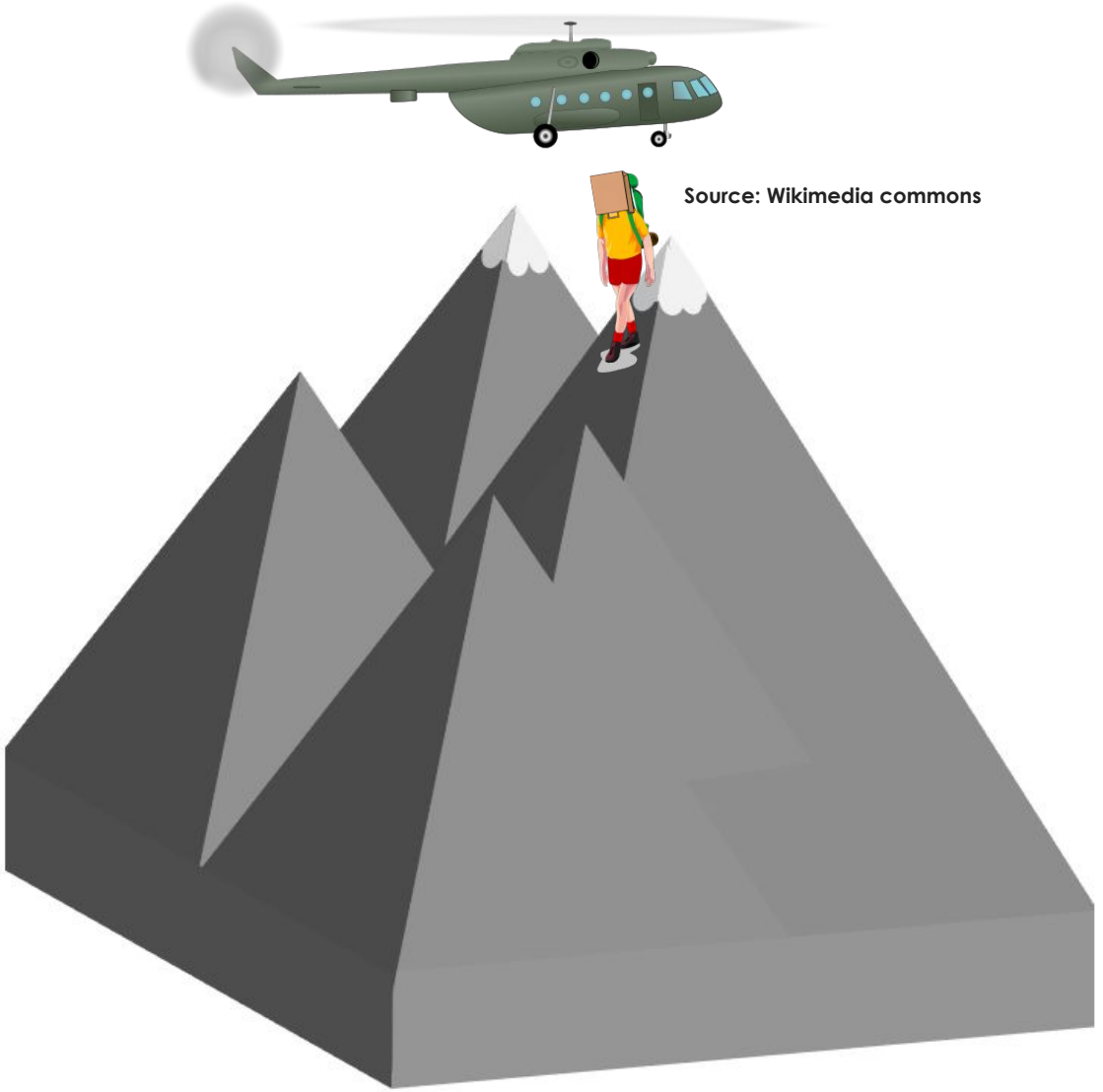
Introduction to Gradient Descent

Deep Learning Pre-Work

Introduction



Source: Wikimedia commons

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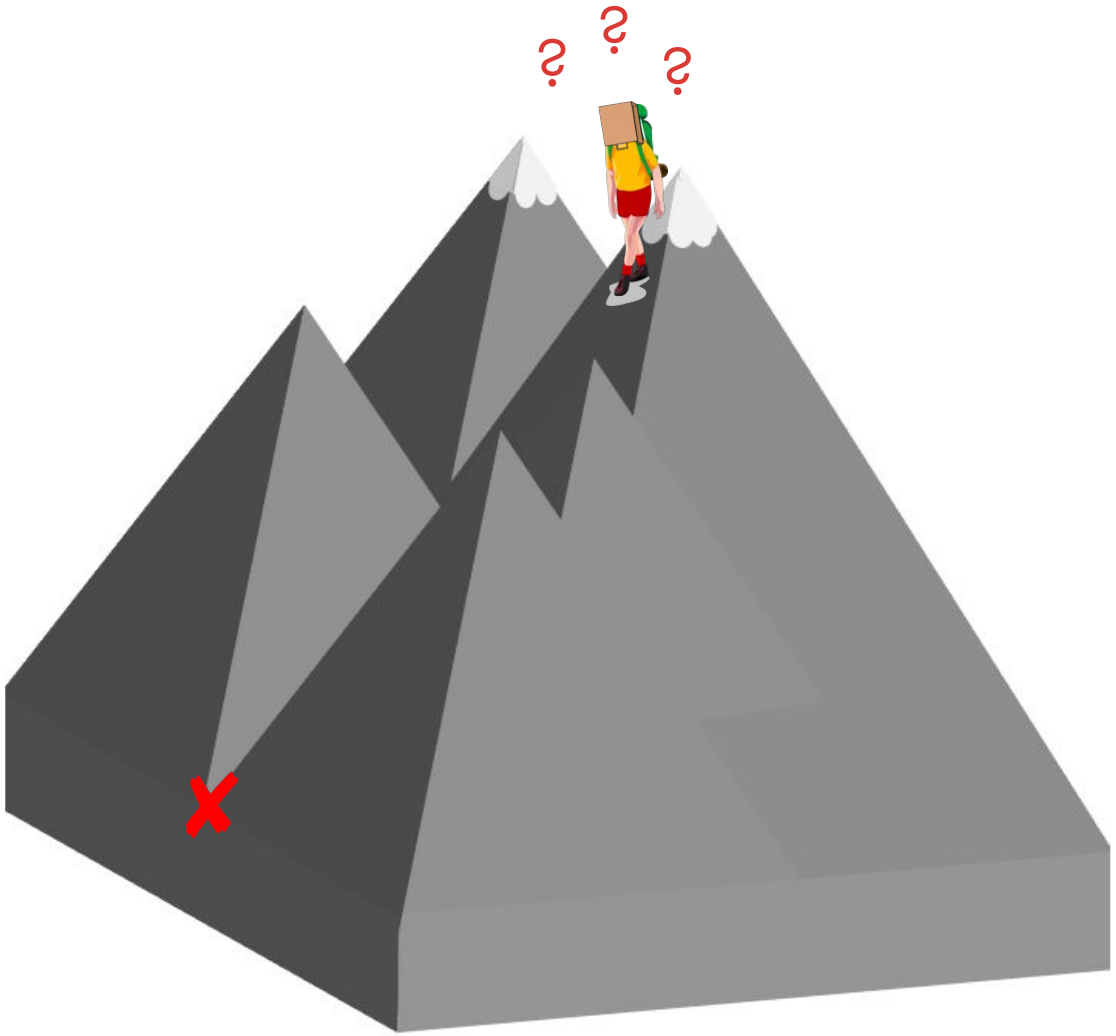

