Artificial Intelligence Masterclass

Statistical Summaries for AI

H.M. Samadhi Chathuranga Rathnayake

M.Sc in CS (SU), PG.Dip in SML (Othm), PG.Dip in HRM (LRN), B.Sc (Hons) in IS (UOC), B.Eng (Hons) in SE (LMU), P. Dip EP & SBO (ABE), Dip SE, Dip IT, Dip IT & E-Com, Dip B.Mgt, Dip HRM, Dip Eng

Mean of Data

Mean is also known as average of all the numbers in the data set which is calculated by below equation.

$$\text{Mean} = \frac{\text{Sum of all data values}}{\text{Number of data values}} \qquad \bar{X} = \frac{\sum X_i}{n}$$

Variance of Data

Variance is the numerical values that describe the variability of the observations from its arithmetic mean. Standard Deviation is the square root of the variance.

$$V(X) = \frac{1}{n}\sum_{i=1}^{n}(X_i - \bar{X})^2$$

Median of Data

Median is mid value in this ordered data set.

First, arrange the observations in an ascending order.

If the number of observations (n) is odd:
the median is the value at position

$$\left(\frac{n+1}{2}\right)$$

If the number of observations (n) is even:

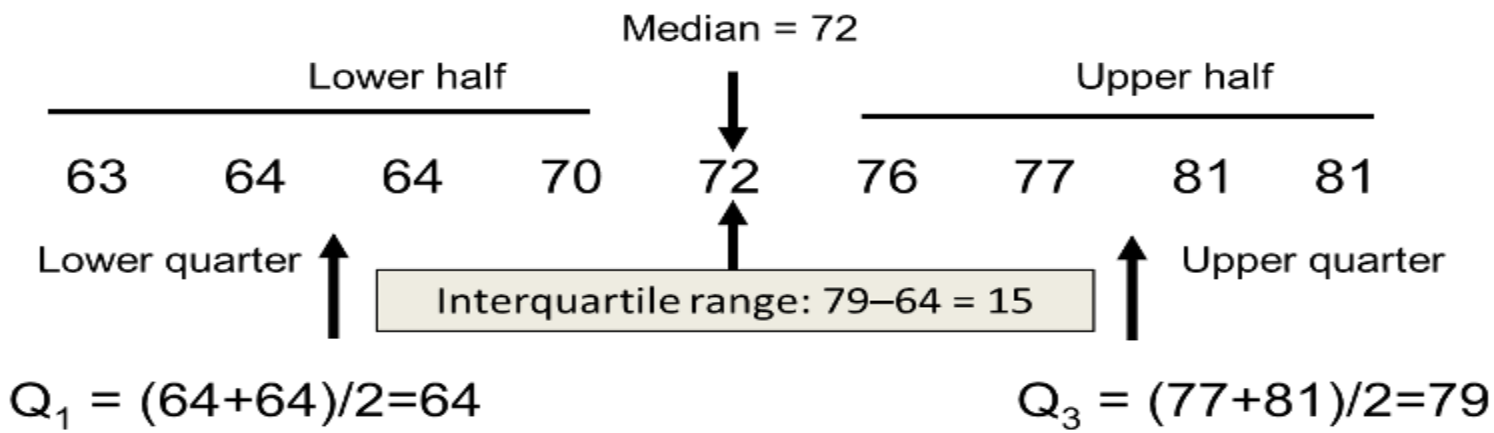
1. Find the value at position $\left(\frac{n}{2}\right)$

