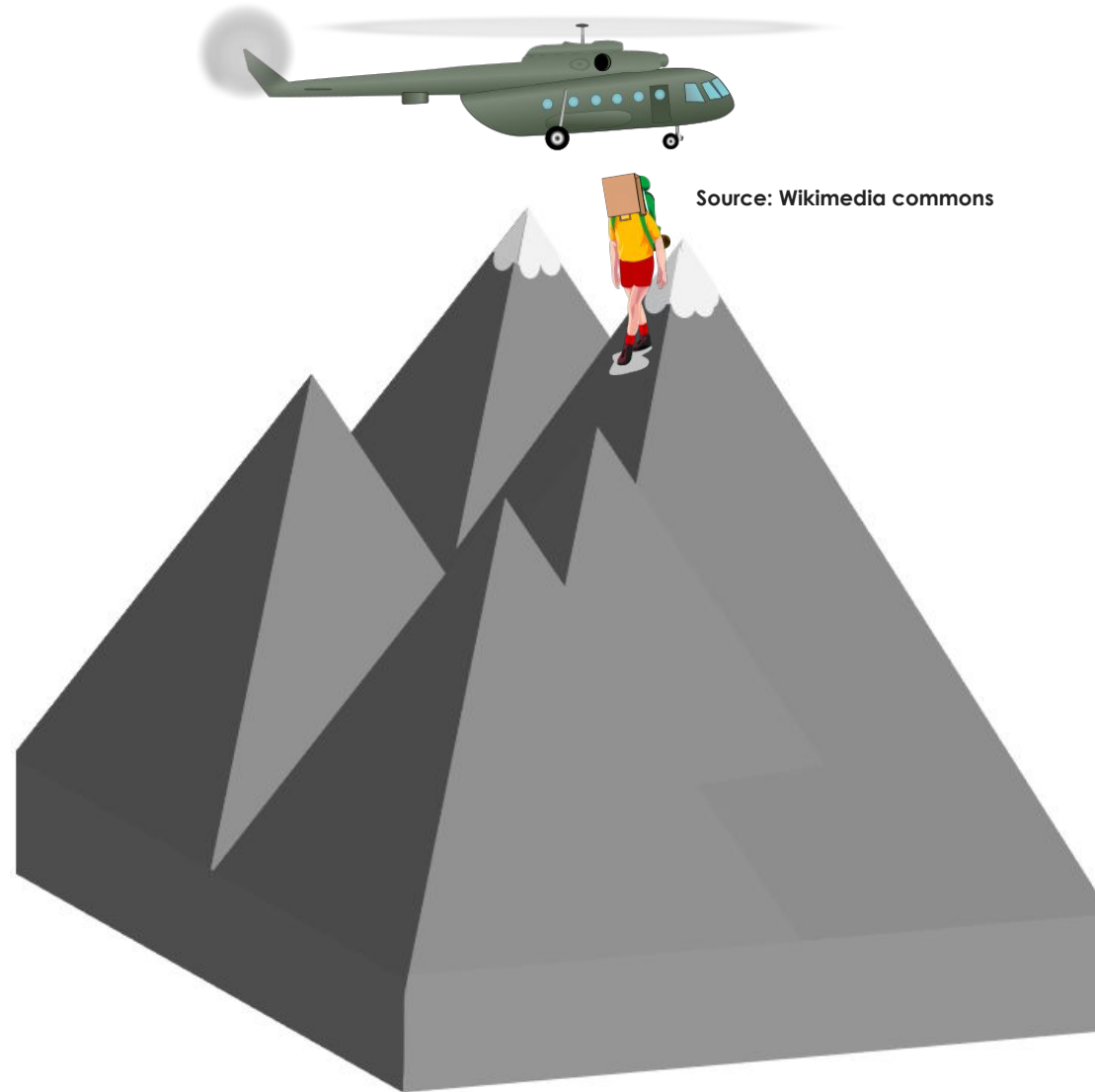




Introduction to Gradient Descent

Deep Learning Pre-Work

Introduction

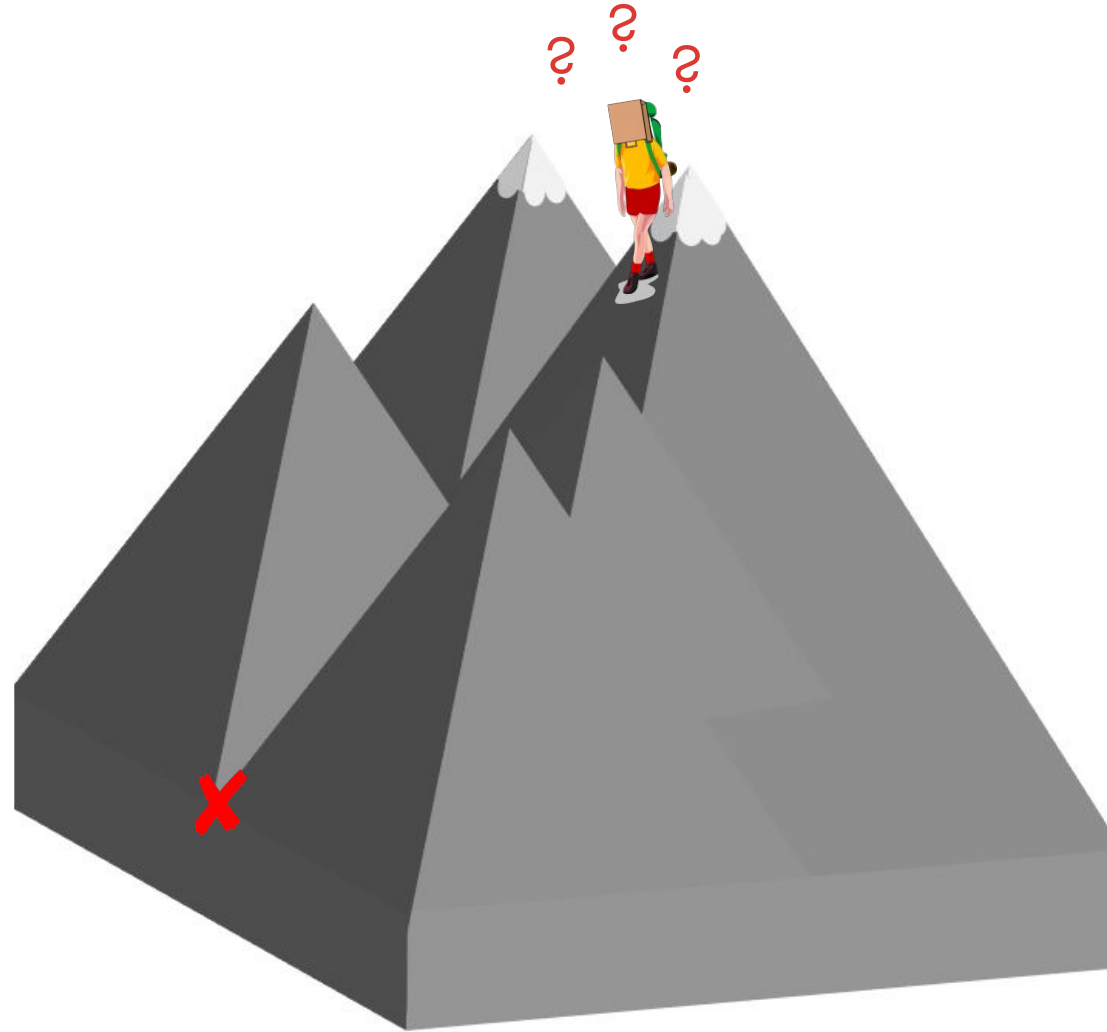


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