



IIT-JEE · CBSE **eBOOKS**

CLASS 11 & 12th



Learning Inquiry
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CLASS 11th

Statistics

misstudy



01. Mean Deviation

I. Mean Deviation For Ungrouped Data or Individual Observations

If x_1, x_2, \dots, x_n are n values of a variable X , then the mean deviation from an average A (median or Arithmetic Mean) is given by

$$M.D. = \frac{1}{n} \sum_{i=1}^n |x_i - A| = \frac{1}{n} \Sigma |d_i|, \text{ where } d_i = x_i - A$$

We may use the following algorithm to find mean deviation of individual observations:

Algorithm

Step I Compute the central value or average 'A' about which mean deviation is to be calculated.

Step II Take deviations of the observations about the central value 'A' obtained in Step I ignoring \pm signs and denote these deviations by $|d_i|$.

Step III Obtain the total of these deviations i.e. $\sum_{i=1}^n |d_i|$.

Step IV Divide the total obtained in step III by the number of observations.

II. Mean Deviation of A Discrete Frequency Distribution

If $x_i/f_i ; i = 1, 2, \dots, n$ is the frequency distribution, then mean deviation from an average A (median or Arithmetic Mean) is given by

$$M.D. = \frac{1}{N} \sum_{i=1}^n f_i |x_i - A|, \text{ where } \sum_{i=1}^n f_i = N$$

We may use the following algorithm to find the mean deviation of a discrete frequency distribution.

Algorithm

Step I Calculate the central value or average 'A' of the given frequency distribution about which mean deviation is to be calculated.

Step II Take deviations of the observations from the central value in step I ignoring signs and denote them by $|d_i|$.

Step III Multiply these deviations by respective frequencies and obtain the total $\sum_{i=1}^n f_i |d_i|$.

Step IV Divide the total obtained in step III by the number of observations i.e. $N = \sum_{i=1}^n f_i$ to obtain the mean deviation.

III. Mean Deviation of A Grouped or Continuous Frequency Distribution

For calculating mean deviation of a continuous frequency distribution the procedure is same as for a discrete frequency distribution. The only difference is that here we have to obtain the mid-points of the various classes and take the deviations of the these mid-points from the given central value (median or mean).