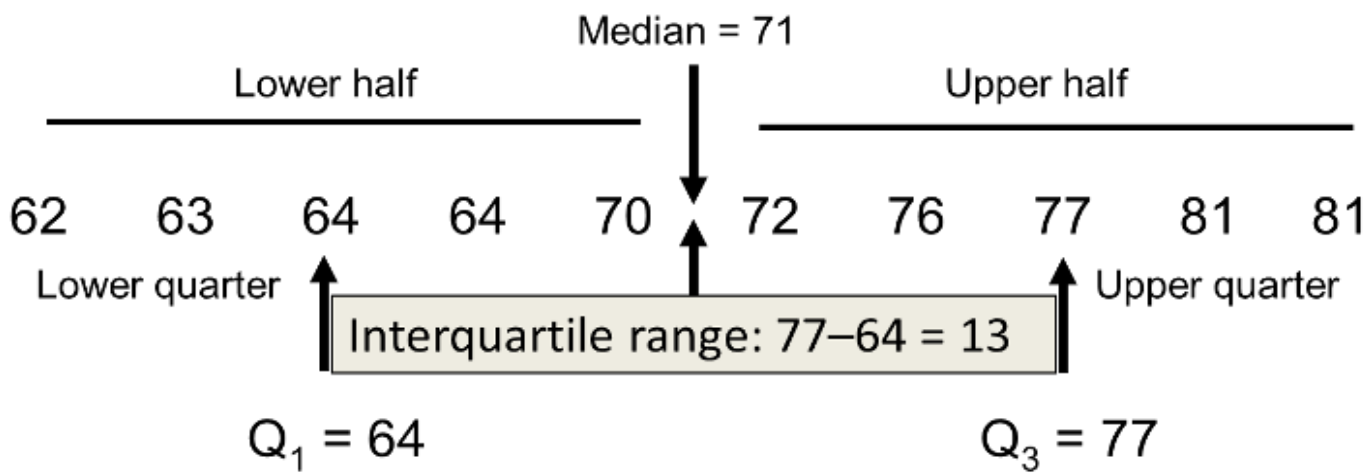
2. Find the value at position $\left(\frac{n+1}{2}\right)$

3. Find the average of the two values to get the median.

Five Number Summary of Data

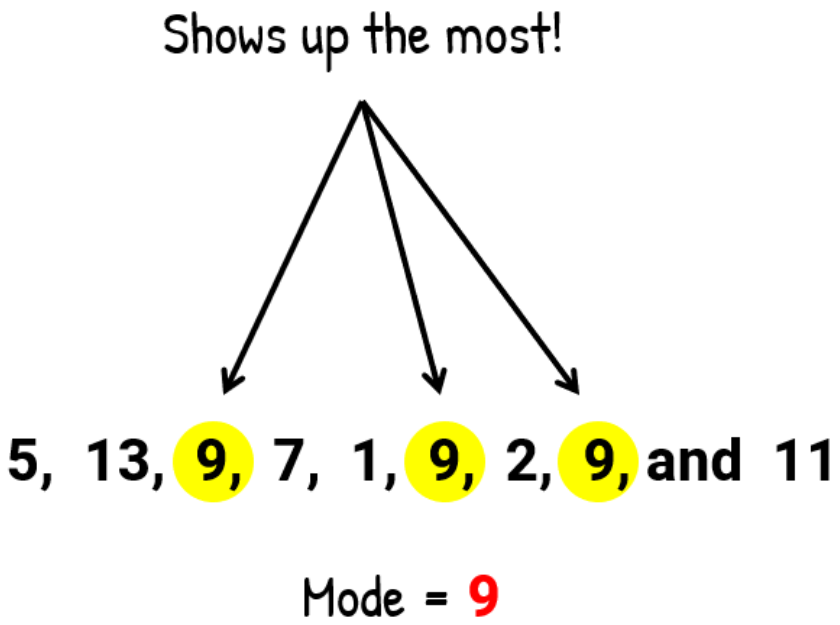
Minimum, 1st Quartile, 2nd Quartile (Median), 3rd Quartile, Maximum





Mode of Data

The mode is the value that has highest number of occurrences in a set of data. Unike mean and median, mode can have both numeric and character data.



Covariance of Two Numerical Variables

Covariance will measure joint variation of two numerical variables. This is a measure of the relationship between two variables.

$$COV(X,Y) = \frac{1}{n}\sum_{i=1}^{n}(X_i - \bar{X})\,(Y_i - \bar{Y})$$

Correlation of Two Numerical Variables

Correlation is also a measurement of the relationship between two numerical variables. It is lying between -1 and +1.

$$CORR(X,Y) = \frac{COV(X,Y)}{\sqrt{V(X)V(Y)}}$$