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In [1]: ###assignment-1-smartinternz
In [2]: # 1-Write a Python program to calculate the area of a rectangle given its length and width.
        length = int(input())
        width = int(input())
        if length>0 and width>0:
            area = length*width
            print(area)
        else:
            print("No length and width")
        7
        6
        42
In [3]: #_2-Write a program to convert miles to kilometers
        miles = int(input())
        #1mile = 1.60934
        kilometers = miles*1.60934
        print(kilometers)
        11.26538
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In [5]: # 3-Write a function to check if a given string is a palindrome.
        def is palindrome(num):
            num str = str(num)
            reversed str = num str[::-1]
            if num str == reversed str:
                return True
            else:
                return False
        num = int(input("Enter a number: "))
        if is palindrome(num):
            print(num, "is a palindrome")
        else:
            print(num, "is not a palindrome")
        Enter a number: 121
        121 is a palindrome
In [6]: # 4-Write a Python program to find the second largest element in a list.
        list1 = [10, 20, 20, 4, 45, 45, 45, 99, 99]
        list2 = list(set(list1))
        list2.sort()
        print("Second largest element is:", list2[-2])
        Second largest element is: 45
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In [7]: # 5-Explain what indentation means in Python
        #INDENTATION:
        #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 ve
        #Python uses indentation to indicate a block of code.
        #sample program to explain an indentation error
        if 5 > 2:
        print("Five is greater than two!")
          Cell In[7], line 11
            print("Five is greater than two!")
        IndentationError: expected an indented block after 'if' statement on line 10
In [8]: #_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)
        Set Difference: {1, 2}
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In [28]: #_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
         1
         2
         8
         9
         10
In [16]: #_8-Write a program to calculate the factorial of a number using a while loop.
         n = int(input())
         fact =1
         itern = 1
         while itern<=n:</pre>
             fact = fact*itern
             itern = itern+1
         print(fact)
         120
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In [17]: # 9-Write a Python program to check if a number is positive, negative, or zero using if-elif-else
         n = int(input())
         if n ==0:
             print("Zero")
         elif n \ge 0:
             print("Positive number")
         else:
             print("Negative number")
         343
         Positive number
In [21]: # 10-Write a program to determine the largest among three numbers using conditional statements
         num1 = int(input())
         num2 = int(input())
         num3 = int(input())
         if (num1 >= num2) and (num1 >= num3):
            largest = num1
         elif (num2 >= num1) and (num2 >= num3):
            largest = num2
         else:
            largest = num3
         print("The largest number is", largest)
         5
         6
         The largest number is 7
```

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In [22]: # 11-Write a Python program to create a numpy array filled with ones of given shape
         import numpy as np
         rows = int(input("Enter the number of rows: "))
         columns = int(input("Enter the number of columns: "))
         ones array = np.ones((rows, columns))
         print("Array filled with ones of shape", one array.shape, ":")
         print(one array)
         Enter the number of rows: 3
         Enter the number of columns: 5
         Array filled with ones of shape (3, 5):
         [[1. 1. 1. 1. 1.]
          [1. 1. 1. 1. 1.]
          [1. 1. 1. 1. 1.]]
In [23]: # 12-Write a program to create a 2D numpy array initialized with random integers.
         import numpy as np
         rows = int(input("Enter the number of rows: "))
         columns = int(input("Enter the number of columns: "))
         random array = np.random.randint(low=0, high=100, size=(rows, columns))
         print("2D NumPy array initialized with random integers:")
         print(random array)
         Enter the number of rows: 5
         Enter the number of columns: 6
         2D NumPy array initialized with random integers:
         [[39 60 3 38 50 17]
          [1 0 20 55 7 0]
          [91 26 11 28 75 18]
          [55 58 35 52 8 6]
          [71 33 32 27 29 56]]
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In [24]: # 13-Write a Python program to generate an array of evenly spaced numbers over a specified range using linspace.
         import numpy as np
         start = int(input("Enter the start value: "))
         stop = int(input("Enter the stop value: "))
         num elements = int(input("Enter the number of elements: "))
         evenly spaced array = np.linspace(start, stop, num elements)
         print("Array of evenly spaced numbers over the range [{}, {}]:".format(start, stop))
         print(evenly spaced array)
         Enter the start value: 3
         Enter the stop value: 45
         Enter the number of elements: 23
         Array of evenly spaced numbers over the range [3, 45]:
         [ 3.
                       4.90909091 6.81818182 8.72727273 10.63636364 12.54545455
          14.45454545 16.36363636 18.27272727 20.18181818 22.09090909 24.
          25.90909091 27.81818182 29.72727273 31.63636364 33.54545455 35.45454545
          37.36363636 39.27272727 41.18181818 43.09090909 45.
In [25]: # 14- Write a program to generate an array of 10 equally spaced values between 1 and 100 using linspace.
         import numpy as np
         equally spaced array = np.linspace(1, 100, 10)
         print("Array of 10 equally spaced values between 1 and 100:")
         print(equally spaced array)
         Array of 10 equally spaced values between 1 and 100:
         [ 1. 12. 23. 34. 45. 56. 67. 78. 89. 100.]
In [26]: # 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:")
         print(even array)
         Array containing even numbers from 2 to 20:
         [ 2 4 6 8 10 12 14 16 18 20]
```