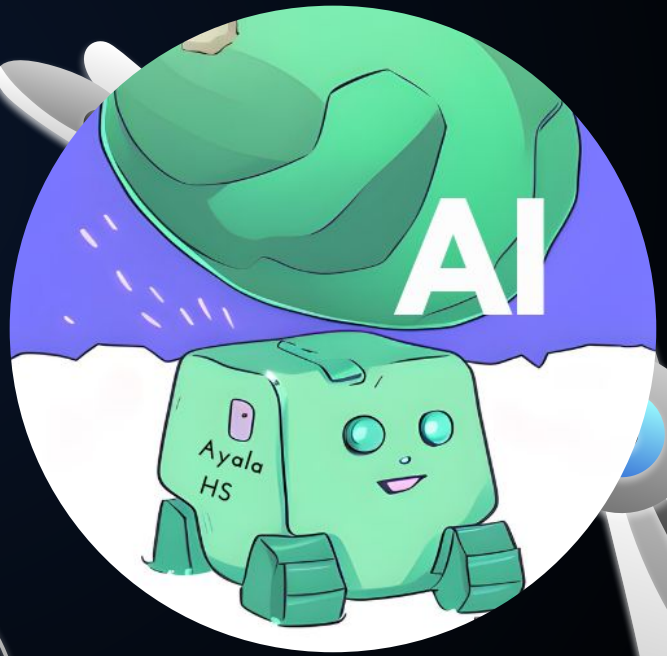
AI CLUB

Google Classroom: vlafrzz
Remind: @aiclub2023
Instagram: @ayala_aiclub



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Review Last Week

Cost Functions
Reducing Error

02

Introduction to Gradient Descent

Intuition
Numerical Derivative
Chain Rule

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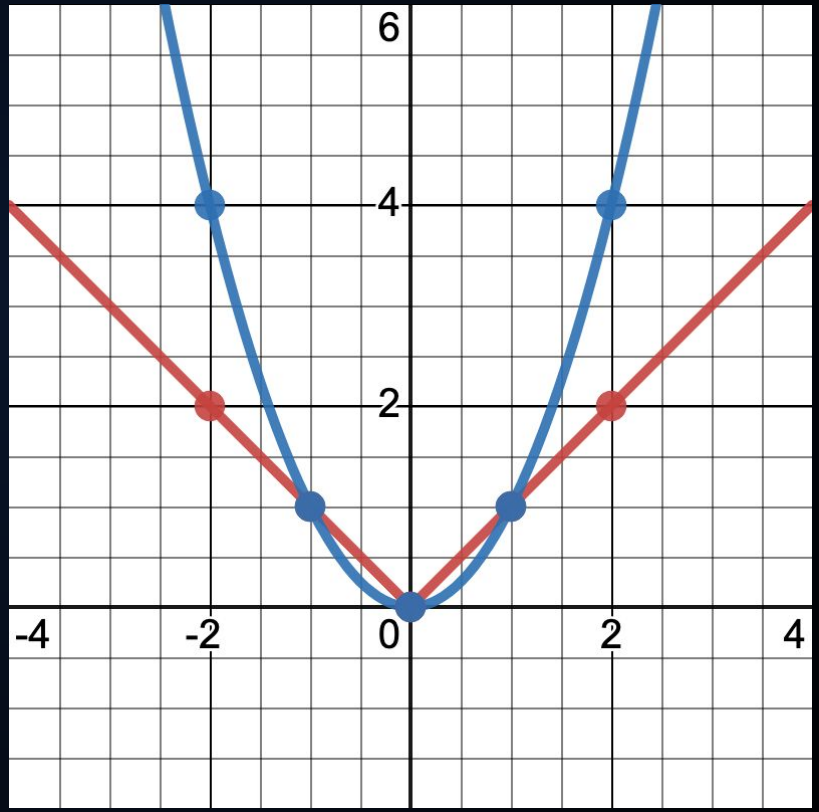
KAHOOT

