

# Moving Average

Plot a moving average graph which helps to understand how the results change over a specified period. The progress of sales and amounts of consumption and production can also be seen.

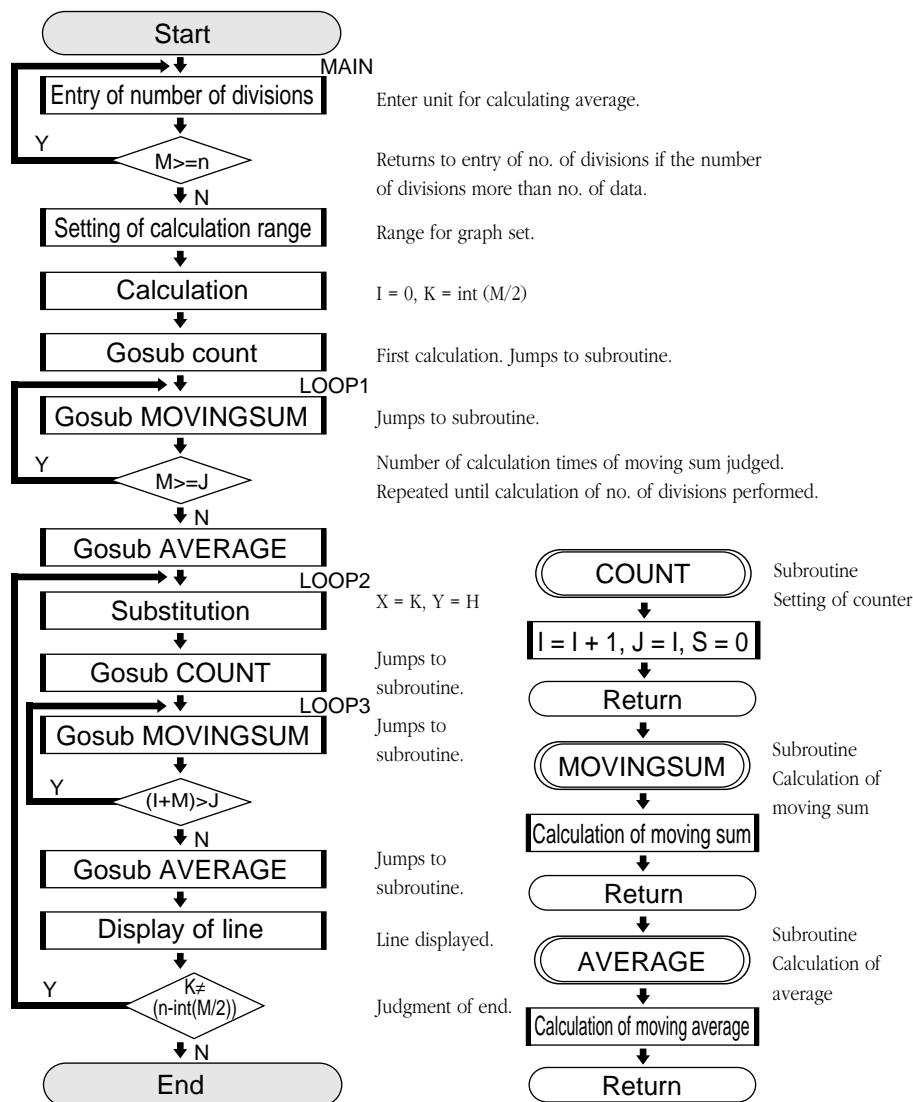
## Calculation

$$H_i = \frac{X_{i-(M-1)/2} + \dots + X_i + \dots + X_{i+(M-1)/2}}{M}$$

$$(I = 1 + \frac{M-1}{2}, 2 + \frac{M-1}{2}, \dots, n + \frac{M-1}{2})$$

$H_i$  : moving average  
 $M$  : number of divisions  
 $X_i$  : data  
 $n$  : number of data

## FLOWCHART



## PROGRAM LIST (STAT MODE)

Title : MVIN AVG

```

Label MAIN
Print "Input DIVISION"
Input D
D ÷> M
1_Stats L1
If M ≥ n Goto MAIN
Rem RANGE
(xmax-xmin)/10 ÷> Yscl
0 ÷> Xmin
n ÷> Xmax
1 ÷> Xscl
xmin ÷> Ymin
xmax ÷> Ymax
0 ÷> I
int (M/2) ÷> K
Gosub COUNT
Label LOOP1
Gosub MOVINGSUM
If M ≥ J Goto LOOP1
Gosub AVERAGE
Label LOOP2
Gosub MOVINGSUM
If (I+M) > J Goto LOOP3
Gosub AVERAGE
Line (X, Y, K, H)
If K ≠ (n-int (M/2)) Goto LOOP2
Wait
End
Label COUNT
I+1 ÷> I
I ÷> J
0 ÷> S
Return
Label MOVINGSUM
S+L1(J) ÷> S
J+1 ÷> J
Return
Label AVERAGE
S/M ÷> H
K+1 ÷> K
Return
  
```

## Parameters

name of parameter	content	name of parameter	content
H	moving average	S	moving sum
I	counter	X	starting point (x)
J	counter	Y	starting point (y)
K	counter	Yscl	scale of y-axis
M	number of divisions	B	input of number of divisions

**Exercise**

Find the moving average every three months (number of divisions: 3) from the following table of monthly sales.

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.
Sales[\$]	300	326	323	344	300	401	398	450

On the graph, Xmax = 8, Ymin = 300, and Ymax = 450.

Set up condition: decimal point in Float Pt Mode.

**2nd F** **SET UP** **C** \* **1** \* **CL**

**Step****Key Operation****Display****1**

Enter statistical data into L1.

**STAT** **A** \* **ENTER**

No	1: L1	2: L2	3: L3
1			
2			
3			
4			
5			
6			
7			
8			
9			

**3** **0** **0** **ENTER** **3** **2** **6**  
**ENTER** **3** **2** **3** **ENTER**  
**3** **4** **4** **ENTER** **3** **0** **0**  
**ENTER** **4** **0** **1** **ENTER**  
**3** **9** **8** **ENTER** **4** **5** **0**  
**ENTER**

No	1: L1	2: L2	3: L3
1	300		
2	326		
3	323		
4	344		
5	300		
6	401		
7	398		
8	450		
9			

**2**

Specify the program mode.  
Select the title MVIN AVG.

**2nd F** **PRGM** **A** \*

EXEC	01 OSCILLAT
EDIT	02 MVIN AVG
NEW	03 XY GRAPH
	04 RUNGE
	05 VARIANCE

**3**

Enter the number of divisions(3). **3** **ENTER**

