What is the correlation coefficient when given the value of R2?

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The correlation coefficient is a statistical measure that quantifies the strength and direction of the relationship between two variables. It is typically denoted as "r" and can range from -1 to 1, with 0 indicating no correlation and a value of 1 or -1 indicating a perfect positive or negative correlation, respectively.

When given the value of R2 (also known as the coefficient of determination), which measures the proportion of variability in one variable that can be explained by the other variable, the correlation coefficient can be calculated by taking the square root of R2. This means that the correlation coefficient and R2 are closely related, with R2 providing additional information about the strength of the correlation between the two variables.

Find the Correlation Coefficient from R2

You can find the between two variables by taking the square root of the R-squared value (R2) of a simple linear regression model.

Correlation coefficient = √R2 of simple linear regression model

The sign of the slope coefficient in the regression model tells you whether the correlation coefficient is positive or negative.

The following examples show how to find the correlation coefficient from the R-squared value of a regression model in practice.

Note: The R-squared value of a regression model is also

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called the coefficient of determination.

Example 1: Find Correlation Coefficient from R2 (when slope is positive)

Suppose we fit a simple linear regression model using hours studied as the predictor variable and exam score as the response variable.

Suppose we receive the following output from the model:

Fitted Regression Equation: Exam Score = 65.55 + 2.78(Hours Studied)

R-Squared (R2) of Regression Model: 0.7845

The R-squared value of the model tells us what percentage of variation in exam scores can be explained by hours studied.

In this example, we can see that hours studied is able to explain 78.45% of the variation in exam scores.

To find the correlation coefficient between hours studied and exam scores, we can take the square root of R2:

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Correlation coefficient = √R2 = √0.7845 = 0.8857

Since the sign is positive for hours studied in the regression equation, this correlation coefficient is positive.

Thus, the correlation coefficient between hours studied and exam score is 0.8857.

Example 2: Find Correlation Coefficient from R2 (when slope is negative)

Suppose we receive the following output from the model:

Fitted Regression Equation: Max bench press = 240.11 - 1.24(Age)

R-Squared (R2) of Regression Model: 0.4773

The R-squared value of the model tells us what percentage of variation in max bench press pounds can be explained by age.

In this example, we can see that age is able to explain 47.73% of the variation in max bench press amount.

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To find the correlation coefficient between age and max bench press, we can take the square root of R2:

Correlation coefficient = √R2 = √0.4773 = 0.6909

Since the sign is negative for age in the regression equation, this correlation coefficient is negative.

Thus, the correlation coefficient between age and max bench press is -0.6909.

The following tutorials provide additional information about correlation coefficients:

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