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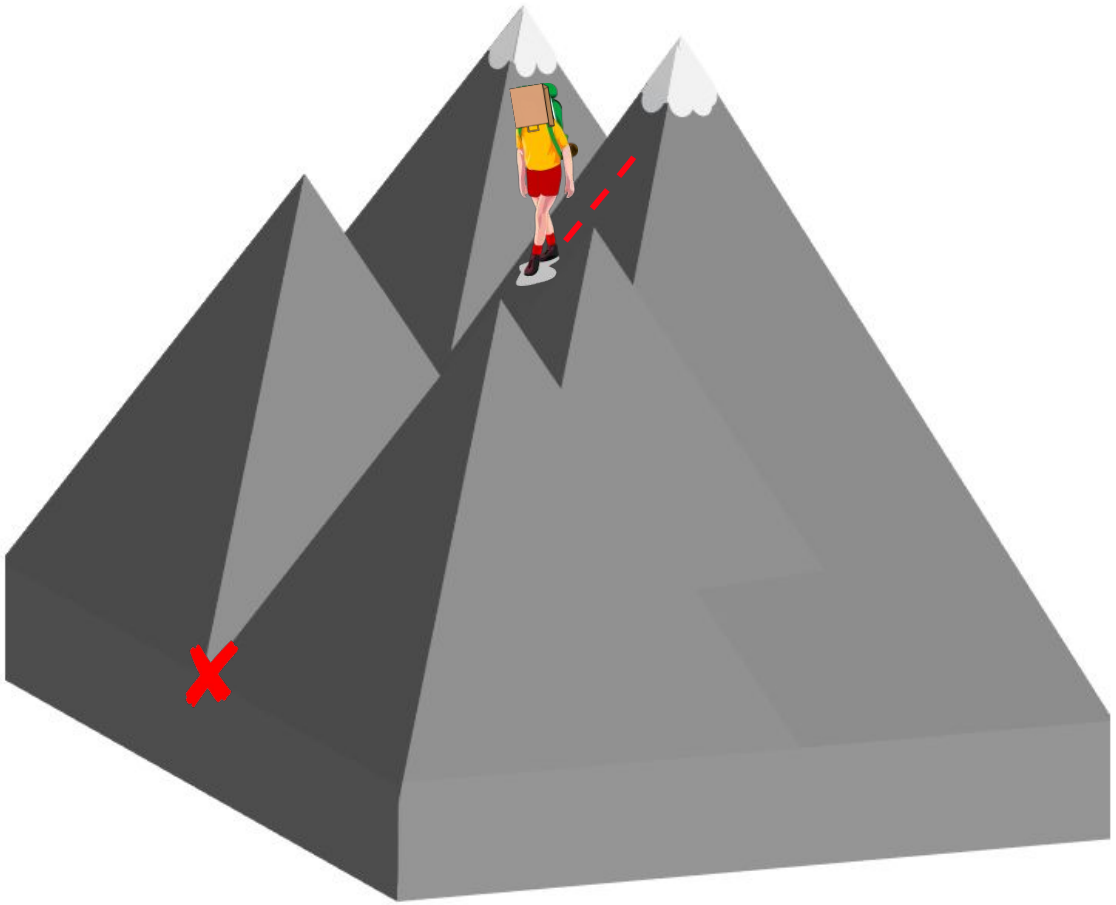