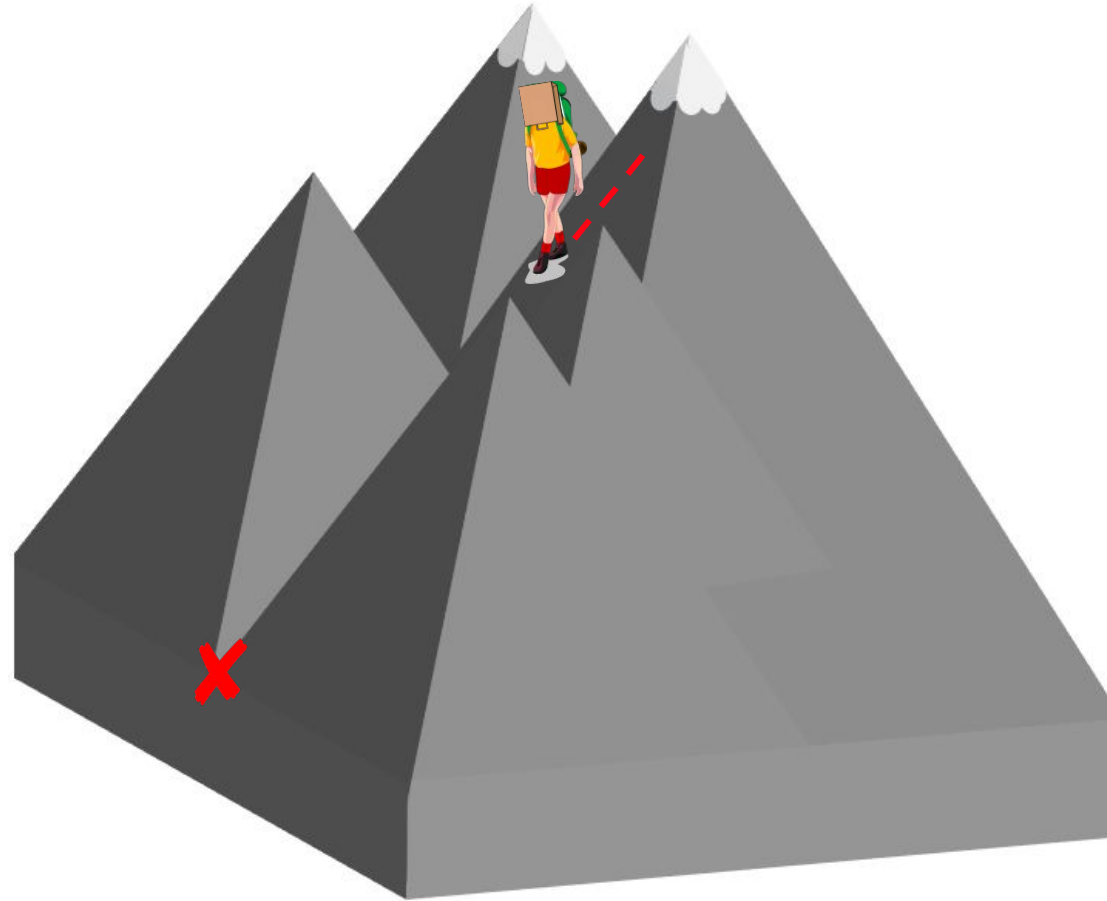
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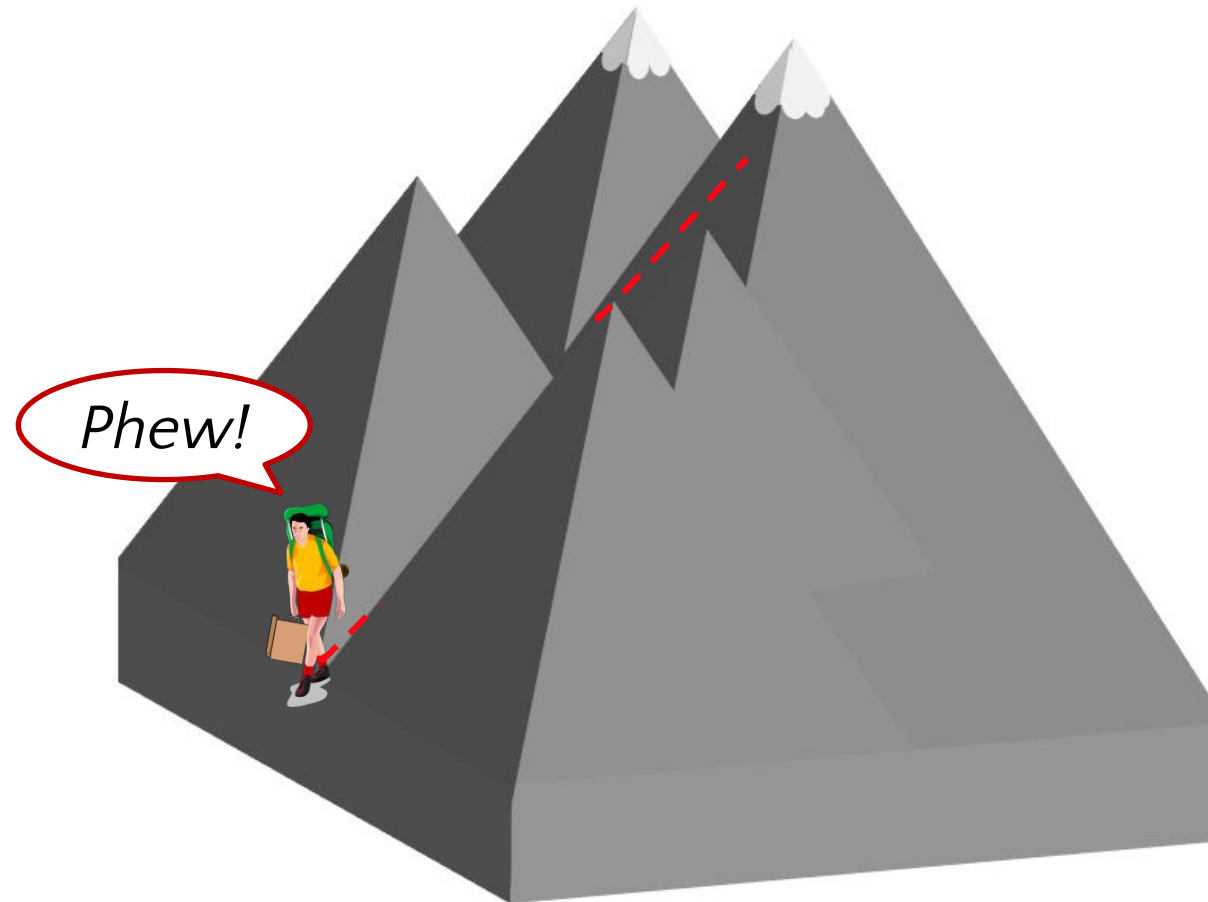
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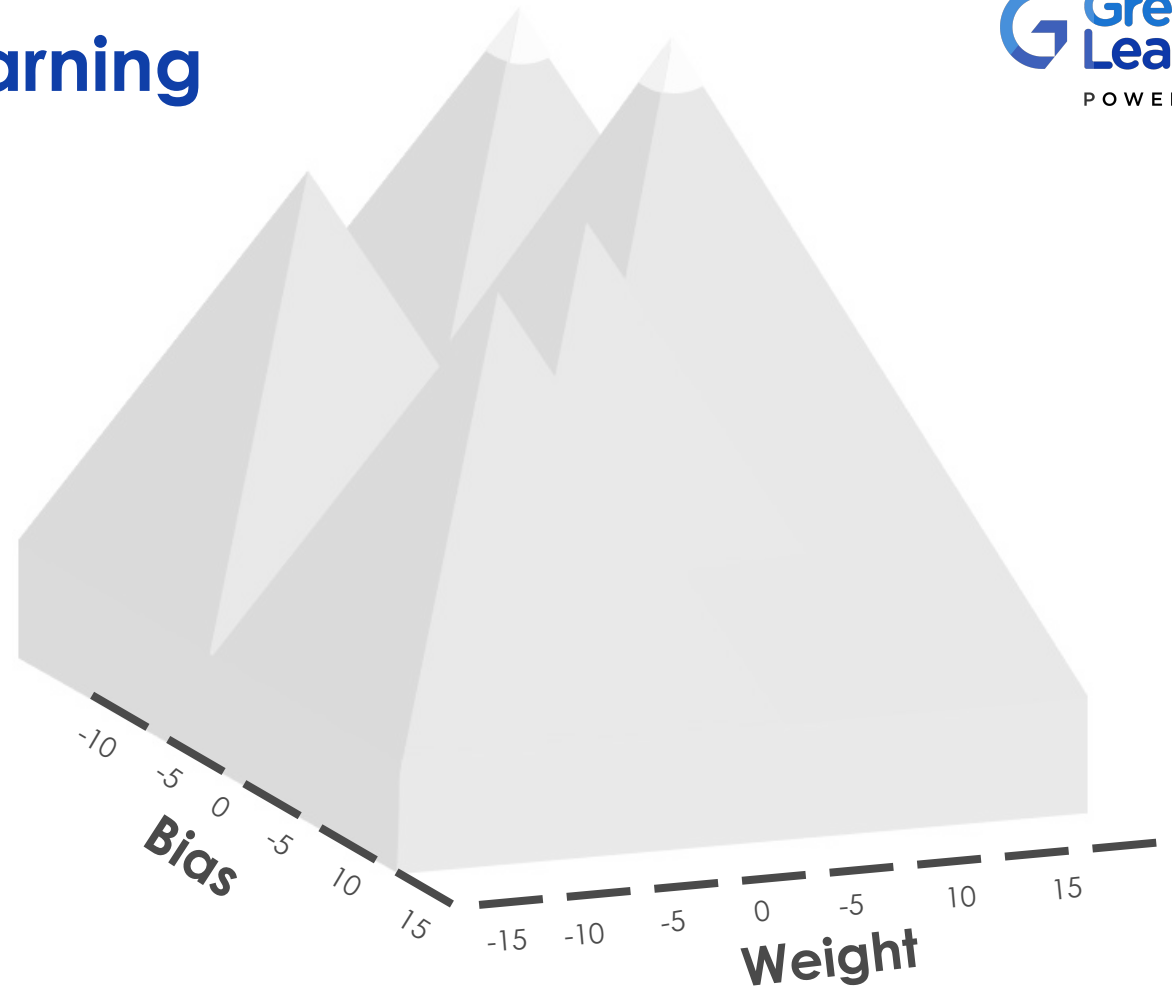
