(Basics of Python)-Day-1

1. WAP to swap the values of two variables without using a third variable.

```
num1 = int(input("Enter num1: "))
num2 = int(input("Enter num2: "))
print(num1, num2)
num1, num2 = num2, num1
print(num1, num2)
```

OUTPUT:

```
Enter num1: 10
Enter num2: 20
10 20
20 10
```

2. WAP to find out area of a triangle by inputting the three sides.

```
import math
s1 = int(input("side1:"))
s2 = int(input("side2:"))
s3 = int(input("side3:"))
s = (s1+s2+s3)//2
area = math.sqrt(s*(s-s1)*(s-s2)*(s-s3))
print(area)
```

OUTPUT:

```
side1:4
side2:3
side3:5
6.0
```

3. WAP to enter the two sides of a rectangle and calculate the radius of the circle whose area is same as the rectangle.

```
import math
l = int(input("length of rectangle: "))
b = int(input("breadth of rectangle: "))
area = l*b
r = math.sqrt(area/math.pi)
```

```
print(r)
```

OUTPUT:

```
length of rectangle: 10
breadth of rectangle: 5
3.989422804014327
```

4. WAP to calculate the gross salary of an employee by giving basic salary. Also calculate DA (60%) HRA(15%), Conveyance (15%), Medical (10%),Tax(5%).

Gross salary = Basic + DA + Conveyance + Medical-Tax

```
basicSalary = int(input("Enter the basic salary: "))

DA = 0.6*basicSalary

HRA = 0.15*basicSalary

Conveyance = 0.15*basicSalary

medical = 0.1*basicSalary

tax = 0.05*basicSalary

GrossSalary = basicSalary + DA + Conveyance + medical - tax

print('DA: ', DA )

print('HRA: ', HRA)

print('Conveyance: ', Conveyance)

print('Medical: ',medical)

print('tax: ', tax)

print('Gross Salary: ', GrossSalary)
```

OUTPUT:

```
Enter the basic salary: 10000

DA:  6000.0

HRA:  1500.0

Conveyance:  1500.0

Medical:  1000.0

tax:  500.0

Gross Salary:  18000.0
```

5. WAP to find the smallest between three numbers using conditional operator.

```
a = int(input('Enter first number  : '))
b = int(input('Enter second number : '))
c = int(input('Enter third number  : '))
smallest = 0
if a < b and a < c :
    smallest = a
if b < a and b < c :
    smallest = b
if c < a and c < b :
    smallest = c
print("Smallest: ",smallest)
```

OUTPUT:

```
Enter first number  : 10
Enter second number : 4
Enter third number  : 22
Smallest:  4
```

6. WAP to evaluate the expression from inputted values of a, b, c, d. x = (a - b) / (c - d). Give a suitable error message if denominator is zero.

```
a = int(input("Enter num1: "))
b = int(input("Enter num2: "))
c = int(input("Enter num3: "))
d = int(input("Enter num4: "))
if c - d == 0:
    print("Error")
else:
    x = (a-b)/(c-d)
    print(x)
```

OUTPUT:

```
Enter num1: 100
Enter num2: 50
Enter num3: 60
Enter num4: 30
1.6666666666666667
```

7. WAP to compute the real roots of the quadratic equation ax2 +bx+c=0. Take care of the situations.

- No solution if a & b are zero.
- There is only one root if a=0.
- There is no real root if b2 -4ac <0
- Otherwise compute the two real roots

```
from math import sqrt
a = int(input("Enter coefficient1: "))
b = int(input("Enter coefficient2: "))
c = int(input("Enter constant: "))
r = (b**2) - (4*a*c)
if a==0 and b==0:
    print("No Solution")
elif a==0 and b!=0:
    x = (-b)/2*a
    print("Only one real root: %f" %x)
elif r==0:
    x1 = x2 = (-b)/2*a
    img = sqrt(-(r))/2*a
    print("Complex roots: ")
    print("root1: %f+%f, root2: %f-%f"%(x1,img,x2,img))
else:
    x1=(-b + sqrt(r)/(2*a))
    x2=(-b - sqrt(r)/(2*a))
```

```
    print("Two real roots are: %f, %f"%(x1, x2))
```

OUTPUT:

```
Enter coefficient1: 10
Enter coefficient2: 33
Enter constant: -6
Two real roots are: -31.177227, -34.822773
```

8. WAP to input the mark of a student in three subjects. Calculate the grade of the student according to the average mark:

i) if average mark >= 90, grade is O

ii) if average mark >= 80, grade is E

iii) if average mark >= 70, grade is A

iv) if average mark >= 60, grade is B

v) if average mark >= 50, grade is C

vi) if average mark >= 40, grade is D

vii) if average mark < 40, grade is F

```
subject1=int(input("Enter marks of 1st subject: "))
subject2=int(input("Enter marks of 2nd subject: "))
subject3=int(input("Enter marks of 3rd subject: "))
average = (subject1+subject2+subject3)/3
if average >= 90:
    print("GRADE: 0")
elif average >=80:
    print("GRADE: E")
elif average >= 70:
    print("GRADE: A")
elif average >= 60:
    print("GRADE: B")
elif average >= 50:
    print("GRADE: C")
elif average >= 40:
```

```
    print("GRADE: D")
else:
    print("GRADE: F")
```

