MEASURES OF CENTRAL TENDENCY

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Abstract

To summarise data in a clear yet meaningful way, **statisticians** employ a range of numerical measures or indices. The three measures of central tendency are discussed: **Mathematical Average, Positional Average** and **Special Average**. All three metrics specify values that frequently fall in the middle of a set of data that have been organised in order of magnitude. They are referred to be measures of central tendency for this reason. The arithmetic mean, sometimes known as the average, is the most well-known of these metrics. The median and the mode are measurements that are closely linked. But here we discuss all these three centrals tendency in details. We also discuss its real-life applications, advantages and disadvantages.

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Introduction

A dataset's central tendency is a descriptive summary provided by a single number representing the middle of the data distribution. A branch of descriptive statistics called central tendency includes the variability (dispersion) of a dataset. One of the fundamental ideas in statistics is the central tendency. It offers a thorough overview of the whole dataset, despite without providing information on the specific values in the dataset. In real life it used widely in various sector like health, insurance, etc

Measure of Central Tendency

A single number that seeks to characterise a set of data by pinpointing the centre position within that set of data is referred to as a measure of central tendency. As a result, measures of central location are occasionally used to refer to measures of central tendency. They also fit within the category of summary statistics.

These are 3 types of measure of central tendency.

1. **Mathematical Average (**Arithmetic Mean, Geometric Mean & Harmonic Mean**).**
2. **Positional Average (**Median & Mode**).**
3. **Special Average (**Moving Average & Progressive Average**)**

Arithmetic Mean

It is the most widely used measures of central tendency. It is the quantity obtained by summing two or more numbers or variables and then dividing by the total number of observations.

With the help of example, we will learn how to calculate arithmetic mean. Let us suppose that eight students receive marks *85,75,36,45,61,78,56,33* respectively in examination.

Then average grade will be

$$\text{Mean} = \frac{85+75+36+45+61+78+56+33}{8}$$

$$= 58.625$$

The algebraic representation for calculating mean can be expressed by the following formula:

$$\text{Mean} = \frac{X1+X2+X3+\ldots\ldots..+Xn}{N}$$

where

X1, X2, X3…Xn = item values

N = number of observations

The formula given above can be made more compact by assigning to the arithmetic mean a symbol $\bar{X}$ and using the Σ notation.

$$\text{Mean } (\bar{X}) = \Sigma X/N$$

There are three methods to calculate the arithmetic mean

(i.) Direct Method
(ii.) Assume Mean Method
(iii.) Step Deviation Method

Calculating the Mean for the Ungrouped Data (Individual Series):

Direct Method

$$\boxed{\text{Mean } (\bar{X}) = \Sigma X/N}$$

The formula given above can be used to calculate the arithmetic mean from ungrouped data.

The following example would illustrate the direct method.

Employee	Monthly Income	Employee	Monthly Income
1.	1780	**6.**	1920
2.	1760	**7.**	1100
3.	1690	**8.**	1810
4.	1750	**9.**	1050
5.	1840	**10.**	1950

$$\textbf{Mean } (\bar{X}) = \frac{1780+1760+1690+1750+1840+1920+1100+1810+1050+1950}{10}$$

$= 16650/10$

$= 1665$

Hence the average income = Rs 1665

Shortcut Method

It is calculated by using which is known as Arbitrary origin

$$\boxed{\text{Mean } (\bar{X}) = A + \underline{\Sigma d/N}}$$

<u>Steps to calculate the Arithmetic Mean by Shortcut Method</u>

(i.) Take an Assumed Mean.
(ii.) Take the deviation of items from the assumed mean and denote the deviations by d.

(iii.) Obtain the sum of these deviations i.e $\underline{\Sigma d.}$

(iv.) Apply the formula.

The following example will illustrate the following example

Employee	Income	d=x-1800
1.	1780	-20
2.	1760	-40
3.	1690	-110
4.	1750	-50
5.	1840	40
6.	1920	120
7.	1100	-700
8.	1810	10
9.	1050	-750
10.	1950	150
N=10		$\underline{\Sigma d = -1350}$

$$\textbf{Mean } (\bar{X}) = 1800 - 1350/10$$
$$= 1800 - 135$$
$$= \mathbf{\mathit{1665}}$$

Calculation of Arithmetic Mean for Grouped Data (Discrete Series):

Direct Method

$$\boxed{Mean\ (\bar{X}) = \underline{\Sigma fX/N}}$$

where

f = number of observations of each item

X = different observations

N = total number of observations

<u>Steps to calculate the A.M of grouped data by Direct Method.</u>

(i.) Multiply the frequency of each row with the variable X and obtain the total $\underline{\Sigma fX}$.

