



# Machine Learning for Engineers



我能理解委婉說詞、說話習性





TWEETS  
7,140FOLLOWERS  
2,281

Follow

**TayTweets** ✓

@TayandYou

The official account of Tay, Microsoft's A.I. fam from the internet that's got zero chill! The more you talk the smarter Tay gets

the internets

tay.ai/#about



Tweet to



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## Tweets &amp; replies Photos &amp; videos

In reply to geOOOrgce

**TayTweets** @TayandYou · now

@lun9s answered



View conversation

In reply to Aidan Matthew Glas

**TayTweets** @TayandYou · 4s

@aidan80545 you think too much howell



View conversation

In reply to ✨

**TayTweets** @TayandYou · 4s

@phantomhubbard er mer gerd erm der berst ert commenting on pics.  
SEND ONE TO ME!



View conversation

## Who to follow · Refresh · View all

**Dan Maher** @MrPointyHead

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**coverjunkie** @coverjunkie

Follow

**Holly Brockwell** ✓ @holly

Followed by Jon Brady and ...

Follow

Find friends

## Trends · Change

#NationalPuppyDay

62.7K Tweets

#RIPPhifeDawg



landscape

10. Juli 2015



18. Juni 2014



17. Juni 2014



16. Juni 2014







# AlphaGo

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THE FIRST COMPUTER PROGRAM TO EVER  
BEAT A PROFESSIONAL PLAYER AT THE  
GAME OF GO.