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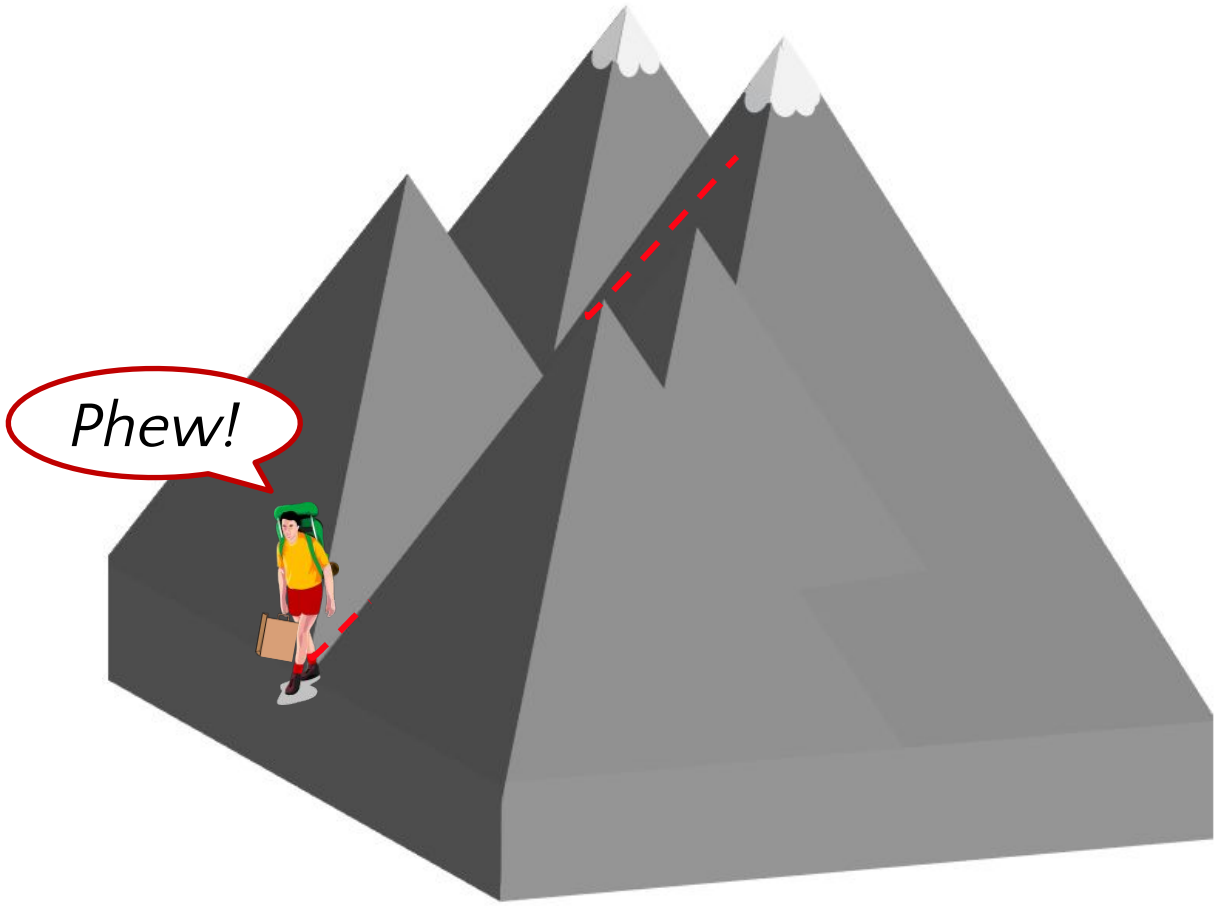
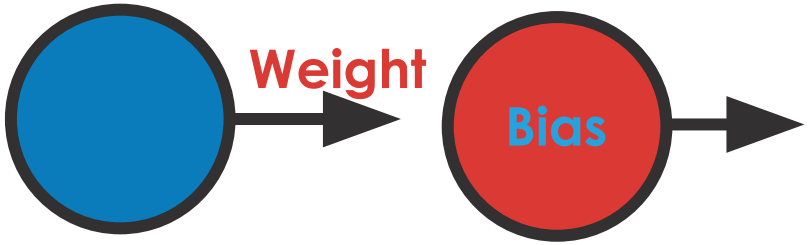
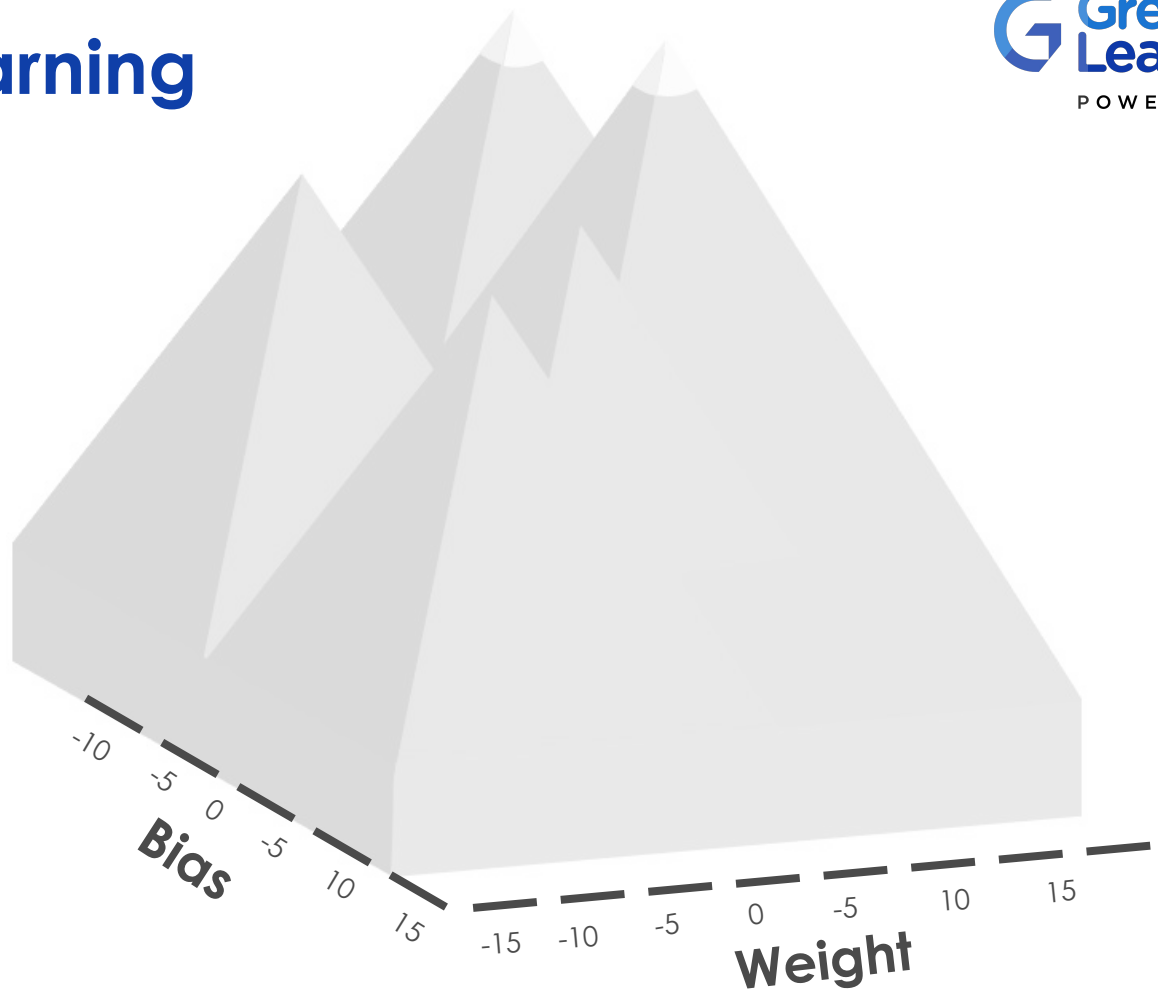


Gradient Descent in Deep Learning





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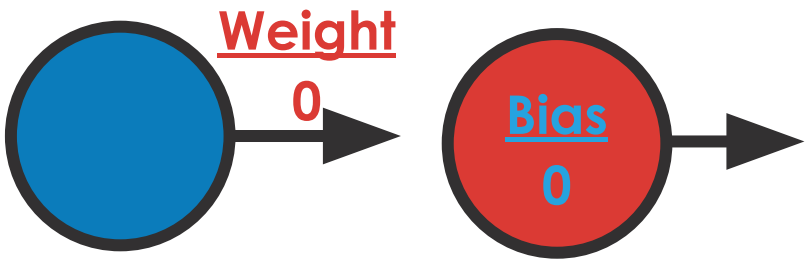

