

LOCATION: BIRMINGHAM

LEVEL 4

LEFEL 4

EXAMINATION PERIOD
JANUARY 2022

CYFNOD ARHOLIADAU
IONAWR 2022

MODULE CODE: ACCA4017
SOFTWARE DEVELOPMENT

TIME: 2 HOURS

ANSWER ALL QUESTION/S IN PART ONE
ANSWER ANY TWO QUESTIONS IN PART TWO

Equipment or materials required – Computers with Python installed or Google Colab

PART ONE: ANSWER ALL QUESTIONS

1. a) What variable type would Python infer for the following values:

1.32 <class 'float'>

124 <class 'int'>

Hello <class 'str'>

-34.62 <class 'float'>

[-562] <class 'str'>

[1 mark each - 5 marks total]

1. b) Spot the errors in the following program to calculate the sum of a numbers to a given input and write the error-free program in the empty box.

Program with errors	Error-free program
<pre>print('Please input a number') var = input() for number in range(1,var) total = total + number PRINT('The sum of first %d numbers is %d' % (var, total))</pre>	

[1.25 mark each mistake identified - 5 marks total]

```
i) for i in range(100):
    print(i)                                0 to 99
```

```
ii)      for i in range(100,10,-10): 100, 90, 80,70,60,50,40,30,20
        print(i)
        .....
```

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

```
total=0
for x in range(5):
    if(x%2 == 0):
        total = total + 2
    else:
        total = total + 1
print(total)
```

[2 marks total]

Temp = [23,24,25,29,40,56]

```
temp = [23,24,25,29,56]
```

```
print("The original list : " + str(temp))
```

```
res = temp[::2] + temp[1::2]
```

```
print(" The ood list is : " + str(res))
```

```
arr=[23,24,25,29,56]
```

```
ans=sum(arr)
```

```
print('Sum of array is',ans)
```

[2 mark each - 4 marks total]

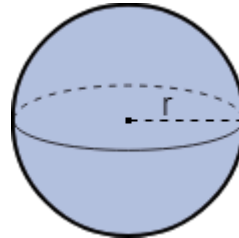
[20 marks total for Question 1]

Part TWO (Answer any two questions)

1. Calculating the surface area of a sphere

The surface area of a sphere is calculated using the formula:

$$A = 4\pi r^2$$



Task:

Write a program to calculate the area of sphere in centimetres (cm) using the above formula.

Allow the user to enter the measurement for diameter of the sphere in meters (m). You may set π as 3.142

pi=3.142

```
radian = float(input('Please enter number in meters: '))
```

```
sur_area = 4 * pi * radian **2
```

```
volume = (4/3) * (pi * radian ** 3)
```

```
print("surface area is: ", sur_area)
```

```
print("Volume is: ", volume)
```

[20 marks total]

2. User defined function

A) Task:

Write two user-defined functions

1. A function named `celsiusToFahrenheit` that converts temperature given in Celsius to Fahrenheit. It takes one parameter for a given Celsius value.
2. A function named `fahrenheitToCelsius` that converts temperature given in Fahrenheit to Celsius. It takes one parameter for a given Fahrenheit value.

Allow the user to enter the temperature in Celsius and Fahrenheit and convert to other unit and display on the screen.

The formula for Celsius to Fahrenheit is:

(Celsius x 9/5) + 32 = Fahrenheit value e.g. (0 x 9/5) + 32 = 32 F

The formula for Fahrenheit to Celsius is:

(Fahrenheit - 32) x 5/9 = Celsius value e.g. (32 - 0) x 5/9 = 0 C

[5 marks each - 10 marks total]

B) Task:

Write a program that initialize a list of ten numbers and compute the average of the largest and the smallest number of the list.

```
def find_len(list1):  
    length = len(list1)  
    list1.sort()  
    print("Largest number is:", list1[length-1])  
    print("Smallest element is:", list1[0])
```

```
list1=[12, 25, 22, 1, 13, 10, 8, 6, 4,18]  
Largest = find_len(list1)  
avg = sum(list1)/len(list1)  
print("The average is ", round(avg,2))
```

[10 marks total]

3. Using Turtle

Using Python with Turtle, draw the following shapes:

- a. A square having width and height of 100 and orange background

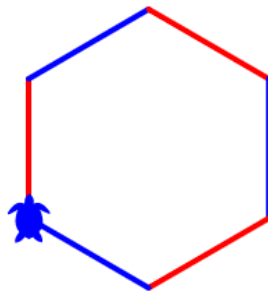
```
from turtle import turtle  
turtle = turtle.Turtle()  
for i in range(4):  
    turtle.color("yellow")  
    turtle.forward(100)  
    my_turtle.right(90)  
turtle.done()
```



[5 marks total]

- b. A hexagon with white background and sides in alternative colours (red and blue).
Write your program using a loop.

```
from turtle import turtle
turtle = turtle.Turtle()
for i in range(6):
    turtle.forward(100)
    my_turtle.right(60)
turtle.done()
```



[15 marks total]

[20 marks total for Question 3]

Diwedd/End