*Session 5: Assignment 4*

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1. Introduction

This assignment will help you to consolidate the concepts learnt in the session.

1. Problem Statement

Given a sequence of n values x1, x2, ..., xn and a window size k>0, the k-th moving

average of the given sequence is defined as follows:

The moving average sequence has n-k+1 elements as shown below.

The moving averages with k=4 of a ten-value sequence (n=10) is shown below

i 1 2 3 4 5 6 7 8 9 10

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Input 10 20 30 40 50 60 70 80 90 100

y1 25 = (10+20+30+40)/4

y2 35 = (20+30+40+50)/4

y3 45 = (30+40+50+60)/4

y4 55 = (40+50+60+70)/4

y5 65 = (50+60+70+80)/4

y6 75 = (60+70+80+90)/4

y7 85 = (70+80+90+100)/4

Thus, the moving average sequence has n-k+1=10-4+1=7 values.

**Problem Statement**

Write a function to find moving average in an array over a window:

Test it over [3, 5, 7, 2, 8, 10, 11, 65, 72, 81, 99, 100, 150] and window of 3.

**Note: Solution submitted via github must contain all the detailed steps.**

**3. Output:**

**Input**:

***import numpy as np***

***def movingaverage(values,window):***

***weights = np.repeat(1,window)/window***

***A = np.convolve(values, weights, 'valid')***

***return A***

***x = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]***

***y = [3, 5, 7, 2, 8, 10, 11, 65, 72, 81, 99, 100, 150]***

***B = movingaverage(y,3)***

***print(B)***

**Output**:

***[ 5. 4.66666667 5.66666667 6.66666667 9.66666667 28.66666667 49.33333333 72.66666667 84. 93.33333333 116.33333333]***

**Screenshot:**

