PRACTICAL 4

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Roll no:-A4_B1_05

Input:-

```
def cross_sum(arr, left, right, middle):
    left_max = float('-inf')
    temp = 0
    max_left_id = middle
    curr_left_id = middle
    for i in range(middle, left - 1, -1):
        temp += arr[i]
        if temp > left_max:
            left_max = temp
            max_left_id = i

    right_max = float('-inf')
    temp = 0
    max_right_id = middle + 1
    curr_right_id = middle + 1
    for i in range(middle + 1, right + 1):
        temp += arr[i]
        if temp > right_max:
            right_max = temp
            max_right_id = i

    return left_max + right_max, arr[max_left_id:max_right_id + 1]


def max_sum(arr, left, right):
    if left == right:
        return arr[left], [arr[left]]

    middle = (left + right) // 2

    left_sum, left_sub = max_sum(arr, left, middle)
    right_sum, right_sub = max_sum(arr, middle + 1, right)
```

```
    crossing_sum, cross_sub = cross_sum(arr, left, right, middle)

    if left_sum >= right_sum and left_sum >= crossing_sum:
        return left_sum, left_sub
    elif right_sum >= left_sum and right_sum >= crossing_sum:
        return right_sum, right_sub
    else:
        return crossing_sum, cross_sub


arr = [-2, 1, -3, 4, -1, 2, 1, -5, 4]
n = len(arr)
max_val, subarray = max_sum(arr, 0, n - 1)
print("Maximum sum subarray:", max_val)
print("Subarray:", subarray)
print("size of subaaray:",len(subarray))
```

Output:-