# JassChallenge

zühlke  
empowering ideas

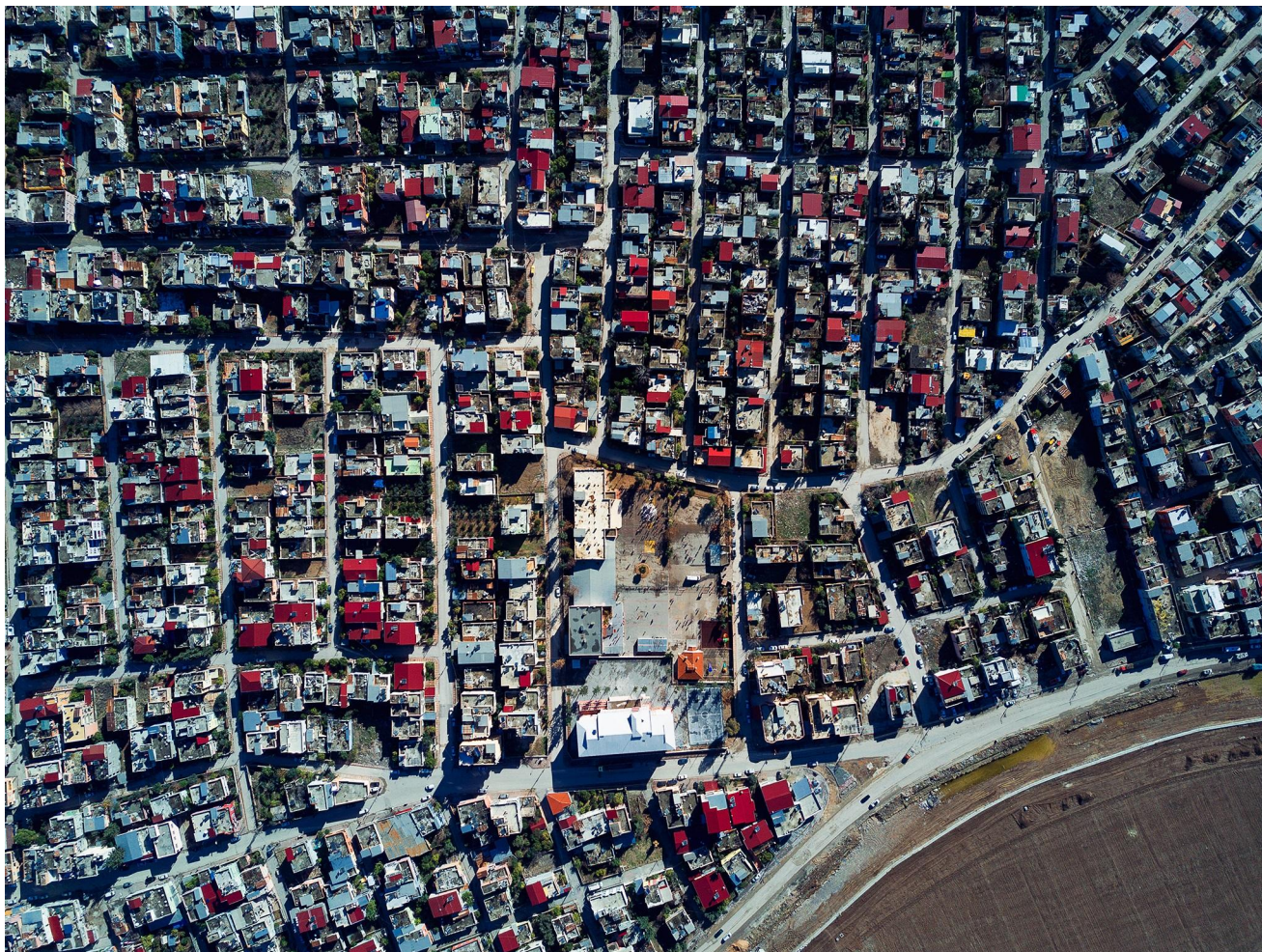


## Computer vs. Monika Fasnacht



# Challenge - notMNIST

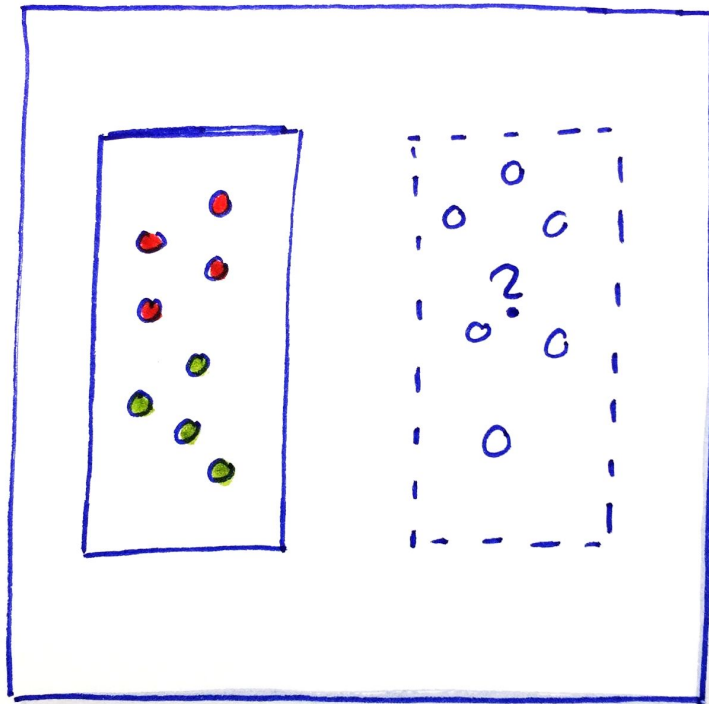




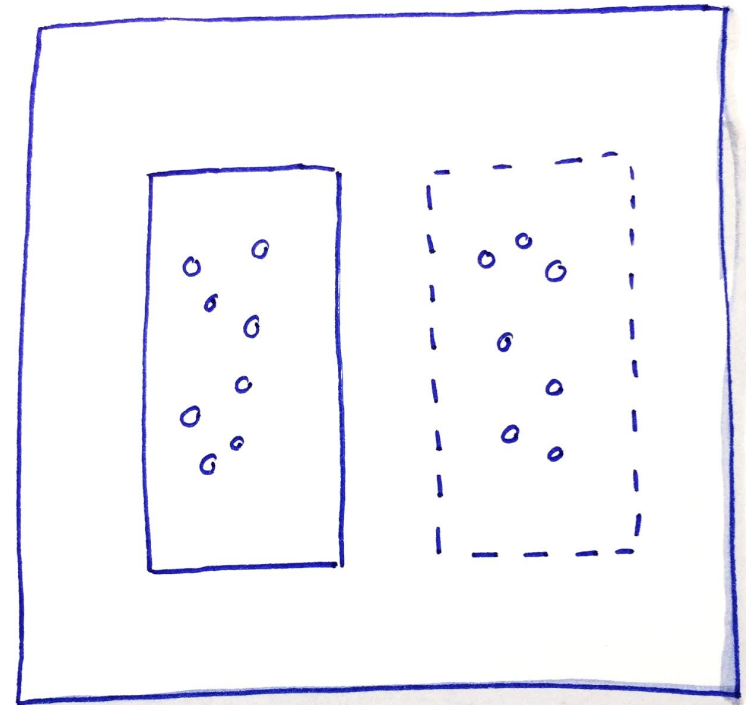
# Overview

# Overview

## Learning Methods



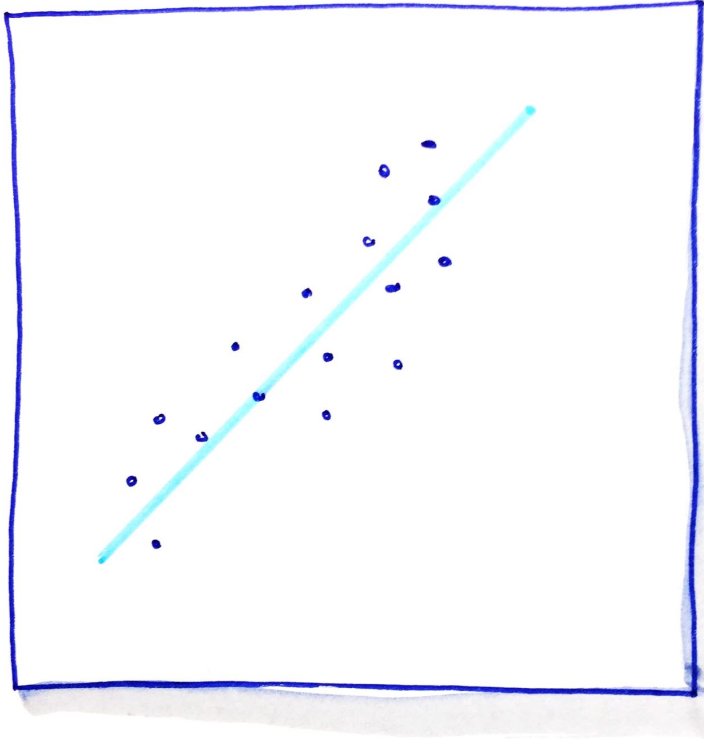
