

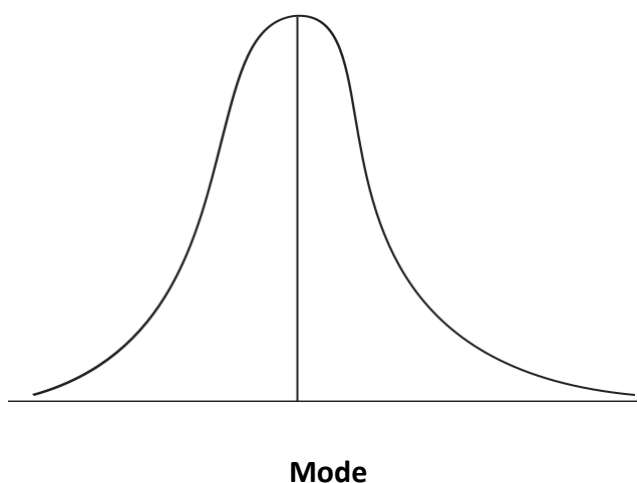
Computation of Mode

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The word 'mode' is formed from the French word 'La mode' which means 'in fashion'. According to statisticians, 'The value of the variable which occurs most frequently in the distribution is called the mode.' The mode of a distribution is the value around the items tends to be most heavily concentrated. It may be regarded at the most typical value of the series.



Method to compute the mode:

a) When the values (or measures) of all the terms (or items) are given:

In this case the mode is the value (or size) of the term (or item) which occurs most frequently.

Example 1. Find the mode from the following size of shoes

Size of Shoes	1	2	3	4	5	6	7	8	9
Frequency	1	1	1	1	2	3	2	1	1

Solution: Here maximum frequency is 3 whose term value is 6. Hence the mode is modal size number 6.

b) In continuous frequency distribution:

In this case the computation of mode is done by the following formula,

$$\text{Mode } M_0 = l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i \quad \dots (i)$$

where

l = lower limit of class,

f_1 = frequency of modal class,

f_0 = frequency of the class just preceding to the modal class,

f_2 = frequency of the class just following of the modal class,

i = class interval

Example 2. Compute the mode of the following distribution:

Class:	0 – 7	7 – 14	14 – 21	21 – 28	28 – 35	35 – 42	42 – 49
Frequency:	19	25	36	72	51	43	28

Solution: Here maximum frequency 72 lies in the class-interval 21-28. Therefore 21-28 is the modal class.

$$l = 21, f = 72, f_0 = 36, f_2 = 51, i = 7$$

$$\begin{aligned} \text{Mode } M_0 &= l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i \\ &= 21 + \frac{72-36}{(2 \times 72 - 36 - 51)} \times 10 \\ &= 21 + 357/87 \\ &= 21 + 4.103 \\ &= 25.103 \end{aligned}$$

c) Method of determining mode by the method of grouping frequencies:

This method is usually applied in the cases when there are two maximum frequencies against two different size of items. This method is also applied in the cases when it is possible that the effect of neighboring frequencies on the size of item (of maximum frequency) may be greater. The method is as follows :

Firstly the items are arranged in ascending or descending order and corresponding frequencies are written against them. The frequencies are then grouped in two and then in threes and then in fours (if necessary). In the first stage of grouping, they are grouped (i.e., frequencies are added) by taking, first and second, third and fourth, ..., After it, the frequencies are added in threes. The frequencies are added in the following two ways :

1. (i) First and second, third and fourth, fifth and sixth, seventh and eighth, ...
(ii) Second and third, fourth and fifth, ...
2. (i) First, second and third; fourth, fifth and sixth, ...
(ii) Second, third and fourth; fifth, sixth and seventh, ...
(iii) Third, fourth and fifth; sixth seventh and eighth, ...

Now the items with maximum frequencies are selected and the item which contains the maximum is called the mode.

Example 3. Compute the mode from the following distribution :

Size of Item:	4	5	6	7	8	9	10	11	12	13
Frequency:	2	5	8	9	12	14	14	15	11	13

Solution: From the given data we observe that size 11 has the maximum frequency 15, but it is possible that the effect of neighboring frequencies on the size of the item may be greater. Thus it may happen that the frequencies of size 10 or 12 may be greater and 11 may not remain mode. We shall apply the method of grouping.

Size of the items	I (f)	II	III	IV	V	VI
4	2	7	13	15	22	29
5	5					
6	8					
7	9	17	21	35	40	43
8	12					
9	14	26	28	40	39	
10	14					
11	15	29	26			
12	11					
13	13	24				

We have used brackets against the frequencies which have been grouped. Now we shall find the size of the item containing maximum frequency:

column	Size of the items having maximum frequency
I	11
II	10, 11
III	9, 10
IV	10, 11, 12
V	8, 9, 10
VI	9, 10, 11

Here size 8 occurs 1 time, 9 occurs 3 times, 10 occurs 5 times, 11 occurs 4 times, 12 occurs 1 time. Since 10 occurs maximum number of times (5 times). Hence the required mode is size 10.

The End