**NAME: SAGAR BHATIA**

**COURSE: MCA**

**STUDENTID: 20711069**

**QUESTION 1:** Write a program to use the mathematical operators.

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

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

sum = a+b

dif=a-b

mul=a\*b

div=a/b

mod=a%b

print(sum)

print(dif)

print(mul)

print(div)

print(mod)

**OUTPUT:**

Enter first number: 15

Enter second number 10

25

5

150

1.5

5

**QUESTION 2:** Write a program to take an input of numbers from the user and print the Fibonacci series to the terminal number.

n = int(input("How many terms? "))

n1, n2 = 0, 1

count = 0

if n <= 0:

print("Please enter a positive integer")

elif n == 1:

print("Fibonacci sequence upto",n,":")

print(n1)

else:

print("Fibonacci sequence:")

while count < n:

print(n1)

nth = n1 + n2

n1 = n2

n2 = nth

count += 1

**OUTPUT:**

How many terms? 8

Fibonacci sequence:

0

1

1

2

3

5

8

13

**QUESTION 3:** Write a program to print the factorial of the number input by the user.

n = int(input("enter no: "))

fact = 1

if n < 0:

print(" Factorial does not exist for negative numbers")

elif n == 0:

print("The factorial of 0 is 1")

else:

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

fact = fact \* i

print(fact)

**OUTPUT:**

enter no: 5

120

**QUESTION 4:** Write a program to check whether a given number is a prime number or not using loops.

n=int(input("enter no: "))

flag=0

m=0

m=n/2

while(m>0):

  if(n%2==0):

    print("number is not a prime number")

    flag=1

    break

  if(flag==0):

    print("number is a prime number")

  break

**OUTPUT:**

enter no: 97

number is a prime number

**QUESTION 5:** Write a program to demonstrate the importing of modules of python.

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("Substraction of a two number: ",num2)

**module.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

**OUTPUT:**

Enter the first number: 10

Enter the second number: 15

Sum of a number: 25

Multiplication of a number: 150

Substraction of a two number: -5

**QUESTION 6:** Write a program to demonstrate the use of nested if statements.

n=int(input("enter no: "))

if n==0:

  print("number is zero")

if n>0:

  print("number is positive number")

if n<0:

  print("number is negative number")

**OUTPUT:**

enter no: 7

number is positive number

**QUESTION 7:** Write a program to demonstrate the use of the else clause.

age=int(input("enter age: "))

if age>=18:

  print("candiate is allowed to vote")

else:

  print("candiate is allowed to vote")

**OUTPUT:**

enter age: 45

candiate is allowed to vote

**QUESTION 8:** Write a program to illustrate the usage of Tuples.

thistuple = ("apple", "banana", "cherry")

print(thistuple)

**OUTPUT:**

('apple', 'banana', 'cherry')

**QUESTION 9:** Write a program for searching an element and sorting a List.

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: 3

number is found

-----Sorted List----------

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

**QUESTION 10:** Write a program to illustrate the usage of Dictionaries.

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

**QUESTION 11:** Write a program to find the mean. mode and median of the given range of numbers.

import numpy as np

from scipy import stats

dataset = [98, 21, 98, 34, 23, 31]

mean = np.mean(dataset)

print(mean)

median = np.median(dataset)

print(median)

mode = stats.mode(dataset)

print(mode)

**OUTPUT:**

50.833333333333336

32.5

ModeResult(mode=array([98]), count=array([2]))

**QUESTION 12:** Write a program to calculate the standard deviation of a given set of numbers.

import statistics

data = [15, 43, 54, 2, 13]

print("Standard Deviation of sample is %s " % (statistics.stdev(data)))

data2 = [5, 4, 76, 56]

print("Standard Deviation of sample is %s " % (statistics.stdev(data2)))

**OUTPUT:**

Standard Deviation of sample is 22.006817125609057

Standard Deviation of sample is 36.436016979540085

**QUESTION 13:** Write a program to calculate the addition of two 3x 3 matrices.

matrix1 = [

[10, 20, 30],

[40, 50, 60],

[70, 80, 90]

]

matrix2 = [

[9, 8, 7],

[6, 5, 4],

[3, 2, 1]

]

matrix = [

[0, 0, 0],

[0, 0, 0],

[0, 0, 0]

]

for i in range(len(matrix1)):

for j in range(len(matrix1[0])):

matrix[i][j]=matrix1[i][j] + matrix2[i][j]

for res in matrix:

print(res)

**OUTPUT:**

[19, 28, 37]

[46, 55, 64]

[73, 82, 91]

**QUESTION 14:** Write a program to calculate the multiplication of two 3x 3 matrices.

matrix1 = [

[10, 20, 30],

[40, 50, 60],

[70, 80, 90]

]

matrix2 = [

[9, 8, 7],

[6, 5, 4],

[3, 2, 1]

]

matrix = [

[0, 0, 0],

[0, 0, 0],

[0, 0, 0]

]

for i in range(len(matrix1)):

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

for k in range(len(matrix2)):

matrix[i][j] += matrix1[i][k] \* matrix2[k][j]

for res in matrix:

print(res)

**OUTPUT:**

[300, 240, 180]

[840, 690, 540]

[1380, 1140, 900]

**QUESTION 15:** Write a program to calculate the inverse of the given matrix.

import numpy as np

A = np.array([[6, 1, 1, 3],

[4, -2, 5, 1],

[2, 8, 7, 6],

[3, 1, 9, 7]])

# Calculating the inverse of the matrix

print(np.linalg.inv(A))

**OUTPUT:**

[[ 0.13368984 0.10695187 0.02139037 -0.09090909]

[-0.00229183 0.02673797 0.14820474 -0.12987013]

[-0.12987013 0.18181818 0.06493506 -0.02597403]

[ 0.11000764 -0.28342246 -0.11382735 0.23376623]]

**QUESTION 16:** Write a program to calculate the transpose of the given matrix.

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]