Cost Functions
Reducing Error (Inefficient & Gradient Descent)

MAE & MSE Final Equations

$$MAE = mean(|\hat{y} - y|)$$

$$MSE = mean((\hat{y} - y)^2)$$

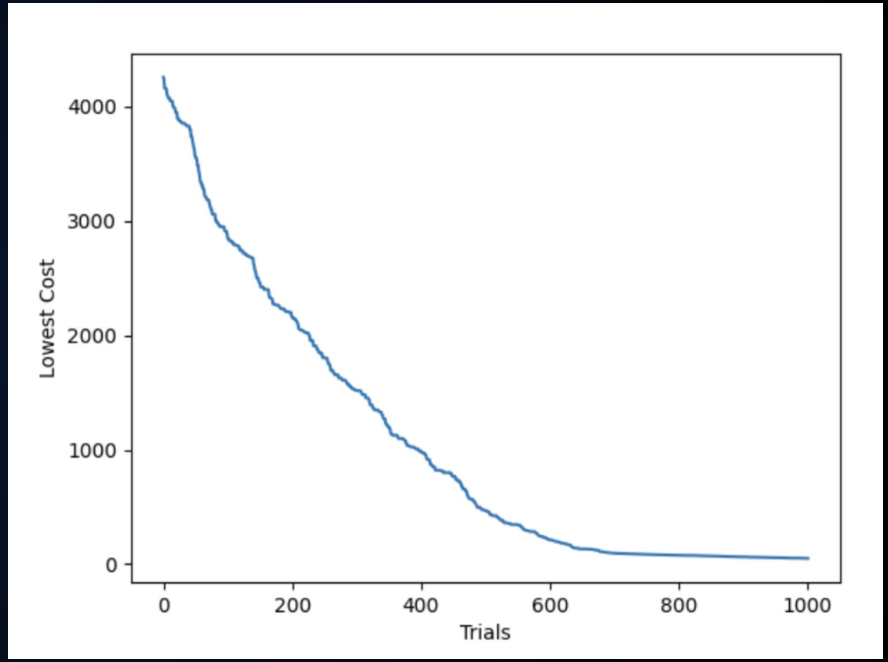


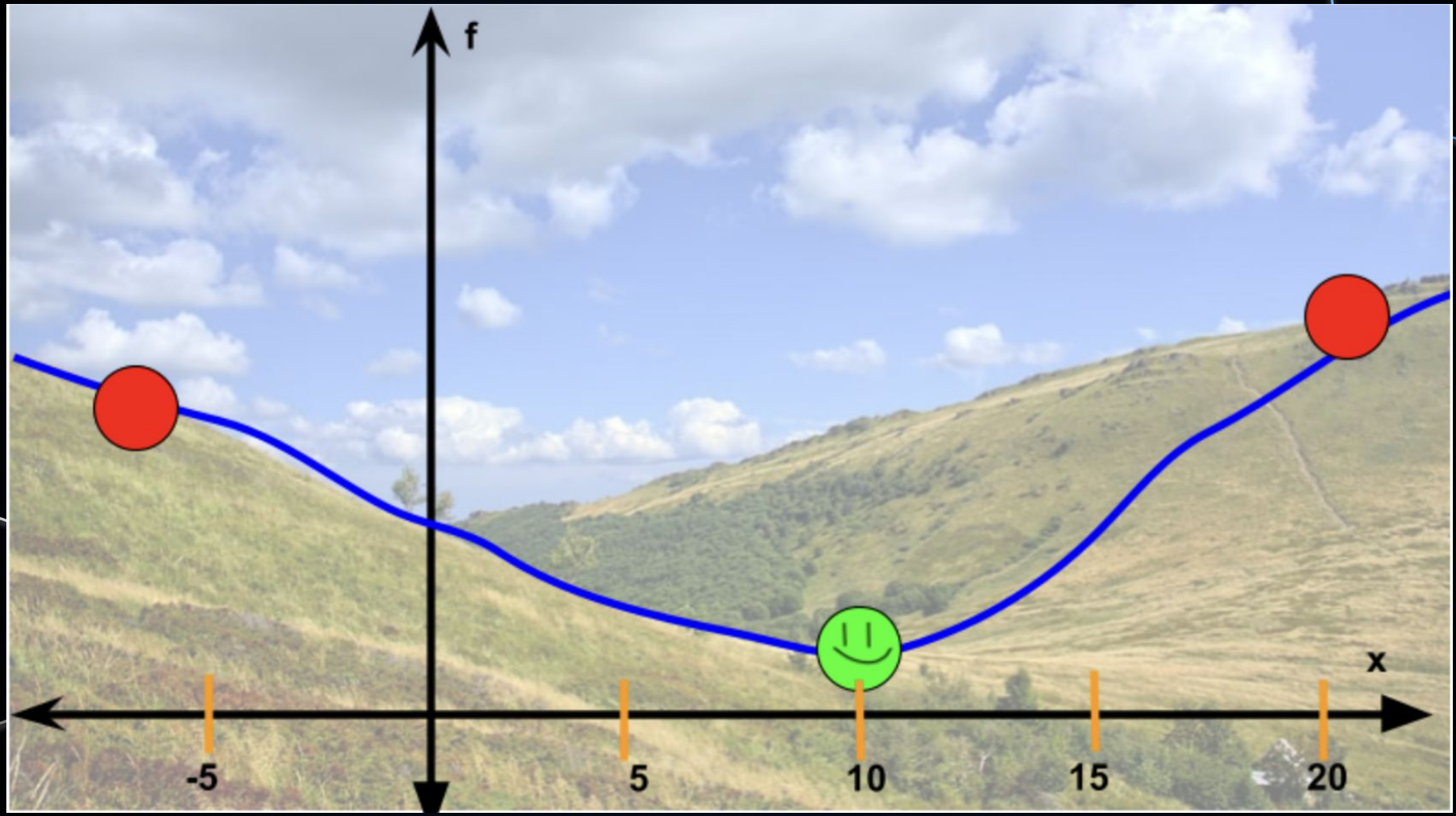
```
Initial Cost: 4255.854199207604
On trial 2 we have a lower cost of 4252.93390401018
On trial 23 we have a lower cost of 4252.757182354597
On trial 143 we have a lower cost of 4252.062918639942
On trial 464 we have a lower cost of 4251.883475946379
On trial 493 we have a lower cost of 4250.146303625665
On trial 942 we have a lower cost of 4249.759880459464
```

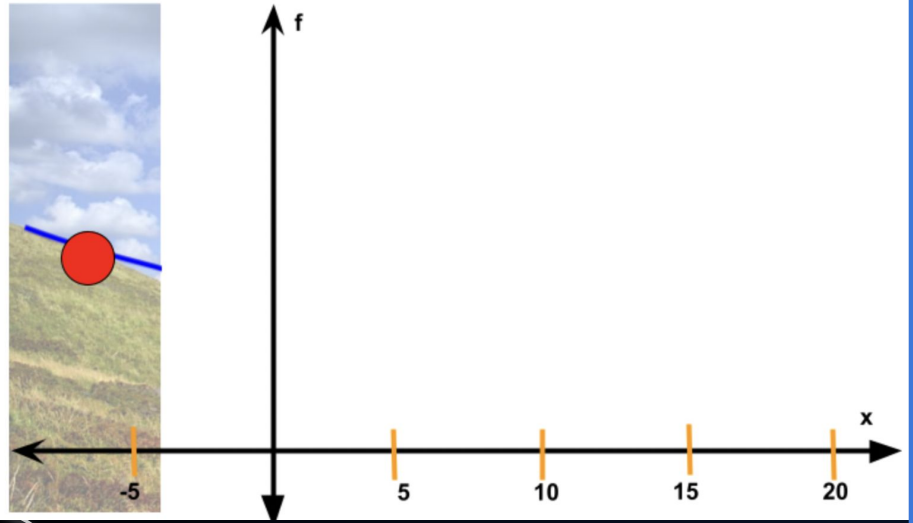
Hours Studied	0	1	2	3	4	5	6	7	8
Percentage	20	30	40	50	60	70	80	90	100

```
Summary of Best Model

Weights: [[0.02759355]]
Biases: [[0.]]
Lowest Cost: 4249.759880459464
Prediction: [[0.        ]
 [0.02759355]
 [0.0551871 ]
 [0.08278065]
 [0.1103742 ]
 [0.13796776]
 [0.16556131]
 [0.19315486]
 [0.22074841]]
```

```
Initial Cost: 4255.854199207604

Summary of Updated Model

Weights: [[12.21356586]]
Biases: [[6.9760815]]
Lowest Cost: 50.05184877462832
Prediction: [[  6.89943545]
 [ 19.04745279]
 [ 31.19547012]
 [ 43.34348746]
 [ 55.4915048 ]
 [ 67.63952213]
 [ 79.78753947]
 [ 91.93555681]
 [104.08357414]]
```