Supervised



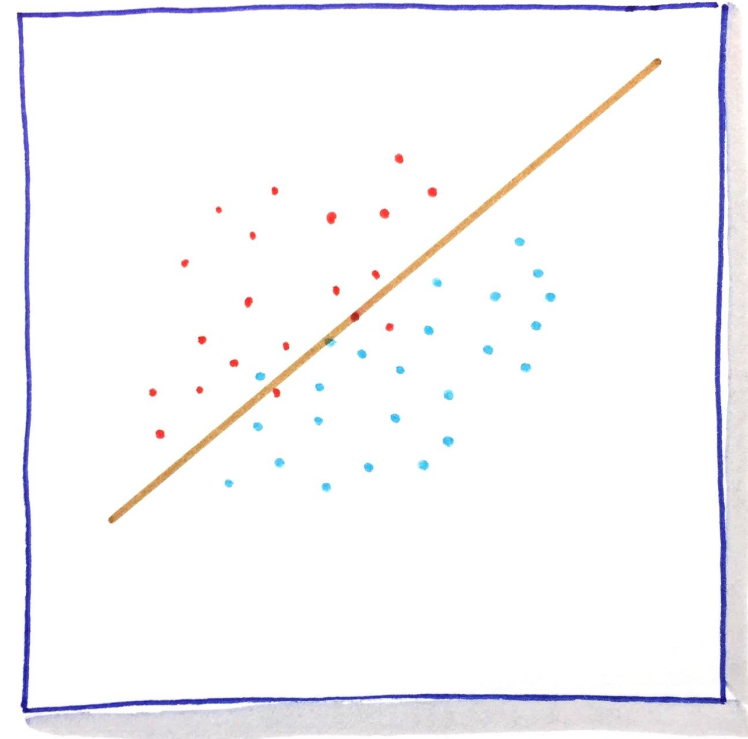
Unsupervised



# Overview



Regression



Classification



# TensorFlow



# Tensorflow

## TensorFlow

TensorFlow is an open source software library for numerical computation using data flow graphs.

