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Problem No. 6

Problem Statement :

Given a large single dimensional array of integers, write functions for sliding window filter with maximum, minimum, median, and average to generate an output array. The window size should be an odd integer like 3, 5 or 7.Explain what you will do with the boundary values.

Solution Approach:

We can take an array and set the first and last value of the array to be zero and taking the remaining elements from the user as the input and then traverse the array taking three elements at a time we can do the things required with the array like calculating the mean ,median and the maximum and minimum of them and store the result in a separate array.

Structured Pseudocode :

1.take an array say arr with the given length

2.suppose the window size is taken from the user to be k,initialise aux array temp of size k

3.initialise result as the output array of which would store the array after the modification in the program

3.for i from 1 to n-k+2

4. for j from i to i+k

5. temp[j]=arr[i]

6. result[i]=func(temp)

Here func() refers to the generalised version which can be either median or maximum or minimum or average

Results:

As a result we obtain the values of the array after slight modification in the window size of say k and then print the corresponding array as the output.

Discussion:

For the boundary values we have taken the original array elements right from the 1st index instead of the zeroth index and taking the zeroth and last elements to be zero as per the requirement of the question

To calculate the median we would be requiring to sort the auxiliary array .

Separate files containing commented source code

The file has been attached.