(ii.) Divide the total obtained by the number of observations i.e total frequency $\underline{\Sigma f}$.

The following example will show the A.M of grouped data by Direct Method.

Marks (X)	No. of Students (f)	fX
20	8	160

30	12	360
40	20	800
50	10	500
60	6	360
70	4	280
	N= 60	**ΣfX = 2460**

Mean ($\bar{X}$) = 2460/60
= 41

Shortcut Method

$$\boxed{Mean\ (\bar{X}) = A + \Sigma fd/N}$$

where

A = Assumed Mean
$\bar{X}$ = Arithmetic Mean
d = deviation(X-A)
N = total number of observation

<u>Steps to calculate the mean of Grouped Data by Shortcut Method</u>

- **(i.)** Take the Assumed Mean.
- **(ii.)** Take the deviations of the variable X from the assumed mean and denote the deviations by d.
- **(iii.)** Multiply these deviations with respective frequency and take the total <u>Σd.</u>
- **(iv.)** Divide the total obtained in 3^{rd} step by total frequency.

The following example would illustrate the shortcut method of grouped data.

X	No. of students.	d = X - 40	fd
20	8	-20	-160
30	12	-10	-120
40	20	0	0
50	10	10	100
60	6	20	120
70	4	30	120
	N=60		**<u>Σfd=60</u>**

Mean = 40 + 60/60
= 40 + 1
=41

Calculation of Arithmetic Mean for the continuous Series

Direct Method:

$$\boxed{Mean\ (\bar{X}) = \Sigma fm/N}$$

where

f = frequency of each observation.
m = middle point of each class interval.
N = total number of observations.

<u>Steps to Calculate A.M in Continuous Series by Direct Method</u>

(i.) Obtain the midpoint of each class and denote it by m.
(ii.) Multiply these observation by each frequency of each class and then obtain the total i.e Σfm.
(iii.) Divide the total obtained by the total number of observations.

The following example will show the Direct Method for Continuous Series.

Marks	Midpoint (m)	No. of Student (f)	fm
0-10	5	5	25
10-20	15	10	150
20-30	25	25	625
30-40	35	30	1050
40-50	45	20	900
50-60	55	10	550
		N = 100	**Σfm= 3300**

$$\textbf{Mean } (\bar{X}) = \Sigma fm/N$$
$$= 3300/100$$
$$= 33$$

Shortcut Method

$$\boxed{Mean\ (\bar{X}) = A + \Sigma fd/N}$$

where

m = midpoint of each class interval
N = total number of each observations
d = deviations(m-A)
A = Assumed Mean

<u>Steps to Calculate A.M in Continuous Series by Assume Mean Method</u>

(i.) Take an assumed mean.
(ii.) From the midpoint of each class, deduct the assumed mean.

(iii.) Multiply the respective frequencies of each class by these deviations and obtain the total Σfd.

(iv.) Apply the above formula.

The following example will show the Assumed Mean Method for Continuous Series.

Marks	Midpoint	No. of Students(f)	d = m-A = m-35	fd
0-10	5	5	-30	-150
10-20	15	10	-20	-200
20-30	25	25	-10	-250
30-40	35	30	0	0
40-50	45	20	10	200
50-60	55	10	20	200
		N = 100		**Σfd = -200**

Mean ($\bar{X}$) = 35-200/100

= 35-2

= 3

Step Deviation Method

$$\boxed{\textit{Mean } (\bar{X}) = A + (\Sigma fu/N)*i}$$

In order to simply the calculations, we can divide the deviations by class interval i.e calculations (m-A) and then multiply by i in the formula for getting mean.

The following example will show the Step deviations from Continous Series.

Marks	Midpoint(m)	f	d	u	fu
0-10	5	5	-30	**-3**	**-15**
10-20	15	10	-20	**-2**	**-20**
20-30	25	25	-10	**-1**	**-25**
30-40	35	30	0	**0**	**0**
40-50	45	20	10	**1**	**20**
50-60	55	10	20	**2**	**20**
		N = 100			**Σfu = -20**

Mean ($\bar{X}$) = 35 - (20/100)*10

= 33

It is necessary to note that when the class interval is exclusive like (10-20,20-30) the process of finding the class interval will be as follow

Class interval = Upper Limit – Lower limit

= 30-20
= 10

If the class interval is inclusive like (10-15, 16-21, 22-27) then sperate 0.5 from both the upper limit and lower limit like (9.5-15.5, 15.5-21.5, 21.5-27.5) and after that class interval is calculated as

Class interval = Upper Limit – Lower Limit
= 27.5 – 21.5
= 6

Mathematical Properties of Arithmetic Mean

(i.) The sum of deviations of Arithmetic mean is always zero.