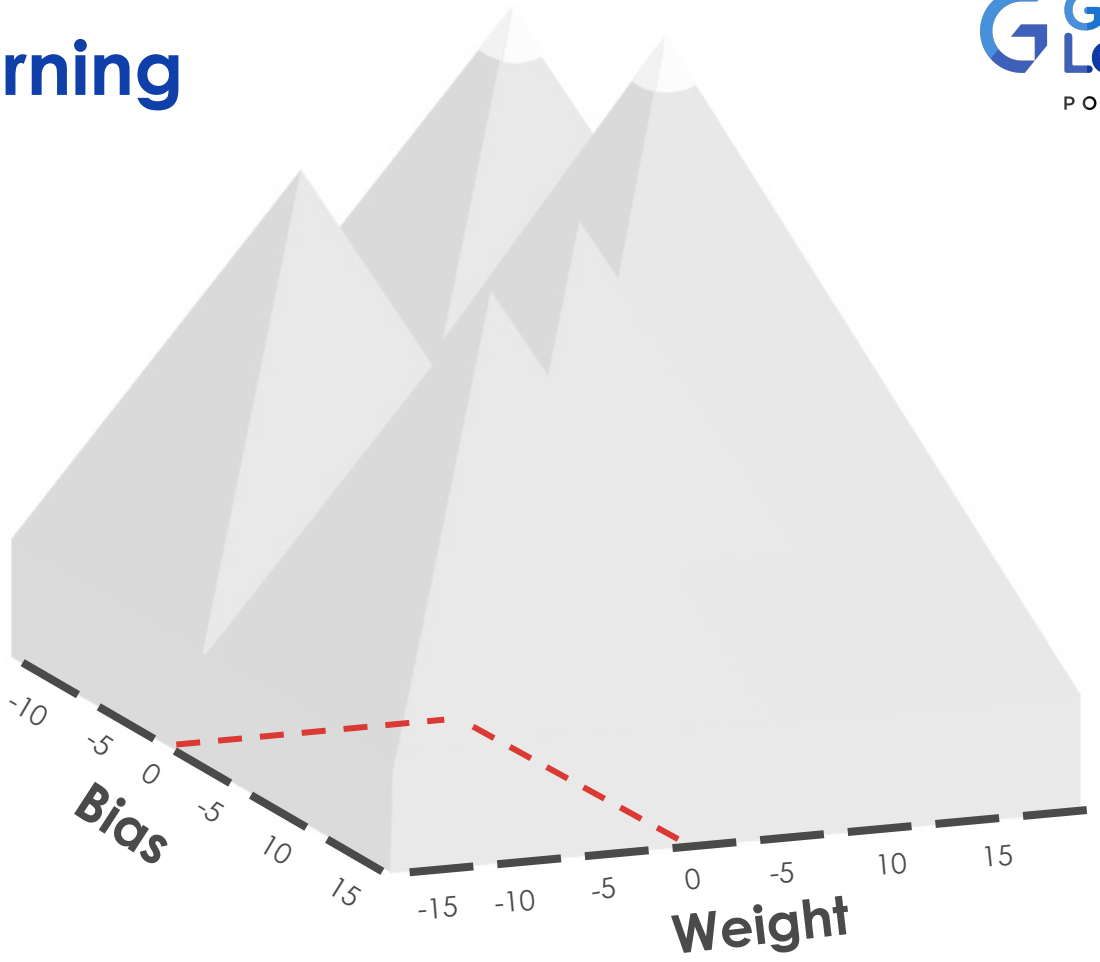

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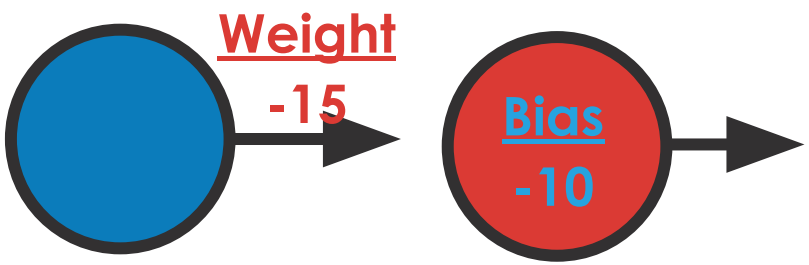

