1. Write a Python program to print "Hello, World!" to the console.

Code:-

```python
print("Hello, World!")
```

Output:-

```
Hello, World!
```

2. Create a program that takes two numbers as input and prints their sum.

Code:-

```python
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
sum = num1 + num2
print("The sum of", num1, "and", num2, "is:", sum)
```

Output:-

```
Enter the first number: 5
Enter the second number: 7
The sum of 5.0 and 7.0 is: 12.0
```

3. Write a program that calculates the area of a rectangle given its length and width.

Code:-

```python
length = float(input("Enter the length of the rectangle: "))
width = float(input("Enter the width of the rectangle: "))
area = length * width
print("The area of the rectangle is:", area)
```

Output:-

```
Enter the length of the rectangle: 4
Enter the width of the rectangle: 5
The area of the rectangle is: 20.0
```

4. Create a Python program that checks if a number is even or odd.

Code:-

```python
num = int(input("Enter a number: "))
if num % 2 == 0:
    print(num, "is an even number.")
else:
    print(num, "is an odd number.")
```

Output:-

```
Enter a number: 10
10 is an even number.
Enter a number: 11
11 is an odd number.
```

5. Write a program to find the largest among three numbers.

Code:-

```python
num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))
num3 = float(input("Enter the third number: "))
if num1 >= num2 and num1 >= num3:
    largest = num1
elif num2 >= num1 and num2 >= num3:
    largest = num2
else:
    largest = num3
print("The largest number is:", largest)
```

Output:-

```
Enter the first number: 10
Enter the second number: 20
Enter the third number: 30
The largest number is: 30.0
```

6. Calculate the factorial of a number using a Python program.

Code:-

```python
num = int(input("Enter a number: "))
factorial = 1
for i in range(1, num + 1):
    factorial *= i
print("The factorial of", num, "is:", factorial)
```

Output:-

```
Enter a number: 5
The factorial of 5 is: 120
```

7. Create a program that checks if a given year is a leap year.

Code:-

```python
year = int(input("Enter a year: "))
if year % 4 == 0 and (year % 100 != 0 or year % 400 == 0):
    print(year, "is a leap year.")
else:
    print(year, "is not a leap year.")
```

Output:-

```
Enter a year: 2020
2020 is a leap year.
Enter a year: 2021
2021 is not a leap year.
```

8. Write a program that swaps the values of two variables.

Code:-

```python
var1 = input("Enter the first variable: ")
var2 = input("Enter the second variable: ")
print("Before swapping:")
print("Variable 1:", var1)
print("Variable 2:", var2)
var1, var2 = var2, var1
print("After swapping:")
print("Variable 1:", var1)
print("Variable 2:", var2)
```

Output:-

```
Enter the first variable: Hello
Enter the second variable: World
Before swapping:
Variable 1: Hello
Variable 2: World
After swapping:
Variable 1: World
Variable 2: Hello
```

9. Calculate the square root of a number using Python.

Code:-

```python
num = float(input("Enter a number: "))
if num < 0:
    print("Error: Square root of a negative number is not a real number.")
else:
    sqrt = num ** 0.5
    print("The square root of", num, "is:", sqrt)
```

Output:-

```
Enter a number: 16
The square root of 16.0 is: 4.0
Enter a number: -4
Error: Square root of a negative number is not a real number.
```

10. Create a program to convert temperature from Fahrenheit to Celsius.

Code:-

```
fahrenheit = float(input("Enter the temperature in Fahrenheit: "))
celsius = (fahrenheit - 32) * 5.0/9.0
print(fahrenheit, "Fahrenheit is equal to", celsius, "Celsius.")
```

Output:-

```
Enter the temperature in Fahrenheit: 100
100.0 Fahrenheit is equal to 37.77777777777778 Celsius.
```

11. Write a Python program to generate the Fibonacci sequence.

Code:-

```
num_terms = int(input("Enter the number of terms: "))
a, b = 0, 1
print("Fibonacci sequence:")
print(a)
print(b)
for i in range(2, num_terms)
   next_term = a + b
   print(next_term)
     a = b
   b = next_term
```

Output:-

```
Enter the number of terms: 10
Fibonacci sequence:
0
1
1
2
3
5
8
13
21
34
```

12. Calculate the sum of all elements in a list using a program.

Code:-

```
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
sum = 0
for num in numbers:
    sum += num
print("Sum of all elements in the list:", sum)
```

Output:-

```
Sum of all elements in the list: 55
```

13. Create a program to find the largest element in a list.

Code:-

```
numbers = [12, 45, 7, 23, 56, 89, 34]
largest = numbers[0]
for num in numbers:
    if num > largest:
        largest = num
print("The largest element in the list is:", largest)
```

Output:-

```
The largest element in the list is: 89
```

14. Write a program to check if a string is a palindrome.

Code:-

```
string = input("Enter a string: ")
string = string.replace(" ", "").lower()
if string == string[::-1]:
    print("The string is a palindrome.")
else:
    print("The string is not a palindrome.")
```

Output:-

```
Enter a string: Madam
The string is a palindrome.
Enter a string: Hello
The string is not a palindrome.
```

15. Calculate the factorial of a number using both iterative and recursive approaches in separate programs.

Code:-

```
num = int(input("Enter a number: "))
factorial = 1
for i in range(1, num + 1):
    factorial *= i
print("The factorial of", num, "is:", factorial)
```

Output:-

```
Enter a number: 5
The factorial of 5 is: 120
```

Recursive Approach:

Code:-

```
def factorial(num):
    if num == 0 or num == 1:
        return 1
    else:
        return num * factorial(num - 1)
num = int(input("Enter a number: "))
result = factorial(num)
print("The factorial of", num, "is:", result)
```