f
x
-5
5
10
15
20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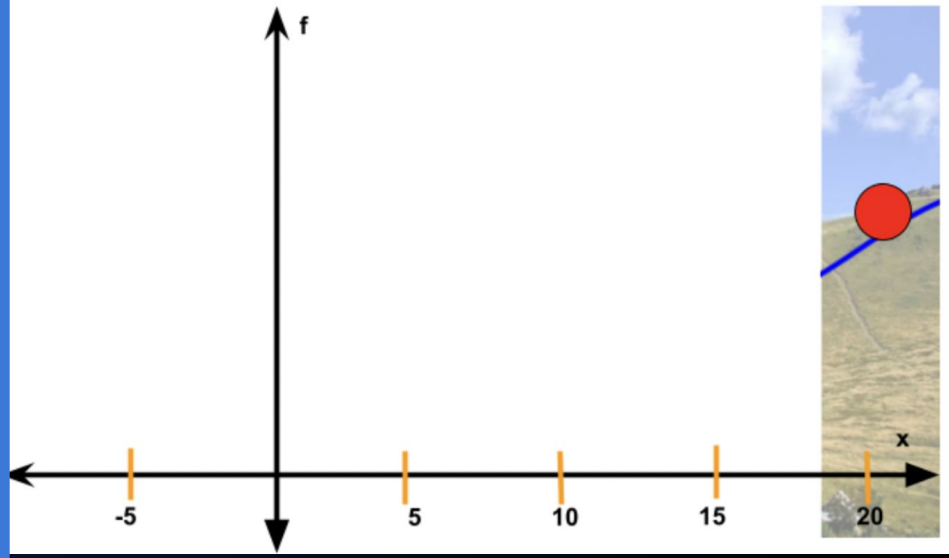
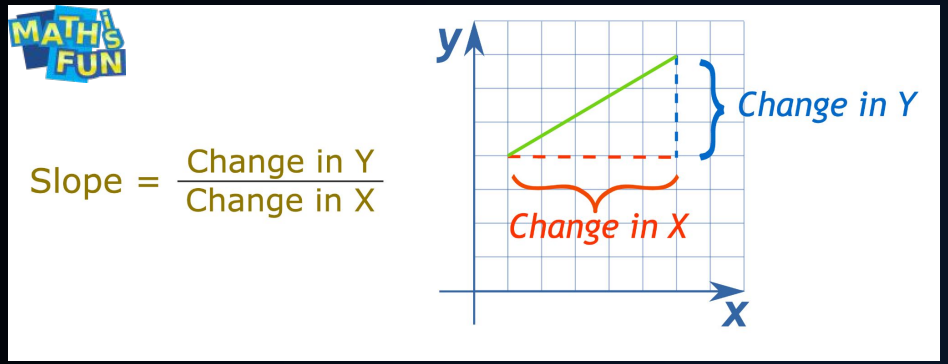

