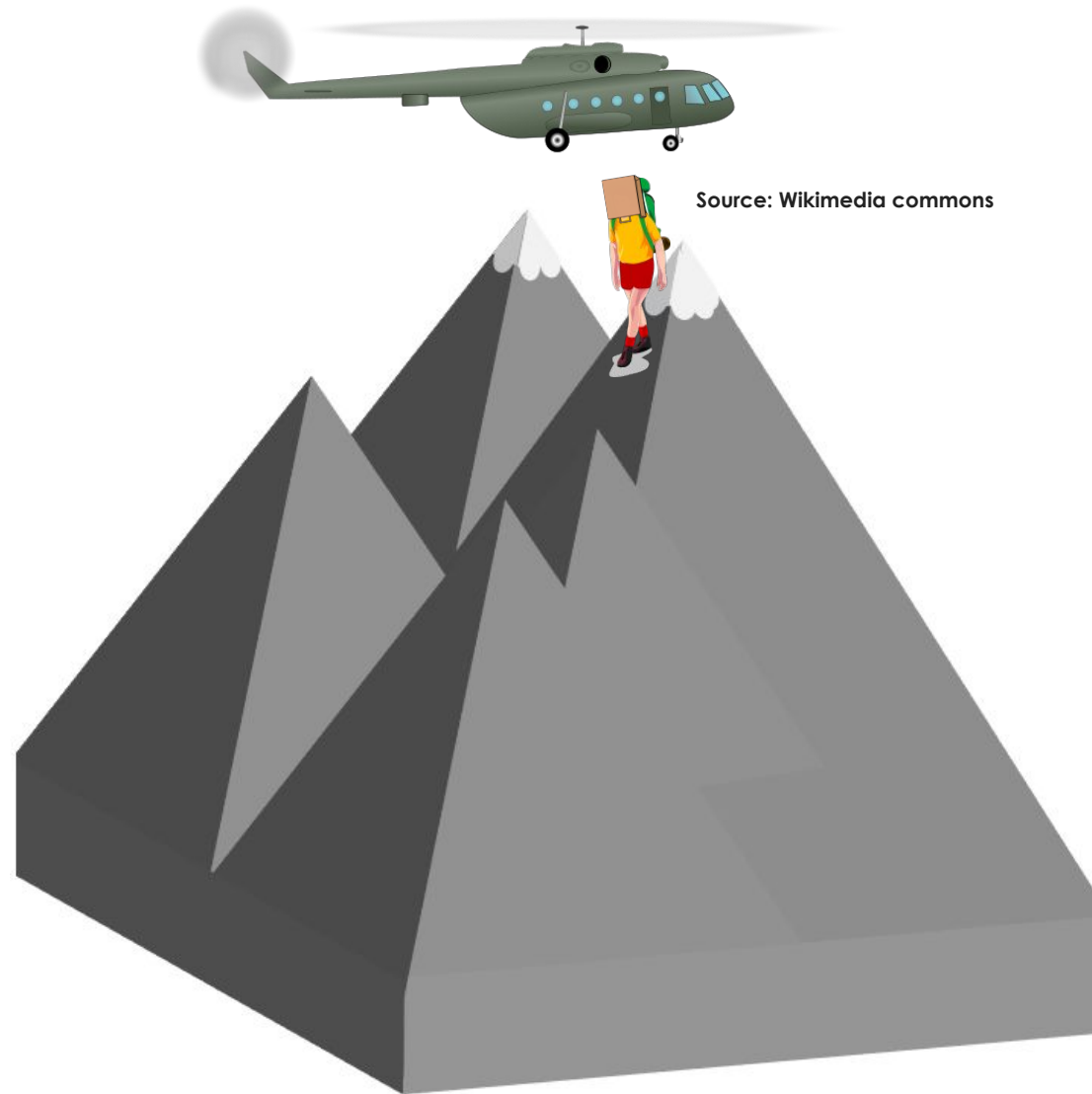




Introduction to Gradient Descent

Deep Learning Pre-Work

Introduction

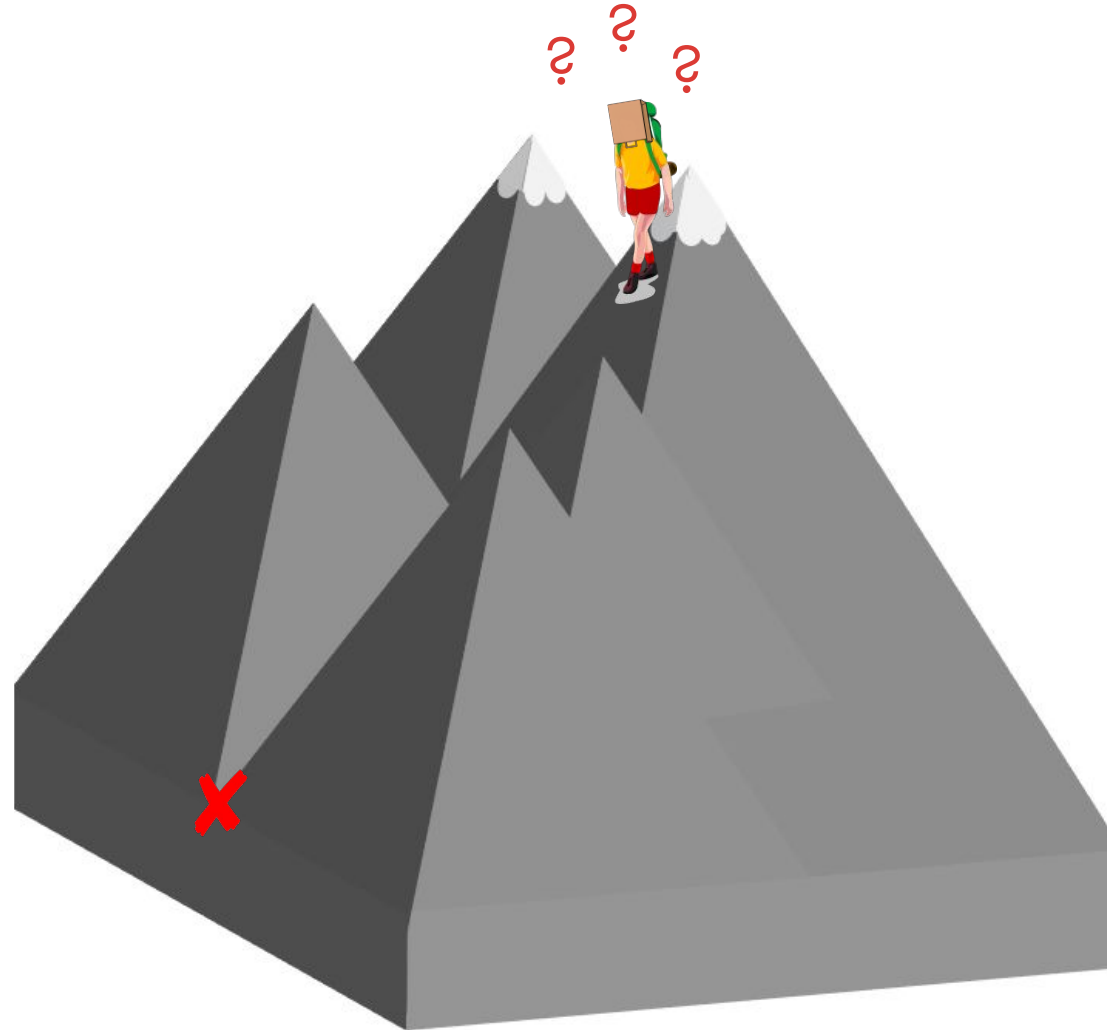


Source: Wikimedia commons

This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

