

Gradient Descent (GD) - 101

Gradient Descent is an optimization algorithm used to find the minimum of a function. It is widely used in machine learning for training models.

The basic idea is to start at an initial point and iteratively move in the direction of the negative gradient of the function, which leads to the minimum.

Mathematically, the update rule for the parameters θ is given by:

$$\theta_{t+1} = \theta_t - \eta \nabla_{\theta} J(\theta_t)$$

where η is the learning rate, $\nabla_{\theta} J(\theta_t)$ is the gradient of the cost function J with respect to the parameters θ at iteration t .

The process continues until the algorithm converges to a minimum, which is often determined by a small change in the cost function over several iterations.

There are several variants of Gradient Descent, including Batch Gradient Descent, Stochastic Gradient Descent, and Mini-batch Gradient Descent.

Batch Gradient Descent uses the entire dataset to calculate the gradient, while Stochastic Gradient Descent uses only one data point at a time.

Mini-batch Gradient Descent strikes a balance between the two, using a small subset of the data for each iteration.

Gradient Descent is a powerful tool for optimizing machine learning models, but it can be sensitive to the choice of learning rate and initial parameters.

Understanding the underlying principles of Gradient Descent is essential for effectively using it in practice.

By following the steps outlined in this article, you can gain a solid understanding of Gradient Descent and its applications.

Next, we will explore the implementation of Gradient Descent in Python, showing how to apply it to a simple linear regression problem.

Stay tuned for the next article in the series, where we will delve into the details of the Python implementation.

Thank you for reading, and we hope you found this article informative and helpful.

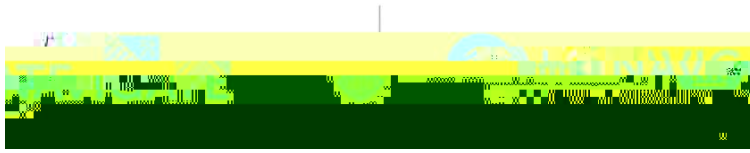
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Let's continue to learn and grow together in the world of machine learning.

With best regards,
The Author

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After making all their selections, the student will see

The screenshot displays a mobile application interface. At the top, there is a navigation bar with a 'Home' button. Below this, a large section contains a 'Scout' button. Underneath the 'Scout' button, there is a section titled 'Comments for your staff...' with a text input field. At the bottom of the screen, there is a navigation bar with five buttons: 'Home', 'Scout', 'Scout with Emile', 'Send Me an Email', and 'Send Me a Text'. To the right of the bottom navigation bar, there is a section titled 'Please provide your mobile number' with a text input field containing the number '906-905-0583'.