SMART INTERNZ - APSCHE AI / ML Training

Assessment-1

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

In [64]:
```
length_of_rectangle=float(input('Enter the "Length of Rectangle" :'))
width_of_rectangle=float(input('Enter the "Width of Rectangle" :'))
area_of_rectangle=length_of_rectangle*width_of_rectangle
if length_of_rectangle<=0 or width_of_rectangle<=0:
    print("Please enter the Positive Values for 'Length and Width of Rectangle'")
else:
    print('The Area of Rectangle is:',area_of_rectangle)
```

```
Enter the "Length of Rectangle" :6
Enter the "Width of Rectangle" :5
The Area of Rectangle is: 30.0
```

2.Write a program to convert miles to kilometers

In [10]:
```
#1mile=1.60934
miles=float(input('Enter the No.of Miles: '))
kilometers=miles*1.60934
print('The conversion of ',miles,' miles into Kilometers is :',kilometers,'kilometers',sep='')
```

```
Enter the No.of Miles: 2.3
The conversion of 2.3 miles into Kilometers is :3.7014819999999995kilometers
```

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

In [60]:

```
#Palindrome for String
def palindrome_string(string):
    j=-1
    flag=0
    for i in string:
        if i!=string[j]:
            flag=1
            break
            pass
        j=j-1
        pass
    if flag==1:
        print('The given String is not a Palindrome')
        pass
    else:
        print('The given String is a Palindrome')
        pass
    pass
palindrome_string(string='akka')
```

```
The given String is a Palindrome
```

(or)

In [75]:

```
#Using slicing operation to check given string is Palindrome or not
def palindrome_num(string_1):
    if(string_1==string_1[::-1]):
        print('The given String is palindrome')
        pass
    else:
        print('The given String is not a palindrome')
        pass
    pass
palindrome_num(string_1='malayalam')

```

```
The given String is palindrome
```

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

In [2]:
```
count=0
range=int(input('Enter the range of a list you required: '))
list1=[]
while True :
    b=int(input('Enter the list elements'))
    list1.append(b)
    count=count+1
    if count==range:
        break
        pass
    pass
pass
list2=set(list1)
sorted_list=sorted(list2)
second_largest=sorted_list[-2]
print('The second largest number in the list is:',second_largest)
```

```
Enter the range of a list you required: 8
Enter the list elements23
Enter the list elements56
Enter the list elements8
Enter the list elements46
Enter the list elements23
Enter the list elements2
Enter the list elements9
Enter the list elements1
The second largest number in the list is: 46
```

5. Explain what indentation means in Python

```
In Python, indentation is used to define the structure and scope of code blocks.
It is not just for visual clarity but is syntactically significant.
Python uses indentation to indicate which statements are grouped together in loops,conditional statements,
function definitions, and other blocks of code and the Symbol used for indentation is ':'.
The indentation is crucial because it tells Python where the if and else blocks start and end.
```

```
6 If you remove or change the indentation incorrectly, Python will raise an IndentationError(SyntaticError:invalid
  syntax.
7 The indentation is crucial because it tells Python where the functions,if and else blocks start and end. If you
  remove or change the indentation incorrectly, Python will raise an IndentationError.
```

In [7]:

```
1  #Example program with Indentation:
2  def print_greeting(name):
3      if name=='Kiran' or 'Ravi' or 'Raj':
4          print("Hello {}, How are you.".format(name))
5          pass
6      else:
6          print('Hello Stranger:')
7          pass
8      pass
9  print_greeting(name=input('Enter your friend name: '))
10
```

```
Enter your friend name: Raj
Hello Raj, How are you.
```

In [8]:

```
1  #Example program without Indentation causes 'SyntaxError: invalid syntax':
2  def print_greeting(name)
3      if name=='Kiran' or 'Ravi' or 'Raj'
4          print("Hello {}, How are you.".format(name))
5          pass
6      else
7          print('Hello Stranger:')
8          pass
9      pass
10 print_greeting(name=input('Enter your friend name: '))
11
```

```
  File "C:\Users\narra\AppData\Local\Temp\ipykernel_11564\1178389149.py", line 2
    def print_greeting(name)
                            ^
SyntaxError: invalid syntax
```

6. Write a program to perform set difference operation

In [12]:

```
'''The difference between the two sets in Python is equal to the difference between the number of elements
in two sets.
The function difference() returns a set that is the difference between two sets.
Let's try to find out what will be the difference between two sets A and B.
Then (set A - set B) will be the elements present in set A but not in B and (set B - set A) will be
the elements present in
set B but not in set A
*If we have equal sets then it will return the null set.
'''
set_1={1,2,3,4,5,9,3}
set_2={4,5,6,1,2}
difference_result1=set_1-set_2
print('The difference of set1-set2 is: ',difference_result1)
difference_result2=set_2-set_1
print('The difference of set2-set1 is: ',difference_result2)
#If we have equal sets then it will return the null set.
set_a={1,2,3,4,5}
set_b={1,2,3,4,5}
result_difference=set_a-set_b
print(result_difference)