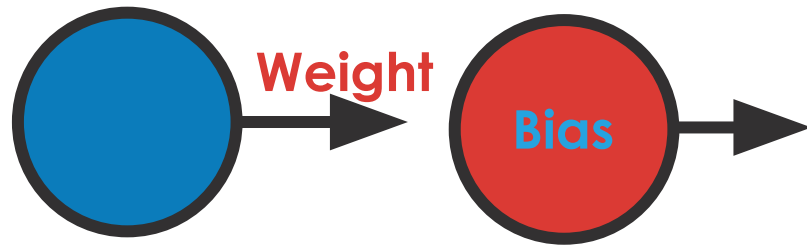
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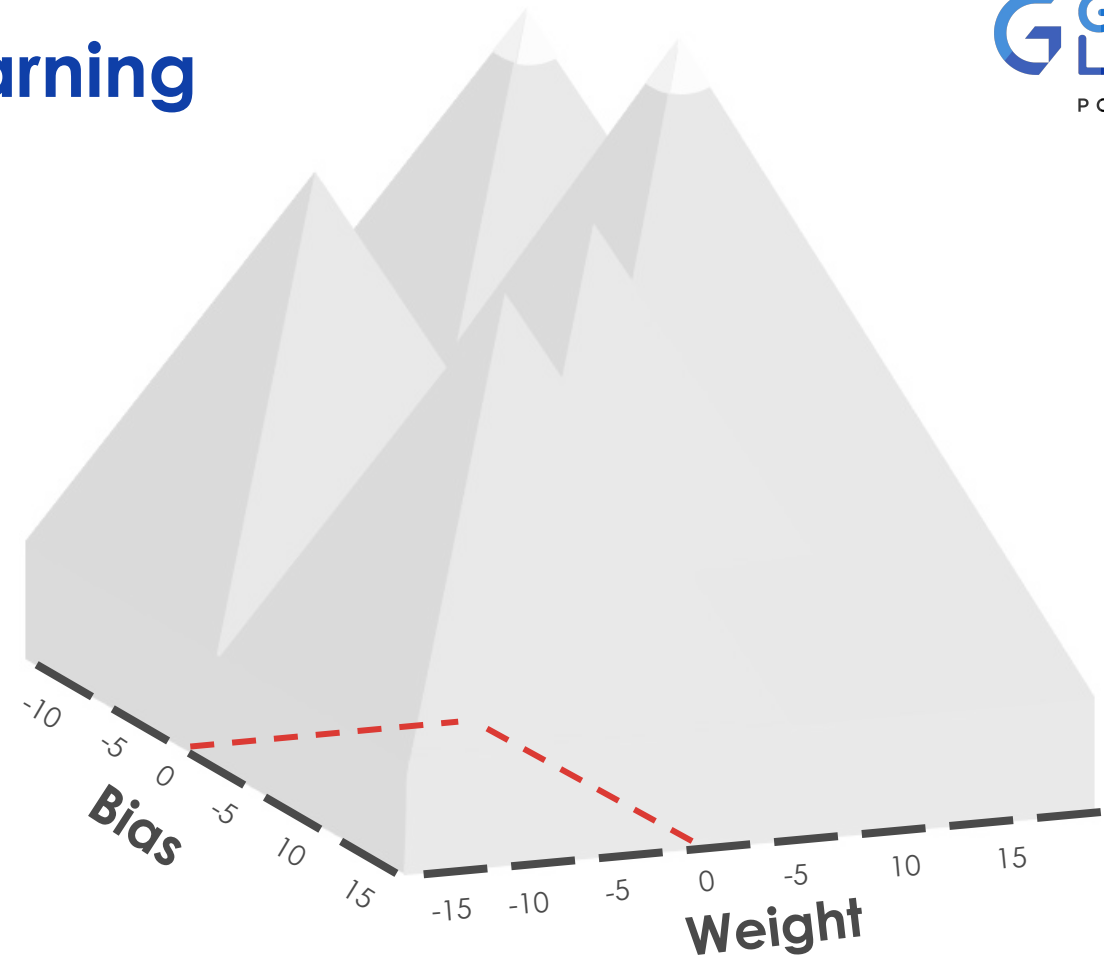
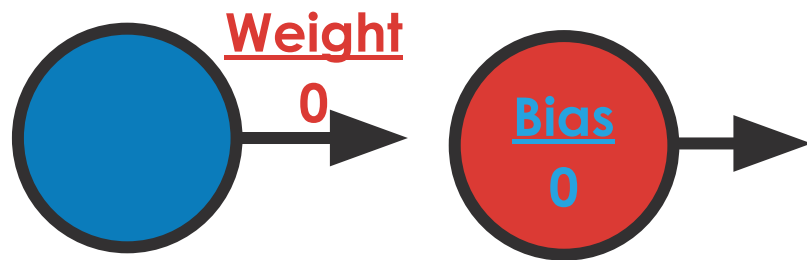
Gradient Descent in Deep Learning



