Reading and Research - Assignment Statements

These tasks are designed to introduce you to the programming topic we will be studying in class next lesson. You **must** complete these activities prior to the lesson.

Simple Calculations

A simple task that we can perform in a programming language is returning the answer of basic calculations. We can use all of the standard mathematical **operators** in Python plus a few than look a little different.

Task 1

Use the Python shell to investigate the expressions given below, describe what each symbol represents and given the answer provided by the shell.

Expression	Symbol description	Answer
`3 + 4`	*addition*	*7*
`2 - 1`	*subtraction*	*1*
`5 * 3`	*multiplication*	*15*
`2**3`	*to the power of*	*8*
`27/7`	*divided by*	*3.857142857142857*
`27//7`	*whole number division*	*3*
`27%7`	*remainder after whole number division*	*6*

Most of Task One should have been very straightforward but you may have struggled to find a description for the last two expressions in the table.

Task 2

Use the Internet to discover the name of each of the symbols listed below and then explain in your own words
the purpose of each symbol.

Symbol	Name	Purpose
`//`	*floor division operator*	*to find the nearest whole number that the two numbers divide evenly into*
`%`	*modulus operator*	*gives the remainder of the left value divided by the right value*

You will use all of the above symbols frequently whilst learning to program in Python so it is important to remember then. Often then are used together to calculate the result of more complex expressions.

More Complex Calculations

Often more than one term will be evaluated in a single expression. In Mathematics there is a rule to deal with such situations.

Investigate the expressions below. Evaluate them by hand first before testing your answer in the Python shell.

Task 3

Expression	Expected Result (Manual Calculation)	Actual Result from Python Shell
`3 + 4 * 2`	*14*	*11*
`3 + 4 / 2`	*5*	*5*
`10 - 2 * 2`	*11*	*11*
`10 - 2 / 2`	*9*	*9*

Expression	Expected Result (Manual Calculation)	Actual Result from Python Shell
`(3 + 4) * 2`	*14*	*14*
`(10 - 2) * 2`	*16*	*16*

ow that you have completed the above table comment on the results in the space below. How do the results relate to your knowledge of Mathematics?

Comments
It does multiplication and division first over other mathematical functions which is a feature of all maths.

Task 4

Use the Python shell to investigate the expressions given below, describe what each symbol represents and give the answer provided by the shell.

Expression	Describe what happens when you enter the expression into the shell
`mark1 = 10`	*nothing happened when enter pressed*
`mark2 = 15`	*again nothing happened*
`mark1 + mark2`	*python added together 10 and 15 to get 25 showing that it stored the numbers previously entered.*

In the space below attempt to explain what has happened with the above expressions:

Comments
It has registered the numbers with mark1 and mark2 and stored them knowing it will need them later, then when the mark1, mark2 commands have been recalled it applies the mathematical application to the two numbers.

Variables

Task four introduced you to the concept of variables. This is a fundamental concept in programming, you must have a good understanding of variables to progress on to more complex concepts.

Task 5

Read pages 28-29 of the AS Computing textbook, which cover variables and assignment statements. Below, define what is meant by the term variable and some of the considerations you should keep in mind when naming variables.

variable definition: *A location in memory that contains one or more data views.*
consideration 1: *When naming a variable a suitable name that describes what the variable is going to be used should be chosen.*
consideration 2: *Languages do not accept spaces or symbols apart from numbers in their identifier.*
consideration 3: *When naming you should use widely known naming practises so that others can understand the programme.*
consideration 4: *Do not use single letter variable identifiers.*

Task 6

Complete the following exercises in Python.

Python Syntax

```
print("hello world")
#outputs the text string to the screen

print("Your age is {0}".format(your_age))
#outputs the text string to the screen followed by the value
contained in the variable
```

```
your_age = 5
#assigns the value 5 to the variable

input_age = int(input("Please enter your age: "))
#assigns the input from the keyboard to the variable
```

1. Write a program that will ask the user for three integers and display the total.
2. Write a program that will ask the user for two integers and display the result of multiplying them together.
3. Ask the user for the length, width and depth of a rectangular swimming pool. Calculate the volume of water required

Include the source code for each of the tasks in the spaces below.

“ `python

Task 6.1

“ `#Harry Robinson
print(“This program will ask for 3 numbers and give the total added together”)
num1 = int(input(“Give the first number: “))
num2 = int(input(“Give the second number: “))
num3 = int(input(“Give the third number: “))
ans = num1 + num2 + num3
print (“The total is {0} + {1} + {2} is {3}”.format(num1,num2,num3,ans))

“ `python

Task 6.2

“ `print(“This programme will ask for two integers and multiply them together”)
num1 = int(input(“Give the first number: “))
num2 = int(input(“Give the second number: “))
ans = num1 * num2
print (“The total is {0} * {1} is {2}”.format(num1,num2,ans))

“ `python

Task 6.3

“ `print(“This programme will work out the volume of a reatngular swimming pool”)
poolH = float(input(“Give the Height of the pool: “))
poolL = float(input(“Give the Length of the pool: “))
poolW = float(input(“Give the Width of the pool: “))
ans = poolH * poolL * poolW
print (“The volume of the pool is {0} * {1} * {2} is {3}”.format(poolH,poolL,poolW,ans))

this uses a float not an int because you could be dealing with decimal numbers and int numbers dont allow that.

Summary

In this R&R you have investigated **assignment statements**. You have seen how **mathematical operators** are used to construct expressions and how values can be stored in **variables**.

Please make sure you have completed this R&R fully before your next programming lesson as it will form the basis of the initial classroom discussion and starter tasks.