

4. In exercise 2 on page 144, the mean of the distribution is $\bar{x} = 4$. Use the frequency table you created, add an additional column (to the right) and calculate the standard deviation.

x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
0			
1			
2			
3			
4			
5			
6			
7			
8			
TOTALS			

Sample problem

The following table shows the distribution of the area, in square metres, of the flats in a building.

SURFACE AREA (m ²)	NO. OF FLATS
60-80	50
80-100	30
100-120	15
120-140	5
TOTALS	100

To find the mean and the standard deviation of the area of the flats in the building, we add the necessary columns to the table:

SURFACE AREA (m ²)	CLASS MARK, x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
60-80	70	50	3,500	245,000
80-100	90	30	2,700	243,000
100-120	110	15	1,650	181,500
120-140	130	5	650	84,500
TOTALS		100	8,500	754,000

Now we can calculate the mean and the standard deviation:

$$\bar{x} = \frac{\sum f_i x_i}{\sum f_i} = \frac{8,500}{100} = 85$$

$$\sigma = \sqrt{\frac{\sum f_i x_i^2}{\sum f_i} - \bar{x}^2} = \sqrt{\frac{754,000}{100} - 85^2} = \sqrt{315} \approx 17.748$$

5. This table displays the time worked per day by the employees in a company:

TIME (hours)	CLASS MARK, x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
5-6	5.5	10		
6-7	6.5	20		
7-8	7.5	40		
8-9	8.5	130		
TOTALS				

Fill in the incomplete boxes.

- How many employees does the company have?
- Calculate the mean of the distribution.
- Calculate the standard deviation of the distribution.

6. The approximate area of each of the four countries that comprise Scandinavia is:

Norway: 325,000 km² Finland: 340,000 km²
 Sweden: 450,000 km² Denmark: 45,000 km²

Calculate the mean area and the standard deviation of the area of the Scandinavian countries.

7. The number of traffic accidents that occurred on a given road on each of the 30 days in a month is listed below:

1, 3, 0, 4, 3 0, 4, 2, 2, 3 3, 2, 1, 1, 2
 2, 2, 2, 2, 1 1, 2, 0, 2, 1 1, 2, 3, 5, 3

Organise the data in the table on the right and calculate the mean and the standard deviation of the number of accidents.

x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
0			
1			
2			
3			
4			
5			
TOTALS			

8. The numbers of times it snowed per year in a given city over 20 consecutive years are listed below:

1, 0, 3, 2, 1 4, 0, 1, 2, 1
 4, 3, 3, 2, 1 2, 3, 4, 2, 1

Input the data into the table on the right and use the table to help you calculate the mean and the standard deviation of the number of days it snowed per year.

x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
0			
1			
2			
3			
4			
TOTALS			

9. The ages of the people who use an indoor pool are displayed in the following table:

AGE (years)	CLASS MARK, x_i	f_i	$f_i \cdot x_i$	$f_i \cdot x_i^2$
0-20		160		
20-40		400		
40-60		200		
60-80		40		
TOTALS				

Complete the table and use it to help you calculate the mean and standard deviation of the ages.