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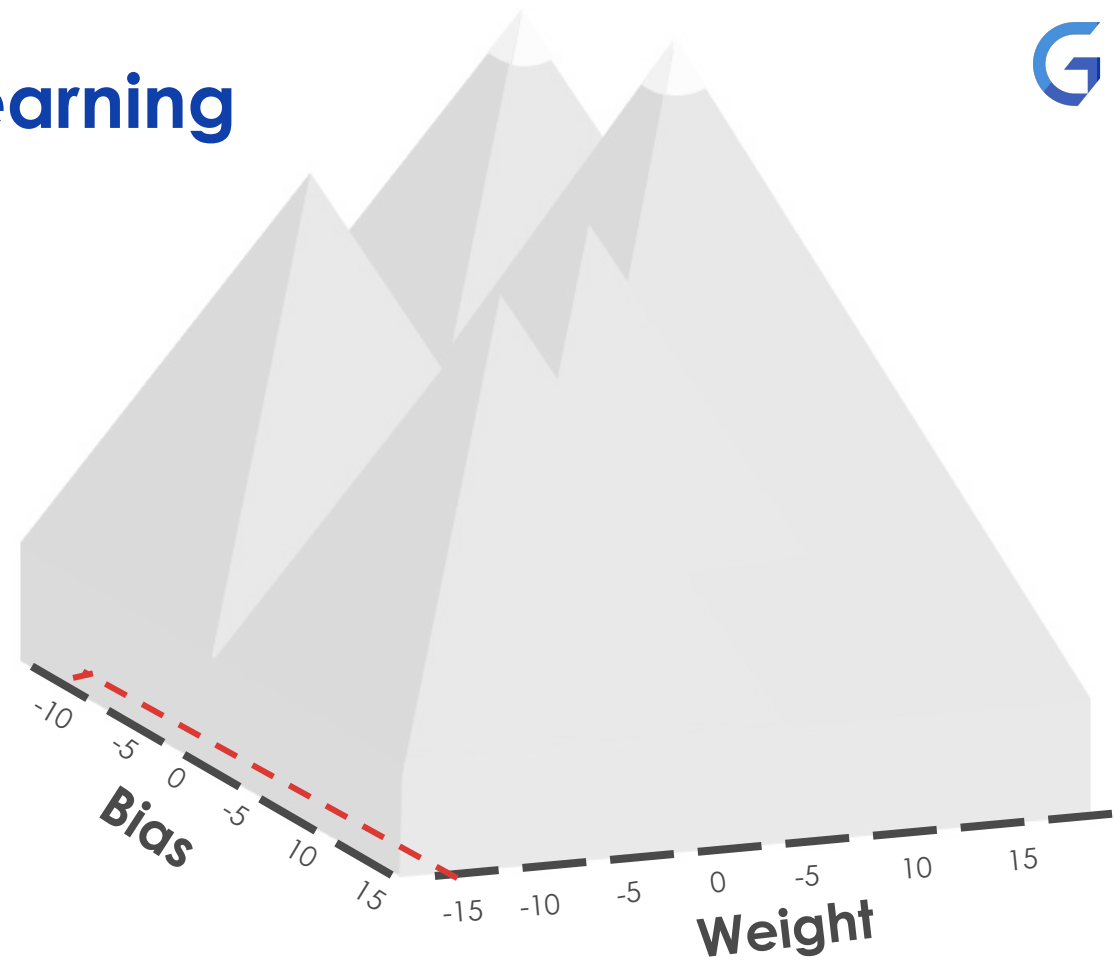
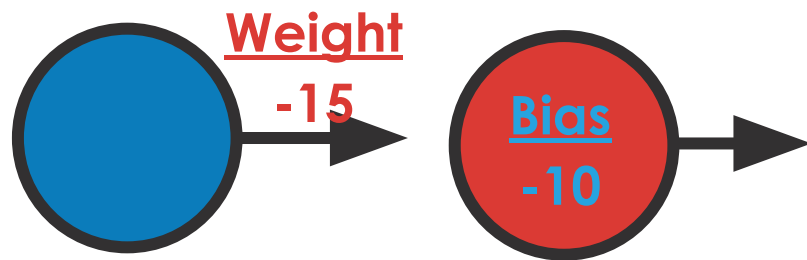
Gradient Descent in Deep Learning



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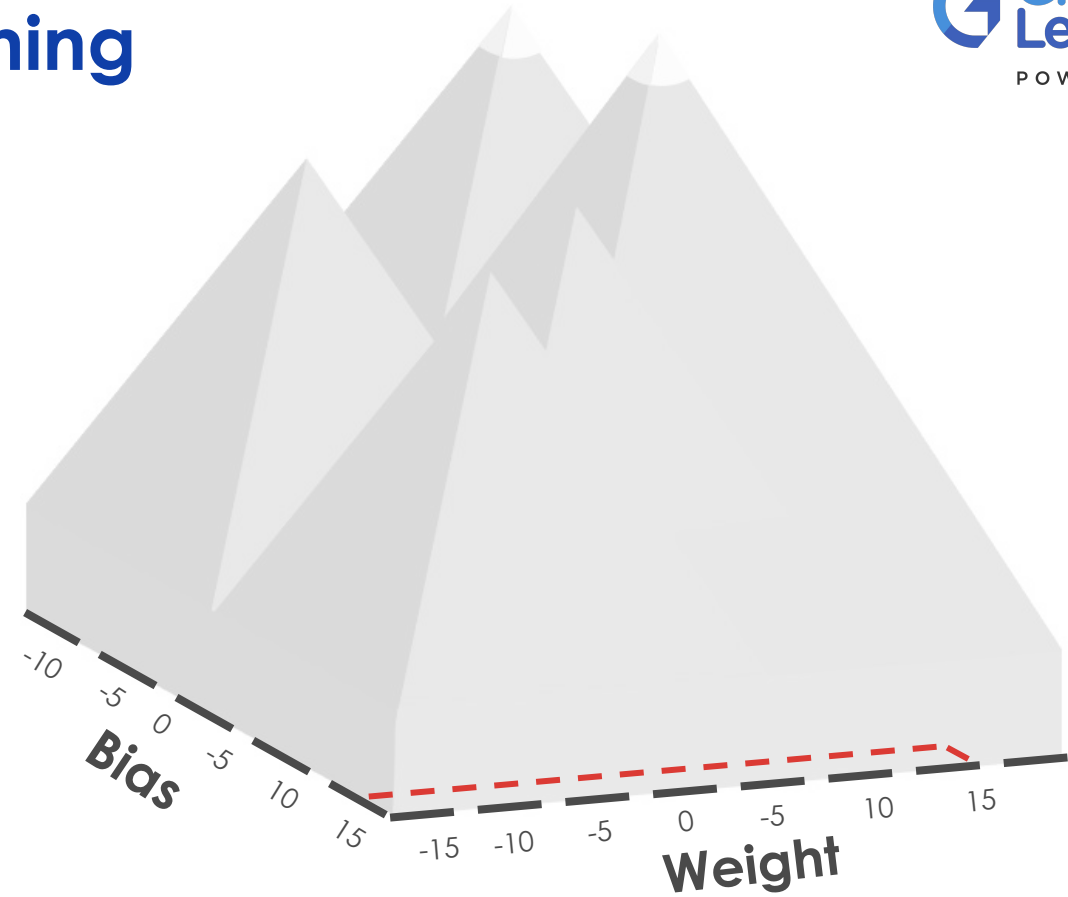
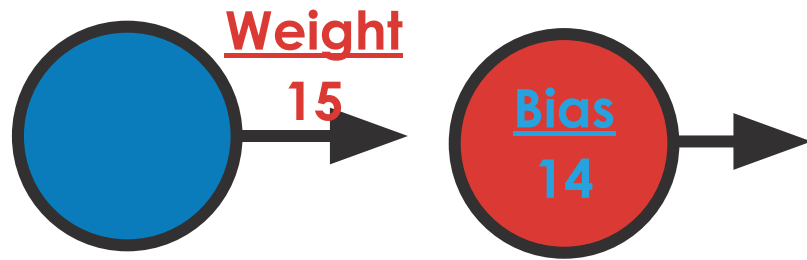
Gradient Descent in Deep Learning



