

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)
```

7

11.26538

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

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}

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  
3  
4  
5  
6  
7  
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:
    fact = fact*itern
    itern = itern+1
print(fact)
```

5  
120

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>=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

7

The largest number is 7

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]]
```

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]
```

```
In [27]: #_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
array_with_step = np.arange(1, 10.5, 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.]
```

In [ ]: