

ASSESSMENT-1

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

```
l = float(input('Enter the length of a Rectangle: '))  
b = float(input('Enter the breadth of a Rectangle: '))  
Area = l * b  
print("Area of a Rectangle is: %.2f" %Area)
```

2. Write a program to convert miles to kilometers

```
miles = float(input("Enter the Miles = "))  
kilometers = miles * 1.6093435  
print("%.2f Miles equals %.2f Kilometers " %(miles,  
kilometers))
```

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

```
def is_palindrome(s):  
    string = s  
    if (string==string[::-1]):
```

```
        print("The string IS a palindrome")
    else:
        print("The string is NOT a palindrome")
return
```

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

```
a=[]
n=int(input("Enter number of elements:"))
for i in range(1,n+1):
    b=int(input("Enter element:"))
    a.append(b)
a.sort()
print("Second largest element is:",a[n-2])
```

5. Explain what indentation means in Python

Indentation refers to the spaces at the beginning of a code line.

Where in other programming languages the indentation in code is for readability only, the indentation in Python is very important.

Python uses indentation to indicate a block of code.

6. Write a program to perform set difference operation.

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

```
set2 = {3, 4, 5, 6, 7}
```

```
difference1 = set1 - set2
```

```
print("Set difference using '-' operator:", difference1)
```

```
difference2 = set1.difference(set2)
```

```
print("Set difference using difference() method:", difference2)
```

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 factorial(n)
```

```
    if n < 0:
```

```
        return "Factorial is not defined for negative numbers"
```

```
    result = 1
```

```
    while n > 0:
```

```
        result *= n
```

```
        n -= 1
```

```
    return result
```

```
number = 5
```

```
print("Factorial of", number, "is", factorial(number))
```

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

```
def check_number(number):  
    if number > 0:  
        print("The number is positive.")  
    elif number < 0:  
        print("The number is negative.")  
    else:  
        print("The number is zero.")  
check_number(5)  
check_number(-3)  
check_number(0)
```

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

```
def find_largest(a, b, c):  
    if a >= b and a >= c:  
        largest = a  
    elif b >= a and b >= c:  
        largest = b  
    else:  
        largest = c  
    return largest  
  
num1 = 10  
num2 = 20
```

```
num3 = 15
```

```
largest_number = find_largest(num1, num2, num3)
```

```
print("The largest number among", num1, ",", num2, ",  
and", num3, "is:", largest_number)
```

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

```
import numpy as np
```

```
def create_ones_array(shape):
```

```
    ones_array = np.ones(shape)
```

```
    return ones_array
```

```
shape = (3, 4) # Shape of the array, e.g., a 3x4 matrix
```

```
ones_array = create_ones_array(shape)
```

```
print("Array filled with ones of shape", shape, ":\n",  
ones_array)
```

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

```
import numpy as np
```

```
def create_random_array(rows, cols, low, high):
```

```
    random_array = np.random.randint(low, high, size=(rows,  
cols))
```

```
    return random_array
```

```
rows = 3
```

```
cols = 4
```

```
low = 1
```

```
high = 10
```

```
random_array = create_random_array(rows, cols, low, high)
```

```
print("2D NumPy array initialized 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
```

```
def generate_linspace(start, stop, num):
```

```
    linspace_array = np.linspace(start, stop, num)
```

```
    return linspace_array
```

```
start = 0
```

```
stop = 10
```

```
num = 5
```

```
linspace_array = generate_linspace(start, stop, num)
```

```
print("Array of evenly spaced numbers over the range  
[{}, {}] with {} samples:\n{}".format(start, stop, num,  
linspace_array))
```

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

```
import numpy as np
```

```
array = np.linspace(1, 100, 10)
```

```
print("Array of 10 equally spaced values between 1 and  
100:")  
print(array)
```

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

```
import numpy as np  
even_numbers = np.arange(2, 21, 2)  
print("Array containing even numbers from 2 to  
20:")  
print(even_numbers)
```

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  
numbers = np.arange(1, 10.5, 0.5)  
print("Array containing numbers from 1 to 10 with a step  
size of 0.5:")  
print(numbers)
```