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Gradient Descent in Deep Learning

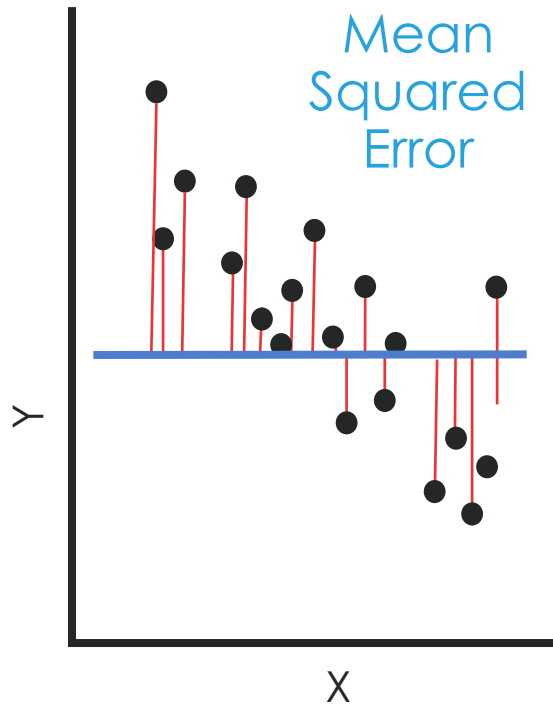


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Loss

Regression



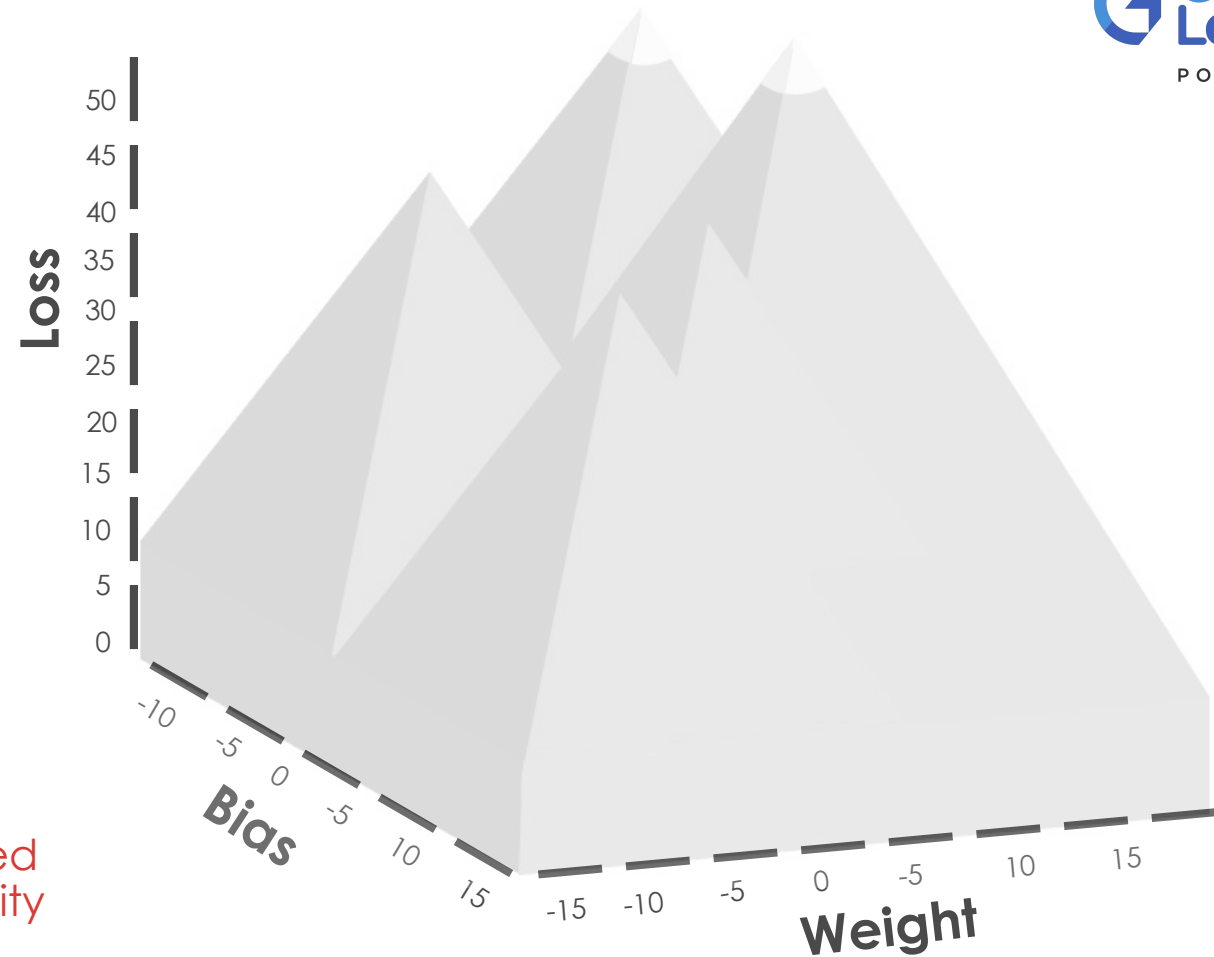
Classification

Cross Entropy

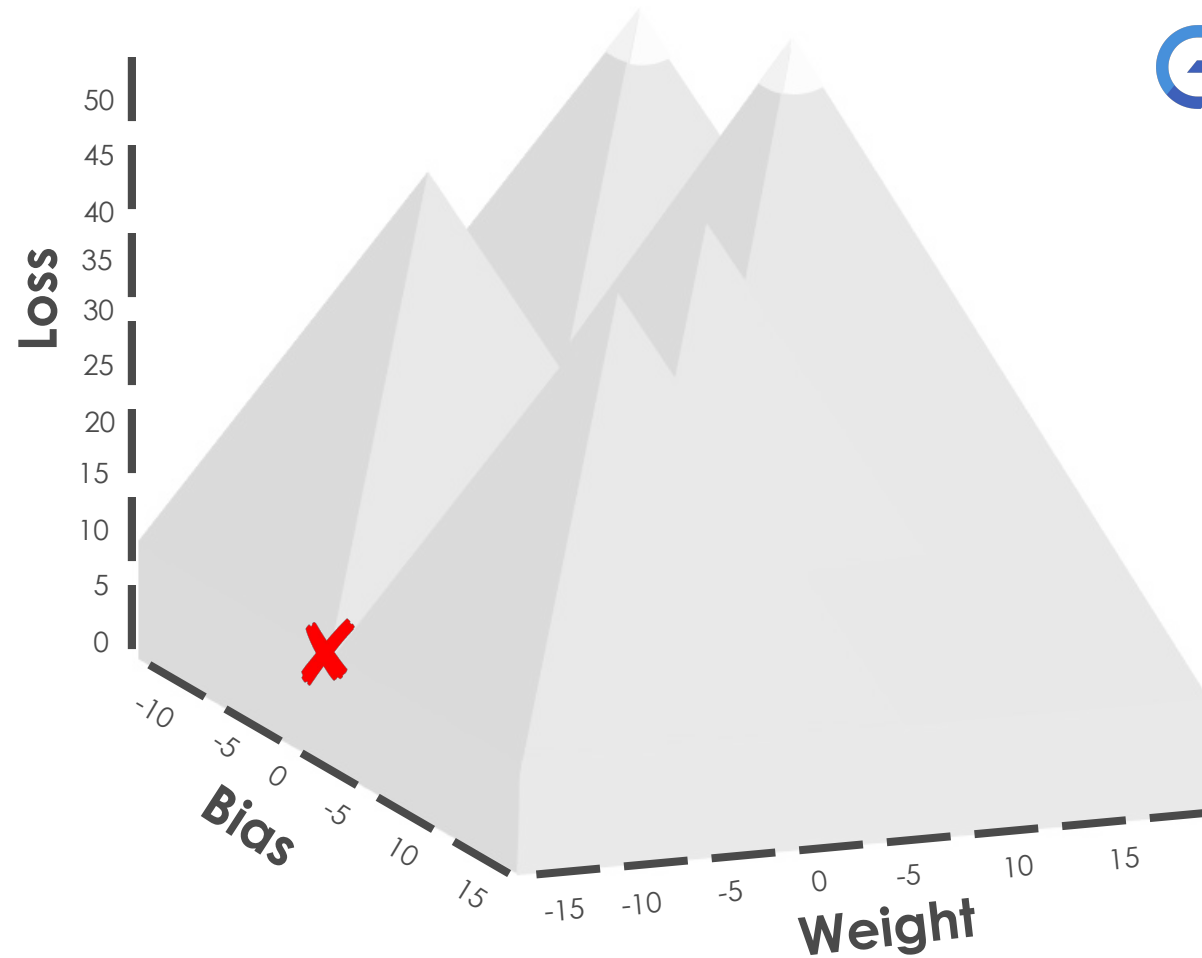
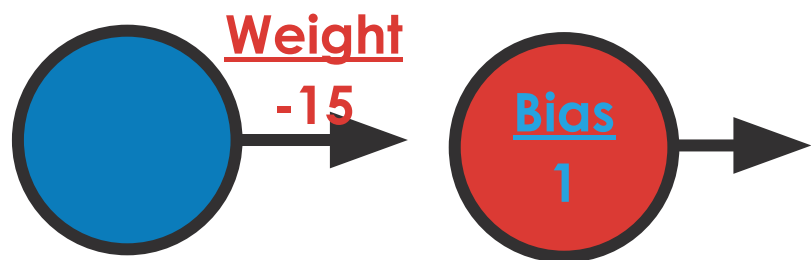
$$-\sum_{i=1}^k y_i \log(\hat{y})$$

