IBA PUBLIC SCHOOL SUKKUR

Programming Basics in Python

Variables, Input, Operators and If/Else

Instructor: Miss Nimra Mughal

Important!(Read this before starting the practice)

- You have to include proper comments for each line (if you don't include comments like I have added in practice tasks. like the author, task title, date of creation etc. at the top, then line by line comments)
- Don't cheat, It will be just a wastage of time and resources
- If you face difficulty at any point then you may ask me but don't try to cheat
- The progress in this manual will show your understanding of all these topics.
- If you would not be able to complete these tasks then you need to provide an official explanation.

Objective of this Manual

After performing these exercises, students will be able to:

- Use the comments in their programs
- Use variables, inputs, operators
- Use if/else statement.

Practice Task 1 (Using variables Input from User):

Write and run a program that reads two integers through the keyboard and performs simple arithmetic operations (i.e., addition, subtraction, multiplication and division) and displays the results.

Solution:

```
# -*- coding: utf-8 -*-
"""
Created on Tue May  4 11:03:22 2021
BASIC AIRTHEMATICS in variables
Divide(/)
multiply(*)
power(**)
add(+)
subtract(-)
@author: Nimra
"""


#TAking input for two numbers
num1 = int(input("please enter the first number: "))
num2 = int(input("Please enter te second number: "))

#Printing addition of these two numbers
#way1: Direct printing
print("Addition: ")
print(num1+num2)
#Way2: stroing result in sum and then printing")
sum = num1+num2
print(sum)

#Printing multiplication of these two numbers
#way1: Direct printing
print("Multiplication: ")
print(num1*num2)
#Way2: stroing result in sum and then printing")
mult= num1*num2
print(mult)

#Printing Division of these two numbers
#way1: Direct printing
print("Division: ")
print(num1/num2)
#Way2: stroing result in sum and then printing")
div= num1/num2
print(div)

#Printing Power of these two numbers
```

```
43 #way1: Direct printing
44 print("Power ")
45 print(num1**num2)
46 #Way2: stroing result in sum and then printing")
47 pow= num1**num2
48 print(pow)
```

Output:

```
In [9]: runfile('E:/IBA PSS/Teaching 2020-21/4  PBL/Python tasks/Airthematic variables.py',
wdir='E:/IBA PSS/Teaching 2020-21/4  PBL/Python tasks')

please enter the first number: 12

Please enter te second number: 2
Addition:
14
14
Multiplication:
24
24
Division:
6.0
6.0
Power
144
144

In [10]:
```

Practice Task 2 (If/Else):

Write a program to ask two numbers, sum both numbers and check whether the sum is greater than 50 or not.

Solution:

```
# -*- coding: utf-8 -*-
"""
Created on Tue May  4 11:03:22 2021
Number greater than 50
@author: Nimra
"""
#Taking input for two numbers
num1 = int(input("please enter the first number: "))
num2 = int(input("Please enter te second number: "))

#Calculating Sum of two numbers
sum = num1+num2

#Checking whether is greater than 50 or NOt
if sum>50:
    print("Sum is greater than 50 and th sum is: ", sum)

else:
    print("Sum is not greater 50 and it is: ", sum)
```

Output:

```
In [10]: runfile('E:/IBA PSS/Teaching 2020-21/4  PBL/Python tasks/Practice2_If_else.py',
wdir='E:/IBA PSS/Teaching 2020-21/4  PBL/Python tasks')

please enter the first number: 34

Please enter te second number: 35
Sum is greater than 50 and th sum is:  69

In [11]:
```

Practice Task 3 (If / Else if / Else)

Write a program to ask student's marks and output grade. Following is criteria:

Marks	Grade
90-100	A1
80-90	A
70-80	B
60-70	C
Less than 60	F

Solution:

```
# -*- coding: utf-8 -*-
"""
Created on Tue May  4 11:03:22 2021
Grade Calculator
@author: Nimra
"""
#Taking input for two numbers
marks = int(input("please enter your marks "))

#Checking criteria and assigning grade
if marks>90 and marks<=100 :
    print("Your grade is A1")
elif marks>80:
    print("Your grade is A")
elif marks>70:
    print("Your grade is B")
elif marks>60:
    print("Your grade is C")
else:
    print("You are fail")
```

Output:

```
In [11]: runfile('E:/IBA PSS/Teaching 2020-21/4  PBL/Py
Calculator.py', wdir='E:/IBA PSS/Teaching 2020-21/4  PB

please enter your marks 45
You are fail

In [12]:
```

Exercises

Question 1:
Write and run a program that performs the following steps:

- Create variable pi and radius r of related data type.
- Assign values to above variables.
- Calculating the circumference using the formula: C = 2*pi*r.
- Displaying the circumference C.

Question 2:
Write and run a program that performs the following steps:

- Create variable f of related data type.
- Assign values to above variables.
- Calculating the equivalent Celsius temperature C using the formula:

  C = (5/9) (f - 32).

- Displaying the Celsius temperature C.

Question 3:
Write a program to take initialVelocity and acceleration from user, save them in respective data types and calculate FINAL VELOCITY as per following formula:

FINAL VELOCITY = initialVelocity + acceleration

Question 4:
Take distance and time from user, save them in respective data types and calculate SPEED as per following formula:

$$Speed = \frac{distance}{time}$$

Question 5:

Take mass and velocity from user, save them in respective data types and calculate KINETIC ENERGY as per following formula:

$$\text{KINETIC ENERGY} = \frac{1}{2} .mass .velocity^2$$

Question 6:

Write a program that will ask UNIT PRICE of chocolate, ice-cream and french-fries.
Then your program will ask about (QUANTITY) how many chocolate, ice-cream and french-fries you have to buy. In the end, you have to print the TOTAL BILL by simply multiplying UNIT PRICE of chocolate with QUANTITY of chocolate and so on and so forth.

$$Total\ Bill = \sum_{i}^{n} QTY_i \,.\, Price_i$$

Question 7:

Make a program where it is asked form user to enter total amount, you have to answer how much ZAKAT to be paid on that amount. ZAKAT is the 2.5% of the total amount.

Question 8:

Write and run a program that reads an angle (expressed in degrees) and states in which quadrant the given angle lies. An angle A is said to be in the

- First quadrant if it is in the range 0 <= A < 90
- second quadrant if it is in the range 90 <= A < 180
- third quadrant if it is in the range 180 <= A < 270
- and fourth quadrant if it is in the range 270 <= A < 360