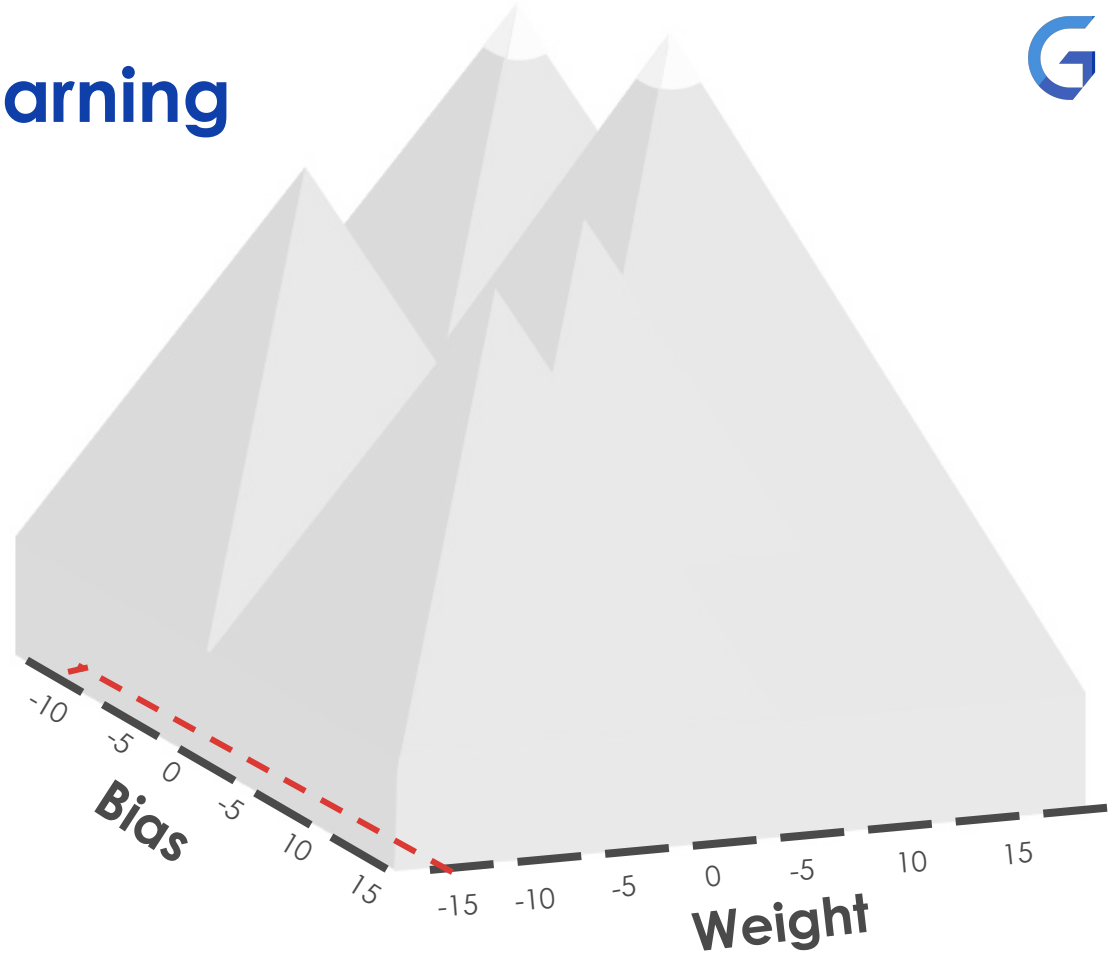

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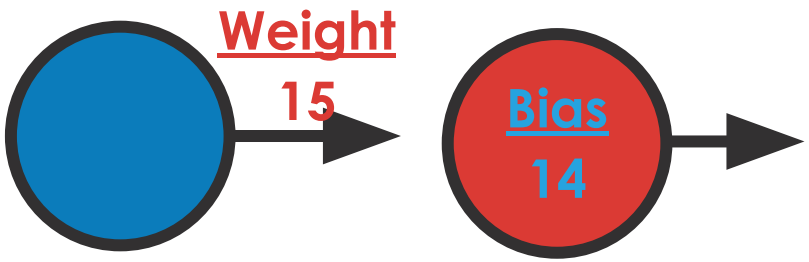
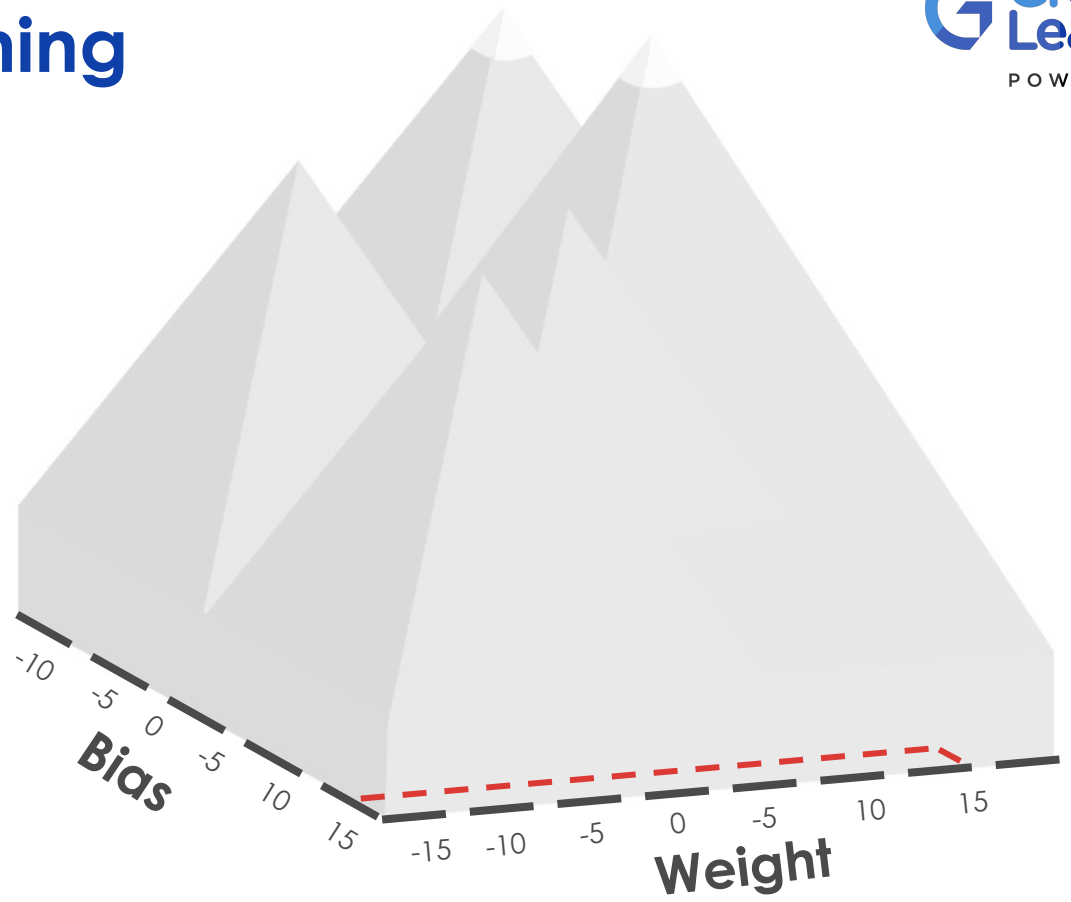
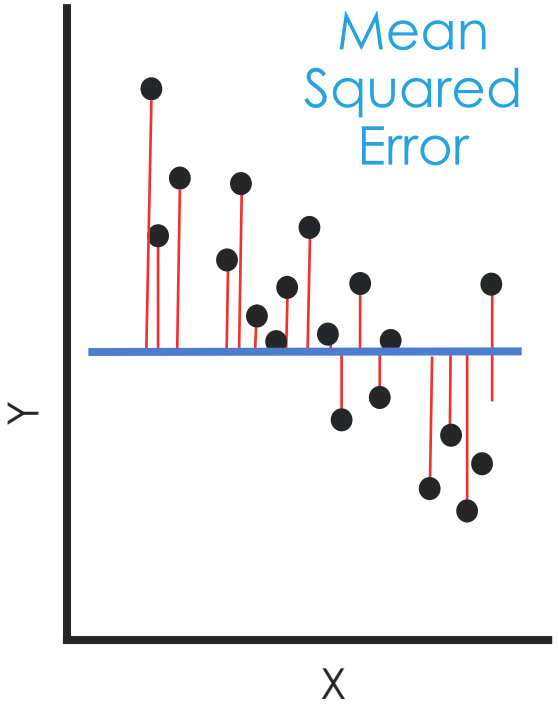