Actual Predicted Probability

The diagram shows the cross entropy loss formula. The term y_i is labeled 'Actual' with a red arrow pointing to it. The term $\log(\hat{y})$ is labeled 'Predicted Probability' with a red arrow pointing to it. The text 'Cross Entropy' is written in blue above the formula.



Loss

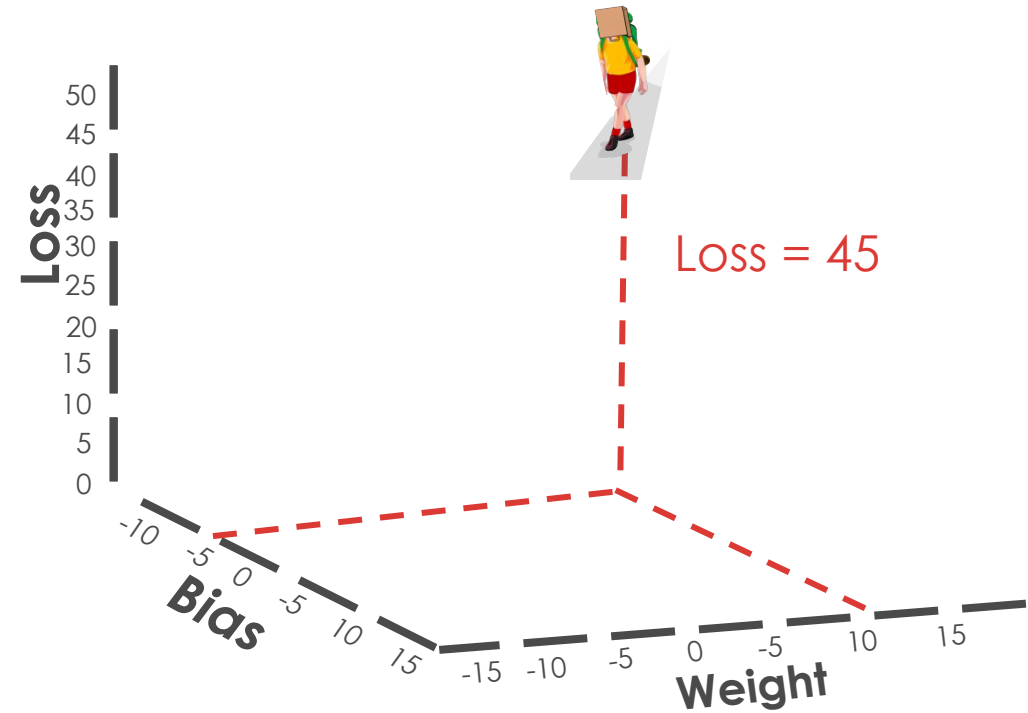
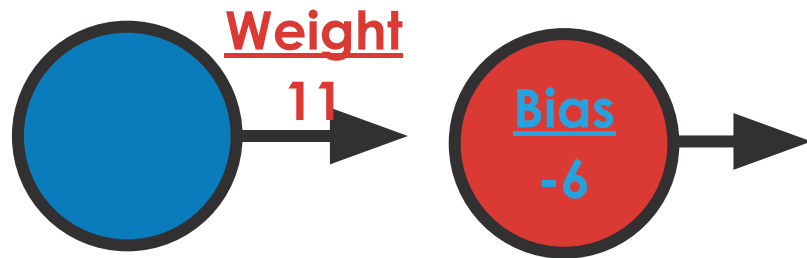