```

```
The difference of set1-set2 is:  {9, 3}
The difference of set2-set1 is:  {6}
set()
```

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

In [18]:

```
num=1
while num<=10:
    print(num)
    num=num+1
    pass


```

```
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

In [23]:

```python
# Note: factorial of 0 and 1 is 1
def factorial(n):
    if n==0 or n==1:
        return 1
    # Initialize the result variable to store the factorial
    result = 1
    # Use a while loop to calculate the factorial
    while n > 1:
        result *=n
        n-=1
    return result

# Test the function with an example
number=int(input('Enter the number to know its factorial: '))
print("The factorial of number is:",factorial(number))

```

```
Enter the number to know its factorial: 6
The factorial of number is: 720
```

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

In [25]:

```python
number=float(input('Enter the number:'))
if number>0:
    print('The given number is Positive')
    pass
elif number<0:
    print('The given number is Negative')
    pass
else:
    print('The given number is zero')
```

```
Enter the number:2
The given number is Positive
```

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

In [56]:

```
number_1=float(input('Enter First Number: '))
number_2=float(input('Enter Second Number: '))
number_3=float(input('Enter Third Number: '))
if number_1>number_2 and number_1>number_3:
    print('The largest number among three is:',number_1,'-->First Number is largest')
    pass
elif number_2>number_1 and number_2>number_3:
    print('The largest number among three is:',number_2,'-->Second Number is largest')
    pass
elif number_3>number_1 and number_3>number_2:
    print('The largest number among three is:',number_3,'-->Third Number is largest')
    pass
elif number_1 and number_2>number_3:
    print('The largest number among three is:',number_1,',',number_2,'-->First and Second numbers is equal and lar
    pass
elif number_2 and number_3>number_1:
    print('The largest number among three is:',number_2,',',number_3,'-->Second and Third numbers is equal and lar
    pass
elif number_1 and number_3>number_2:
    print('The largest number among three is:',number_1,',',number_3,'-->First and Third numbers is equal and larg
    pass
else:
    print('The largest number among three is:',number_1,',',number_2,',',number_3,'All Three numbers are equal')

```

```
Enter First Number: 1
Enter Second Number: 2
Enter Third Number: 3
The largest number among three is: 3.0 -->Third Number is largest
```

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

In [25]:

```
import numpy as np
def create_ones_array(shape):
    ones_array=np.ones(shape)
    return ones_array
shape=(3,4)
ones_array=create_ones_array(shape)
print("Array of ones with shape",shape,":\n",ones_array)
```

```
Array of ones with shape (3, 4) :
 [[1. 1. 1. 1.]
 [1. 1. 1. 1.]
 [1. 1. 1. 1.]]
```

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

In [39]:

```
import numpy as np
def create_random_array(rows, cols, min_val, max_val):
    # Create a NumPy array with random integers in the specified range
    random_array = np.random.randint(min_val,max_val, size=(rows, cols))
    return random_array
# Test the function
rows = 3
cols = 4
min_val = 1
max_val = 10
random_array = create_random_array(rows, cols, min_val, max_val)
print("2D Array initialized with random integers:")
print(random_array)

```

```
2D Array initialized with random integers:
[[6 6 3 1]
 [8 8 8 3]
 [5 3 9 8]]
```

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

In [48]:

```
import numpy as np
def generate_linspace(start,stop,num):
    linspace_array = np.linspace(start,stop,num)
    return linspace_array
start=int(input('Enter the start value: '))
stop=int(input('Enter the stop value: '))
num=int(input('Enter range of number you want to print '))
linspace_array = generate_linspace(start,stop,num)
print("Array of evenly spaced numbers over the range [0, 10]:")
print(linspace_array)

```

```
Enter the start value: 2
Enter the stop value: 25
Enter range of number you want to print 8
Array of evenly spaced numbers over the range [0, 10]:
[ 2.          5.28571429  8.57142857 11.85714286 15.14285714 18.42857143
 21.71428571 25.        ]
```

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

In [50]:

```
import numpy as np
equally_spaced_array = np.linspace(1, 100, 10)
print("Array of 10 equally spaced values between 1 and 100:\n",equally_spaced_array)

```

```
Array of 10 equally spaced values 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

In [53]:

```
import numpy as np
end_with=int(input('Enter number end with: '))
even_array = np.arange(2,end_with,2)
print("Array containing even numbers from 2 to 20:")
print(even_array)
```

```
Enter number end with: 25
Array containing even numbers from 2 to 20:
[ 2  4  6  8 10 12 14 16 18 20 22 24]
```

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

In [54]:

```
import numpy as np
array_with_step = np.arange(1,15,0.5)
print("Array containing numbers from 1 to 10 with a step size of 0.5:")
print(array_with_step)
```

```
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.  10.5 11.  11.5 12.  12.5 13.  13.5 14.  14.5]
```