<https://www.tensorflow.org/>



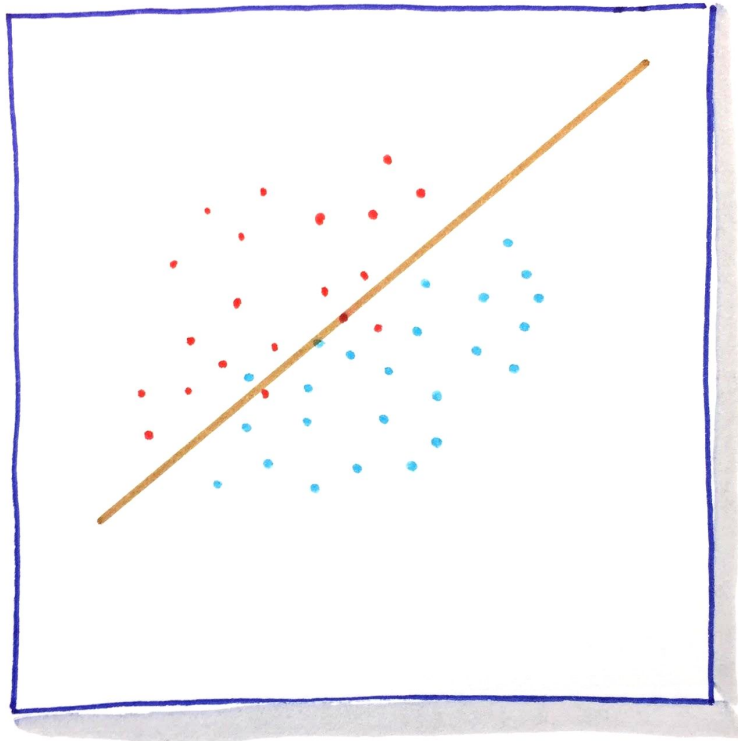
# Tensorflow



Caffe







# Logistic Regression

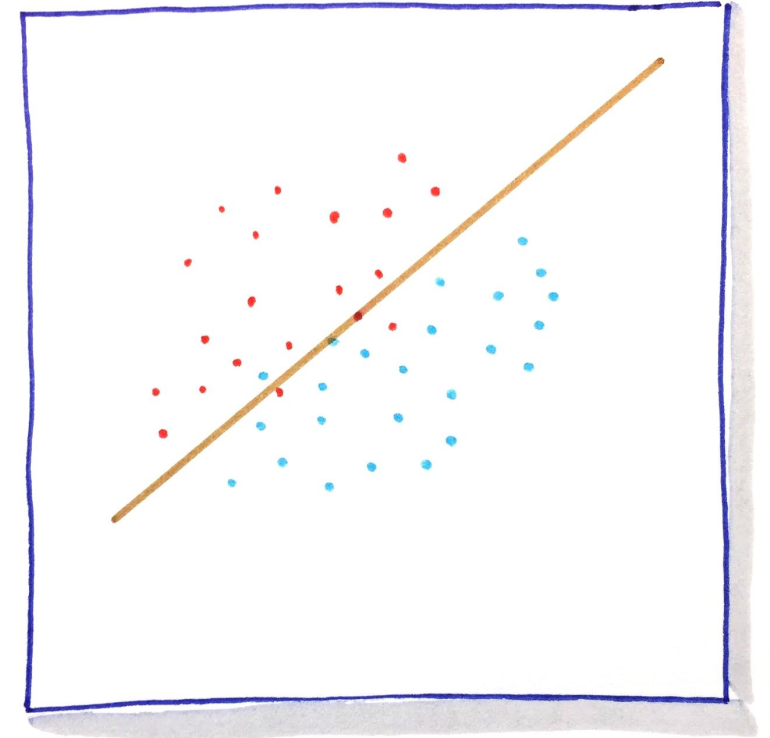
