



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

LOCATION: SWANSEA

LLEOLIAD: ABERTAWE

LEVEL 4

LEFEL 4

EXAMINATION PERIOD
MAY 2022

CYFNOD ARHOLIADAU
MAI 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 – Cyfrifiraduron 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	Char
2112	Int
Sarah	String
3.21	double
H2	String
-34.62	double

[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

```
static void Main(string[] args)
{
    Console.WriteLine("Welcome to my program");
    Console.WriteLine("Input your name");
    int myName = Console.ReadLine();
    Console.WriteLine("Hello {0}, Nice to meet you", myName);
    Console.WriteLine("I shall greet you 11 times!");
    for (int i = 0; i < 10; i++)
    {
        Console.WriteLine("Greetings!!");
    }
}
```

[5 marks]

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

```
for (int i = 1; i < 8; i++)  
{  
    Console.WriteLine("Hello");  
}
```

7

```
int x = 3;  
while (x < 14)  
{  
    Console.WriteLine("Hello");  
    x = x * 2;  
}
```

4

[4 marks – 2 marks each]

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

```
int total = 0;  
for (int i = 0; i < 8; i++)  
{  
    total = total + (x);  
    if (x == 5)  
    {  
        total = 0;  
    }  
}
```

0

[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

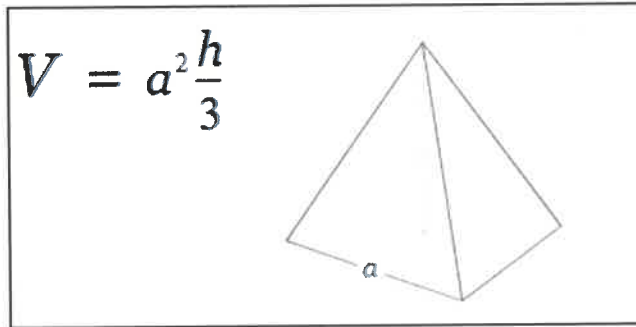
$$12/3 = 4$$

[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:



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

[10 marks total for Question 2]

3. Using lists or arrays

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 array eg

```
int[] ages = new int[6];
```

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
```

[15 marks total for Question 3]

4. Using Methods

Task:

Write a method called *EnterName()* to allow the user to enter the name of a conference delegate and return it as a string variable.

The method should be called 3 times, once for each of 3 conference delegates, and the (local scope) name entered returned to the main program and stored in an list or array.

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

```

1  using System;
2
3  namespace Question2
4  {
5      class Program
6      {
7          static void Main(string[] args)
8          {
9              //Rhys Hughes Question2
10
11              //a: number, positive.
12              bool aCorrect = false;
13              double a = 0;
14              while (!aCorrect)
15              {
16                  Console.Write("Please enter the measurment for 'a': ");
17                  bool aNumber = double.TryParse(Console.ReadLine(), out a);
18                  if (!aNumber || a <= 0)
19                  {
20                      Console.WriteLine("a must be a positive number");
21                  }
22                  else
23                  {
24                      aCorrect = true;
25                  }
26              }
27
28              //h: number, positive
29              bool hCorrect = false;
30              double h = 0;
31              while (!hCorrect)
32              {
33                  Console.Write("Please enter the measurment for 'h': ");
34                  bool hNumber = double.TryParse(Console.ReadLine(), out h);
35                  if (!hNumber || h <= 0)
36                  {
37                      Console.WriteLine("h must be a positive number");
38                  }
39                  else
40                  {
41                      hCorrect = true;
42                  }
43              }
44
45              double volume = (h/3) * (a*a);
46
47              Console.WriteLine("The volume is {0}", volume.ToString("0.00"));
48
49          }
50      }
51 }
52

```

$2 \times 4 \times 4$

10


```

1  using System;
2
3  namespace Question3
4  {
5      class Program
6      {
7          static void Main(string[] args)
8          {
9              //Rhys Hughes Question 3
10
11
12              const int people = 6; //amount of people in the room
13              int[] ages = new int[people];
14
15              //for loop till all ages captured
16              for (int i = 0; i < people; i++)
17              {
18                  int displayNum = i + 1; //adds one to make it better for user,
19                  "Enter age 1" rather than "Enter age 0"
20
21                  //age: number, whole, >0, <=110
22                  bool ageCorrect = false;
23                  int age = 0;
24                  while (!ageCorrect)
25                  {
26                      Console.WriteLine("Please enter age {0}:", displayNum);
27                      bool ageNum = int.TryParse(Console.ReadLine(), out age);
28                      if (!ageNum || age <= 0 || age > 110)
29                      {
30                          Console.WriteLine("Please enter a number that is
31                          sensible for age (>0, <=110)");
32                      }
33                      else
34                      {
35                          ageCorrect = true;
36                      }
37                  }
38                  ages[i] = age;
39
40              }
41
42              //loop around till all ages displayed
43              Console.WriteLine("Here are the ages you entered:");
44              for (int i = 0; i < people; i++)
45              {
46                  Console.Write(ages[i] + " ");
47              }
48
49              //average: add them all up divide by how many there
50              double averageAge = 0;
51              foreach (var item in ages)
52              {
53                  averageAge += item;
54              }
55              averageAge /= people;
56
57
58              Console.WriteLine("\n The average age is: {0}",
59              averageAge.ToString("0.00"));
60          }
61      }
62

```

5+5+3+2

15


```

1  using System;
2
3  namespace Question4
4  {
5      class Program
6      {
7          static void Main(string[] args)
8          {
9              //Rhys Hughes Question 4
10
11              const int numDelegates = 3; //How many delegates are there
12              const int costPerPerson = 65; //How much it costs one person to
13              attend the conference
14              string[] delegateNames = new string[numDelegates];
15
16              for (int i = 0; i < numDelegates; i++)
17              {
18                  int displayNum = i + 1; //adds one to i to make it better for
19                  users
20                  Console.WriteLine("Please enter delegate name {0}: ", displayNum);
21                  delegateNames[i] = EnterName();
22              }
23
24              Console.WriteLine("The delegates who attended today were: ");
25              for (int i = 0; i < numDelegates; i++)
26              {
27                  Console.Write(delegateNames[i] + " ");
28              }
29
30              int bill = numDelegates * costPerPerson; //Multiplies amount of
31              delegates by the price of the conference together to get the total
32              bill for the conference
33              Console.WriteLine("\n The total due is: {0}", bill.ToString("£0.00"));
34
35          }
36          static string EnterName()
37          {
38              //reads the users input and sets it as the name
39              string name = Console.ReadLine();
40
41              return name;
42          }
43      }
44  }

```

No validation of input.



$$2 + 5 + 3 + 2 + 2$$