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Gradient Descent Steps

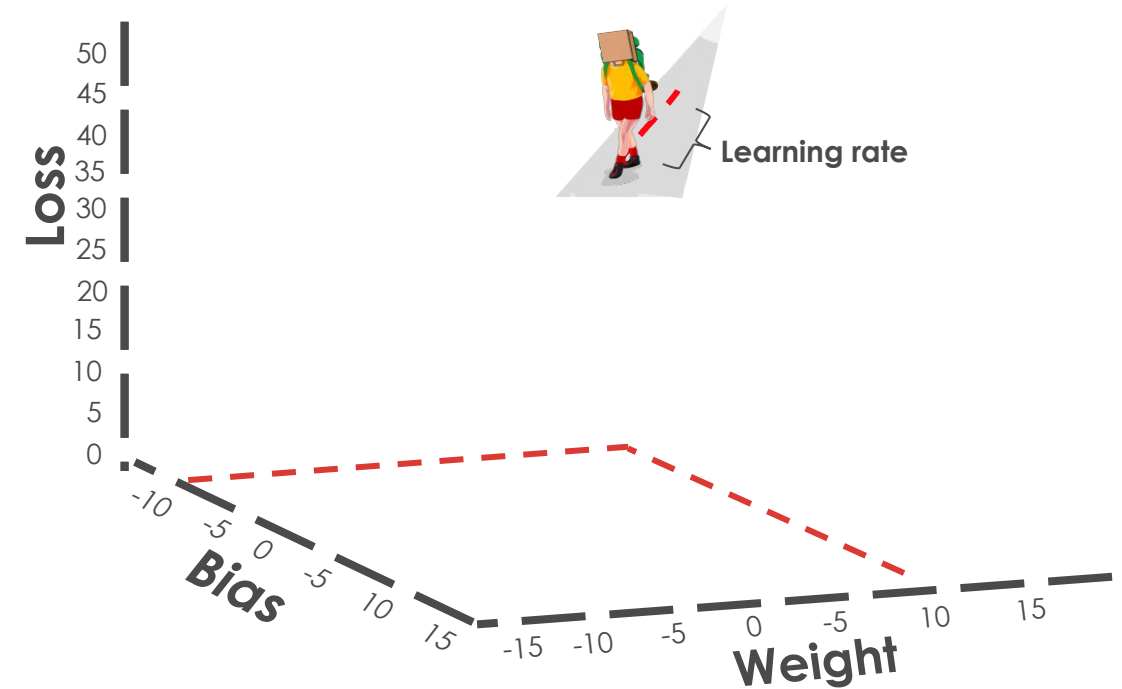
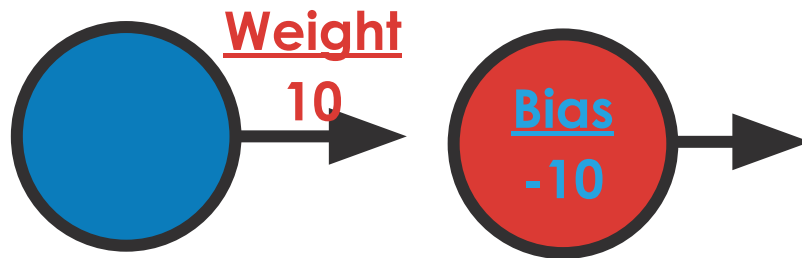
Step 1 Start at a random bias and weight and calculate the loss



Gradient Descent Steps

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

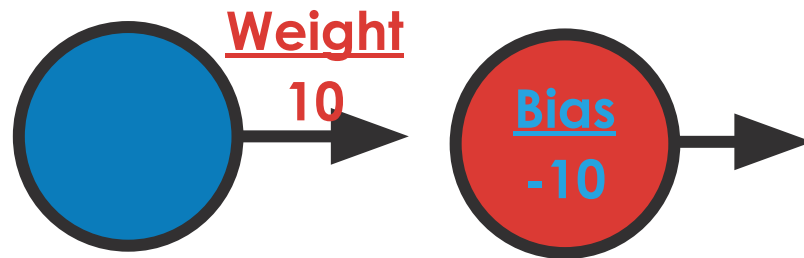
Step 2 Take a step in the direction with the steepest gradient



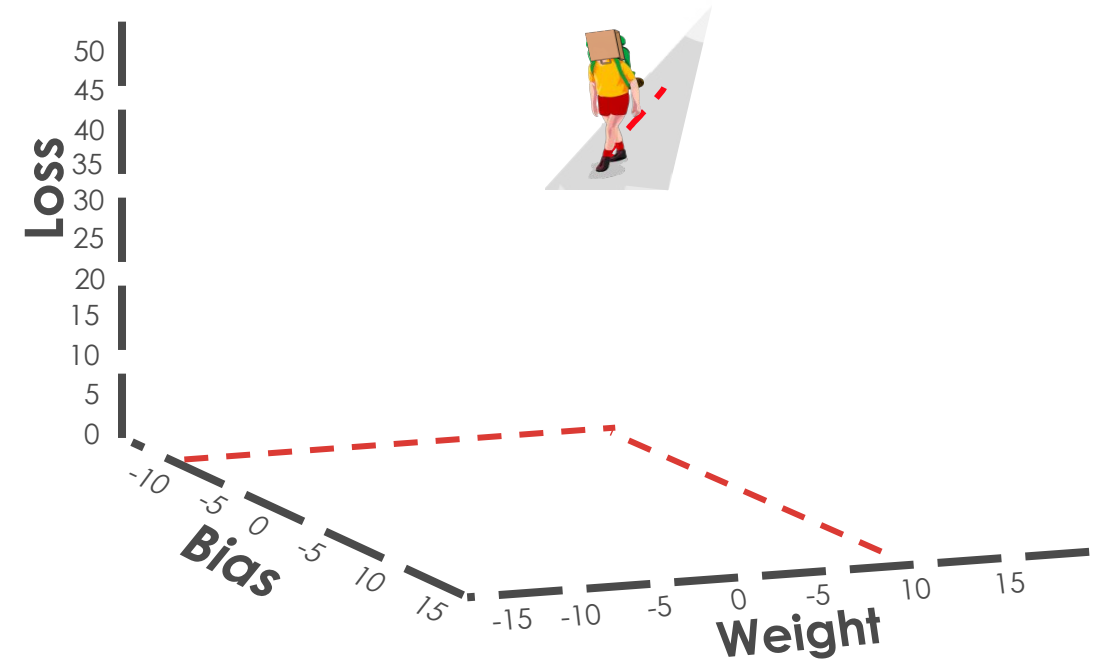
Gradient Descent Steps

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

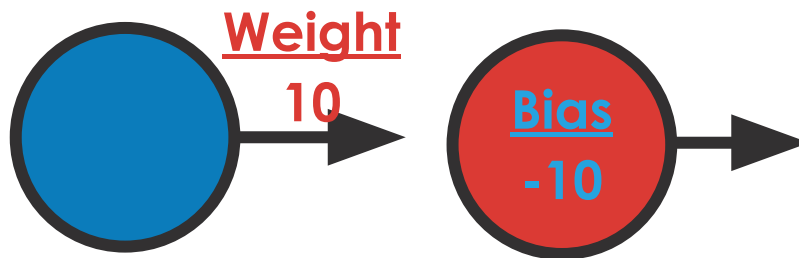
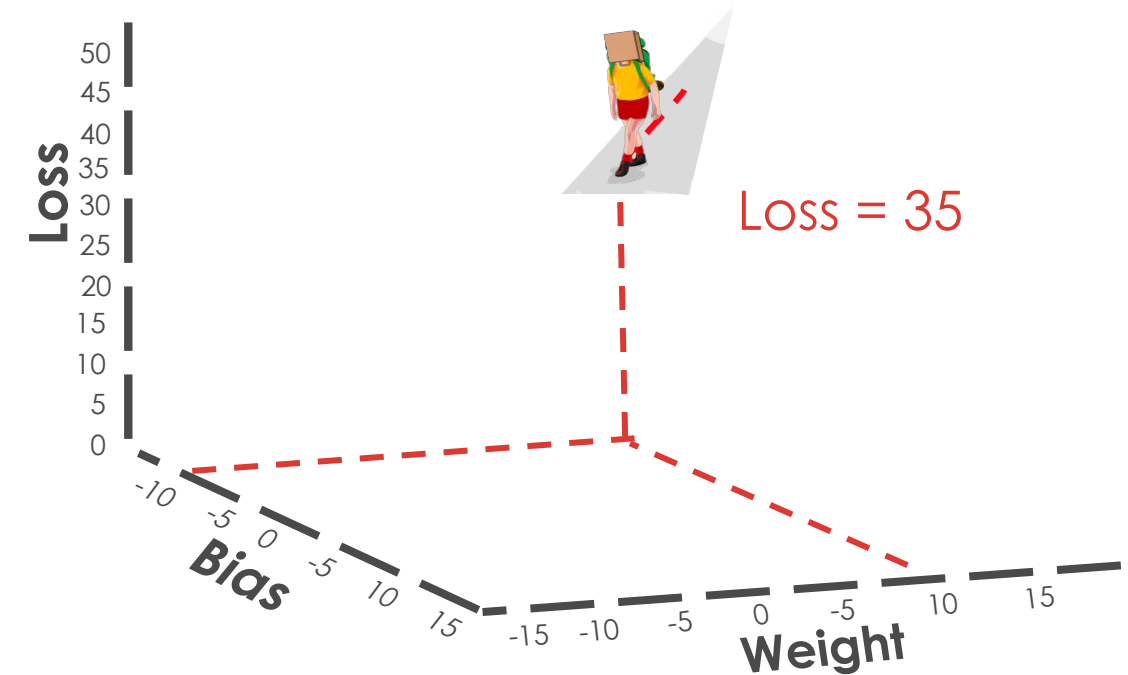


