

The difference between Covariance and Correlation

We use both of these concepts to understand relationships between data variables and values. We can quantify the relationship between variables and then use these learnings to either select, add or alter variables for predictive modeling, insight generation or even storytelling using data. Thus, both correlation and covariance have high utility in machine learning and data analysis.

Put simply, both covariance and correlation measure the relationship and the dependency between two variables. Covariance indicates the direction of the linear relationship between variables while correlation measures both the strength and direction of the linear relationship between two variables. Correlation is a function of the covariance.

Now you will see the differences between Covariance and Correlation.

Basis for comparison	Covariance	Correlation
Definition	Covariance is an indicator of the extent to which 2 random variables are dependent on each other. A higher number denotes higher dependency.	Correlation is a statistical measure that indicates how strongly two variables are related.
Values	The value of covariance lies in the range of $-\infty$ and $+\infty$.	Correlation is limited to values between the range -1 and +1
Change in scale	Affects covariance	Does not affect the correlation
Unit-free measure	No	Yes