Loss

Regression



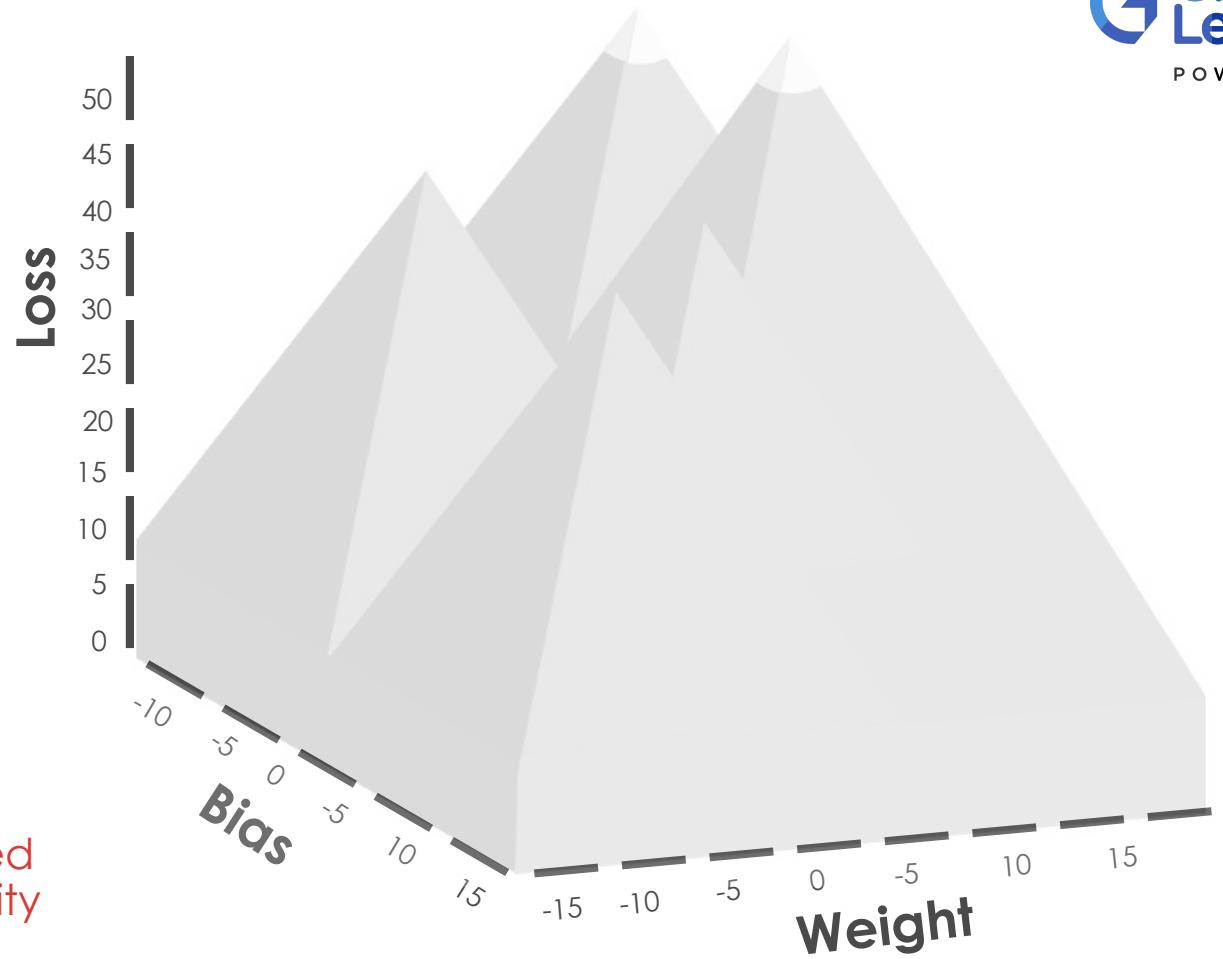
Classification

Cross
Entropy

$$-\sum_{i=1}^{k} y_i \log(\hat{y})$$

Actual

Predicted
Probability



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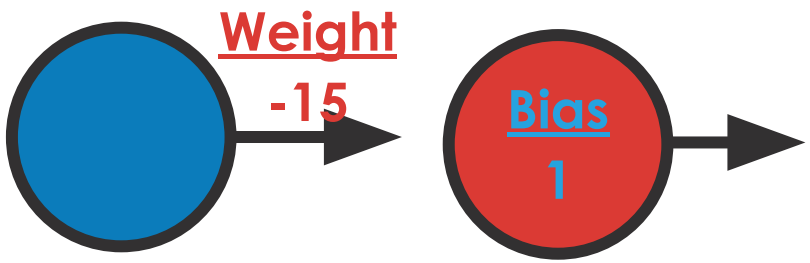
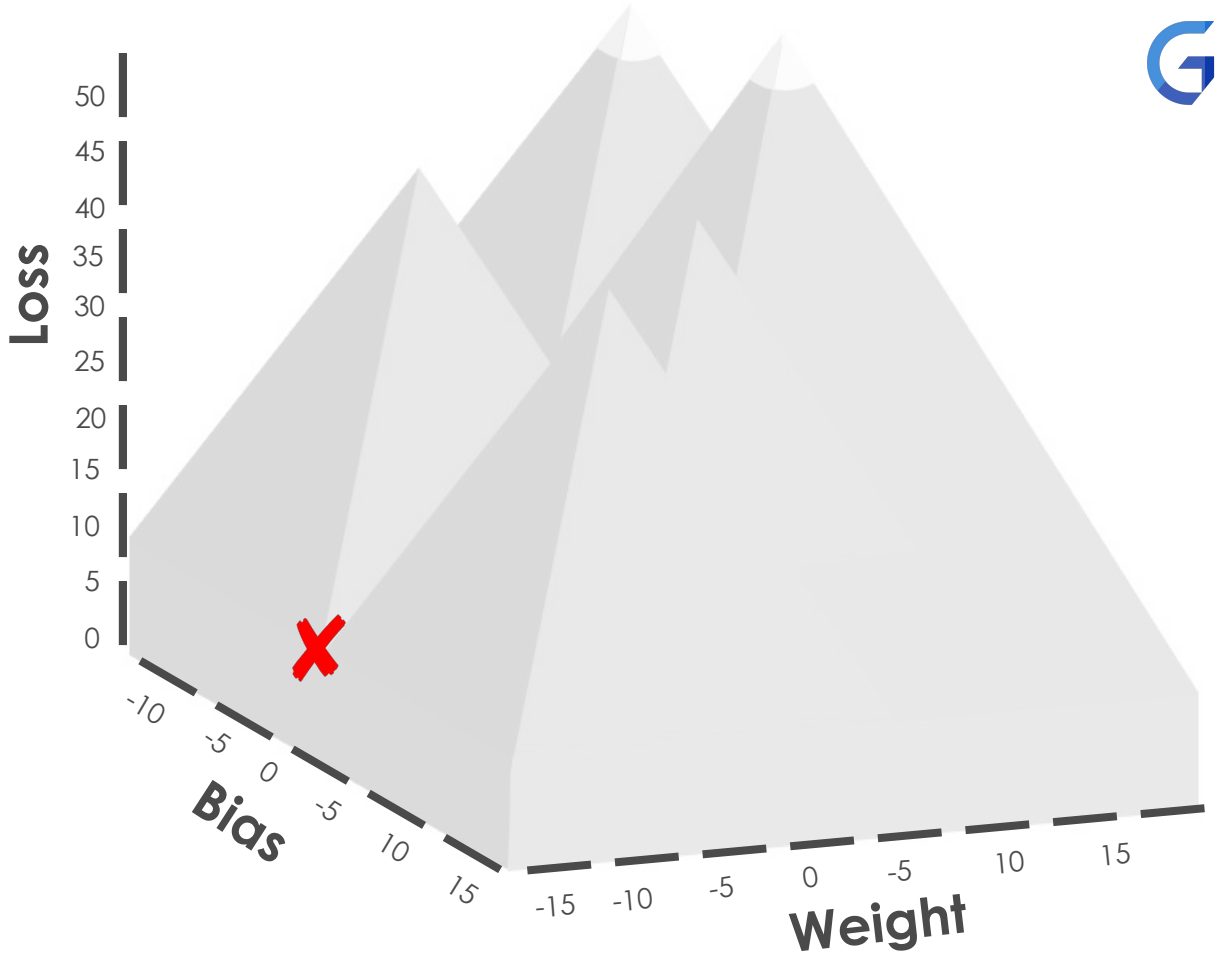
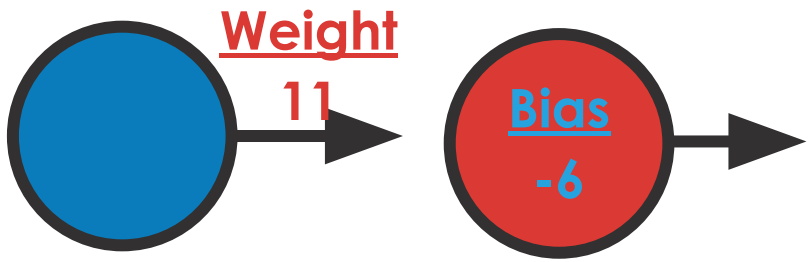
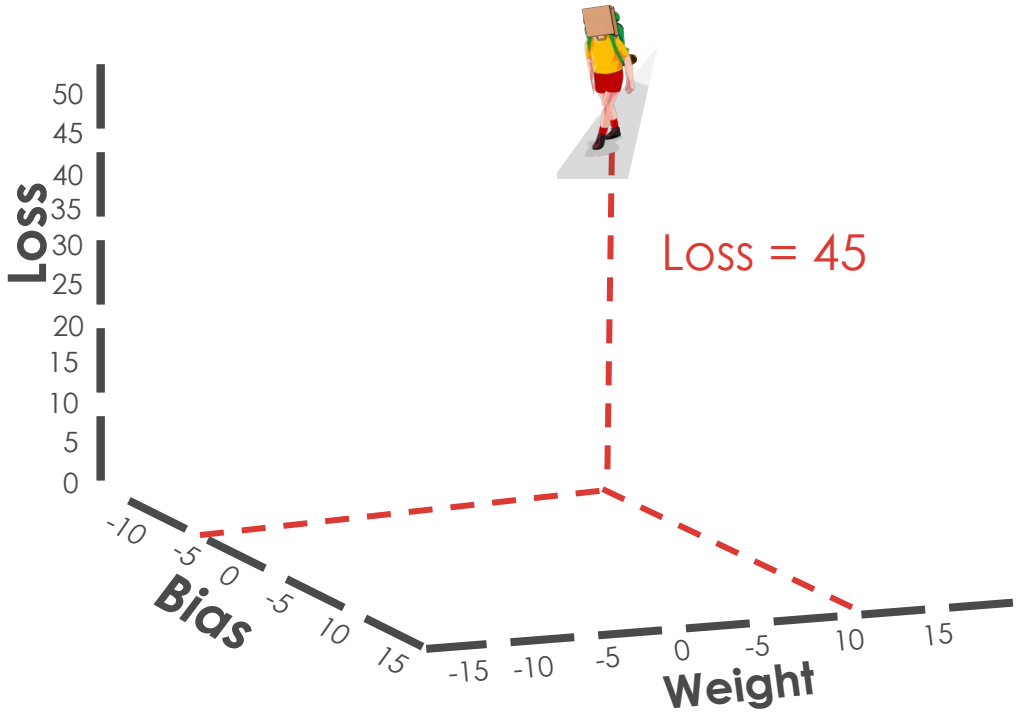




