**1.Write a Python program to calculate the area of a rectangle given its length and width.**

**def calculate\_rectangle\_area(length, width):**

**area = length \* width**

**return area**

**# Example usage:**

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

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

**area = calculate\_rectangle\_area(length, width)**

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

**2.Write a program to convert miles to kilometers**

**Def miles\_to\_kilometers(miles):**

**Kilometers = miles \* 1.60934**

**Return kilometers**

**# Example usage:**

**Miles = float(input(“Enter distance in miles: “))**

**Kilometers = miles\_to\_kilometers(miles)**

**Print(f”{miles} miles is equal to {kilometers:.2f} kilometers.”)**

**3.Write a function to check if a given string is a palindrome.**

**Def is\_palindrome(input\_string):**

**Cleaned\_string = ‘’.join(char.lower() for char in input\_string if char.isalnum())**

**Return cleaned\_string == cleaned\_string[::-1]**

**# Example usage:**

**User\_input = input(“Enter a string to check for palindrome: “)**

**Result = is\_palindrome(user\_input)**

**If result:**

**Print(“It’s a palindrome!”)**

**Else:**

**Print(“It’s not a palindrome.”)**

**4.Write a Python program to find the second largest element in a list.**

**Def find\_second\_largest(lst):**

**If len(lst) < 2:**

**Return “List should have at least two elements.”**

**Unique\_elements = set(lst)**

**Sorted\_elements = sorted(unique\_elements, reverse=True)**

**Return sorted\_elements[1]**

**# Example usage:**

**User\_list = [int(x) for x in input(“Enter a list of numbers separated by spaces: “).split()]**

**Second\_largest = find\_second\_largest(user\_list)**

**Print(“The second largest element in the list is:”, second\_largest)**

**5.Explain what indentation means in Python.**

**In Python, indentation is a fundamental part of the syntax and is used to define blocks of code. Unlike many other programming languages that use braces or keywords to denote blocks, Python uses indentation to indicate the grouping of statements.**

**Indentation helps to visually represent the structure of the code. A consistent level of indentation is used to indicate which statements belong to a particular block, such as those within a function, loop, or conditional statement. Python relies on the level of indentation to determine the scope of code blocks.**

**If condition:**

**# Code block inside the if statement**

**Statement1**

**Statement2**

**# Code outside the if statement**

**The indentation level (typically using spaces or tabs) indicates the scope of the code within the if statement. It’s crucial to maintain consistent and proper indentation to ensure the code’s correctness. Incorrect indentation may lead to syntax errors or unintended logical behavior.**

**6.Write a program to perform set difference operation.**

**Set1 = {1, 2, 3, 4, 5}**

**Set2 = {3, 4, 5, 6, 7}**

**Difference\_set = set1 – set2**

**Print(“Set Difference:”, difference\_set)**

7.Write a Python program to print numbers from 1 to 10 using a while loop.

**Num = 1**

**While num <= 10:**

**Print(num)**

**Num += 1**

8.Write a program to calculate the factorial of a number using a while loop.

**Def calculate\_factorial(n):**

**Result = 1**

**While n > 0:**

**Result \*= n**

**N -= 1**

**Return result**

**Number = int(input(“Enter a number: “))**

**Factorial = calculate\_factorial(number)**

**Print(f”The factorial of {number} is: {factorial}”)**

**9.Write a Python program to check if a number is positive, negative, or zero using if-elif-else statements.**

**Num = float(input(“Enter a number: “))**

**If num > 0:**

**Print(“Positive number”)**

**Elif num < 0:**

**Print(“Negative number”)**

**Else:**

**Print(“Zero”)**

10.Write a program to determine the largest among three numbers using conditional statements.

**Num1 = float(input(“Enter first number: “))**

**Num2 = float(input(“Enter second number: “))**

**Num3 = float(input(“Enter third number: “))**

**Largest = max(num1, num2, num3)**

**Print(“The largest number is:”, largest)**

**11.Write a Python program to create a numpy array filled with ones of given shape.**

**Import numpy as np**

**Shape = (2, 3) # Adjust the shape as needed**

**Ones\_array = np.ones(shape)**

**Print(“Numpy Array filled with ones:\n”, ones\_array)**

**12.Write a program to create a 2D numpy array initialized with random integers.**

**Import numpy as np**

**Shape = (2, 3) # Adjust the shape as needed**

**Random\_array = np.random.randint(1, 100, shape)**

**Print(“2D Numpy Array with random integers:\n”, random\_array)**

**13.Write a Python program to generate an array of evenly spaced numbers over a specified range using linspace**

**Import numpy as np**

**Start, stop, num\_values = 2, 20, 10 # Adjust the range and number of values as needed**

**Evenly\_spaced\_array = np.linspace(start, stop, num\_values)**

**Print(“Array of evenly spaced numbers using linspace:\n”, evenly\_spaced\_array)**

**14.Write a program to generate an array of 10 equally spaced values between 1 and 100 using linspace.**

**Import numpy as np**

**Values = np.linspace(1, 100, 10)**

**Print(“Array of 10 equally spaced values between 1 and 100:\n”, values)**

**15.Write a Python program to create an array containing even numbers from 2 to 20 using arange.**

**Import numpy as np**

**Even\_array = np.arange(2, 21, 2)**

**Print(“Array containing even numbers from 2 to 20 using arange:\n”, even\_array)**

**16.Write a program to create an array containing numbers from 1 to 10 with a step size of 0.5 using arange.**

**Import numpy as np**

**Array\_with\_step = np.arange(1, 11, 0.5)**

**Print(“Array containing numbers from 1 to 10 with a step size of 0.5 using arange:\n”, array\_with\_step)**