Problem Statement 2: 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 ===== == == == == == == == == == == 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.

In [7]:

```
import pandas as pd
import numpy as np
```

In [17]:

```
def gen_vander_matrix(ipvector , n , increasing = True):
    if not increasing:
        op_matx = np.array([x**(n-1-i) for x in ipvector for i in range(n)]).reshape(ipvect
    elif increasing:
        op_matx = np.array([x**i for x in ipvector for i in range(n)]).reshape(ipvector.siz
    return op_matx
```

In [18]:

```
ipvector = np.array([1,2,3,4,5])
n = 5
```

In [16]:

```
gen_vander_matrix(ipvector,n)
```

Out[16]:

```
array([[  1,   1,   1,   1,   1],
       [ 16,   8,   4,   2,   1],
       [ 81,  27,   9,   3,   1],
       [256,  64,  16,   4,   1],
       [625, 125,  25,   5,   1]])
```

In [19]:

```
gen_vander_matrix(ipvector,n)
```

Out[19]:

```
array([[  1,   1,   1,   1,   1],
       [  1,   2,   4,   8,  16],
       [  1,   3,   9,  27,  81],
       [  1,   4,  16,  64, 256],
       [  1,   5,  25, 125, 625]])
```

```
Problem Statement 2:
```

```
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
===== == == == == == == == == == ==
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.
```

In [22]:

```
df = pd.DataFrame({'Variables' : [3,5,7,8,10,11,65,72,81,99,100,150]})
df['Rolling'] = df.rolling(window=3 , min_periods=2).mean().round(2)
df
```

Out[22]:

	Variables	Rolling
0	3	NaN
1	5	4.00
2	7	5.00
3	8	6.67
4	10	8.33
5	11	9.67
6	65	28.67
7	72	49.33
8	81	72.67
9	99	84.00
10	100	93.33
11	150	116.33

In [ ]: