Calculate Cumulative Frequency in Excel

Authored by

Mohammed looti

November 6, 2025

Understanding Frequency Distributions

A **frequency table** is a fundamental statistical tool used to organize and display information about data occurrences. These tables quantify **Frequency**, which simply measures how many times a specific event, value, or range of values appears within a dataset.

For instance, consider a retail scenario. The following table illustrates the **Frequency** of items sold across various price ranges (classes) during a typical week in a shop. This organized presentation allows for immediate insights into sales distribution.

Item Price Class	Frequency (Units Sold)
$1 - $10	20
$11 - $20	21
$21 - $30	13
$31 - $40	8
$41 - $50	4

In this structure, the first column defines the price class, and the second column provides the corresponding sale **Frequency** for that class. While helpful, a simple frequency table does not immediately show the running total of events.

Defining Cumulative Frequency

To gain a deeper understanding of the distribution, especially concerning percentiles or median values, it is necessary to calculate the **cumulative frequency** for each class. The **cumulative frequency** represents the running total of frequencies up to and including a specific class interval.

By adding this crucial column, the table transforms to show the total number of items sold up to the upper limit of each price range. This running summation provides a quick way to assess how many observations fall below a specific point in the data.

Item Price Class	Frequency (f)	Cumulative Frequency (Cf)
$1 - $10	20	20
$11 - $20	21	41 (20 + 21)
$21 - $30	13	54 (41 + 13)
$31 - $40	8	62 (54 + 8)
$41 - $50	4	66 (62 + 4)

The calculation is sequential: the first cumulative frequency (20) equals the first class frequency. The second cumulative frequency (41) is the sum of the first two frequencies. This process continues, with each cumulative value being the sum of the current frequency and the previous cumulative total. The final cumulative frequency (66) must equal the total number of observations.

Calculating Cumulative Frequency using Excel

Microsoft **Excel** provides a robust environment for generating these statistical calculations efficiently. We will demonstrate how to set up the data and use simple formulas to automate the cumulative summation process.

First, input your data into columns A and B, representing the class intervals and their corresponding frequencies, respectively. For calculation purposes, ensure the numeric frequency values are correctly placed in column B.

	A	B	C	D	E
1	**Item Price**	**Frequency**			
2	$1 - $10	20			
3	$11 - $20	21			
4	$21 - $30	13			
5	$31 - $40	8			
6	$41 - $50	4			
7					
8					
9					
10					
11					
12					
13					
14					

Next, introduce column C to house the **cumulative frequency** results. The key to calculating the running total lies in referencing the previous cumulative total and adding the current frequency. This iterative process is crucial for statistical accuracy.

The calculation logic within **Excel** is as follows:

For the first cell (C2), the cumulative frequency is equal to the initial frequency (B2).
For the subsequent cells (C3 onwards), the cumulative frequency is calculated as the sum of the previous cumulative frequency (C2) and the current frequency (B3). This formula can then be dragged down.

The image below illustrates the formulas applied in column C, with Column D showing the formula text for clarity:

	A	B	C	D	E
1	**Item Price**	**Frequency**	**Cumulative Frequency**		
2	$1 - $10	20	20	=SUM($B$2:B2)	
3	$11 - $20	21	41	=SUM($B$2:B3)	
4	$21 - $30	13	54	=SUM($B$2:B4)	
5	$31 - $40	8	62	=SUM($B$2:B5)	
6	$41 - $50	4	66	=SUM($B$2:B6)	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Visualizing Data: Creating the Ogive Chart

The **ogive chart**, also known as a cumulative frequency graph, is the standard visual representation for cumulative frequency distributions. This line graph is essential as it clearly maps the rising total of observations across the class intervals.

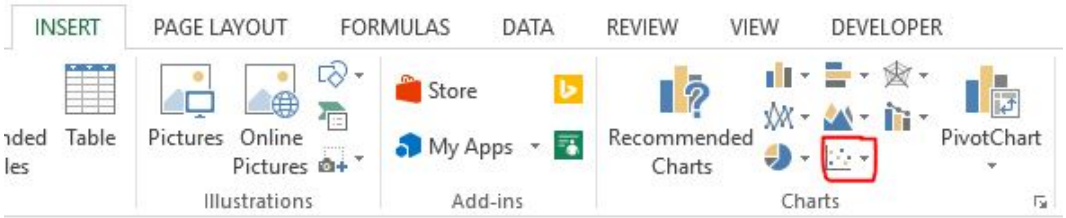
To begin creating the **ogive chart** in **Excel**, you must first select the data columns that contain the class definition and the cumulative frequency totals. Hold down the **CTRL** key and simultaneously highlight Column A (Classes) and Column C (Cumulative Frequency).

	A	B	C	D	E
1	**Item Price**	**Frequency**	**Cumulative Frequency**		
2	$1 - $10	20	20	=SUM($B$2:B2)	
3	$11 - $20	21	41	=SUM($B$2:B3)	
4	$21 - $30	13	54	=SUM($B$2:B4)	
5	$31 - $40	8	62	=SUM($B$2:B5)	
6	$41 - $50	4	66	=SUM($B$2:B6)	
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

With the required data selected, navigate to the **Insert** tab on the Excel ribbon. Since an ogive requires connecting points to show growth, we use a scatter plot with connected lines to represent the cumulative totals effectively.

