**PROGRAMS ON BASICS OF PYTHON**

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| **Name** | **-** TANYA GUPTA | **Course –** MCA – 3rd SEM |
| **Section** | **–** B | **Subject Name–** ML using Python |
| **Univ Roll No.** | **–** 2001157 | **Student Id –** 20712068 |

**PROBLEM STATEMENT 1:** WRITE A PROGRAM TO USE THE MATHEMATICAL OPERATORS.

**SOURCE CODE:**

num = int(input("Enter first number: "))

num2 = int(input("Enter second number: "))

print()

print("Sum of Two Number: " ,num + num2)

print("Substraction of two num: ", num -num2)

print("Multiplication of two number: ", num\*num2)

print("Division of two number: ", num / num2)

print("Modulas of two number: ", num%num2)

**OUTPUT:**

#Enter first number: 5

#Enter second number: 12

#Sum of Two Number: 17

#Substraction of two num: -7

#Multiplication of two number: 60

#Division of two number: 0.4166666666666667

#Modulas of two number: 5

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**PROBLEM STATEMENT 2:** WRITE A PROGRAM TO TAKE AN INPUT OF NUMBERS FROM THE USER AND PRINT THE FIBONACCI SERIES TO THE TERMINAL NUMBER.

**SOURCE CODE:**

num = int(input("Enter the terminal number: "))

num1 = 0

num2 = 1

print(num1)

print(num2)

for i in range(0,num):

num3 = num1 + num2

print(num3)

num1 = num2

num2 = num3

**OUTPUT:**

#Enter the terminal number: 8

#0

#1

#1

#2

#3

#5

#8

#13

#21

#34

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**PROBLEM STATEMENT 3:** WRITE A PROGRAM TO PRINT THE FACTORIAL OF THE NUMBER INPUT BY THE USER.

**SOURCE CODE:**

sum = 1

num = int(input("Enter the number: "))

for i in range(1,num+1):

sum = sum\*i

print("Factorial of a number: ",sum)

**OUTPUT:**

#Enter the number: 5

#Factorial of a number: 120

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**PROBLEM STATEMENT 4:** WRITE A PROGRAM TO CHECK WHETHER A GIVEN NUMBER IS A PRIME NUMBER OR NOT USING LOOPS.

**SOURCE CODE:**

num = int(input("Enter the number: "))

check = False

for i in range(2,num-1):

if num % i == 0:

check = True

break

if check:

print("Number is not prime")

else:

print("Number is prime")

**OUTPUT:**

#Enter the number: 16

#Number is not prime

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**PROBLEM STATEMENT 5:** WRITE A PROGRAM TO DEMONSTRATE THE IMPORTING OF MODULES OF PYTHON.

**SOURCE CODE OF MODULES.py:**

def add(a, b):

result = a + b

return result

def mul(a,b):

result = a \* b

return result

def sub(a,b):

result = a - b

return result

**SOURCE CODE OF MAIN FILE:**

import modules

a = int(input("Enter the first number: "))

b = int(input("Enter the second number: "))

num = modules.add(a,b)

print("Sum of a number: ",num)

num1 = modules.mul(a,b)

print("Multiplication of a number: ",num1)

num2 = modules.sub(a,b)

print("Subtraction of a two number: ",num2)

**OUTPUT:**

#Enter the first number: 5

#Enter the second number: 2

#Sum of a number: 7

#Multiplication of a number: 10

# Subtraction of a two number: 3

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**PROBLEM STATEMENT 6:** WRITE A PROGRAM TO DEMONSTRATE THE USE OF NESTED IF STATEMENTS.

**SOURCE CODE:**

num1 = int(input("Enter the first number: "))

num2 = int(input("Enter the second number: "))

num3 = int(input("Enter the third number: "))

i = 13

if (num1 > num2):

if (num1 > num3):

print ("Largest no is ", num1)

else:

print("Largest no is ", num3)

else:

if num2 > num3:

print("Largest number is ", num2)

else:

print("Largest no is ", num3)

**OUTPUT:**

#Enter the first number: 5

#Enter the second number: 4

#Enter the third number: 1

#Largest no is 5

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**PROBLEM STATEMENT 7:** WRITE A PROGRAM TO DEMONSTRATE THE USE OF THE ELSE CLAUSE.

**SOURCE CODE:**

num1 = int(input("Enter the first number: "))

num2 = int(input("Enter the second number: "))

if num1 > num2:

print("largest number is : ", num1)

else:

print("largest number is : ", num2)

**OUTPUT:**

#Enter the first number: 80

#Enter the second number: 54

#largest number is : 80

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**PROBLEM STATEMENT 8:** WRITE A PROGRAM TO ILLUSTRATE THE USAGE OF TUPLES.