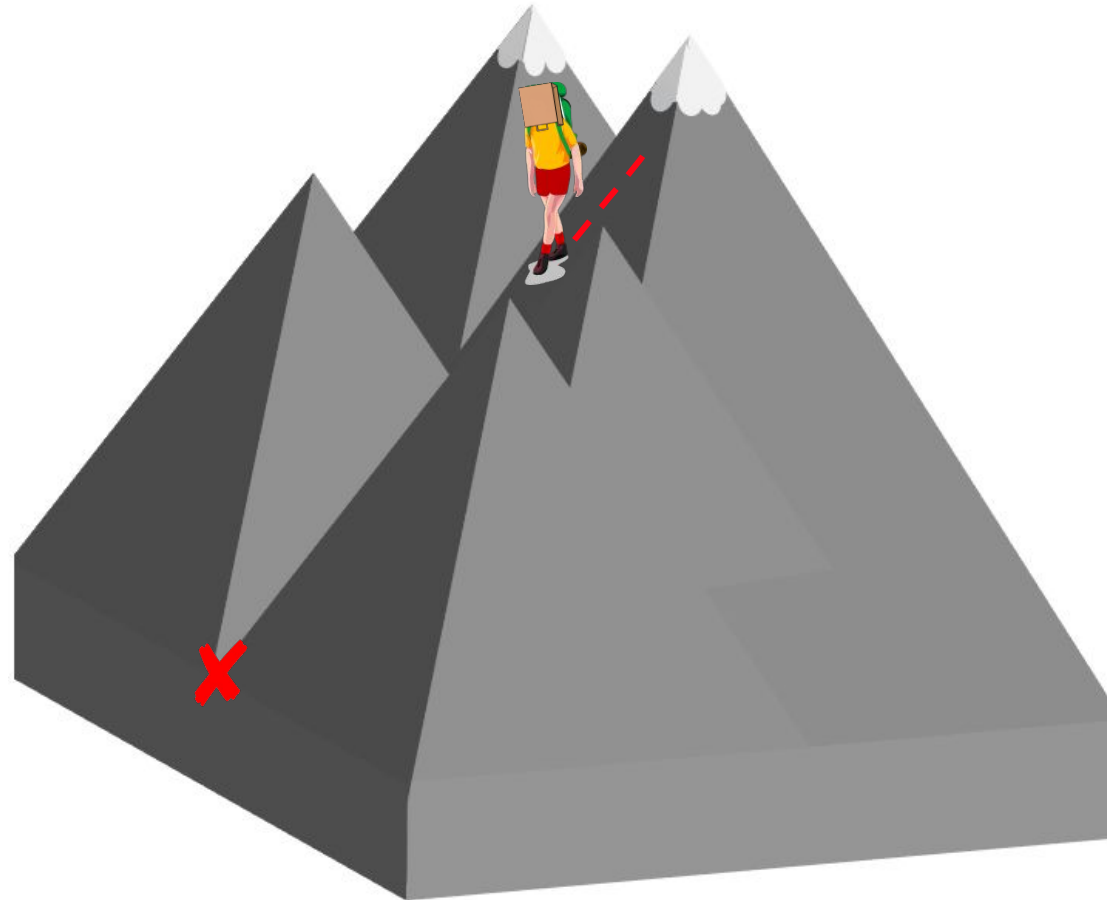
Introduction



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

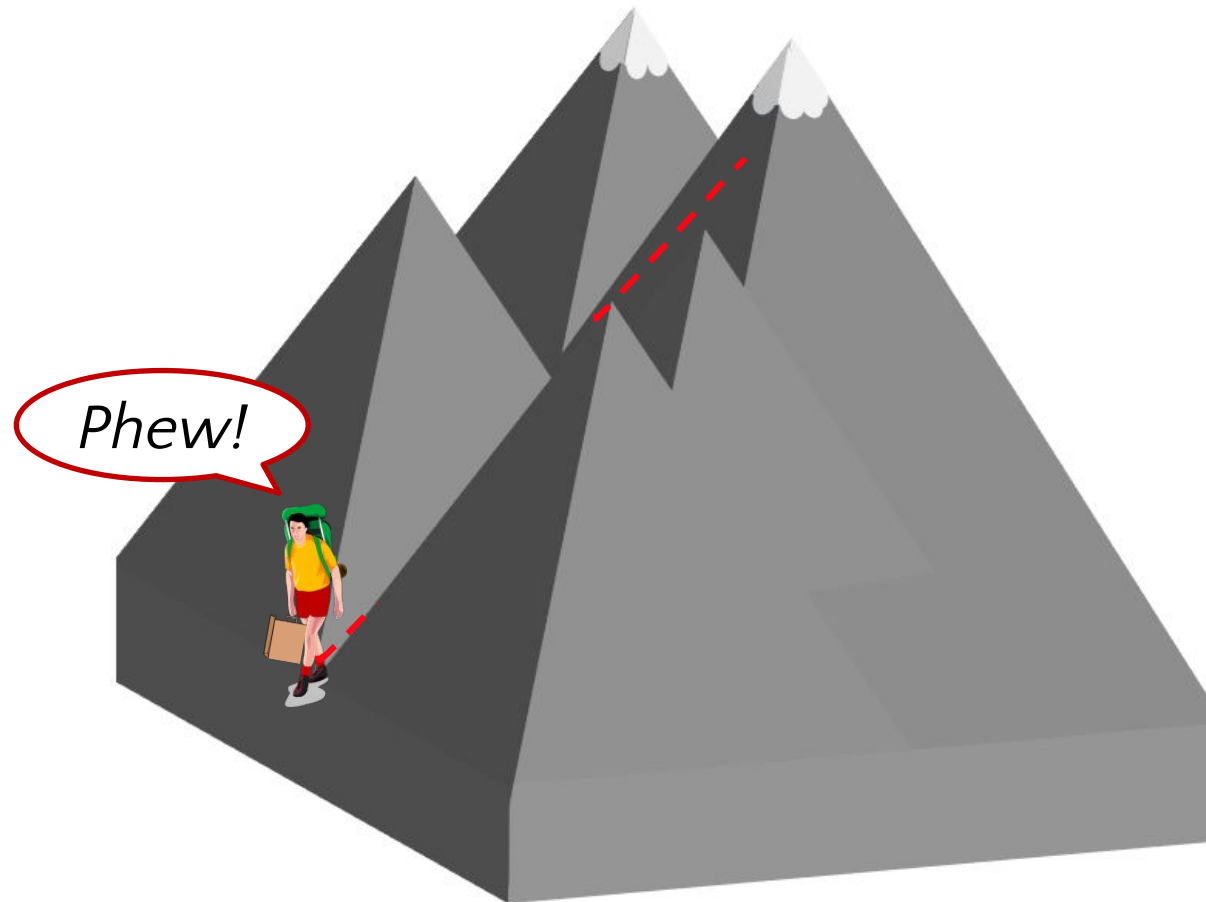
Introduction



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

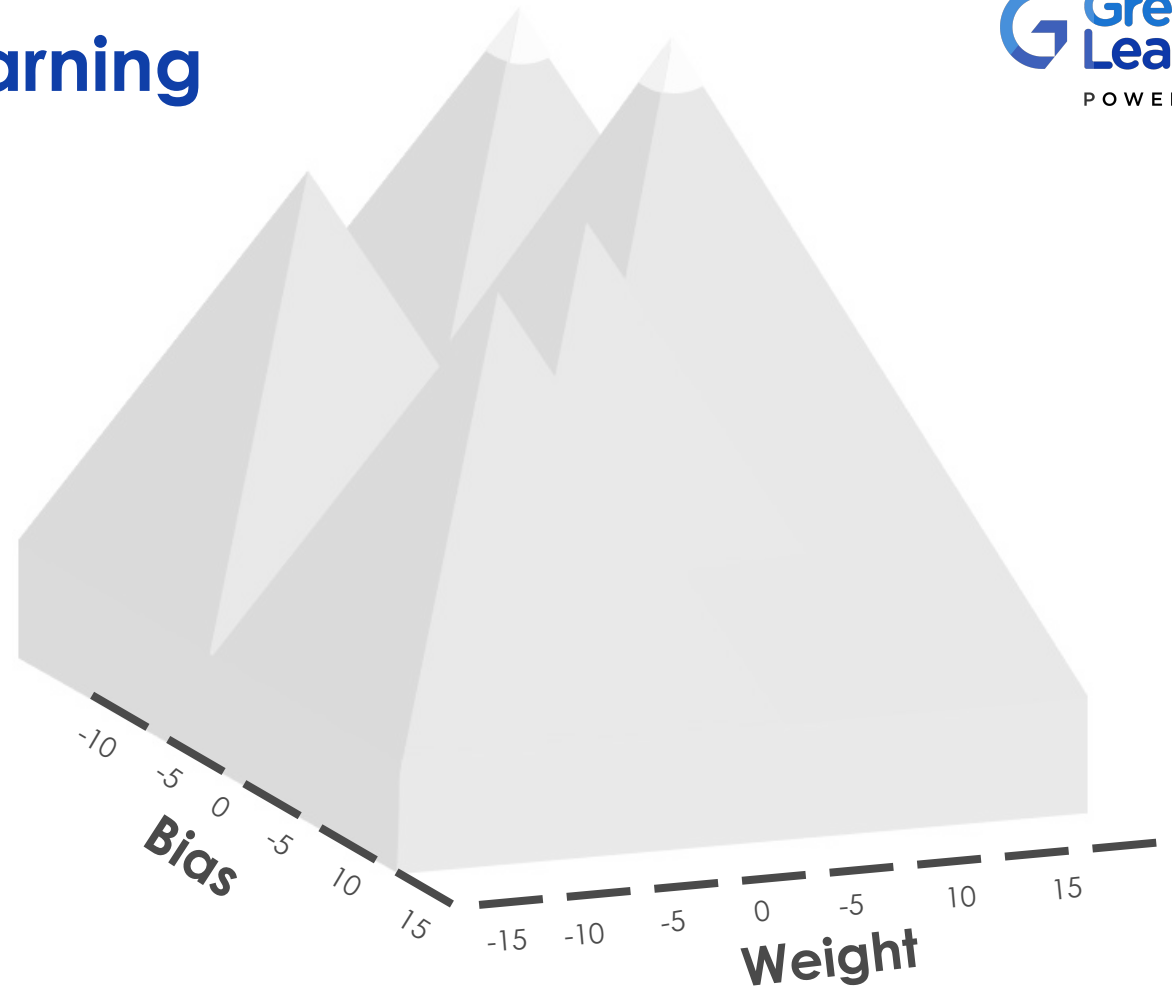
