

Write a function so that the columns of the output matrix are powers of the input vector.

The order of the powers is determined by the increasing boolean argument. Specifically, when increasing is False, the i -th output column is the input vector raised element-wise to the power of $N - i - 1$.

HINT: Such a matrix with a geometric progression in each row is named for Alexandre-Theophile Vandermonde.

Problem Statement

Given a sequence of n values x_1, x_2, \dots, x_n 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
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.

Question: 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.