Gradient Descent Steps

Step 1 Start at a random bias and weight and calculate the loss

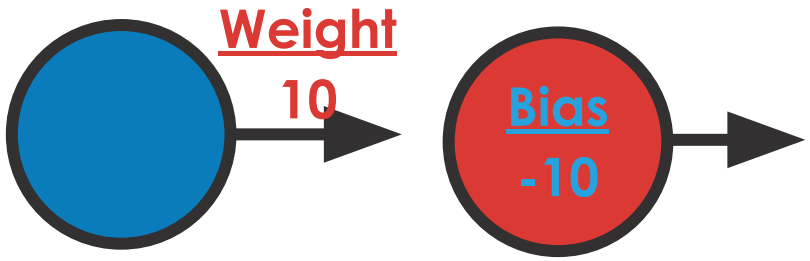


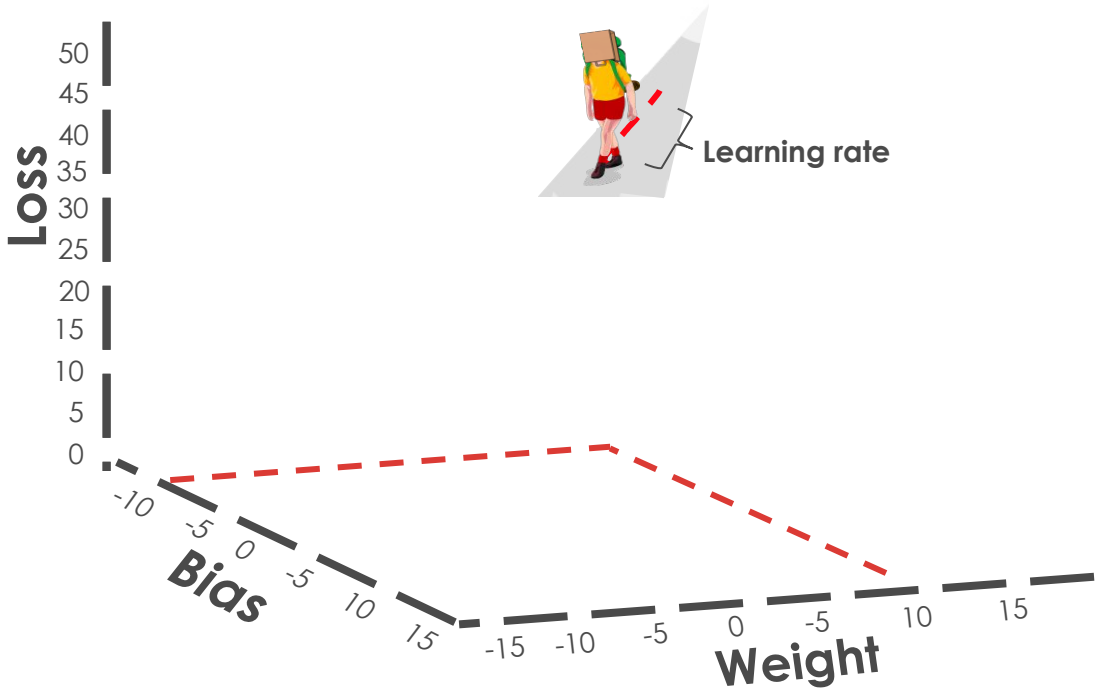


Gradient Descent Steps

Step 1 Start at a random bias and weight and calculate the loss

Step 2 **Take a step in the direction with the steepest gradient**





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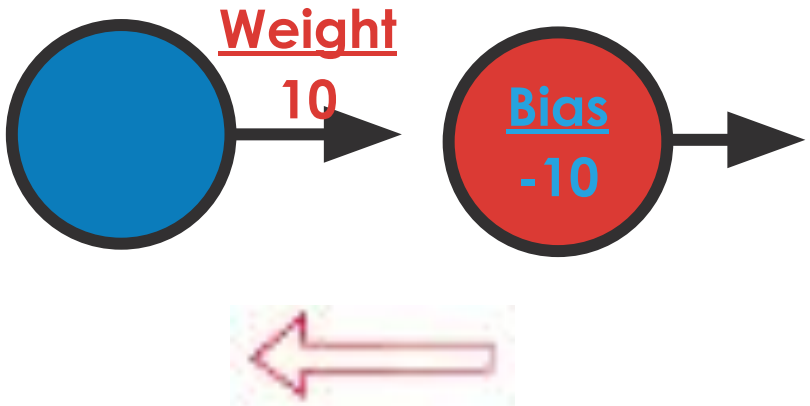
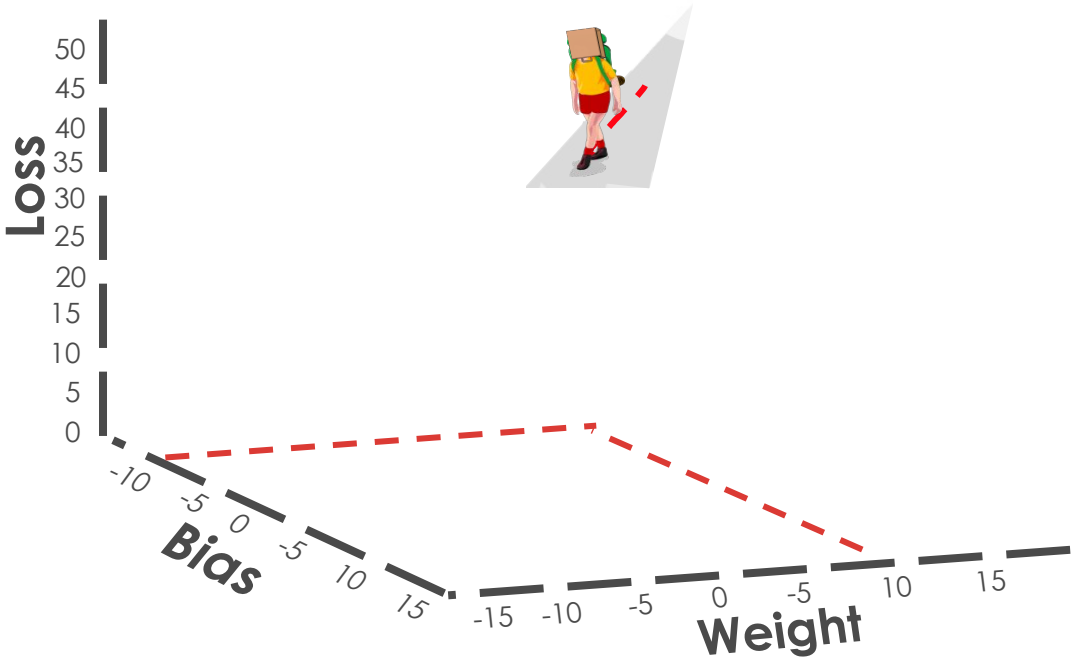