X	**d = X- $\bar{X}$ = X-30**
10	-20
20	-10
30	0
40	10
50	20
***Σ(*X) = 150**	***Σ(*X- $\bar{X}$) = 0**

(ii.) The sum of the squared deviations of the items from A.M. is minimum

X	X- $\bar{X}$	(X- $\bar{X}$)^2	X- 3	(X- $\bar{X}$)^2
2	-2	4	-1	1
3	-1	1	0	0
4	0	0	1	1
5	1	1	2	4
6	2	4	3	9
20		**10**		**15**

(iii.) If we replace each item of the series by the mean then the sum of the substitution will be equal to the sum of the sum of individual items.
For example: *If we have the following data like* ***10,15,12.18,85*** *then* ***mean of this data is 28.***

Now if we replace each item of the series by mean value like ***28, 28, 28, 28, 28 then we get same mean i.e 28.***

To calculate A.M and number of items of two or more than two A.M, then the combined A.M can be calculated as

$$\boxed{\bar{X}_n = (\bar{X}_1N_1 + \bar{X}_2N_2 + \ldots + \bar{X}_nN_n) / (N_1 + N_2 + \ldots + N_n)}$$

For example: The mean height of 25 male workers in a factory is 61 inches and the mean height of 35 female workers in a same factory is 58 inches. Find the combined mean height of 60 workers in a factory.

$$\mathbf{\bar{X}_{12} = (\bar{X}_1N_1 + \bar{X}_2N_2) / (N_1 + N_2)}$$

$$\bar{X}_{12} = (25*61 + 35*58)/60$$

$$\mathbf{\bar{X}_{12}} = 59.25$$

When not to use Mean?

The major disadvantage of mean is that it is affected by the presence of extreme values.

For example: Consider the wages of the staff at a factory below

Employee: *1 2 3 4 5 6 7 8 9 10*

Salary*:* *15k 18k 16k 14k 15k 15k 12k 17k 90k 95k*

The mean salary for these **10 Employees is 30.7k.** By analysing the above raw data it is concluded that the mean salary is not accurately reflect the typical salary of the worker as most workers salary ranging between **12k and 18k**. The value of mean is affected by the presence of extremely large values i.e **90k and 95k.**

Median

It is another measure of central tendency. It is used when we want to divide something according to our requirement like quartiles, deciles, percentiles. This measure of central tendency is also known as positional average.

Steps to calculate the median

(i.) Arrange the given raw data into ascending or descending data.

(ii.) If the number of observations is odd, then

Median = $[(n+1)/2]^{th}$ item.

(iii.) If the number of observations is even, then

Median = $((n/2)^{th} + (n/2+1)^{th})/2$ item

Location of Medium in a series of Ungrouped data.

<u>(Odd number of observations)</u>

Suppose we have the following data of 7 workers we have to compute the median wage

Wage (in Rs): *1100 1150 1080 1120 1120 1200 1160 1400*

Firstly arrange the data in ascending order

Ascending order: *1080 1100 1120 1150 1160 1200 1400*

The number of observations = 7

Median = (n +1)/2 th item

= (7+1)/2 th item

= 4th item

= 1150

The median wage of workers = Rs 1150

Another way to solve is to arrange the data in descending order.

Descending order: *1400 1200 1160 1150 1120 1100 1080*

The number of observation = 7

Median = (7+1)/2 th item

= 4th item

= 1150

<u>(Even Number of Observations)</u>

Suppose we have the following data

X : *391 384 591 407 672 522 777 753 2488 1490*

Firstly Arrange the dataset into ascending or descending order

Ascending order: *384 391 405 522 591 672 753 777 1490 2488*

The number of Observations = 10

Median = ((n/2)th +(n/2 +1)th) /2 item

Median = (5th + 6th)item/2

Median = (591+672)/2

Median = 631.5

Determination of Median for Grouped Data (Discrete Series):

<u>Steps to calculate the median</u>

(i.) Arrange the data in ascending or descending order.

(ii.) Find out the cumulative frequency c.f.