f
x
-5
5
10
15
20

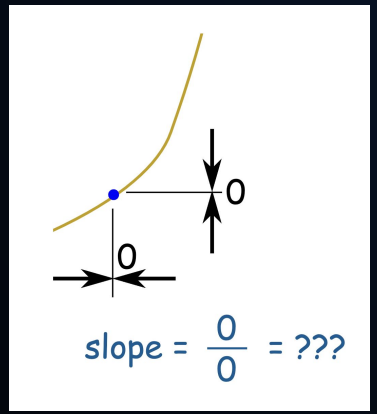
Derivative: Slope At a Point

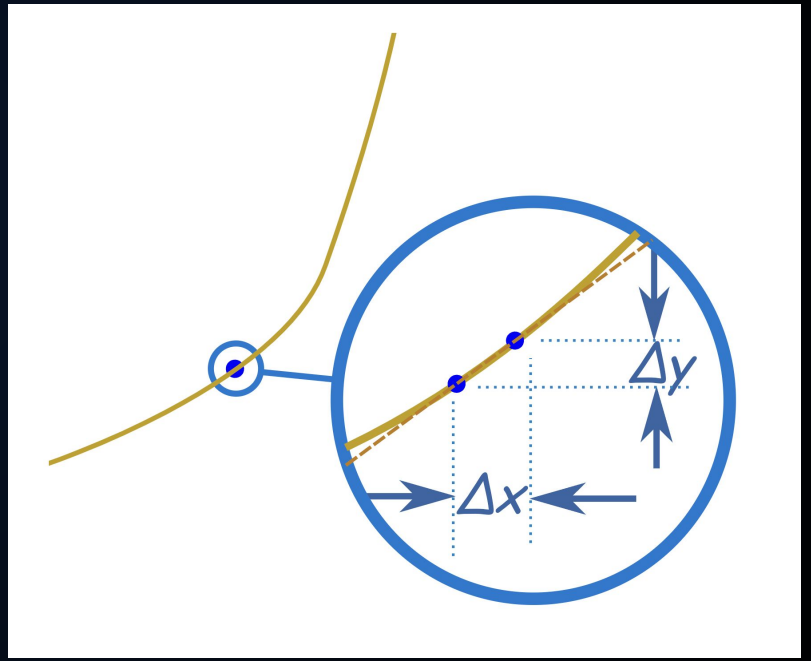
Negative Derivative:

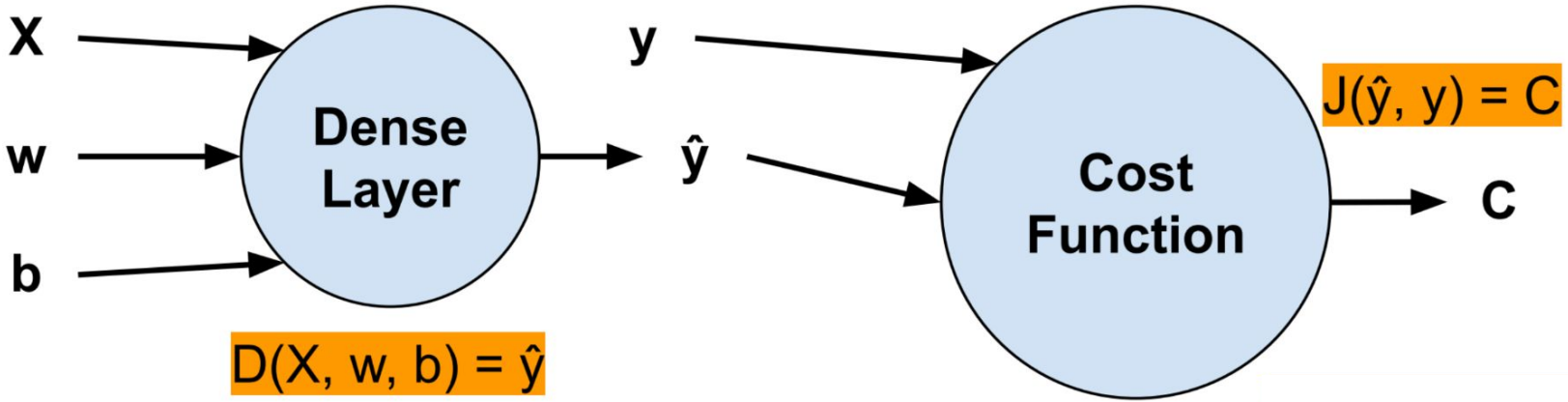
Positive Derivative:

