1. **Write a Python program to calculate the area of a rectangle using user input for length and width.**

**Answer:**

A=input()

B=input()

length = float(A)

width = float(B)

area = length \* width

print(f"Area of the rectangle: {area}")

**Input:**3,5

**Output:**15.0

1. **Write a Python program to find the maximum of three numbers using conditional statements.**

**Answer:**

a = int(input())

b = int(input())

c = int(input())

if a >= b and a >= c:

max\_num = a

elif b >= a and b >= c:

max\_num = b

else:

max\_num = c

print(f"The maximum number is {max\_num}")

**Input**:3,5,6

**Output:**6

**3. Write a Python program to swap the values of two variables without using a temporary variable.**

**Answer:**

a = int(input())

b = int(input())

a, b = b, a

print(f"Swapped values: a = {a}, b = {b}")

**input:** 9, 3

**Output**: Swapped values: a = 3, b = 9

1. **Write a Python program to convert temperature from Celsius to Fahrenheit and vice versa using functions.**

**Answer:**

def celsius\_to\_fahrenheit(celsius):

return (celsius \* 9/5) + 32

def fahrenheit\_to\_celsius(fahrenheit):

return (fahrenheit - 32) \* 5/9

temp = float(input("Enter temperature: "))

unit = input("Enter unit (C/F): ").upper()

if unit == "C":

print(f"Temperature in Fahrenheit: {celsius\_to\_fahrenheit(temp)}")

elif unit == "F":

print(f"Temperature in Celsius: {fahrenheit\_to\_celsius(temp)}")

else:

print("Invalid unit")

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

**Answer:**

vowels = "aeiouAEIOU"

string = input()

count = sum(1 for char in string if char in vowels)

print(f"Number of vowels: {count}")

**Input:**Leelavathi

**Output**:Number of vowels: 5

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

**Answer:**

def is\_prime(n):

if n < 2:

return False

for i in range(2, int(n \*\* 0.5) + 1):

if n % i == 0:

return False

return True

num = int(input())

print(f"{num} is prime" if is\_prime(num) else f"{num} is not prime")

**Input:**5

**Output**: 5 is prime

**7.Write a Python program to find the factorial of a given number using recursion.**

**Answer:**

def factorial(n):

return 1 if n == 0 else n \* factorial(n - 1)

num = int(input())

print(f"Factorial of {num} is {factorial(num)}")

**Input**:5

**Output:** Factorial of 5 is 120

1. **Write a Python program to generate the Fibonacci sequence up to a certain number of terms.**

**Answer:**

def fibonacci(n):

a, b = 0, 1

for \_ in range(n):

print(a, end=' ')

a, b = b, a + b

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

fibonacci(n)

**Input:**9

**Output:** Enter the number of terms: 0 1 1 2 3 5 8 13 21

1. **Write a Python program to remove duplicates from a list.**

**Answer:**

lst = list(map(int, input("Enter list elements: ").split()))

unique\_list = list(set(lst))

print(f"List after removing duplicates: {unique\_list}")

**Input:** 1 2 2 3 4 4 5

**Output:** List after removing duplicates: [1, 2, 3, 4, 5]

1. **Write a Python program to find the intersection of two lists.**

**Answer:**

list1 = set(map(int, input("Enter first list: ").split()))

list2 = set(map(int, input("Enter second list: ").split()))

print(f"Intersection: {list1 & list2}")

**Input:**

First list: 1 2 3 4 5

Second list: 3 4 5 6 7

**Output:** Intersection: {3, 4, 5}

**11. Write a Python program to find the longest word in a given list of words.**

**Answer:**

words = input().split()

longest\_word = max(words, key=len)

print(f"Longest word: {longest\_word}")

**Input**: apple banana cherry Pomegranate

**Output:** Longest word: Pomegranate

**12. Write a Python program to count the occurrences of each word in a given string.**

**Answer:**

from collections import Counter

text = input()

word\_counts = Counter(text.split())

print(word\_counts)

**Input**: apple banana cherry watermelon apple banana apple banana cherry watermelon

**Output:** Counter({'apple': 3, 'banana': 3, 'cherry': 2, 'watermelon': 2})

**13. Write a Python program to reverse a given string.**

**Answer:**

string = input("Enter a string: ")

print(f"Reversed string: {string[::-1]}")

