# 1. Calculate the area of a rectangle:

length = float(input("Enter length of the rectangle: "))

width = float(input("Enter width of the rectangle: "))

area = length \* width

print("The area of rectangle is:", area)

# 2.Convert miles to kilometers:

m=float(input("Enter distance in miles: "))

k= m\*1.60934

print("The distance in kilometers is: ",k)

# 3. Check if a string is a palindrome:

def is\_palindrome(s):

    return s==s[::-1]

str=input("Enter a string: ")

if is\_palindrome(str):

    print("The string is a palindrome.")

else:

    print("The string is not a palindrome.")

# 4. Find the second largest element in a list:

my\_list = [5, 3, 8, 1, 9, 4, 7]

second\_largest = sorted(my\_list)[-2]

print("The second largest element is:", second\_largest)

# 5. indentation means in Python

Indentation is used to define the structure and hierarchy of code blocks in Python, such as loops, conditional statements, and function definitions.

# 6. Perform set difference operation:

set1 = {1, 2, 3, 4, 5}

set2 = {4, 5, 6, 7, 8}

difference = set1 - set2

print("The set difference is:", difference)

# 7. Print numbers from 1 to 10 using a while loop:

n = 1

while n <= 10:

    print(n)

    n += 1

# 8. Calculate the factorial of a number using a while loop:

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

fact = 1

while n > 0:

    fact \*= n

    n -= 1

print("The factorial is:", fact)

 9. Check if a number is positive, negative, or zero using if-elif-else statements:

n = float(input("Enter a number: "))

if n > 0:

    print("The given number is positive.")

elif n < 0:

    print("The given number is negative.")

else:

    print("The given number is zero.")

# 10. Determine the largest among three numbers using conditional statements:

n1 = float(input("Enter the first number: "))

n2 = float(input("Enter the second number: "))

n3 = float(input("Enter the third number: "))

largest\_num = n1

if n2 > largest:

    largest = n2

if n3 > largest:

    largest\_num = n3

print("The largest number is:", largest\_num)

# 11. Create a NumPy array filled with ones of given shape:

import numpy as np

shape = tuple(map(int, input("Enter the shape of the array: ").split()))

arr\_ones = np.ones(shape)

print("Numpy aray filled with ones:")

print(arr\_ones)

# 12. Create a 2D NumPy array initialized with random integers:

import numpy as np

rows = int(input("Enter number of rows: "))

cols = int(input("Enter number of columns: "))

random\_arr = np.random.randint(1, 100, size=(rows, cols))

print("2D Array initialized with random integers:")

print(random\_arr)

# 13. Generate an array of evenly spaced numbers over a specified range using linspace:

import numpy as np

s = float(input("Enter start value: "))

e = float(input("Enter end value: "))

no\_points = int(input("Enter number of points: "))

result\_arr = np.linspace(s, e, no\_points)

print("array of evenly spaced numbers:")

print(result\_arr)

# 14. Generate an array of 10 equally spaced values between 1 and 100 using linspace:

import numpy as np

result\_arr = np.linspace(1, 100, 10)

print("Array of 10 equally spaced numbers between 1 and 100: ")

print(result\_arr)

# 15. Create an array containing even numbers from 2 to 20 using arange:

import numpy as np

even\_arr = np.arange(2, 21, 2)

print("Array containing even numbers from 2 to 20:")

print(even\_arr)

# 16. Create an array containing numbers from 1 to 10 with a step size of 0.5 using arange:

import numpy as np

arr = np.arange(1, 10.5, 0.5)

print("Array containing numbers from 1 to 10 with a step size of 0.5:")

print(arr)