



WHAT IS LINEAR REGRESSION?

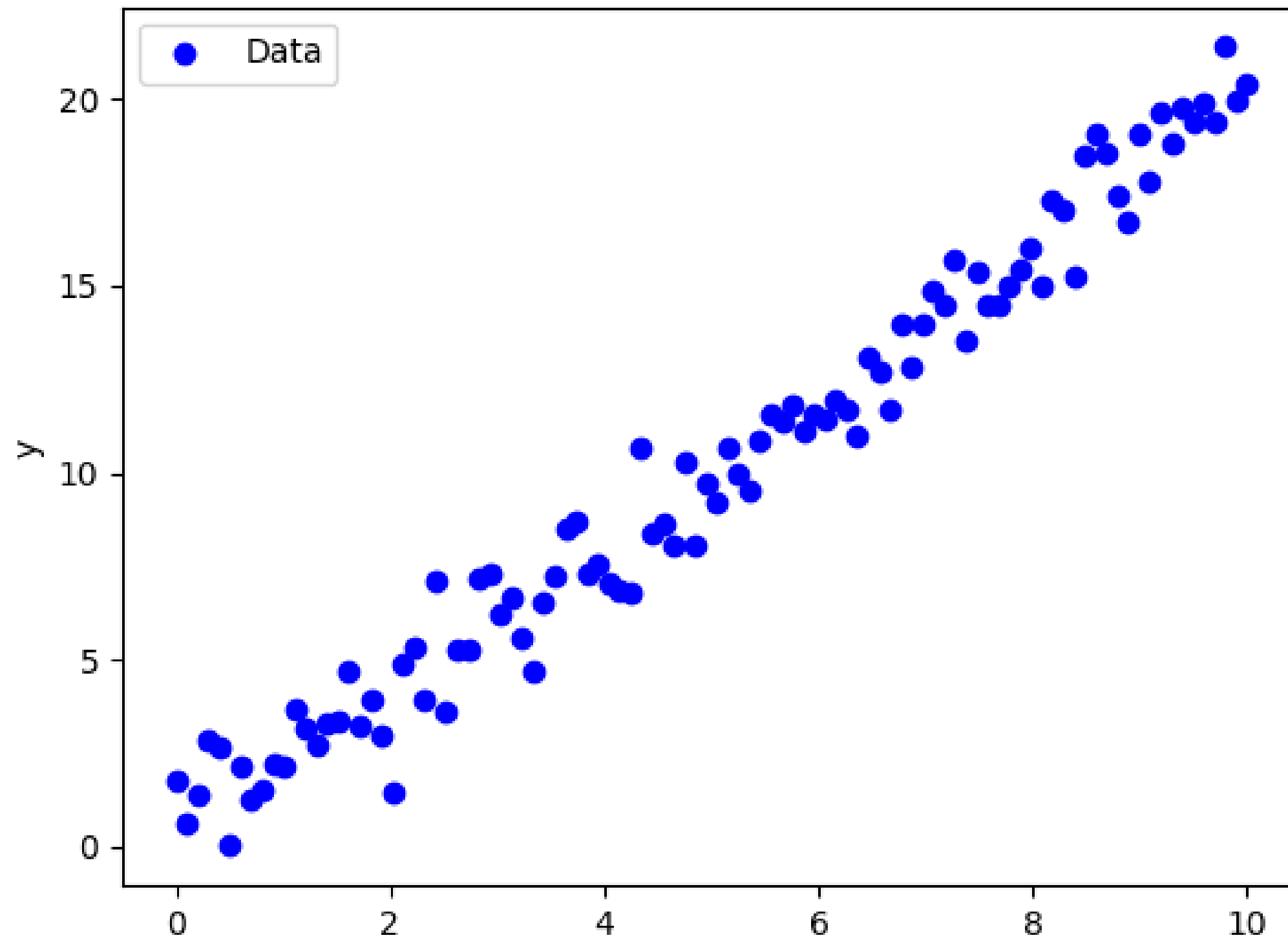
Imagine you have a bunch of friends and you know their ages and heights. If you plot their ages on the x-axis and their heights on the y-axis, you can draw a line through the points that best fits the data. Then, if you want to guess how tall someone is based on their age, you can use this line to make a prediction.

Linear regression in machine learning is just like this, but with a lot more data and calculations. It helps us make predictions by finding the best line that fits the data we have. So, it's like guessing someone's height based on their age, but with math and a computer!



DRCFS

Linear Regression





MEAN SQUARE LOSS ?

In machine learning, mean square loss is a measure of how well a model's predictions match the actual values. It's often used in regression problems where the goal is to predict a continuous value, such as a stock price or a person's height.

To calculate mean square loss, you take the difference between each predicted value and its corresponding actual value, square it, and then take the average of all these squared differences. This gives you a single number that represents the average squared distance between the predicted and actual values.



MEAN SQUARE LOSS FORMULAE

- y_i is the actual value of the i -th data point
- $f(x_i)$ is the predicted value of the i -th data point
- n is the total number of data points

$$\text{MSE} = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2$$

The larger the mean square loss, the worse the model's predictions are. This means that the model needs to be improved by adjusting its parameters or changing the algorithm used.

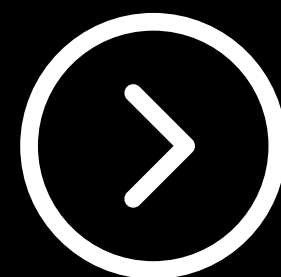
On the other hand, a smaller mean square loss indicates that the model is making more accurate predictions. This means that the model is performing well and can be used to make predictions on new, unseen data.

So, mean square loss is a way to measure how well a machine learning model is performing in terms of accuracy, by calculating the average squared difference between its predicted values and the actual values.



WHAT IS GRADIENT DESCENT?

Gradient descent is an algorithm used to find the best parameters for a model by repeatedly adjusting them in the direction of the steepest descent of the error function.



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