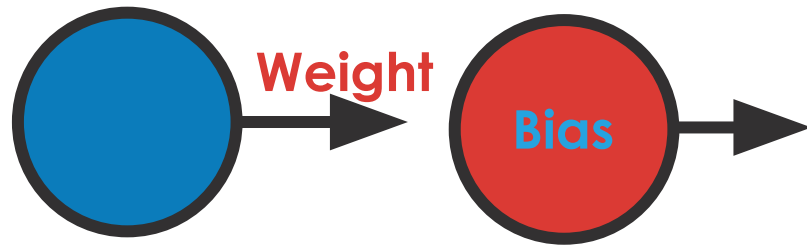
Introduction



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

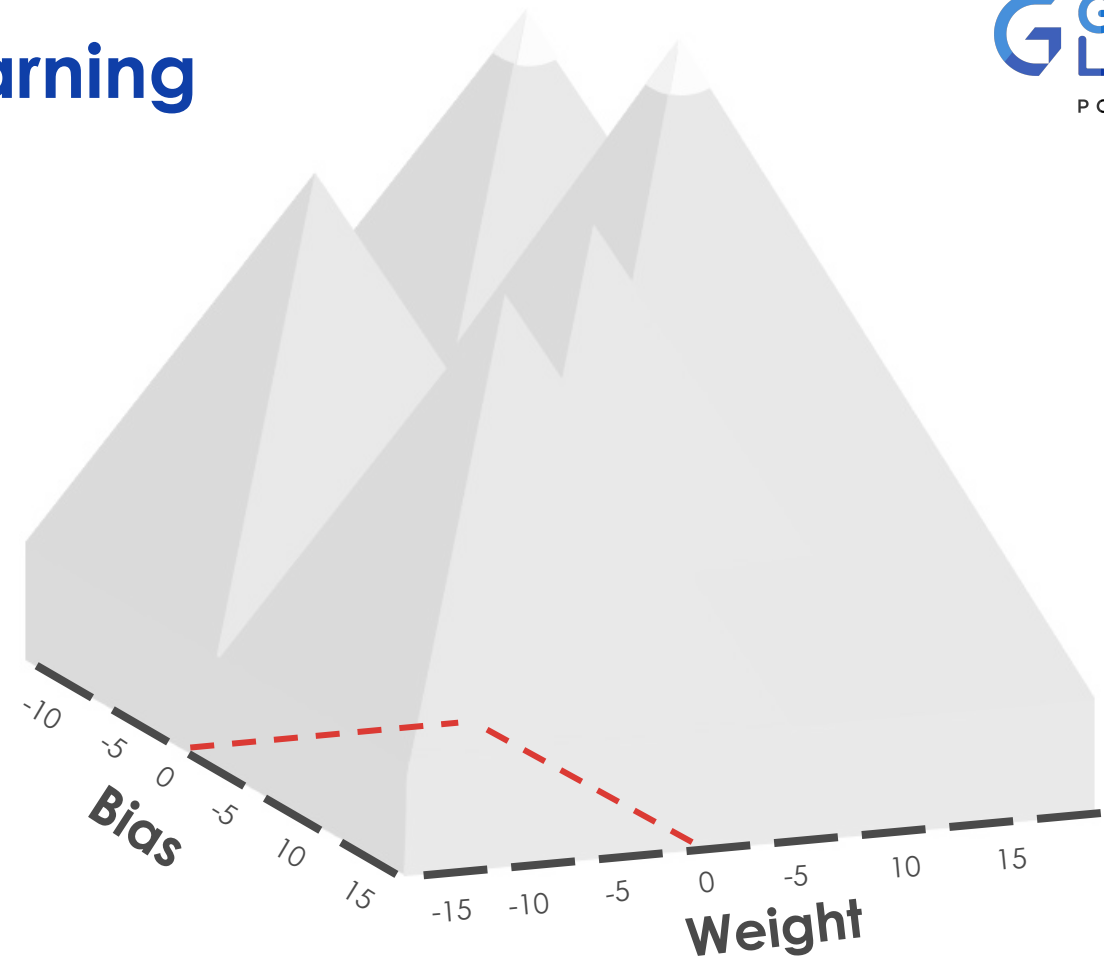
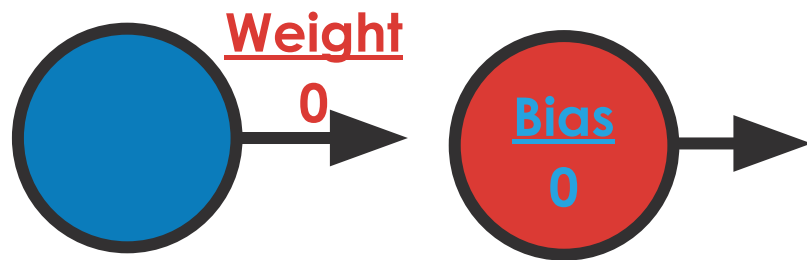
Gradient Descent in Deep Learning



