NWU®

NAME & SURNAME: ..... Student Nr: .....

1. Question 1 *(Short questions)* **[10]**

1.1. Provide the code needed to write data to a text file named "Output.txt" in the project folder, using an existing StreamWriter object called "saver".

_____ **saver = File.CreateText(Output.txt)**_____ (2)

1.2. Which property of a control needs to be changed from private to public to allow it to be accessed from another form?

_____ **Modifiers** _____ (1)

1.3. When working with files in C#, which method can be called to verify that a file operation was successful?

_____ **The ShowDialog method**_____ (1)

1.4. When creating an object of the Random class, you can specify a _____**seed value**_____ which determines the point from which the object will begin generating random numbers. If you do not specify a value, it uses the system clock. (1)

1.5. What is the difference between passing an argument by reference and passing an argument by value?

By reference: **When passing an argument by value, the method receives a <u>copy of the argument's value</u>. Changes made to the parameter inside the method do not affect the original variable outside the method**

_____

By value: **When passing an argument by reference, the method receives a <u>reference to the actual variable, not a copy</u>. Changes made to the parameter inside the method directly affect the original variable.**

<u>One mark for answering both correctly</u>

_____ (3)

1.6. How many times will the loop below iterate? _____**5 times**_____(1)

```
int count = 3;
decimal cost = 500m;
while (count < 8)
{
        cost += 150;
        count++;
}
```

1.7. What will be the final value of cost be, after the loop completes? _____**1250m**_____ (1)

2. Question 2 (Short Programming Questions) [8]

2.1. Consider the method header below, name the different parts in the method header.

```
[2.1.1]  [2.1.2]  [2.1.3][2.1.4]
{
        MessageBox.Show("The amount of tax is: " + tax.ToString("P2"));
}
```

2.1.1. (_____**Access modifier**_____)
2.1.2. (_____**Return type**_____)
2.1.3. (_____**Method name**_____)
2.1.4. (**Parentheses or parameter(s) or parameter list**) (4)

2.2. Consider question 2.1.4 above. Provide an example of code that can be used there, where the method accepts only one default argument. Tip: Look at the method body.

_____**(decimal tax = 0.05m) or similar, but variable name must be tax**_____(1)

2.3. What would be the output of the given code.

```
int val  =  51;
```

Messagebox.Show(val); _____**51**_____

Messagebox.Show(++val); _____**52**_____

Messagebox.Show(val ++); _____**52**_____

Messagebox.Show(val); _____**53**_____ **Half mark each** (2)

2.4. What is the difference between the for and while loop?

_____**For is counter based and for a known number of iterations**_____

_____**While is for while a certain condition remains true.**_____ **Half mark each** (1)

3. Question 3 (Programming Questions) [20]

3.1. Write a method declaration for a method, which can be used in any class that calls it, as follows:

- The method name must be called **ShowRandomValue**.
- The purpose of the method is to display a randomly generated number in a message box.
- The randomly generated number must be between 10 and 100, including 100.
- The method is declared in one class and called from another class.
- The object, through which the method will be called, is named **dataHandler** (already created).

Write the method, and then write the statement to call this method using the **dataHandler** object.

Method Declaration:

```
public void ShowRandomValue()
{
    // Create a Random object
    Random rand = new Random();

    // Generate a random number between 10 and 100 (inclusive)
    int randomNumber = rand.Next(10, 101); // Upper bound is exclusive

    // Display the random number in a message box
    MessageBox.Show("Random Number: " + randomNumber.ToString());
}
```

Calling the Method:

```
dataHandler.ShowRandomValue();
```

- 1 mark for using the **public** access modifier, indicating the method can be accessed from other classes.
- 1 mark for correctly naming the method **ShowRandomValue**.
- 2 marks for generating a random number between 10 and 100 (using **rand.Next(10, 101)**).
- 2 marks for correctly displaying the number in a **MessageBox**.
- 1 mark for providing the correct call to the method using the **dataHandler** object.
- 1 mark for correct syntax and structure throughout the method and call.

_____ (8)

3.2. Write a method declaration for a method, to be used only within the class where it is declared, as follows:

- The method name must be **CalculateBMIReference**.
- The following arguments should be passed to the method: **weightKg**, **heightM**, **lastName**.
- The method should calculate the **BMI (weightKg / (heightM * heightM))** and concatenate it with the passed **lastName**.
- The concatenated result must be returned to the part of the program where the method was called.
- Once returned to the calling part (outside of the method), the concatenated result must be stored in a variable named **bmiReference** of the appropriate data type.

```
private string CalculateBMIReference(decimal weightKg, decimal heightM, string lastName)
{
    // Calculate BMI
    decimal bmi = weightKg / (heightM * heightM);

    // Concatenate BMI with lastName
    string result = lastName + ": " + bmi.ToString("F2");

    // Return the concatenated result
    return result;
}
```

- 1 mark for using the **private** access modifier, indicating the method is only accessible within the class.
- 1 mark for the correct method name **CalculateBMIReference**.
- 2 marks for specifying the correct argument types: **weightKg** (decimal), **heightM** (decimal), and **lastName** (string).
- 2 marks for calculating BMI with the formula **weightKg / (heightM * heightM)** and concatenating it with **lastName**.
- 1 mark for returning the concatenated result.
- 1 mark for correctly storing the returned value in a **bmiReference** variable in the calling part.

_____ (8)

3.3. Write the C# code that allows a programmer to create an object named calculator of a Form called FinanceForm.cs.

✓ ✓ ✓

_____ **FinanceForm calculator = new FinanceForm();**_____ (3)

3.4. Fill in the missing code that writes and displays the following output in a text file (Note: only one word may be written to the file at a time). Hence, 5 statements are required.

Apple Banana Cherry
Grape Orange
Watermelon

StreamWriter writeThingy = File.CreateText(SaveFileDialog1.FileName);

writeThingy. __ **Write**_____ ("Apple");

writeThingy. __ **Write**_____ ("Banana");

writeThingy. __ **WriteLine**_____ ("Cherry");

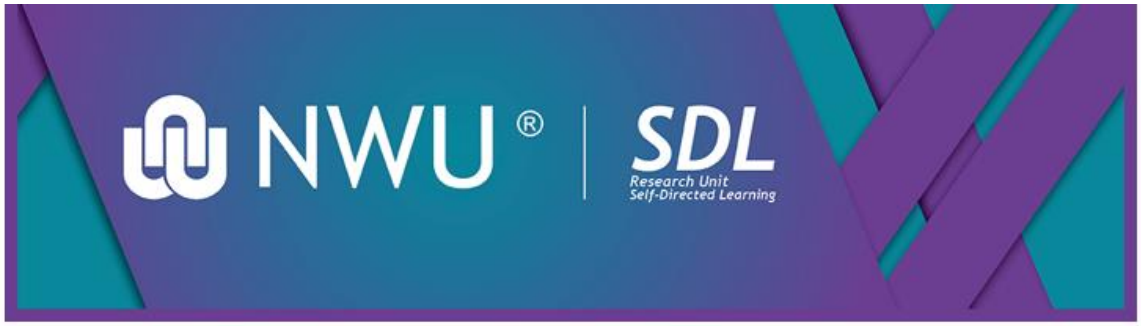
writeThingy. __ **Write**_____ ("Grape");

writeThingy. __ **WriteLine**_____ ("Orange");

writeThingy. __ **WriteLine**_____ ("Watermelon");

Half mark each (3)

. . . . . TOTAL / *TOTAAL*: 40



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