**SOURCE CODE:**

thistuple = ("hi", "hello", "howareyou")

print(thistuple)

**OUTPUT:**

#(‘hi’, ‘hello’, ‘howareyou’)

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**PROBLEM STATEMENT 9:** WRITE A PROGRAM FOR SEARCHING AN ELEMENT AND SORTING A LIST.

**SOURCE CODE:**

def bubble\_sort(list1):

for i in range(0,len(list1)-1):

for j in range(len(list1)-1):

if(list1[j]>list1[j+1]):

temp = list1[j]

list1[j] = list1[j+1]

list1[j+1] = temp

return list1

list1 = [2,6,1,9,4,3,8,7,5]

num = int(input("Enter the number you want to search: "))

check = False

count = 0

for i in list1:

if num == i:

check = True

break

if check == True:

print("number is found")

else:

print("Number is not found")

print("-----Sorted List----------")

print(bubble\_sort(list1))

**OUTPUT:**

#Enter the number you want to search: 8

#number is found

#-----Sorted List----------

#[1, 2, 3, 4, 5, 6, 7, 8, 9]

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**PROBLEM STATEMENT 10:** WRITE A PROGRAM TO ILLUSTRATE THE USAGE OF DICTIONARIES.

**SOURCE CODE:**

d={"one":"1","two":"2","three":"3","count":{"12":"2","5":"prime number"}}

print(d)

print(d["two"])

print(d["count"]["5"])

**OUTPUT:**

#{'one': '1', 'two': '2', 'three': '3', 'count': {'12': '2', '5': 'prime number'}}

#2

#prime number

**Programs on Statistical Concepts and introduction to Linear Algebra using Python**

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**PROBLEM STATEMENT 1:** WRITE A PROGRAM TO FIND THE MEAN. MODE AND MEDIAN OF THE GIVEN RANGE OF NUMBERS.

**SOURCE CODE:**

list1 = [1,2,3,4,5,6,7,8,9,10,2]

sum = 0

for i in list1:

sum = sum + i

mean = sum /len(list1)

print("Mean of the list is: ",mean)

print()

median =int(len(list1)/2)

print("Meadian of the list is: ",list1[median])

print()

mode = max(set(list1), key = list1.count)

print("Mode of the list is: ",mode)

**OUTPUT:**

#Mean of the list is: 5.181818181818182

#Meadian of the list is: 6

#Mode of the list is: 2

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**PROBLEM STATEMENT 2:** WRITE A PROGRAM TO CALCULATE THE STANDARD DEVIATION OF A GIVEN SET OF NUMBERS.

**SOURCE CODE:**

import math

list1 = [1,2,3,4,5,6,7,8,9,10,2]

list2=[]

sum = 0

for i in list1:

sum = sum + i

mean = int(sum /len(list1))

for i in list1:

diff =abs(int( mean - i))

list2.append(diff)

sum1 = 0

for i in list2:

sum1 = sum1 +(i\*i)

sum1 = sum1/len(list2)

std = math.sqrt(sum1)

print("Standard deviation is: ",std)

**OUTPUT:**

#Standard deviation is: 2.9232609437842774

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**PROBLEM STATEMENT 3:** WRITE A PROGRAM TO CALCULATE THE ADDITION OF TWO 3X 3 MATRICES.

**SOURCE CODE:**

num1 = [[1,2,3],

[4,5,6],

[7,8,9]]

num2= [[11,18,37],

[61,51,44],

[13,42,11]]

result = [[0,0,0],

[0,0,0],

[0,0,0]]

for i in range(len(num1)):

for j in range(len(num1[0])):

result[i][j] = num1[i][j] + num2[i][j]

for r in result:

print(r)

**OUTPUT:**

#[12, 20, 40]

#[65, 56, 50]

#[20, 50, 20]

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**PROBLEM STATEMENT 4:** WRITE A PROGRAM TO CALCULATE THE MULTIPLICATION OF TWO 3X 3 MATRICES.

**SOURCE CODE:**

num1 = [[15, 4, 13],

[12, 14, 16],

[4, 17, 9]]

num2 = [[3, 12, 4],

[14, 31, 6],

[12, 17, 5]]

Result = [[0, 0, 0],

[0, 0, 0],

[0, 0, 0]]

for m in range(len(num1)):

for n in range(len(num2[0])):

for o in range(len(num2)):

Result[m][n] += num1[m][o] \* num2[o][n]

for res in Result:

print(res)

**OUTPUT:**

#[257, 525, 149]

#[424, 850, 212]

#[358, 728, 163]

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**PROBLEM STATEMENT 6:** WRITE A PROGRAM TO CALCULATE THE TRANSPOSE OF THE GIVEN MATRIX.

**SOURCE CODE:**

X = [[1,2],

[3 ,4],

[5 ,6]]

result = [[0,0,0],

[0,0,0]]

for i in range(len(X)):

for j in range(len(X[0])):

result[j][i] = X[i][j]

for r in result:

print(r)

**OUTPUT:**

#[1, 3, 5]

#[2, 4, 6]