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

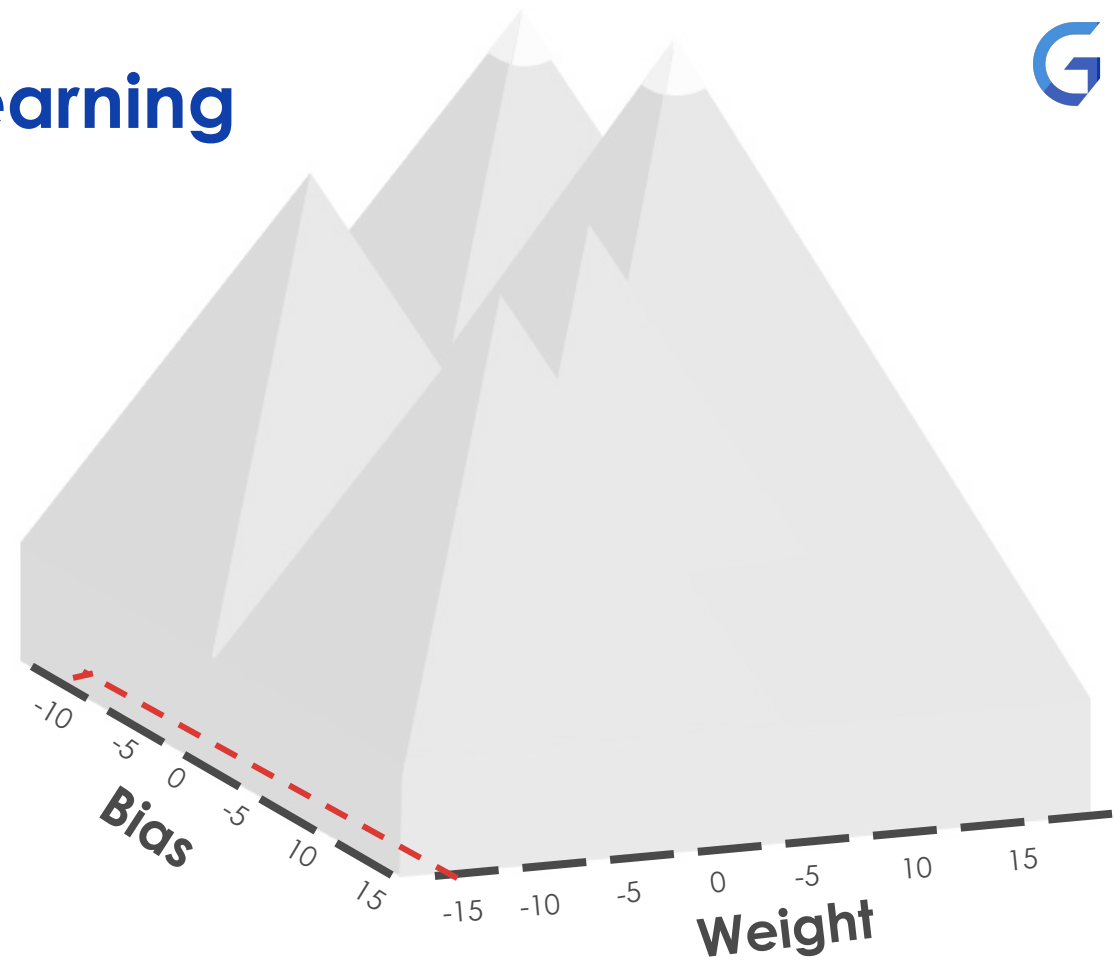
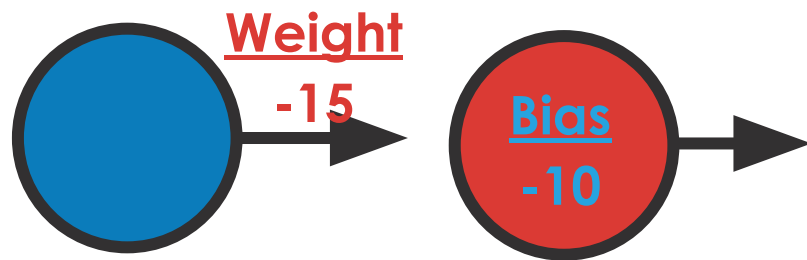
Gradient Descent in Deep Learning



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

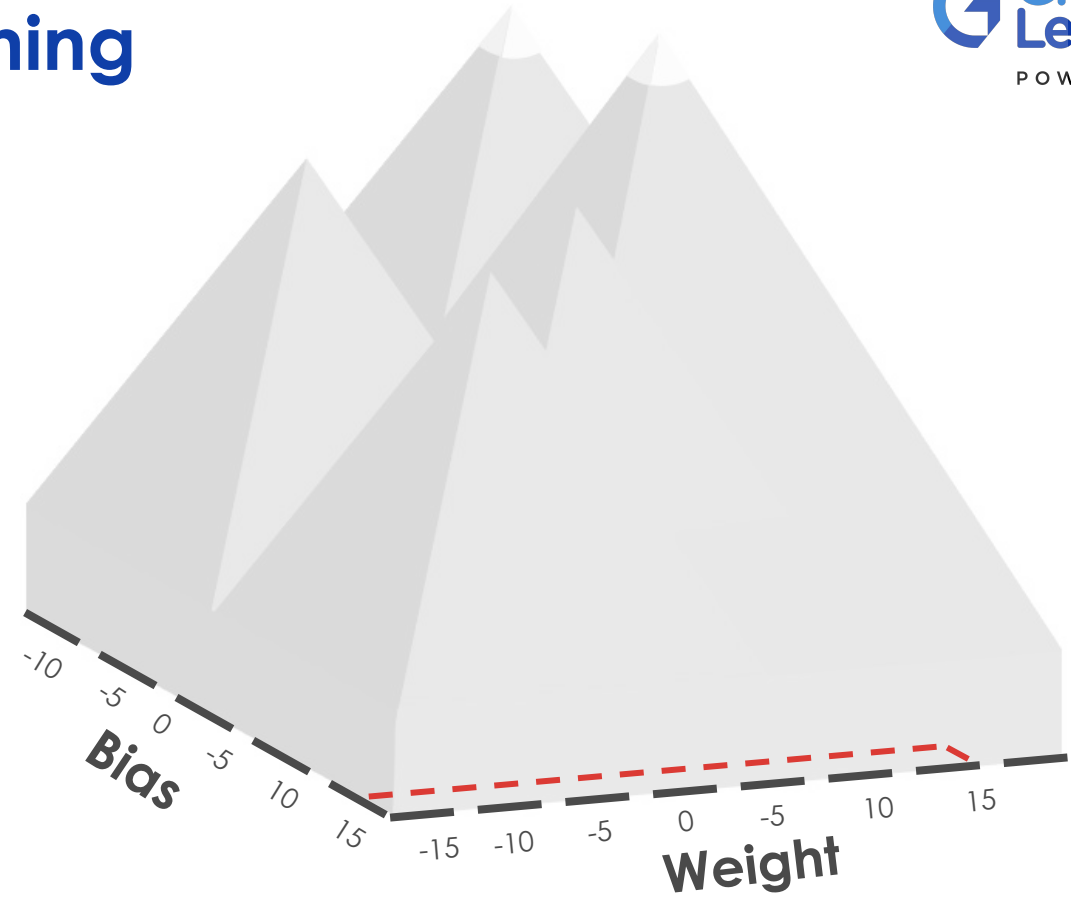
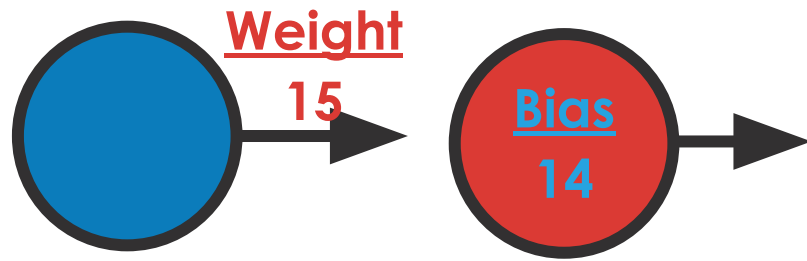
Gradient Descent in Deep Learning