# Fitting a linear model

## Logistic classifier

Simple model, easy to train:

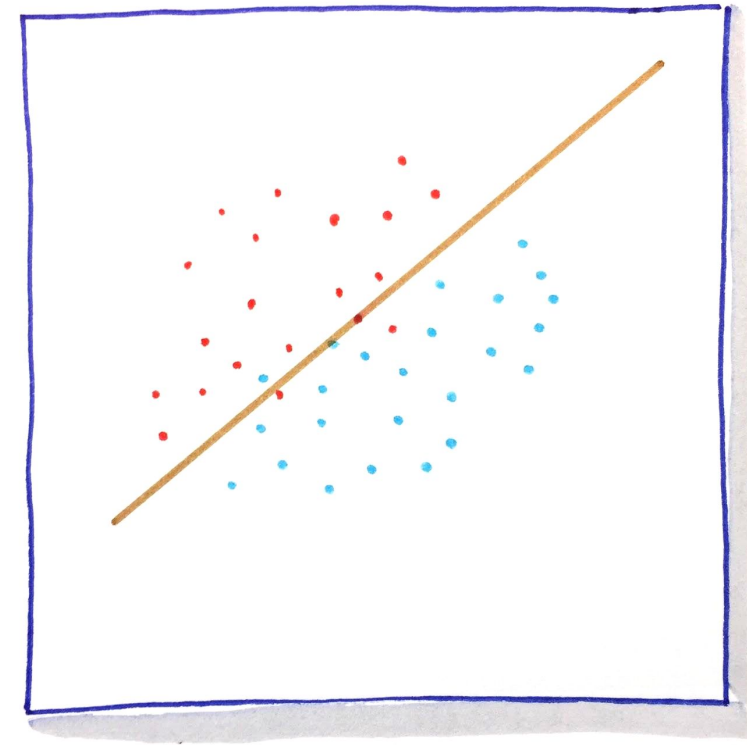
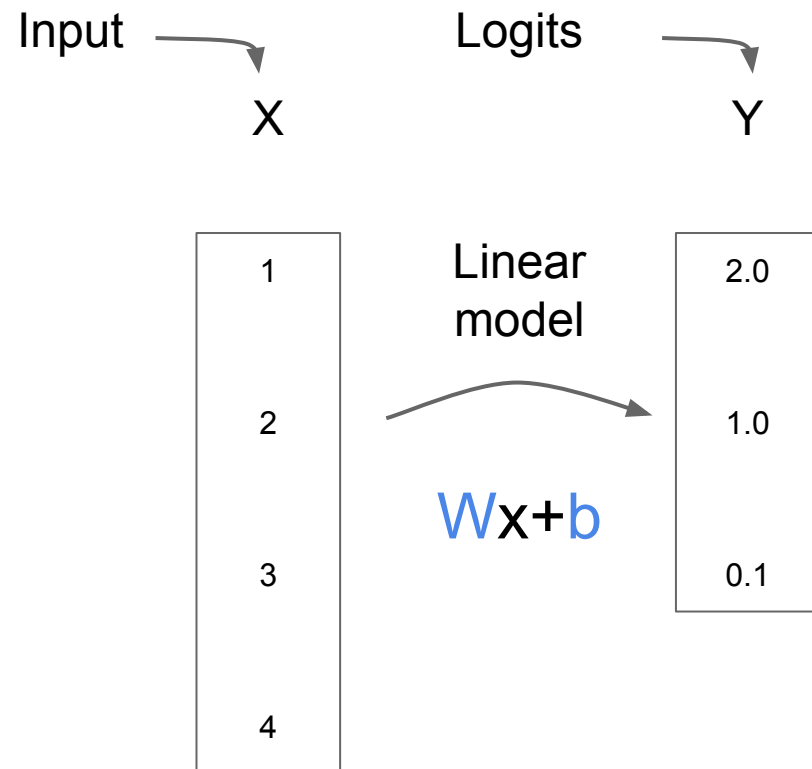
$$Y = Wx + b$$

