***SET A***

**1)Write a Python program that simulates a basic calculator, performing addition, subtraction,**

**multiplication, and division.**

print("CALCULATOR")

def add(x, y):

return x + y

def subtract(x, y):

return x - y

def multiply(x, y):

return x \* y

def divide(x, y):

if y == 0:

return "Error! Division by zero."

return x / y

def calculator():

print("Select operation:")

print("1. Add")

print("2. Subtract")

print("3. Multiply")

print("4. Divide")

choice = input("Enter choice (1/2/3/4): ")

if choice in ['1', '2', '3', '4']:

num1 = float(input("Enter first number: "))

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

if choice == '1':

print(f"{num1} + {num2} = {add(num1, num2)}")

elif choice == '2':

print(f"{num1} - {num2} = {subtract(num1, num2)}")

elif choice == '3':

print(f"{num1} \* {num2} = {multiply(num1, num2)}")

elif choice == '4':

print(f"{num1} / {num2} = {divide(num1, num2)}")

else:

print("Invalid input")

calculator()

2) **Write a Python program that converts a given decimal number to its binary equivalent.**

dec =int(input("Enter the decimal number:"))

binary =""

while dec>0:

binary=str(dec%2)+binary

dec=dec//2

print("binary equvalence of your number is:",binary)

3) **Write a Python program that asks for the user's age and then prints a message stating whether the user is a minor, an adult, or a senior.**

age =int(input("Enter your age :"))

if age < 18 :

print("You are a minor")

elif age >= 18 and age < 60:

print("You are a adult")

else :

print("You are a senior")

4) **Write a Python program to swap the values of two variables without using a third variable.**

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

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

print(f"Before swapping the number first number ={a}, second number = {b}")

a = a+b

b = a-b

a = a-b

print(f"After swapping the number first number = {a}, second number = {b}")

5) **Write a Python program to print the first 10 numbers of the Fibonacci series.**

a = 1

b = 1

next\_term = a+b

print(f"The numbers of series are :" )

for i in range(0,10):

print(a,",",end ="")

a = b

b = next\_term

next\_term = a+b

6**)Write a Python program to check if a given number is prime or not.**

n = int(input("Enter your positive number: "))

flag = 0

if n <= 0 or n == 1:

flag = 1

else:

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

if n % i == 0:

flag = 1

break

if flag == 0:

print("It is a prime number")

else:

print("It is not a prime number")

7)**Write a Python program that takes three numbers as input and checks if the third number is the**

**sum of the first two numbers using logical operators.**

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

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

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

if (num1 + num2 == num3) and (num3-num2==num1 or num3-num1==num2):

print("The third number is the sum of the first two numbers.")

else:

print("The third number is not the sum of the first two numbers.")

8)**Write a Python program that imports a custom module you created with a function that returns**

**the factorial of a number.**

#File1(fact.py)

def fact(n):

x = 1

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

x = x \* i

return x

#File 2(question8.py)

from fact import fact

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

result = fact(n)

print("Factorial of your number is :",result)

**9)Write a Python program that takes two numbers as input and performs division, handling the**

**case where the divisor is zero.**

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

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

if (b==0):

print("Can't be divisible by zero")

else :

c = a/b

print(f"The division of your number is : {c}")

**10) Write a Python function that takes a list of numbers and returns the maximum value in the list.**

numbers = list(map(int, input("Enter numbers separated by spaces: ").split()))

if len(numbers) == 0:

max\_value = None

else:

max\_value = numbers[0]

for number in numbers:

if number > max\_value:

max\_value = number

print("The maximum value in the list is:", max\_value)

11) **Write a Python function that takes a name and an optional age parameter and prints a greeting.**

**If the age is not provided, it should default to 25.**

name = input("Please enter your name: ")

age\_input = input("Please enter your age (press Enter to skip): ")

age = int(age\_input) if age\_input else 25

print(f"Hello, {name}! You are {age} years old.")

12) **Write a Python program to count the number of vowels in a given string.**

s = input("Please enter a string: ")

vowels = "aeiouAEIOU"

count = 0

for char in s:

if char in vowels:

count += 1

print(f"The number of vowels in the string is: {count}")

1. **Write a Python program that prints a multiplication table up to (numberx10).**

num =int(input("Enter the number which multiplication table you want :"))

for i in range (1,11):

print(num,"X",i,"=",num\*i)

**14)Write a Python program to print a right-angled triangle of '\*' with a given number of rows.**

num\_rows = int(input("Enter the number of rows: "))

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

print('\*' \* i)

**15)Write a Python program to print a pyramid of '\*' with a given number of rows.**

num\_rows = int(input("Enter the number of rows: "))

for i in range(num\_rows):

print(' ' \* (num\_rows - i - 1), end='')

print('\*' \* (2 \* i + 1))

**SET-B**

**1)Given an integer x, return true if x is a palindrome, and false otherwise. (LeetCode: Palindrome**

**Number)**

x = int(input("Enter an integer: "))

str\_x = str(x)

if str\_x == str\_x[::-1]:

print(f"{x} is a palindrome.")

else:

print(f"{x} is not a palindrome.")

**2)Given a non-empty array of integers nums, every element appears twice except for one. Find**

**that single one. (LeetCode: Single Number)**

nums = list(map(int, input("Enter numbers separated by spaces: ").split()))

single\_number = 0

for num in nums:

single\_number ^= num

print(f"The single number in the array is: {single\_number}")

3)**Given an array of integers nums and an integer target return indices of the two numbers such**

**that they add up to target. You may assume that each input would have exactly one solution,**

**and you may not use the same element twice. You can return the answer in any order.**

**(LeetCode: Two Sum)**

def two\_sum(nums, target):

num\_map = {}

for i, num in enumerate(nums):

complement = target - num

if complement in num\_map:

return [num\_map[complement], i]

num\_map[num] = i

return []

input\_nums = input("Enter numbers separated by spaces: ").split()

nums = list(map(int, input\_nums))

target = int(input("Enter the target sum: "))

result = two\_sum(nums, target)

if result:

print(f"Indices of the two numbers that add up to {target}: {result}")

else:

print("No solution found.")

**4) Write an algorithm to determine if a number *n* is happy. (LeetCode: Happy Number)**

def is\_happy(n):

seen = set()

while n != 1 and n not in seen:

seen.add(n)

n = sum(int(digit) \*\* 2 for digit in str(n))

return n == 1

num = int(input("Enter a number to check if it's happy: "))

if is\_happy(num):

print(f"{num} is a happy number.")

else:

print(f"{num} is not a happy number.")

**5)Given an integer array nums, return trueif any value appears at least twice in the array, and**

**return falseif every element is distinct. (LeetCode: Contains Duplicate)**

def contains\_duplicate(nums):

seen = set()

for num in nums:

if num in seen:

return True

seen.add(num)

return False

input\_nums = input("Enter numbers separated by spaces: ").split()

nums = list(map(int, input\_nums))

if contains\_duplicate(nums):

print("True.")

else:

print("False.")