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

Gradient Descent in Deep Learning

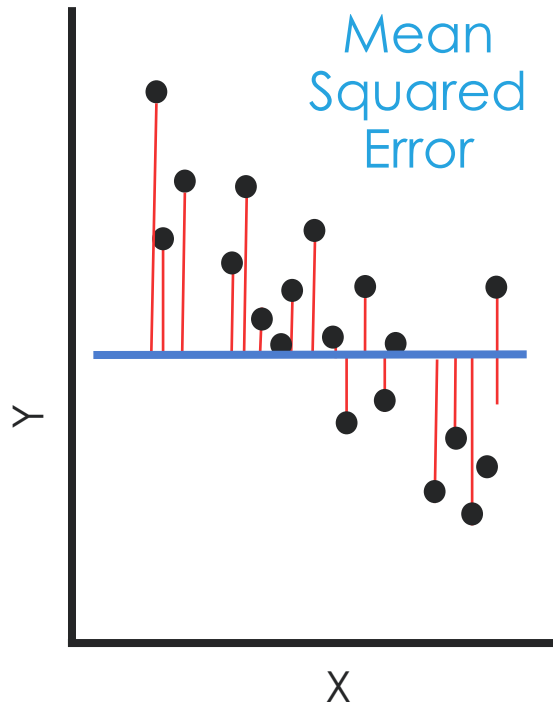


This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

Loss

Regression



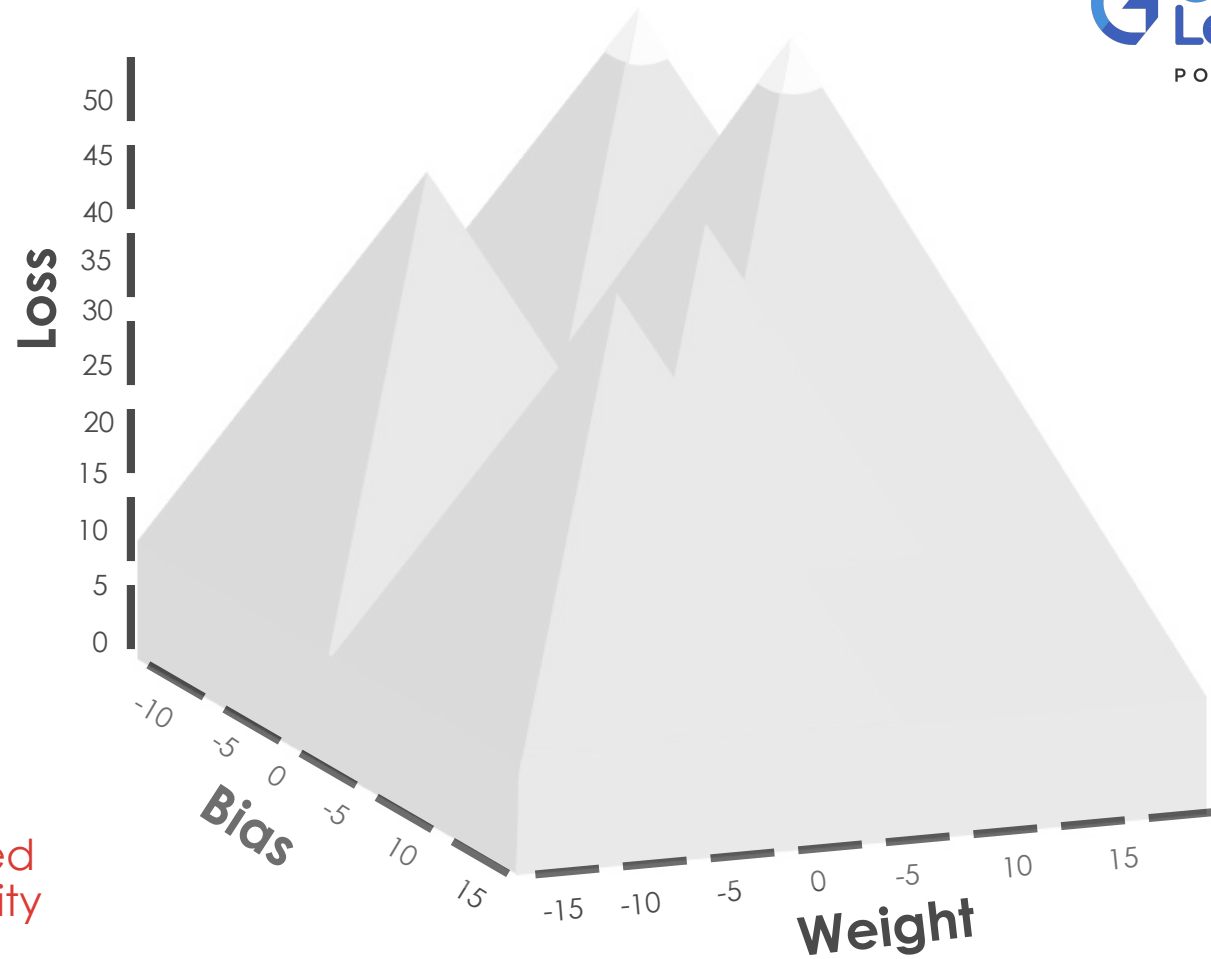
Classification

