1. Write a Python Program to find sum of array?

ANS: def array\_sum(arr):

return sum(arr)

if \_\_name\_\_ == "\_\_main\_\_":

try:

input\_str = input("Enter the elements of the array separated by spaces: ")

arr = list(map(int, input\_str.split()))

array\_sum\_result = array\_sum(arr)

print(f"The sum of the array is: {array\_sum\_result}")

except ValueError:

print("Invalid input. Please enter a list of numbers separated by spaces.")

For example, if you enter 1 2 3 4 5, the program will display:

The sum of the array is: 15

1. Write a Python Program to find largest element in an array?

ANS: def find\_largest\_element(arr):

if not arr:

return None

return max(arr)

if \_\_name\_\_ == "\_\_main\_\_":

try:

input\_str = input("Enter the elements of the array separated by spaces: ")

arr = list(map(int, input\_str.split()))

largest\_element = find\_largest\_element(arr)

if largest\_element is not None:

print(f"The largest element in the array is: {largest\_element}")

else:

print("The array is empty. Please enter some elements.")

except ValueError:

print("Invalid input. Please enter a list of numbers separated by spaces.")

For example, if you enter `5 10 2 8 3`, the program will display:

The largest element in the array is: 10

This is the largest element in the array [5, 10, 2, 8, 3].

1. Write a Python Program for array rotation?

ANS: Array rotation is the process of shifting the elements of an array to the left or right by a given number of positions.

def rotate\_array\_left(arr, n):

n = n % len(arr)

return arr[n:] + arr[:n]

def rotate\_array\_right(arr, n):

n = n % len(arr)

return arr[-n:] + arr[:-n]

if \_\_name\_\_ == "\_\_main\_\_":

try:

input\_str = input("Enter the elements of the array separated by spaces: ")

arr = list(map(int, input\_str.split()))

rotation\_choice = input("Enter 'L' for left rotation or 'R' for right rotation: ").upper()

rotation\_count = int(input("Enter the number of positions to rotate: "))

if rotation\_choice not in ('L', 'R'):

print("Invalid rotation choice. Please enter 'L' for left rotation or 'R' for right rotation.")

else:

if rotation\_choice == 'L':

rotated\_array = rotate\_array\_left(arr, rotation\_count)

else:

rotated\_array = rotate\_array\_right(arr, rotation\_count)

print(f"The array after rotation is: {rotated\_array}")

except ValueError:

print("Invalid input. Please enter a list of numbers separated by spaces and a valid rotation choice.")

For example, if you enter `1 2 3 4 5` for the array, choose 'L' for left rotation, and rotate by 2 positions, the program will display:

The array after rotation is: [3, 4, 5, 1, 2]

This is the result of left rotating the array [1, 2, 3, 4, 5] by 2 positions. You can also perform right rotation by choosing 'R' and specifying the number of positions to rotate.

1. Write a Python Program to Split the array and add the first part to the end?

ANS: An array into two parts and adds the first part to the end:

def split\_and\_add(arr, n):

return arr[n:] + arr[:n]

if \_\_name\_\_ == "\_\_main\_\_":

try:

input\_str = input("Enter the elements of the array separated by spaces: ")

arr = list(map(int, input\_str.split()))

split\_position = int(input("Enter the position to split the array: "))

if 0 <= split\_position < len(arr):

result\_array = split\_and\_add(arr, split\_position)

print(f"The array after splitting and adding is: {result\_array}")

else:

print("Invalid split position. Please enter a valid position within the array length.")

except ValueError:

print("Invalid input. Please enter a list of numbers separated by spaces and a valid split position.")

For example, if you enter `1 2 3 4 5` for the array and choose to split at position `2`, the program will display:

The array after splitting and adding is: [3, 4, 5, 1, 2]

This is the result of splitting the array `[1, 2, 3, 4, 5]` at position `2` and adding the first part to the end.

1. Write a Python Program to check if given array is Monotonic?

ANS: An array is considered monotonic if it is either entirely non-increasing or non-decreasing. In other words, the elements in the array should be in non-increasing order or non-decreasing order.

Here's a program to check if a given array is monotonic:

def is\_monotonic(arr):

increasing = decreasing = True

for i in range(1, len(arr)):

if arr[i] > arr[i - 1]:

decreasing = False

elif arr[i] < arr[i - 1]:

increasing = False

return increasing or decreasing

if \_\_name\_\_ == "\_\_main\_\_":

try:

input\_str = input("Enter the elements of the array separated by spaces: ")

arr = list(map(int, input\_str.split()))

if is\_monotonic(arr):

print("The array is monotonic.")

else:

print("The array is not monotonic.")

except ValueError:

print("Invalid input. Please enter a list of numbers separated by spaces."

Save this code into a `.py` file and run it using Python. When prompted, enter the elements of the array separated by spaces, and the program will check if the array is monotonic or not.

For example, if you enter `1 2 3 4 5`, the program will display:

The array is monotonic.

As the array is in non-decreasing order, it is considered monotonic. Similarly, if you enter `5 4 3 2 1`, the program will display:

The array is monotonic.

Since the array is in non-increasing order, it is still considered monotonic. However, if you enter a combination of increasing and decreasing elements, the program will display:

The array is not monotonic.

For example, entering `1 2 3 2 4`, the program will detect that the array is not entirely non-increasing or non-decreasing and, therefore, not monotonic.