Sliding Window Pattern

arr = [2, 4, 5, 2, 5, 7, 8, 9, 56, 23] [Subarray, Subsequence, Subset]
Subarray - Order & Contiguous
Subsequence - Order not Contiguous
Subset - Not order & contiguous

Subarray:

```java
public void printArr(int[] a, int s, int e){
        System.out.print("{");
        for (int i = s; i <= e; i++){
            System.out.print(a[i]+" ");
        }
        System.out.println("}");
    }

public void printAllSubArr(int[] a, int n){
        for (int s = 0; s < n; s++){
            for (int e = s; e < n; e++){
                printArr(a, s, e);
            }
        }
    }
```

Method 1 (Brute Force): arr = [3, 5, -1, 8, 4, 2, -6, 10, 7] O(n^2)

```java
int maxSumArray(int[] a, int k){
int maxSum = INT_MIN;
   for(int i = 0; i < n-k; i++)
   {
      int sum = 0;
      for(int j = 0; j < k; j++)
      {
         sum += a[i + j];
      }
      if(sum > maxSum) maxSum = sum;
    }
    return maxSum;
}
```

Method 2 (Optimize): arr = [3, 5, -1, 8, 4, 2, -6, 10, 7] O(n)

```
1 int sumMaxSubArr(int[] a, int k)
2 {
3   int winsum = INT_MIN;
4   //SUM OF 1st WINDOW
5   for(int i = 0; i < k; i++)
6   {
7      winsum += a[i];
8   }
9   int maxSum = winsum;
10  for(int i = 1; i < n - k; i++)
11  {
12    winsum = winsum - a[i-1] + a[k + i - 1];
13    if(winsum > maxSum) maxSum = winsum;
14  }
15  return maxSum;
16 }
```

Similarly, We can solve

1. **Min sum of subarray**
2. **Max no of prime number of subarray**
3. **Max negative number of subarray**
4. **Max even or odd number of subarray**

Similar Leetcode problem:

1) **LeetCode 3 - Longest Substring Without Repeating Characters [*medium*]**
2) **LeetCode 30 - Substring with Concatenation of All Words [*hard*]**
3) **LeetCode 76 - Minimum Window Substring [*hard*]**
4) **LeetCode 209 - Minimum Size Subarray Sum [*medium*]**
5) **LeetCode 424 - Longest Repeating Character Replacement [*medium*]**
6) **LeetCode 438 - Find All Anagrams in a String [*medium*]**
7) **LeetCode 567 - Permutation in String [*medium*]**
8) **LeetCode 904 - Fruit Into Baskets [*medium*]**
9) **LeetCode 1004 - Max Consecutive Ones III [*medium*]**