Cross Entropy

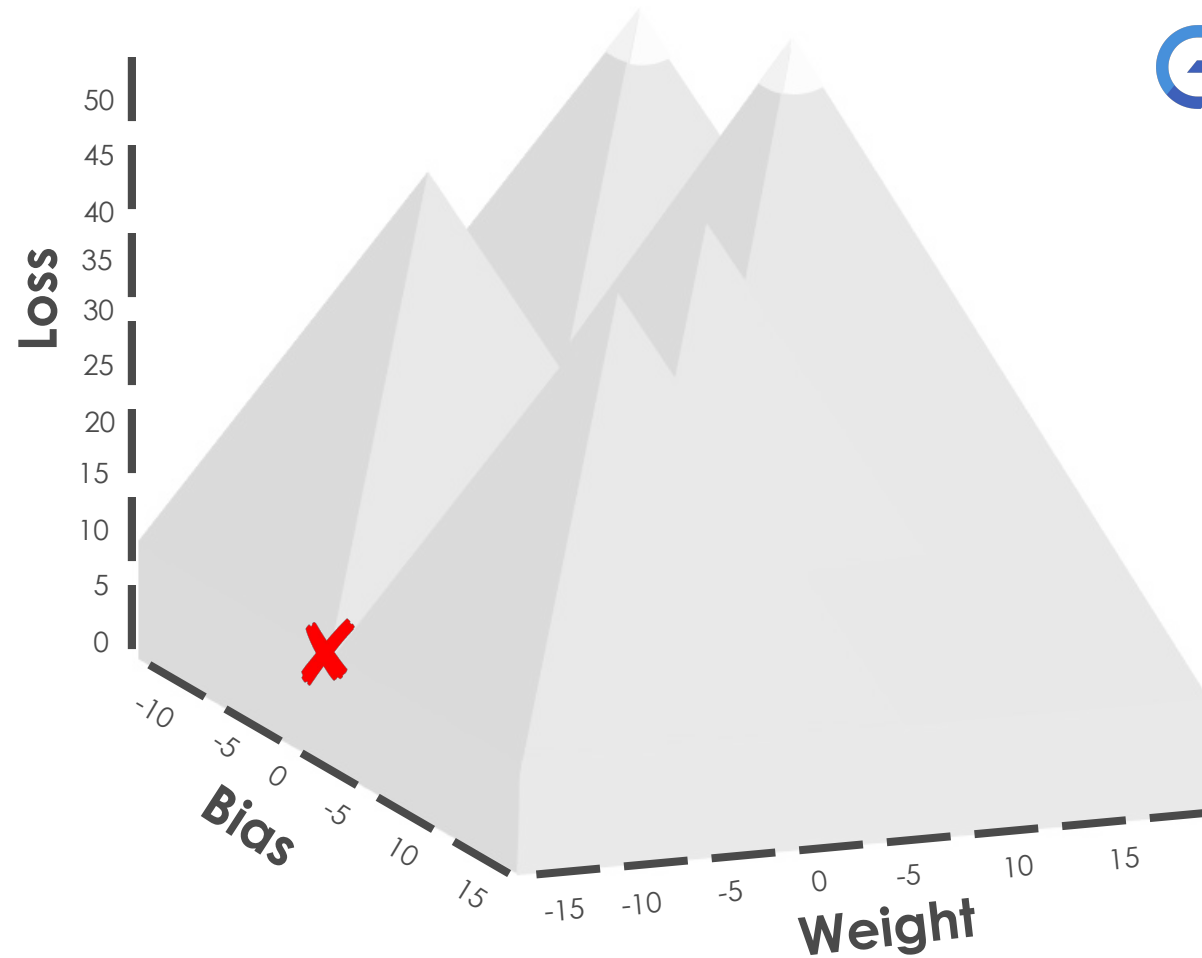
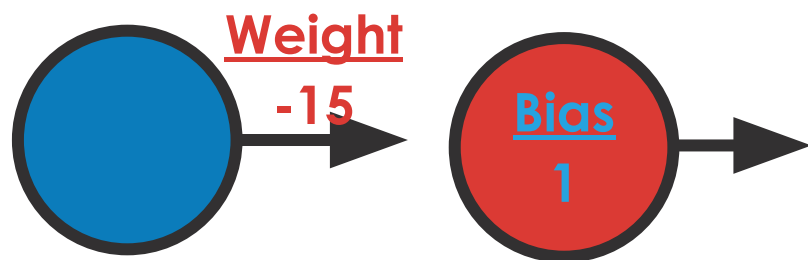
$$-\sum_{i=1}^k y_i \log(\hat{y})$$

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

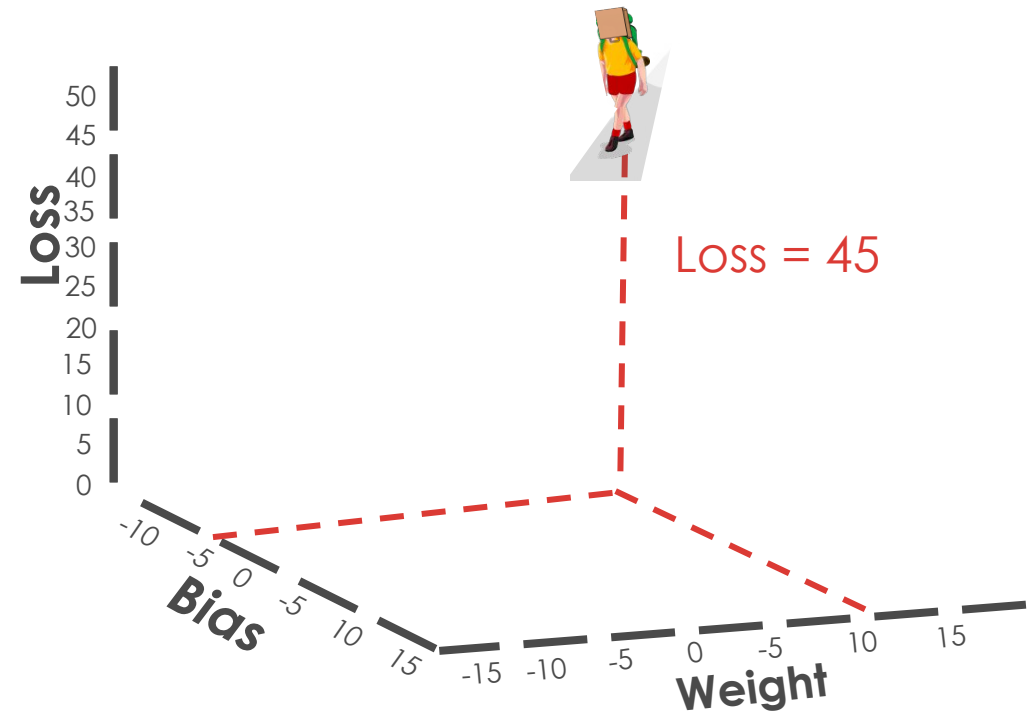
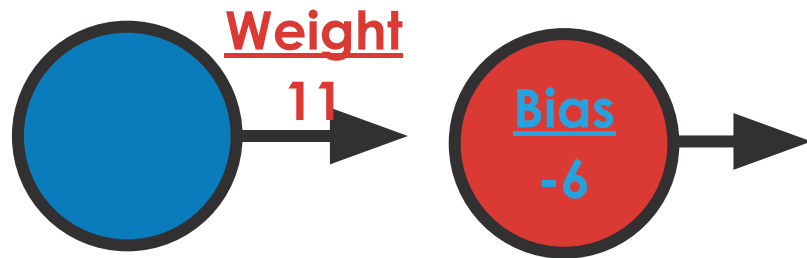