**Input:** hello

**Output:** Reversed string olleh

**14. Write a Python program to sort a list of tuples based on the second element of each tuple.**

**Answer:**

tuples = [(1, 3), (3, 2), (2, 1)]

tuples.sort(key=lambda x: x[1])

print(tuples)

**Input:** [(1, 3), (3, 2), (2, 1)]

**Output**: [(2, 1), (3, 2), (1, 3)]

**15. Write a Python program to find the sum of all elements in a list using a loop.**

**Answer:**

nums = list(map(int, input().split()))

print(f"Sum: {sum(nums)}")

**Input:** 1 2 3 4 6

**Output:** Sum: 16

**16. Write a Python program to remove the last element from a list.**

**Answer:**

lst = list(map(int, input("Enter elements: ").split()))

lst.pop()

print(lst)

**Input**: 1 2 3 4 5

**Output**: [1, 2, 3, 4]

**17. Write a Python program to check if a given string is a palindrome.**

**Answer:**

string = input()

print("Palindrome" if string == string[::-1] else "Not a palindrome")

**Input:** madam

**Output:** Palindrome

**18. Write a Python program to find the common characters between two strings.**

**Answer:**

s1, s2 = input("Enter two strings: ").split()

print(set(s1) & set(s2))

**Input:** apple pineapple

**Output:** {'p', 'a', 'e', 'l'}

**19. FWrite a Python program to find the length of the longest consecutive sequence of a given list of integers.**

**Answer:**

def longest\_consecutive(nums):

nums = set(nums)

longest = 0

for num in nums:

if num - 1 not in nums:

length = 1

while num + length in nums:

length += 1

longest = max(longest, length)

return longest

lst = list(map(int, input("Enter numbers: ").split()))

print(longest\_consecutive(lst))

**Input:** 100 4 200 1 3 2

**Output:** 4

**20. Write a Python program to find the difference between two sets.**

**Answer:**

set1 = set(input("Enter first set: ").split())

set2 = set(input("Enter second set: ").split())

print(set1 - set2)

**Input:** {1, 2, 3, 4} {3, 4, 5, 6}

**Output:** {1, 2}

**21.Arithmetic Operators**

1. **Create two variables a and b with numeric values.**
2. **Calculate the sum, difference, product, and quotient of a and b.**
3. **Print the results.**

**Answer:**

a, b = 10, 20

print(f"Sum: {a + b}")

print(f"Difference: {a - b}")

print(f"Product: {a \* b}")

print(f"Quotient: {a / b}")

**Output:** Sum: 30

Difference: -10

Product: 200

Quotient: 0.5

**22. Comparison Operators**

1. **Compare the values of a and b using the following comparison operators: <, >, <=, >=, ==, and !=.**
2. **Print the results of each comparison.**

**Answer:**

a, b = 10, 20

print(a < b, a > b, a <= b, a >= b, a == b, a != b)

**Output:** False True False True False True

**23. Logical Operators**

1. **Create two boolean variables, x and y.**
2. **Use logical operators (and, or, not) to perform various logical operations on x and y.**
3. **Print the results.**

**Answer:**

x, y = True, False

print(x and y, x or y, not x)

**Output:** False True False

**24. Assignment Operators**

1. **Create a variable total and initialize it to 10.**
2. **Use assignment operators (+=, -=, \*=, /=) to update the value of total.**
3. **Print the final value of total.**

**Answer:**

total = 10

total += 5

total -= 2

total \*= 3

total /= 2

print(total)

**Output:** 19.5

**25. Bitwise Operators (Optional)**

1. **If you are comfortable with bitwise operators, perform some bitwise operations on integer values and print the results. If not, you can skip this task.**

**Answer:**

a, b = 10, 4

print(f"Bitwise AND: {a & b}")

print(f"Bitwise OR: {a | b}")

print(f"Bitwise XOR: {a ^ b}")

print(f"Bitwise NOT of a: {~a}")**:**

**Output:** Bitwise AND: 0

Bitwise OR: 14

Bitwise XOR: 14

Bitwise NOT of a: -11

**26. Identity and Membership Operators**

1. **Create a list my\_list containing a few elements.**
2. **Use identity operators (is and is not) to check if two variables are the same object.**
3. **Use membership operators (in and not in) to check if an element is present in my\_list.**
4. **Print the results**.

**Answer:**

my\_list = [1, 2, 3, 4]

a, b = my\_list, [1, 2, 3, 4]

print(a is b, a is not b)

print(3 in my\_list, 5 not in my\_list)

**Output:**

False True

True True