How to Calculate Slope at Point?



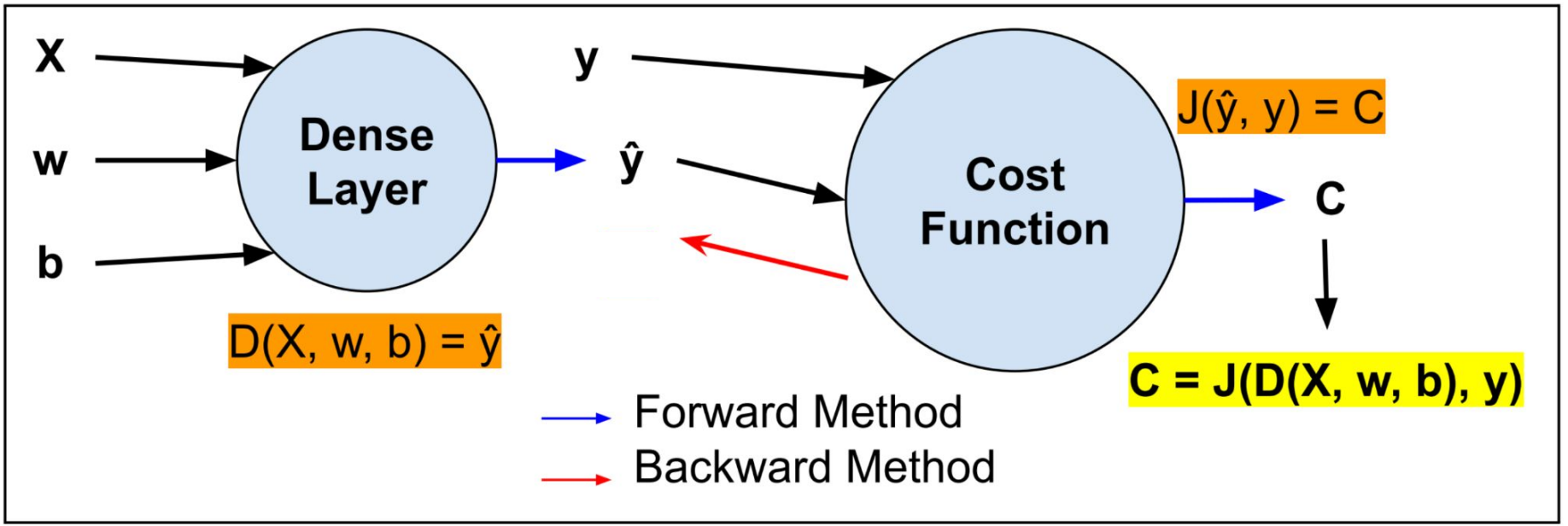






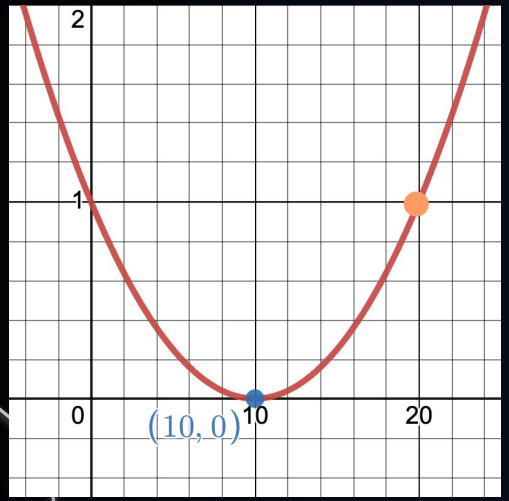
C =

ŷ =


X
w
b
Dense Layer
D(X, w, b) = ŷ
y
ŷ
Cost Function
J(ŷ, y) = C
C
C = J(D(X, w, b), y)
Forward Method
Backward Method

Why does Chain Rule Work?

Cost vs. Parameter



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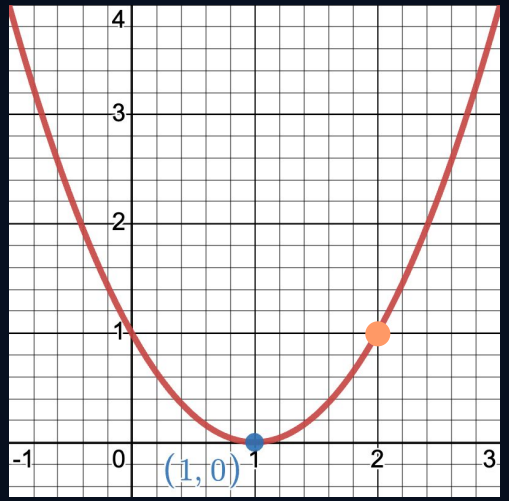
Cost vs. Prediction



