ASSESSMENT -1 (GOOGLE AI&ML)

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

```
length = float(input("length of the rectangle: "))
width = float(input("width of the rectangle: "))
area = length * width
print("Area of rectangle is:", area)
```

```
length of the rectangle: 23
width of the rectangle: 21
Area of rectangle is: 483.0
```

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∨ 2. Write a program to convert miles to kilometers

```
def miles_to_kilometers(miles):
    kilometers = miles * 1.60934
    return kilometers
# Taking input from the user
miles = float(input("Enter the distance in miles: "))
# Converting miles to kilometers
kilometers = miles_to_kilometers(miles)
# Displaying the result
print(f"{miles} miles is equal to {kilometers} kilometers")
```

```
Enter the distance in miles: 12
12.0 miles is equal to 19.31208 kilometers
```

∨ 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: 121
The string is a palindrome.
```

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

```
l = [6, 4, 6, 2, 9, 11, 7]
second_largest = sorted(l)[-2]
print("The second largest element is:", second_largest)
```

```
The second largest element is: 9
```

∨ 5. Explain what indentation means in Python

ANS:

Identation means it represents the structure for writing a program. It 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: 21
The given number is positive.
```

⌄ 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: "))
if n1>n2:
  if n1>n3:
    print("First number is largest")
elif n2>n3:
  if n2>n1:
    print("Second number is largest")
else:
  print("Third number is largest")
```

```
    Enter the first number: 23
    Enter the second number: 43
    Enter the third number: 21
    Second number is largest
```

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:
    [[32 48]
     [81 46]]
```

13. Write a Python program to 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)
```

```
    Enter start value: 12
    Enter end value: 34
    Enter number of points: 3
    array of evenly spaced numbers:
    [12. 23. 34.]
```

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

```python
import numpy as np
result_arr = np.linspace(1, 200, 8)
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.          29.42857143  57.85714286  86.28571429 114.71428571
     143.14285714 171.57142857 200.         ]
```

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

```python
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.

```python
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. ]
```

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