ASSESSMENT-1

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

```
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)
```

```
Enter length of the rectangle: 12
Enter width of the rectangle: 5
The area of rectangle is: 60.0
```

2. Write a program to convert miles to kilometers

```
m=float(input("Enter distance in miles: "))
k= m*1.60934
print("The distance in kilometers is: ",k)
```

```
Enter distance in miles: 4
The distance in kilometers is:  6.43736
```

3. Write a function to check if a given 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.")
```

```
Enter a string: MADAM
The string is a palindrome.
```

4. Write a Python program to 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)
```

```
The second largest element is: 8
```

5. Explain what 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. Write a program to 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)
```

```
The set difference is: {1, 2, 3}
```

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

```
n = 1
while n <= 10:
    print(n)
    n += 1
```

```
1
2
```

```
3
4
5
6
7
8
9
10
```

8. Write a program to 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)
```

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

9. Write a Python program to 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.")
```

```
Enter a number: -2
The given number is negative.
```

10. Write a program to 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_num:
    largest_num = n2
if n3 > largest_num:
    largest_num = n3
print("The largest number is:", largest_num)
```

```
Enter the first number: 1
Enter the second number: 2
Enter the third number: 3
The largest number is: 3.0
```

11. Write a Python program to 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)
```

```
Enter the shape of the array: 3
Numpy aray filled with ones:
[1. 1. 1.]
```

12. Write a program to 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)
```

```
Enter number of rows: 2
Enter number of columns: 2
2D Array initialized with random integers:
[[59 64]
 [61 77]]
```

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

```
import numpy as np
start_value = float(input("Enter start value: "))
end_value = float(input("Enter end value: "))
num_points = int(input("Enter number of points: "))
result_array = np.linspace(start_value, end_value, num_points)
print("Array of evenly spaced numbers:")
print(result_array)
```

```
Enter start value: 1
Enter end value: 7
Enter number of points: 3
Array of evenly spaced numbers:
[1. 4. 7.]
```

14. Write a program to 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)
```

```
Array of 10 equally spaced numbers between 1 and 100:
[  1.  12.  23.  34.  45.  56.  67.  78.  89. 100.]
```

15. Write a Python program to 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)
```

```
Array containing even numbers from 2 to 20:
[ 2  4  6  8 10 12 14 16 18 20]
```

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
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)
```

```
Array containing numbers from 1 to 10 with a step size of 0.5:
[ 1.   1.5  2.   2.5  3.   3.5  4.   4.5  5.   5.5  6.   6.5  7.   7.5
  8.   8.5  9.   9.5 10. ]
```