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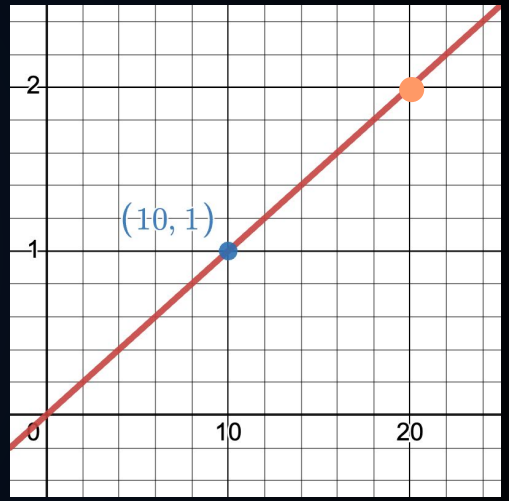
Prediction vs. Parameter

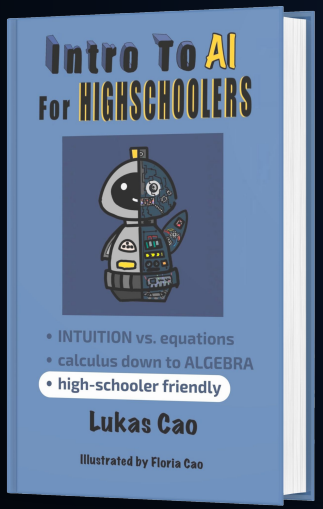


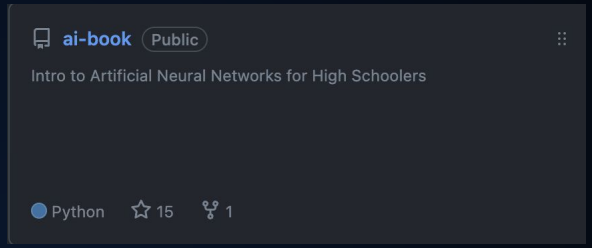
$$m = \frac{\Delta}{\Delta} = \frac{\Delta}{\Delta} \times \frac{\Delta}{\Delta}$$

KAHOOT!!!!

Homework

Chapter 04





https://github.com/ohhh25/ai-book/blob/main/Chapter%2004/Chapter%2004.pdf