OUTPUT:

```
Enter marks of 1st subject: 85
Enter marks of 2nd subject: 75
Enter marks of 3rd subject: 66
GRADE: A
```

9. WAP to calculate the electric bill by inputting the previous and present meter reading. (The bill amount for 1st 100 units Rs 2.40 per unit, for next 100 units Rs 3.50 per unit and for rest units Rs 4.20 per unit)

```
curr = int(input("Enter current value:"))
prev = int(input("Enter previous meter value:"))
if prev >= curr:
    print("Wrong Info")
else:
    unit = curr - prev
    if unit <= 100:
        bill = unit * 2.40
        print(bill)
    elif unit <= 200:
        bill = (100 * 2.40 )+ (unit-100) * 3.50
        print(bill)
    else:
        bill = (100 * 2.40) + (100 * 3.50) + (unit-200) * 4.20
        print(bill)
```

OUTPUT:

```
Enter current value:250
Enter previous meter value:90
450.0
```

10. WAP to round a given floating point number to integer by considering the floor & ceiling operation without using built in function. Also re write the same program using built-in functions.

Note: import math and use math.floor(value) math.ceil(value)

```
import math
num = float(input("Enter a floating number: "))
print("WITHOUT BUILTIN FUNCTION")
if num > 0:
    num1 = str(num)
    s = num1.find('.')
    print("CEILING: %d"%(int(num1[0:s])+1))
    print("FLOORING: %d"%int(num1[0:s]))
else:
    num1 = str(num)
    s = num1.find('.')
    print("CEILING: %d"%int(num1[0:s]))
    print("FLOORING: %d"%(int(num1[0:s])-1))

print("WITH BUILTIN FUNCTION")
print("CEILING: ", math.ceil(num))
print("FLOORING: ",math.floor(num))
```

OUTPUT:

```
Enter a floating number: 5.5
WITHOUT BUILTIN FUNCTION
CEILING: 6
FLOORING: 5
WITH BUILTIN FUNCTION
CEILING:  6
FLOORING:  5

Enter a floating number: -3.5
```

```
WITHOUT BUILTIN FUNCTION
CEILING: -3
FLOORING: -4
WITH BUILTIN FUNCTION
CEILING:  -3
FLOORING:  -4
```

11. Find the GCD and LCM of two numbers.

```
a = int(input("Enter number1: "))
b = int(input("Enter number2: "))
if a>b:
    greater = a
else:
    greater = b
while(True):
    if greater % a == 0 and greater % b ==0:
        lcm = greater
        break
    greater += 1

print("LCM: ", lcm )

gcd = (a*b)/lcm

print("GCD: ", gcd)
OUTPUT:
Enter number1: 20
Enter number2: 50
LCM:  100
GCD:  10.0
```

12. WAP to input n random numbers & find the largest and smallest number from those.

```
n = int(input("Enter value n: "))
arr = list(map(int, input().split()))
print("largest: ", max(arr))
print("smallest: ",min(arr))
```

OUTPUT:

```
Enter value n: 5
2 6 8 19 77
largest:  77
smallest:  2
```

13. WAP to convert a decimal number into binary number.

```
def DecimalToBinary(num):
    if num >= 1:
        DecimalToBinary(num // 2)
    print(num % 2, end = '')
num = int(input("Enter a number: "))
DecimalToBinary(num)
```

OUTPUT:

```
Enter a number: 6
0110
```

14. WAP to print a number in letters. (i.e. 97: Nine Seven, 635: Six Three Five).

```
num = input("Enter number: ")
for digit in  num:
    if digit == '0':
        print("Zero ", end = " ")

    elif digit == '1':
```

```
        print("One ", end = " ")

    elif digit == '2':
        print("Two ", end = " ")

    elif digit=='3':
        print("Three",end=" ")

    elif digit == '4':
        print("Four ", end = " ")

    elif digit == '5':
        print("Five ", end = " ")

    elif digit == '6':
        print("Six ", end = " ")

    elif digit == '7':
        print("Seven", end = " ")

    elif digit == '8':
        print("Eight", end = " ")

    elif digit == '9':
        print("Nine ", end = " ")
```

OUTPUT:

```
Enter number: 786
Seven Eight Six
```

15.

```
                                a
                            a   b   a
                        a   b   c   b   a
                    a   b   c   d   c   b   a
                a   b   c   d   e   d   c   b   a
```

```
total = int(input())
for row in range(total):
    for space in range(total-row):
        print(" ",end=" ")
    for col in range(1, row+1):
        print(chr(col+96),end=" ")
    for col1 in range(row-1,0,-1):
        print(chr(col1+96),end=" ")
    print()
```

OUTPUT:

```
6

          a
        a b a
      a b c b a
    a b c d c b a
  a b c d e d c b a
```

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