Follow these precise steps to generate the graph:

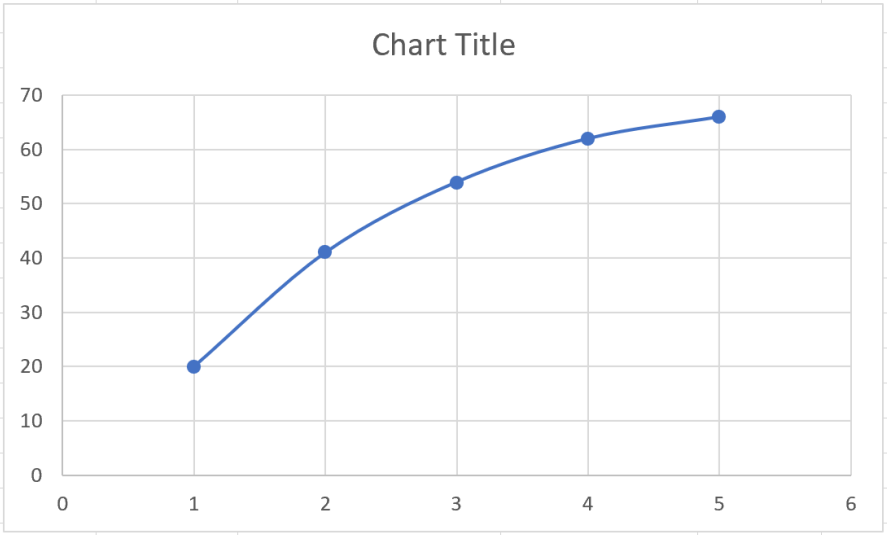
Go to the **Insert** tab.
Locate the **Charts** group.
Click on the **Scatter Chart** icon (often found within the Line/Area chart options).
Select the **Scatter with Straight Lines and Markers** option.



Refining the Ogive Visualization

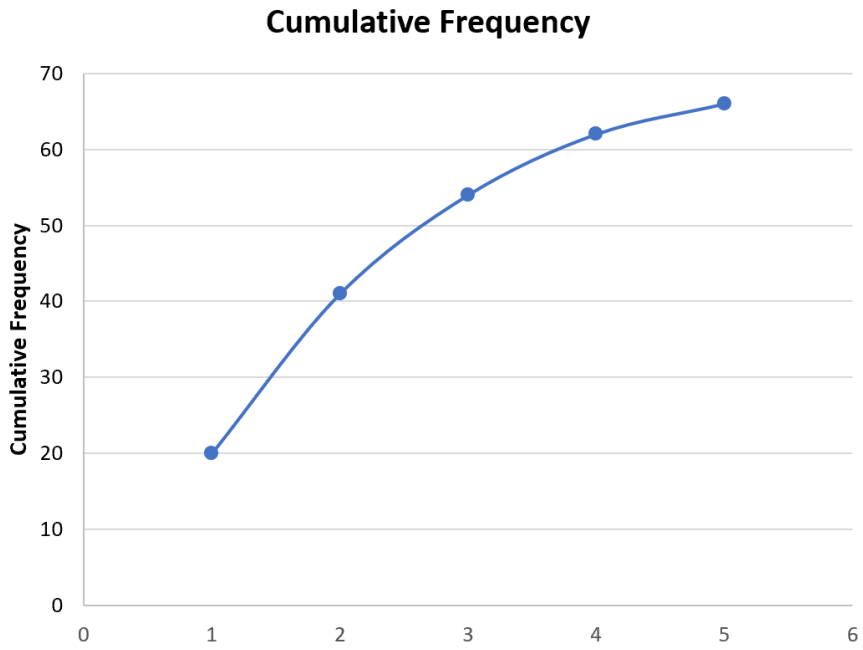
Executing the chart creation steps will automatically produce the initial **ogive chart** output. The graph provides a clear visual representation of the cumulative growth of sales over the defined price classes:

	A	B	C	D	E	F
1	**Item Price**	**Frequency**	**Cumulative Frequency**			
2	$1 - $10	20	20	=SUM($B$2:B2)		
3	$11 - $20	21	41	=SUM($B$2:B3)		
4	$21 - $30	13	54	=SUM($B$2:B4)		
5	$31 - $40	8	62	=SUM($B$2:B5)		
6	$41 - $50	4	66	=SUM($B$2:B6)		
7						



For professional presentation, report generation, and improved readability, it is crucial to refine the chart elements. This typically involves customizing the chart title, accurately labeling the axes (e.g., Price Range vs. Cumulative Sales), and ensuring appropriate scaling for both the X and Y axes.

Adjusting these elements within **Excel**'s design tools ensures the visualization is not only aesthetically appealing but also effectively communicates the underlying statistical distribution to the audience:



Additional Resources for Statistical Analysis

Mastering the calculation and visualization of **cumulative frequency** is a vital skill in descriptive statistics. For those interested in exploring related concepts or learning more advanced data visualization techniques in **Excel**, several resources are available.

We recommend investigating related topics to deepen your analytical capabilities:

Relative Frequency Distributions and Percentiles
Grouped Data Summarization and Interpretation
Creating Histograms and Frequency Polygons for data comparison

These skills build upon the foundation established here, enabling robust data exploration and professional reporting.