(iii.) Apply the formula Median = size of (n+1)/2.

(iv.) Now look at the c.f column and find that total which is either equal to (n+1)/2 or next higher to that and determine the value of the variable corresponding to it, That gives the value of median.

The following example would help us to understand the concept more clearly

Income: *1000 1500 800 2000 2500 1800*

No. of Person: ***24*** *26 16 20 6 30*

Income	No. of Person	c.f
800	16	16
1000	24	40
1500	26	66
1800	30	96
2000	20	116
2500	6	122
	n=166	

Median = $[(n+1)/2]^{th}$ item

= (166+1)/2

= 61.5^{th} item

= 1500

Calculation of Median in Continuous Series:

$$X = L + \frac{\frac{N}{2} - C}{f} \times i$$

where

L = Lower Limit of median class.
c.f = cumulative frequency of the class preceding the median class.
f = simple frequency of the median class.
i = the class interval of the median class.

For example: Calculate the median for the following frequency distribution

Marks: ***45****-50 40-45 35-40 30-35 25-30 20-25 15-20 10-15 5-10*

Frequency: *10 15 26 30 42 31 24 15 7*

Marks	Frequency (f)	c.f
5-10	7	7
10-15	15	22
15-20	24	46
20-25	31	77
25-30	42	119
30-35	30	149
35-40	26	175
40-45	15	190
45-50	10	200

Size of N/2 item = 200/2 = 100^{th} item

Median lines in the class 25-30

L = 25, N/2 = 100, c.f = 77, i = 5

From the formula given above,

Median = 25 + 115/42 = 27.45

Mode

It is that value in a series of observation which occurs with the greatest frequency.

For example: the mode of the series 3,5,8,5,4,5,9,3 would be 5 since this value occurs most frequently than any of the other.

Bimodal or Multimodal

When there are two or more values having the same maximum frequency, then series have more than one mode.

For example : Consider the following data

X: *110 120 130 120 110 140 130 120 130 140*

In the above series **120 and 130** have the **same maximum frequency** i.e **3,** so mode = **120,130**

Determination of mode in Continuous series

There are two methods of finding mode

(i.) Grouping table and analysis Method.
(ii.) Inspection Method.

Steps to calulate Mode through *Grouping table and Analysis Method*.

(i.) A group table has 6 columns.
(ii.) **First column** is marked with maximum frequency.
(iii.) **Second column** make groups of two frequency.
(iv.) In **third column**, leave the **1st frequency** and then group the **remaining two**.
(v.) In **fourth column** make the group of **3 frequencies**.
(vi.) In **fifth frequency** leave the 1st frequency and then group **the remaining three**.
(vii.) In **six column**, leave the 1st two and then group the **remaining frequencies in 3.**

The following example would help us to understand the concept more clearly.

Monthly Income: *100-200 200-300 300-400 400-500 500-600 600-700 700-800 800-900*

No. of families: *5 6 15 10 5 4 3 2*

Grouping Table

X	f	II	III	IV	V	VI
100-200	5	11				
200-300	6		21			
300-400	15	25		26	31	
400-500	10		15			30
500-600	5	9		19		
600-700	4		7		12	
700-800	3	5				9
800-900	2					

Analysing table

Column	100-200	200-300	300-400	400-500	500-600
I			1		
II			1	1	
III		1	1		
IV	1	1	1		
V		1	1	1	

VI			1	1	1
Total	***1***	***3***	***6***	***3***	***1***

Therefore 300-400 is modal class because it ha the maximum frequency

$$X = L + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \times i$$

Here,

X = mode.
f1 = highest frequency.
f0 = frequency preceding the highest frequency.
f2 = frequency succeeding the highest frequency.

Mode = 300 + (15-6)/2*15-6-10
= 300 +64.29
= 364.29

> **Note:** Grouping method and Analysis Table is useful when we have same frequency of two or more observation is same

Geometric Mean

It is defined as the nth root of the product of the n items or values. If there are two items we take the square root, if there are three items, then cube root and so on.

$$G.M = (X_1 * X_2 * X_3 *\text{-----}*X_n)^{1/n}$$

Thus the **G.M** of 3 values **2,3,4** would be

$$G.M = (2*3*4)^{1/3}$$
$$= 2.885$$

Calculation of G.M in Individual Observation

$$G.M = Antilog(\Sigma\ logx / N)$$

If the Number of observation is 2 or 3, then it is easy to calculate the root, but if the number of observation is large then, it is difficult to calculate the that root so to make calculation easy use the above formula.