Output:-

```
Enter a number: 5
The factorial of 5 is: 120
```

16. Create a program that generates a random number between 1 and 100.

Code:-

```
import random
random_number = random.randint(1, 100)
print("The random number is:", random_number)
```

Output:-

```
The random number is: 53
```

17. Write a Python program to find the GCD (Greatest Common Divisor) of two numbers.

Code:-

```python
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))
def gcd(a, b):
    while b != 0:
        a, b = b, a % b
    return a
result = gcd(num1, num2)
print("The GCD of", num1, "and", num2, "is:", result)
```

Output:-

```
Enter the first number: 48
Enter the second number: 18
The GCD of 48 and 18 is: 6
```

18. Calculate the sum of all even numbers from 1 to 100 using a program.

Code:-

```python
total=0
for num in range(1, 101):
    if num % 2 == 0:
        total += num
print("The sum of all even numbers from 1 to 100 is:", total)
```

Output:-

```
The sum of all even numbers from 1 to 100 is: 2550
```

19. Create a program that reverses a given string.

Code:-

```python
input_string = input("Enter a string: ")

reversed_string = input_string[::-1]

print("The reversed string is:", reversed_string)
```

Output:-

```
Enter a string: Hello World

The reversed string is: dlroW olleH
```

20. Write a Python program to check if a number is prime.

Code:-

```python
num = int(input("Enter a number: "))
def is_prime(n):
    if n <= 1:
        return False
    for i in range(2, int(n**0.5) + 1):
        if n % i == 0:
            return False
    return True
if is_prime(num):
    print(num, "is a prime number.")
else:
    print(num, "is not a prime number.")
```

Output:-

```
Enter a number: 25
25 is not a prime number.
```

21. Calculate the area of a circle given its radius using a program.

Code:-

```python
import math
radius = float(input("Enter the radius of the circle: "))
area = math.pi * (radius ** 2)
print("The area of the circle is:", area)
```

Output:-

```
Enter the radius of the circle: 5
The area of the circle is: 78.53981633974483
```

22. Create a program that counts the number of vowels in a string.

Code:-

```
input_string = input("Enter a string: ")
vowel_count = 0
vowels = "aeiouAEIOU"

for char in input_string:
    if char in vowels:
        vowel_count += 1
print("The number of vowels in the string is:", vowel_count)
```

Output:-

```
Enter a string: Hello World
The number of vowels in the string is: 3
```

23. Write a program to check if a given number is positive, negative, or zero.

Code:-

```
num = float(input("Enter a number: "))
if num > 0:
    print(num, "is a positive number.")
elif num < 0:
    print(num, "is a negative number.")
else:
    print(num, "is zero.")
```

Output:-

```
Enter a number: 10
10.0 is a positive number.
Enter a number: -5
-5.0 is a negative number.
```

24. Calculate the power of a number using a program (e.g., 2^3 = 8).

Code:-

```
base = float(input("Enter the base: "))
exponent = float(input("Enter the exponent: "))
result = base ** exponent
print(base, "raised to the power of", exponent, "is:", result)
```

Output:-

```
Enter the base: 2
Enter the exponent: 3
2.0 raised to the power of 3.0 is: 8.0
Enter the base: 5
Enter the exponent: 2
5.0 raised to the power of 2.0 is: 25.0
```

25. Create a program to find the smallest element in a list.

Code:-

```
numbers = [12, 45, 7, 23, 56, 89, 34]
smallest = min(numbers)
print("The smallest element in the list is:", smallest)
```

Output:

```
The smallest element in the list is: 7
```

26. Write a Python program to find the LCM (Least Common Multiple) of two numbers.

Code:-

```
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))
def gcd(a, b):
    while b != 0:
        a, b = b, a % b
    return a
lcm = (num1 * num2) // gcd(num1, num2)
print("The LCM of", num1, "and", num2, "is:", lcm)
```

Output:-

```
Enter the first number: 12
Enter the second number: 15
The LCM of 12 and 15 is: 60
```

27. Calculate the average of numbers in a list using a program.

Code:-

```
numbers = [10, 20, 30, 40, 50]
total = sum(numbers)
average = total / len(numbers)
print("The average of the numbers is:", average)
```

Output:-

```
The average of the numbers is: 30.0
```

28. Create a program that generates a multiplication table for a given number.

Code:-

```
num = int(input("Enter a number: "))
print("Multiplication Table of", num)
for i in range(1, 11):
    print(num, "x", i, "=", num * i)
```

Output:-

```
Enter a number: 7
Multiplication Table of 7
7 x 1 = 7
7 x 2 = 14
7 x 3 = 21
7 x 4 = 28
7 x 5 = 35
7 x 6 = 42
7 x 7 = 49
7 x 8 = 56
7 x 9 = 63
7 x 10 = 70
```

29. Write a program to count the number of words in a string.

Code:-

```
input_string = input("Enter a string: ")
words = input_string.split()
word_count = len(words)

print("The number of words in the string is:", word_count)
```

Output:-

```
Enter a string: Hello World, this is a test string.
The number of words in the string is: 7
```

30. Calculate the sum of all prime numbers from 1 to 100 using a program.

Code:-

```
def is_prime(n):
    if n <= 1:
        return False
    for i in range(2, int(n**0.5) + 1):
        if n % i == 0:
            return False
    return True
sum_of_primes = 0
for num in range(1, 101):
    if is_prime(num):
        sum_of_primes += num
print("The sum of all prime numbers from 1 to 100 is:", sum_of_primes)
```

Output:

```
The sum of all prime numbers from 1 to 100 is: 1060
```