Backpropogation

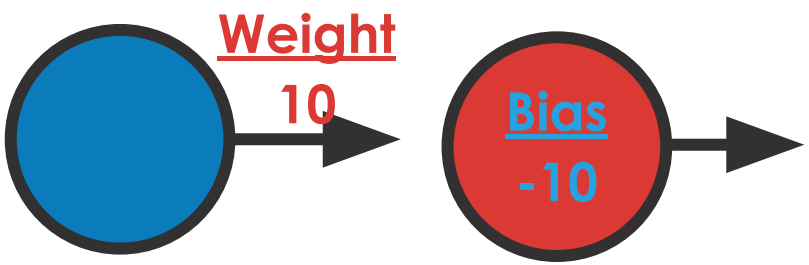


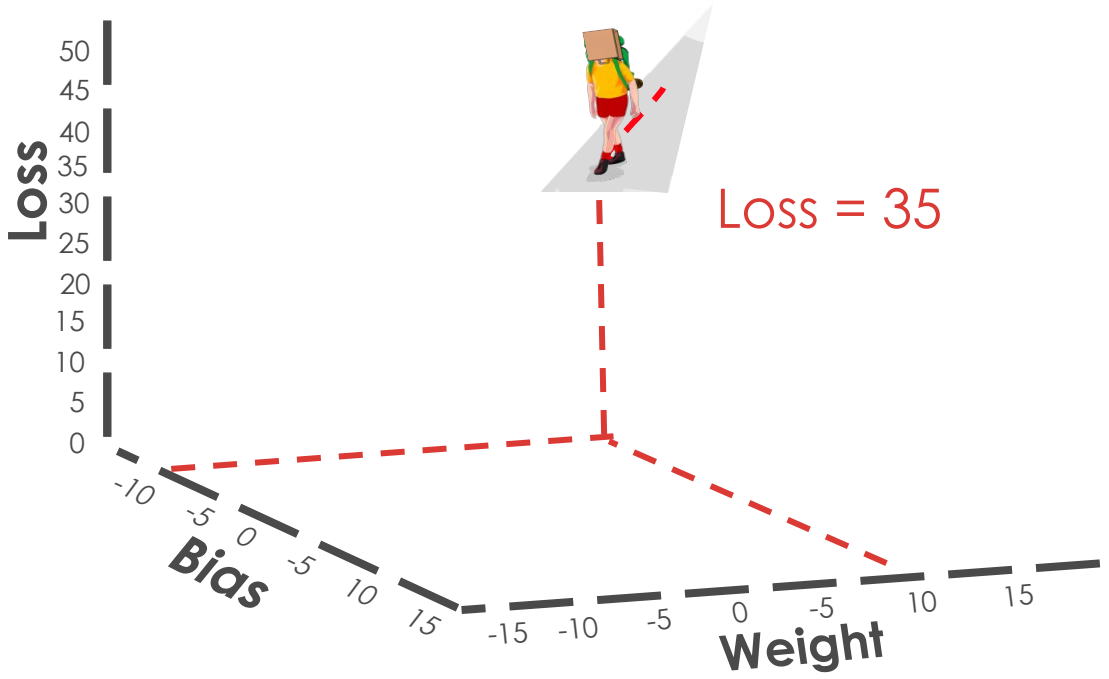
Gradient Descent Steps

Step 1 Start at a random bias and weight and calculate the loss

Step 2 Take a step in the direction with the steepest gradient

Step 3 Calculate the new loss





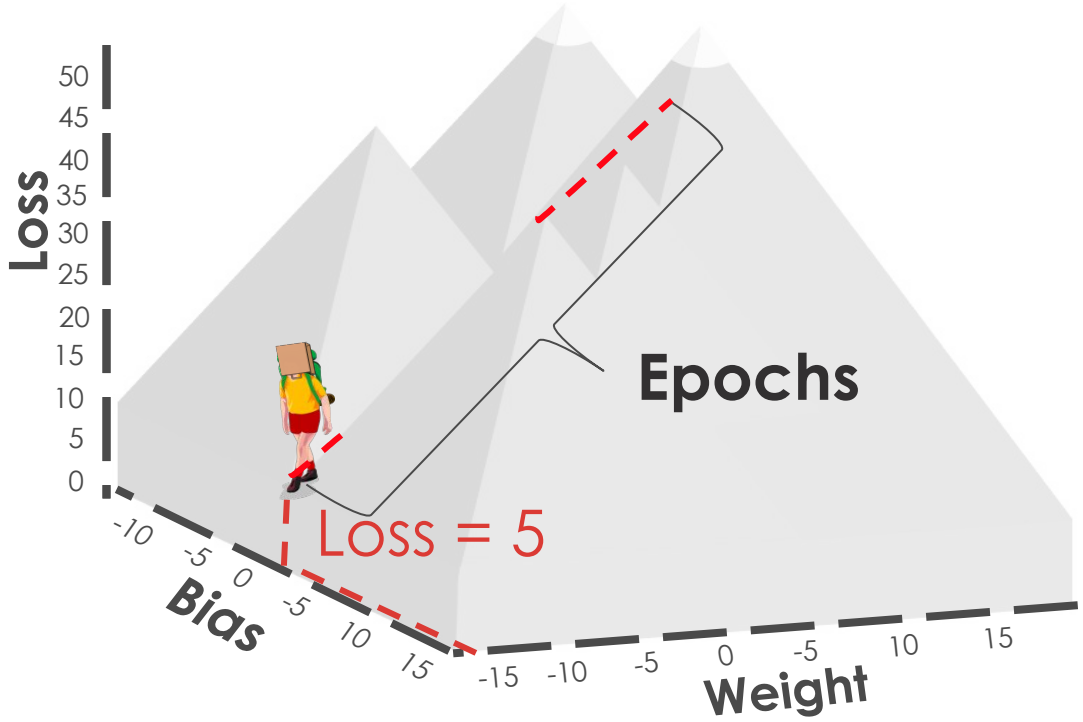
Gradient Descent Steps

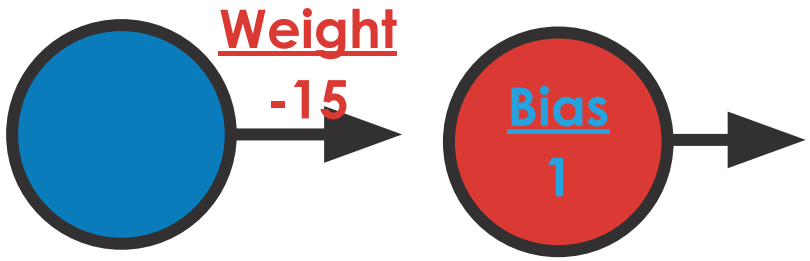
Step 1 Start at a random bias and weight and calculate the loss

Step 2 Take a step in the direction with the steepest gradient

Step 3 Calculate the new loss

Step 4 Repeat steps 2 and 3





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