Principles of Programming

CT4029

Workbook – Session 3

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Today, we covered code reusability programming by using functions. As discuss, functions significantly reduce the size of the code by enabling programmer to reuse blocks of code that perform specific actions. To solve the exercises in this section, you are required to use functions.

Following are the Learning Outcomes of this Section:

- **Code Reusability through Functions**
- **Using Built-in Functions**
- **Creating and Using New Functions**
- **Passing Arguments in Functions**

1. Section A

1.1. Example 1

```
def greet(name):
    """This function greets to
    the person passed in as
    parameter"""
    print("Hello, " + name + ". Good morning!")

greet('Sam')
```

Output:

```
Hello, Sam. Good morning!
```

1.1. Example 2

This example presents a function, which has a ***nested loop***. A ***nested loop*** is a loop within a loop, an inner loop within the body of an outer one. How this works is that the first pass of the outer loop triggers the inner loop, which executes to completion. Then the second pass of the outer loop triggers the inner loop again. This repeats until the outer loop finishes. Of course, a break within either, the inner or outer loop, would interrupt this process.

```
def triangle():
  print('Make a Triangle!')
  for rows in range(8, 0, -1):
    for columns in range(rows):
      print('*', end='')
    print()

triangle()
```

In the example above, the print statement has a parameter ***end.*** Python's *print( )* function comes with a parameter called 'end'. By default, the value of this parameter is '\n', i.e. the new line character. You can end a print statement with any character/string using this parameter.

Output:

```
Make a Triangle!
********
*******
******
*****
****
***
**
*
```

1.2. Question 1:

Develop a function which prints the following output:

1.3. Question 2:

Write a program, which takes gross salary per month and prints the net salary along with the details of deductions, such as; Tax, NI.
Sample Output:
Enter your Gross Salary:
Your Net Salary After Deduction is:
Your Tax Deduction is:
Note: Following is the tax deduction bands. Your program should be able to differentiate between different levels of incomes and deduct tax accordingly. You are required to use conditions and functions for this program

Band	Taxable income	Tax rate
Personal Allowance	Up to £11,850	0%
Basic rate	£11,851 to £46,350	20%
Higher rate	£46,351 to £150,000	40%
Additional rate	over £150,000	45%

1.4. Question 3:

Write a program, which asks dimension of three triangles and prints their area, along with their type (isosceles, equilateral, scalene). Use function and conditions.