This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

Gradient Descent Steps

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



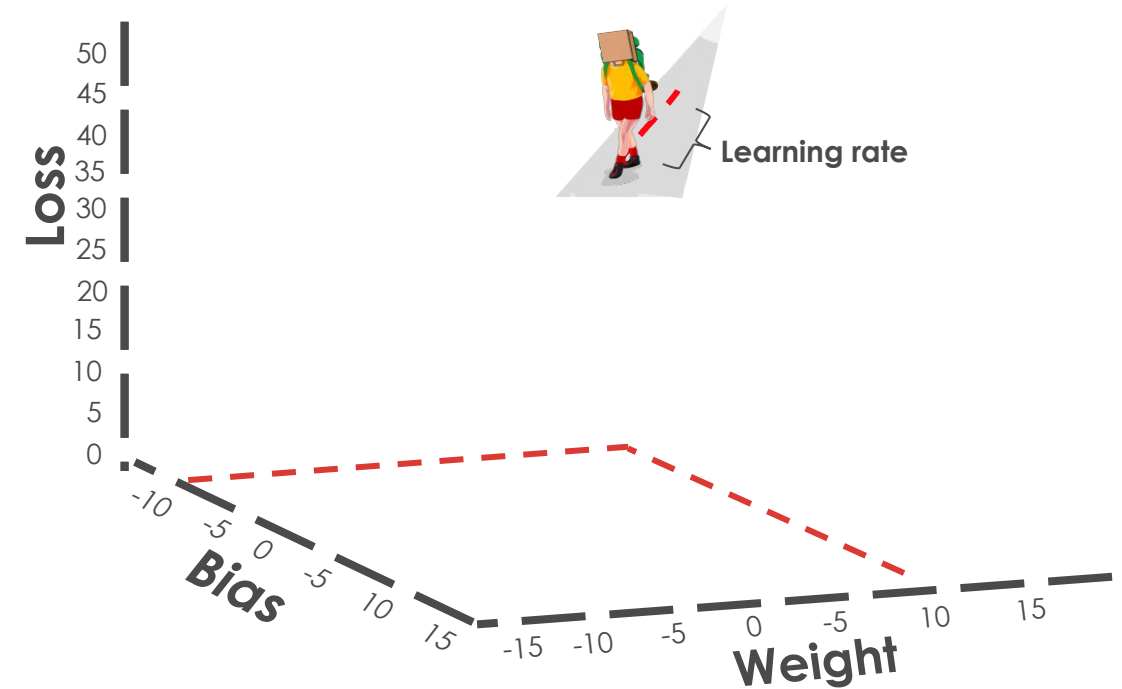
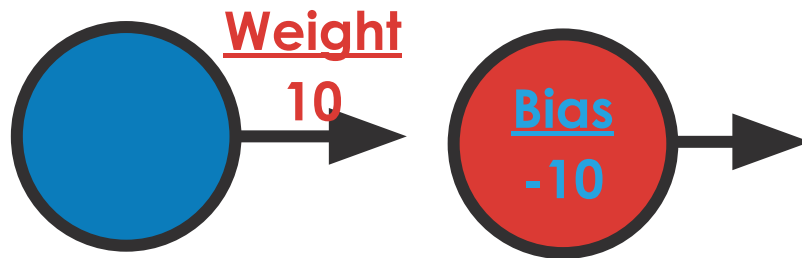
This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

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



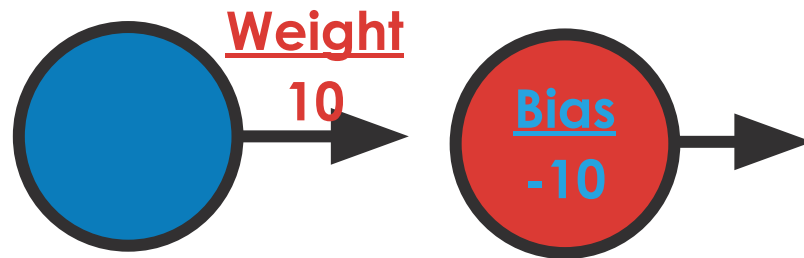
This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

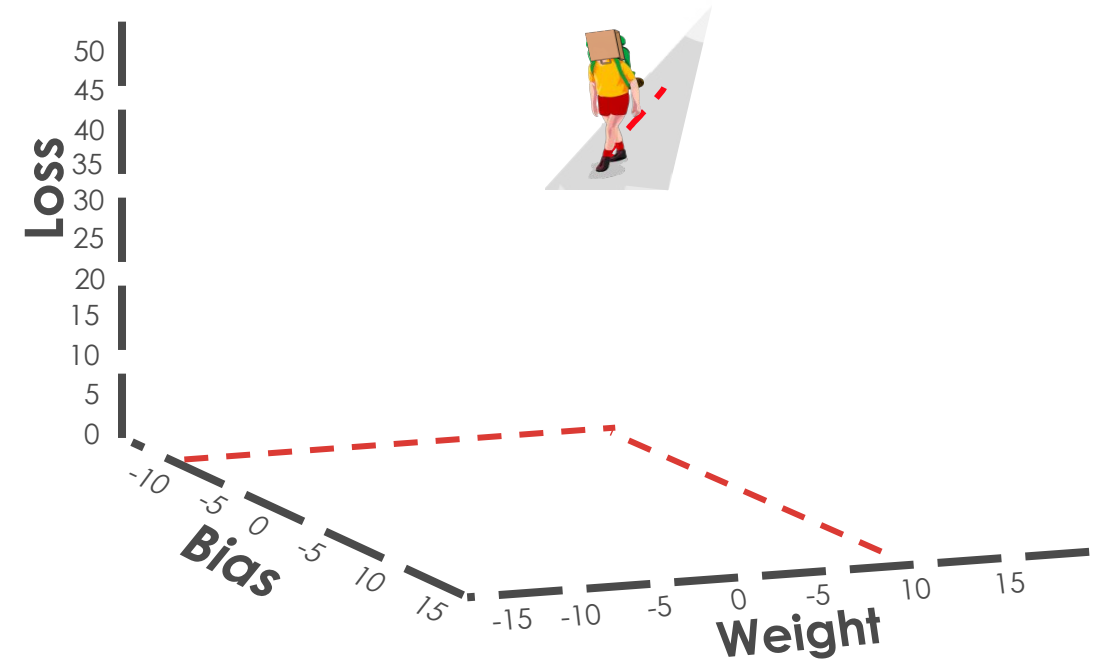
Gradient Descent Steps

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

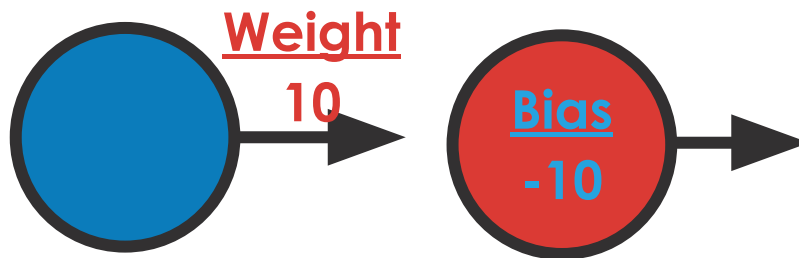
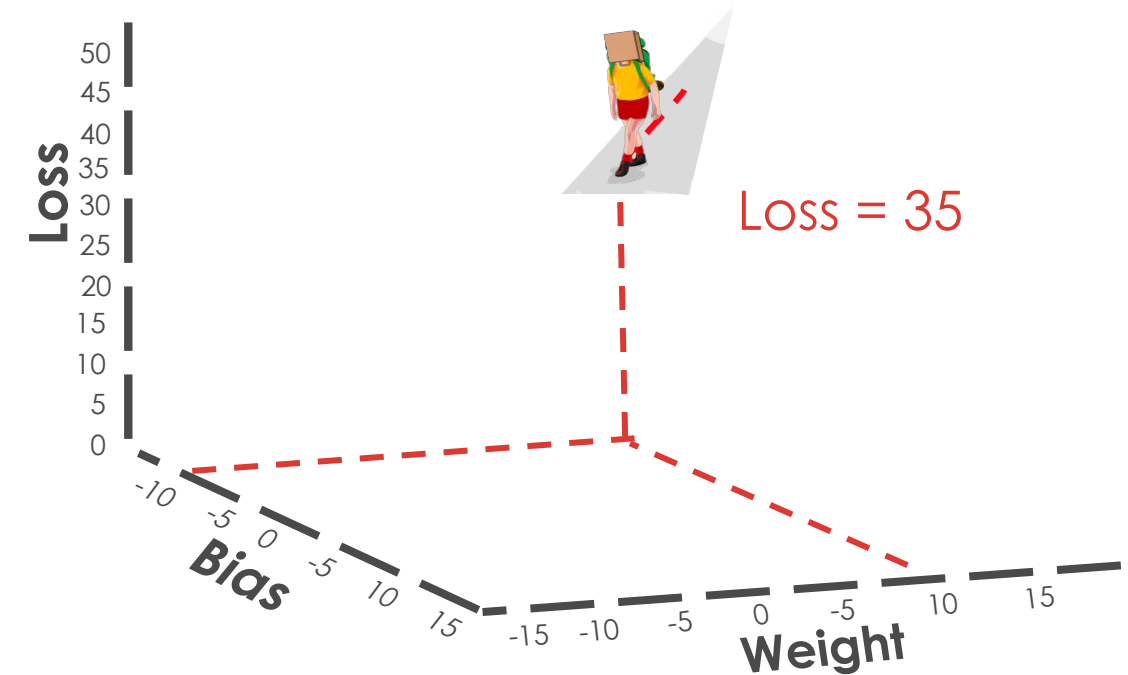


