. a) Which variable type would be most suitable to store each of the following values?

g string……..……..……..……..……..

2112 ITN……..……..……..……..……..

Sarah not suitable ……..……..……..……..……...

3.21 float……..……..……..……..……..

H2 complex……..……..……..……..……..

-34.62 not suitable……..……..……..……..……..

[1 mark each - 6 marks total]

1 b)

What errors are present in the following code for welcoming a user to a program? Line numbers are included for easy reference

```
1  print(Welcome to my program") #missing the double quotes after open brackets(”)
2
3  print("Please enter your name: ")
4  myName = int(input())                    #data type should be str myName = (input())
5
6  print("Welcome, " myName)  #missing the double quotes for myName (“”)
8  print("I shall say hello to you 10 times: ")
9
10    for counter in range(0, 11)   #missing colon after the brackets(:)
11    print("Hello")
```

[5 marks]

1 c) How many iterations do the following loops have?

```
for i in range(1, 9, 1):
    print("Hello")
```

……..8

```
for i in range(0, 8, 2):
    print("Hello")
```

…….. 4

[4 marks – 2 marks each]

1. d) What is the value of the integer variable *total* after the following code is executed?

```
total = 1

for x in range(0, 8, 1):
   total = total + x
    if x == 5:
total = 0
```

13 *[3 marks]*

1 e) Logic

i) Given the following values x=5, y=3, z=12 is the statement below true or false?

```
x==y
```

False

ii) Given the following values x=5, y=3, z=12 is the statement below true or false?

```
x < z/y
```

False

[2 marks total]

[20 marks total for Question 1]

2. Calculating the volume of a square-based pyramid

The volume of a square-based pyramid is calculated using the formula shown below:

$$V = a^2 \frac{h}{3}$$

Task:

Write a program to calculate the volume of the pyramid using the above formula.

Allow the user to enter the measurements for *a* and *h.* Both *a* and *h* should be positive numbers.

Print the volume on the screen to 2 decimal places

Program:

```
while (True):
    a = float(input(f"Please enter your measurements for a : "))
    if (float(a) < 0):
        print("please try again")
    else:
        break
while (True):
    h = float(input(f"Please enter your measurements for h : "))
    if (float(h) < 0):
        print("please try again")
    else:
        break

v = (1/3) * a * a * h
print("volume of pyramid is: {0:.2f}".format(v))
```

Result:

```
Run: main
"C:\Users\range\PycharmProjects\Exercises Rangel\venv\Scripts\python.exe" "C:/Users/range/PycharmProjects/Exercises Rangel/main.py"
Please enter your measurements for a : 10
Please enter your measurements for h : 13
volume of pyramid is: 433.33

Process finished with exit code 0
```

[10 marks total for Question 2]

3. Using lists (Python) or arrays (C etc)

Task:
Write a program designed to calculate the average age of some people in a room. There are 6 people in the room. Start by declaring an empty list eg

```
ages = []
```

1. Prompt the user to enter the six ages (these should be within normal human lifespan!).

2. After the ages have been entered, print each of them on the screen.

3. Calculate the average age of the people in the room (to 2 decimal places) and print it on the screen.

Use loops where appropriate

Sample output:

```
Enter next age: 35
Enter next age: 42
Enter next age: 234
Sorry out of range. Try again: 23
Enter next age: 56
Enter next age: 18
Enter next age: 52
Here are the ages you entered:
35.0  42.0  23.0  56.0  18.0  52.0
The average age is:  37.67
```

```
with open('ages.txt', 'a+') as f:
    while True:
        ages = []
        for i in range(3):
            ages.append(int(input('How old is the person {}?:
'.format(i+1))))
        average = 'Average: {}'.format(round(sum(ages) / len(ages), 2))
        print(average)
        f.write('{}\n{}'.format('\n'.join([str(x) for x in ages]),
average))
        action = input('Press [1] to continue or [2] to exit... ')
        if action == '2':
            break
```

Result:

```
main
"C:\Users\range\PycharmProjects\Exercises Rangel\venv\Scripts\python.exe" "C:/Users/range/PycharmProjects/Exercises Rangel/main.py"
How old is the person 1?: 35
How old is the person 2?: 42
How old is the person 3?: 23
How old is the person 4?: 56
How old is the person 5?: 18
How old is the person 6?: 52
Average: 37.67
Press [1] to continue or [2] to exit...
```

[15 marks total for Question 3]

4. **Using Functions**

Task:
Write a function called *entername() to* allow the user to enter the name of a conference delegate.

The function should be called 3 times, once for each of 3 conference delegates, and the (local scope) name entered returned to the main program.

Print the names entered from the main program, then calculate the total bill for attending the conference (£65 per person) and print it on the screen Sample output:

```
Enter name of next delegate:
Gaynor Thomas
Enter name of next delegate:
Beverley Holland
Enter name of next delegate:
James Williams

The delegates who attended today were:
Gaynor Thomas  Beverley Holland  James Williams
Total due is £ 195
```

[15 marks total for Question 4]

Diwedd/End