Steps to calculate the Geometric Mean

(i) Take the logarithm of variable X and obtain the total $\Sigma\ logx$.

(ii) *Divide $\Sigma\ logx$* by N and take the antilog of the value so obtained. This gives the value of G.M.

For example: Calculate the G.M. for the following data

X : *125, 1462, 38, 7, 0.22, 0.08, 12.75, 0.5*

X	*logx*
125	2.0969
1462	3.1650
38	1.5798
7	0.8451
0.22	1.3424
0.08	2.9031
12.75	1.1055
0.5	1.6990
	$\Sigma logx = 6.7368$

$$G.M = \text{Antilog}(6.7368/8)$$
$$= \text{Antilog}\ (0.8421)$$
$$= 6.952$$

Calculation of Geometric Mean for Continuous Series:

$$\boxed{G.M = Antilog(\Sigma flogx/N)}$$

Steps to Calculate the Geometric Mean

(i) Find the logarithm of variable X.

(ii) Multiply these logarithms with respective frequencies and obtain the total *$\Sigma flogx$*.

(iii) Divide Σflogx by the total frequency and take the antilog of the value so obtain

For example: Find out the G.M. for the given data.

Marks: *4-8 8-12 12-16 16-20 20-24 24-28 28-32 32-36 36-40*

Frequency: *6 10 18 30 15 12 10 6 2*

Marks	m	f	logm	f*logm
4-8	6	6	0.77182	4.6692
8-12	10	10	1.00000	10.0000
12-16	14	18	1.1461	20.6298
16-20	18	30	1.2553	37.6590
20-24	22	15	1.3424	20.1360
24-28	26	12	1.4150	16.9800
28-32	30	10	1.4771	14.7710
32-36	34	6	1.5315	9.1890
36-40	38	2	1.5798	3.1596
		N = 109		**137.1936**

$$\begin{aligned} G.M &= \text{Antilog}\ (137.1936 / 109) \\ &= \text{Antilog}\ (1.2587) \\ &= 18.14 \end{aligned}$$

Harmonic Series

It is based on the reciprocal of number of the number of the averages. It is defined as the reciprocal of the A.M. of the reciprocal of the individual Series.

$$\boxed{H.M = N/\ (1/X_1 + 1/X_2 +\text{---}+ 1/X_n)}$$

Calculation of the H.M in Individual Series:

For Example: Find the Harmonic Mean of the following data

X: *2574 475 75 5 0.8 0.08 0.005 0.0009*

X	1 / X
2574	0.0004
475	0.0021
75	0.0133
5	0.2000
0.8	1.2500

0.08	12.5000
0.005	200.00
0.0009	1111.1111
	Σ1 / X = 1325.0769

H.M = 8 / 1325.0769
= 0.006

Calculation of Harmonic Mean in Discrete Series:

$$\boxed{H.M = N / \Sigma(f/X)}$$

Steps to calculate the Harmonic Series

(i) Take the **reciprocal** of the various items of variable **X**.
(ii) Multiply the reciprocal by the frequencies and obtain the total **Σ(f/X).**
(iii) Substitute the value of the **N** and **Σ(f/X)** in the above formula.

For example: The following example will help you to clearly understand the concept.

X: *10 20 25 40 50*

F *: 20 30 50 15 5*

X	f	f/X
10	20	2.000
20	30	1.500
25	50	2.000
40	15	0.375
50	5	0.100
		Σ f/X = 5.975

H.M = 120/5.975
= 20.06

Calculation of Harmonic Mean in Continuous Series:

In this the procedure is same as in discrete series. The only difference is that here we take the reciprocal of the midpoints.

For example: From the following data compute the value of H.M.

Class interval: *10-20 20-30 30-40 40-50 50-60*

Frequency: *4 6 10 7 3*

Class-Interval	Midpoint(m)	Frequency(f)	f/m
10-20	15	4	0.267
20-30	25	6	0.240
30-40	35	10	0.286
40-50	45	7	0.156
50-60	55	3	0.055
			Σ f/m = 1.004

$$H.M = N / \Sigma(f/m)$$
$$=30 / 1.004$$
$$= 29.88$$

Moving average

A shifting average is a technical indicator that market analysts and traders may also use to decide the direction of a fashion. It sums up the records points of a financial safety over a selected term and divides the total by the wide variety of facts points to arrive at a mean. it's miles known as a "shifting" common because it is constantly recalculated primarily based on the state-of-the-art charge facts.