Backpropagation



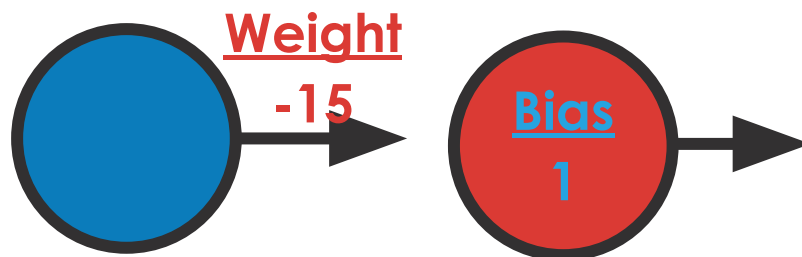
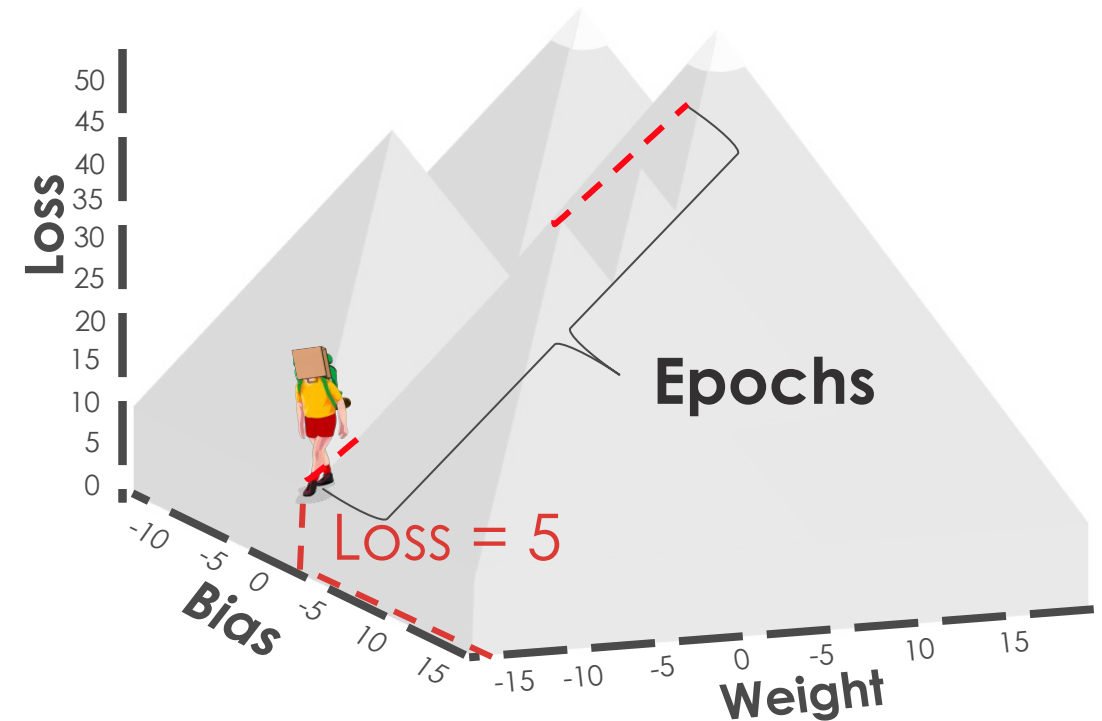
Gradient Descent Steps

- 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

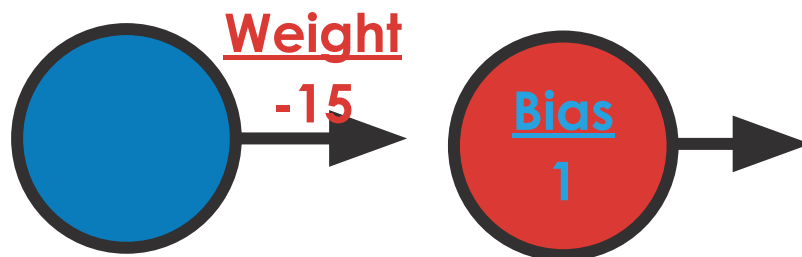
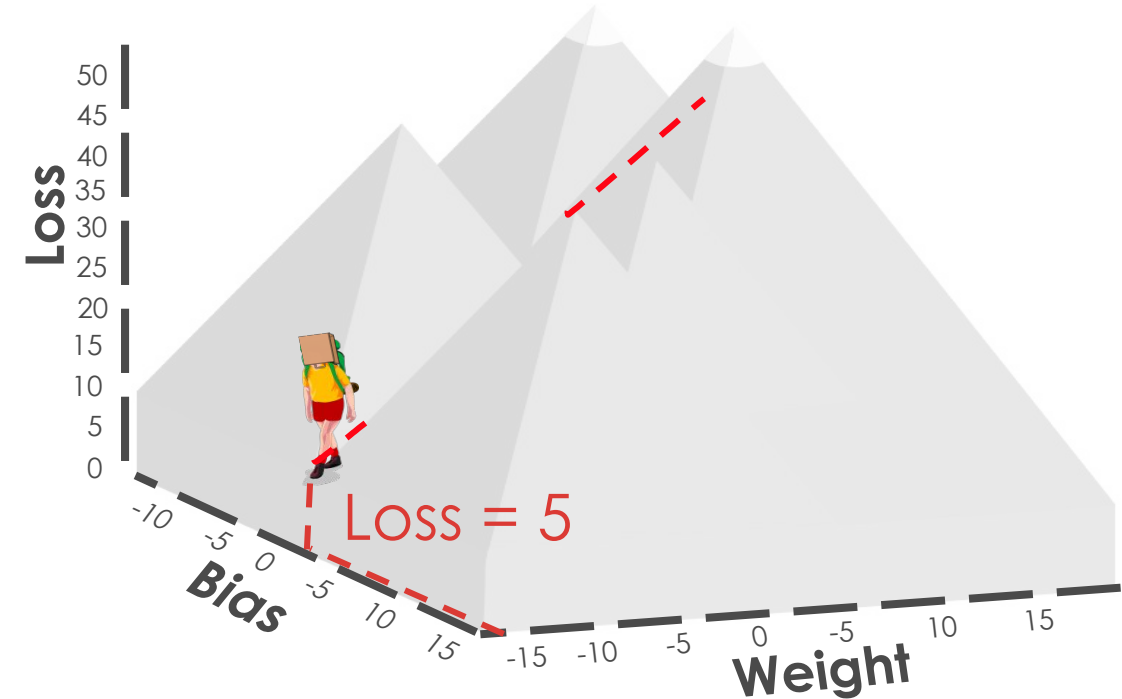


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Gradient Descent Steps

- 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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