Backpropagation



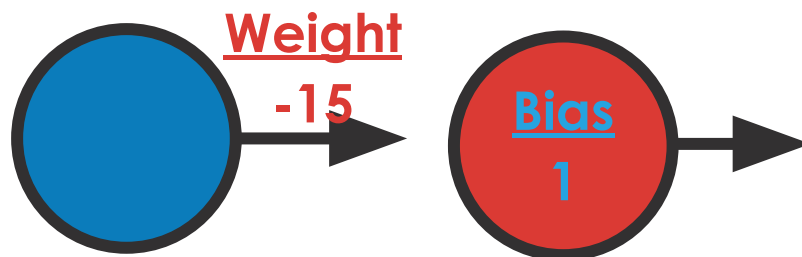
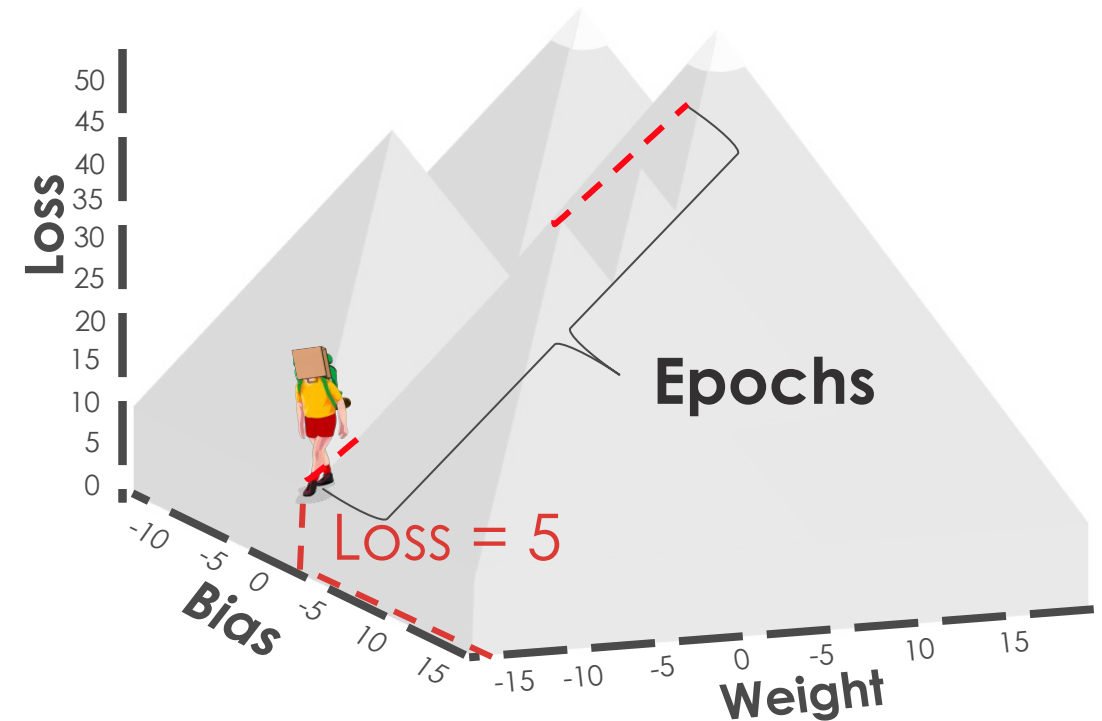
Gradient Descent Steps

- 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

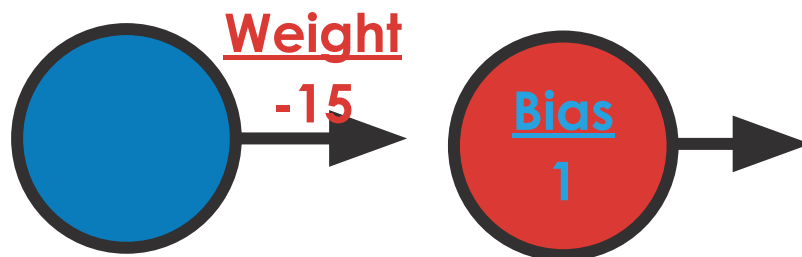
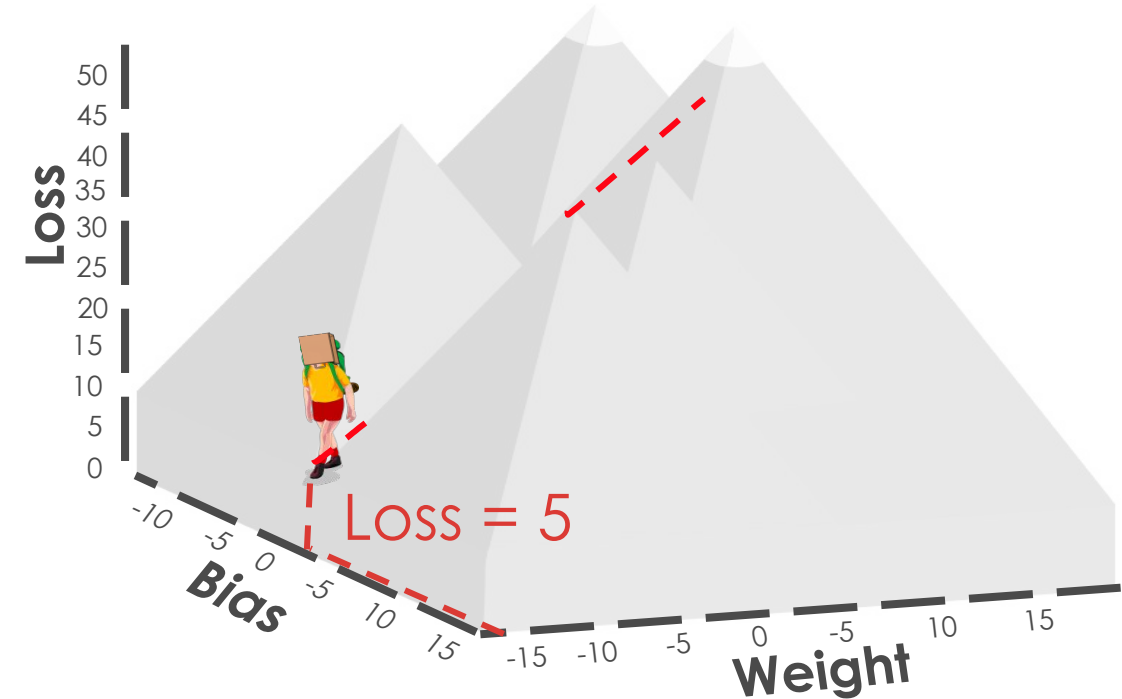


This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.

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**



This file is meant for personal use by brentjones@gmail.com only.

Sharing or publishing the contents in part or full is liable for legal action.