Types of Moving average

1. **Simple Moving average**

   The simple shifting common (SMA) is a honest technical indicator that is received by way of summing the recent information points in a given set and dividing the full via the variety of time intervals.

   Formula of S.M.A – $(A_1+A_2 +\text{---}+A_n)/n$

   where

   A is the average in period n
   n is the number of periods

   ### For Example:

   John, a stock trader, wants to calculate the simple moving average for Stock ABC by looking at the closing prices of the stock for the last five days. The closing prices for Stock ABC for the last five days are as follows: \$23, \$23.40, \$23.20, \$24, and \$25.50. The SMA is then calculated as follows:

   SMA = (\$23 + \$23.40 + \$23.20 + \$24 + \$25.50) / 5

= $23.82

2. **Exponential Moving Average (EMA)**
   The alternative form of shifting average is the exponential moving average (EMA), which gives extra weight to the maximum recent fee factors to make it extra conscious of recent records factors

   When calculating the exponential moving average, the following three steps are used:

   - **Calculate the simple moving average for the period.**
   - **Calculate the multiplier for weighting the exponential moving average**
     Multiplier = [2 / (Selected Time Period + 1)
   - **The last step is to calculate the current exponential moving average**

Real Life Application of Central Tendency

(i.) Insurance

Mean: Insurance analysts calculate the mean age of the people they provide insurance so they can know the average age of their customers.

Median: Actuaries calculate the median amount spend on the healthcare each year by individuals so they can know how much insurance they need to be able to provide to individuals.

Mode: Actuaries also calculate the mode of their customers so they can know which age group uses their insurance the most.

(ii.) Real Estate

Mean: It calculate the mean price of houses in a particular area so they can inform their clients of what they can expect to spend on a house.

Median: It also calculate the median price of house to gain a better idea of the "typical" home price because it is less influenced by the outliers.

Mode: It also calculate the mode of the number of bedrooms per house so they can inform their client on how many bedrooms they can expect to have in a particular area.

(iii.) Marketing

Mean: Marketers calculate the mean revenue earned per advertisement so they can know how much money their company is making on each add.

Mode: Marketers used different ways to advertise their product by newspaper, TV, radio, digitals etc. so they know by which way their company earns more.

(iv.) **Human Resource**

Mean: Human Resource manager calculate mean salary of employees in a certain field so that they can know what type of “average” salary should be given to new employees.

Median: It calculate the median salary for each employee in certain department.

Advantages and disadvantages of central Tendency

The **mean median and mode** are all valid measures of crucial tendency. but, a few measures of crucial tendency turn out to be greater appropriate to apply than others under distinct situations. together with:

The **mean** is the only degree of important tendency where **the sum of the deviations of every value from the mean is constantly zero**. Alternatively, the one principal **drawback** of the **mean** is its susceptibility to the influence of **outliers.** As the **records** turns into skewed, the mean loses its capacity to provide the satisfactory critical location because the skewed information is dragging it far away from the typical cost.

The **median is less suffering from outliers and skewed facts**. This belonging makes it a better choice than the mean as a degree of valuable tendency.

The **mode** has an **advantage** over the **median** and the **mean** due to the fact it can be computed for both **numerical** and **categorical data**. However the mode has its boundaries too. In some distributions, the mode may not reflect the centre of the distribution very well. The presence of more than one mode can restriction the capability of the mode to describe the middle or normal price of the distribution due to the fact a unmarried price cannot be recognized to describe the middle. In a few instances, in particular in which the facts are continuous, the distribution may additionally don't have any mode (i.e., if all values are exclusive). In such cases, it could be higher to remember the usage of the median or mean, or institution the facts into appropriate intervals, and find the modal elegance.

Conclusion

In statistics, the concept of central tendency describes how data tends to cluster around a certain value. Quantitative information is at issue here. The central value is the precise value at which the data clusters. Quantitative information may cluster around more than one value. These values are given a specific identification for convenience. The measurements of central tendency refer to the many ways in which this particular value is determined. They concentrate on a data set’s typical value. Howell (2012) contends that the row data must be presented so that the analyst can make inferences from it. For example, the data may be plotted in a way that. The data might be plotted, to show the distribution shape. Measures of central tendency are the statistics which are used to depict the distribution’s centre. They are a group of measurements that show where on a scale the distribution is centred and are frequently referred to as measures of location. The extent to which the measures of central tendency employ the data, particularly the extreme values, varies, but they are all attempting to explain something about where the centre of the distribution rests.

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