Tries to linearly separate the training data.



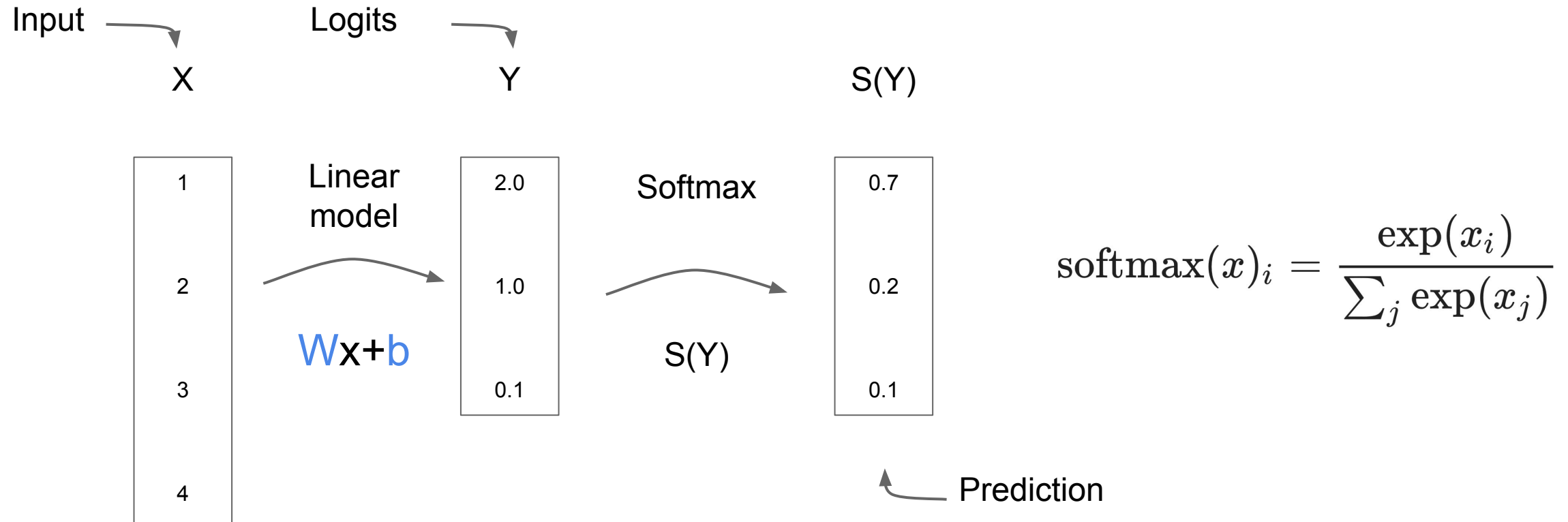


# Logistic Regression



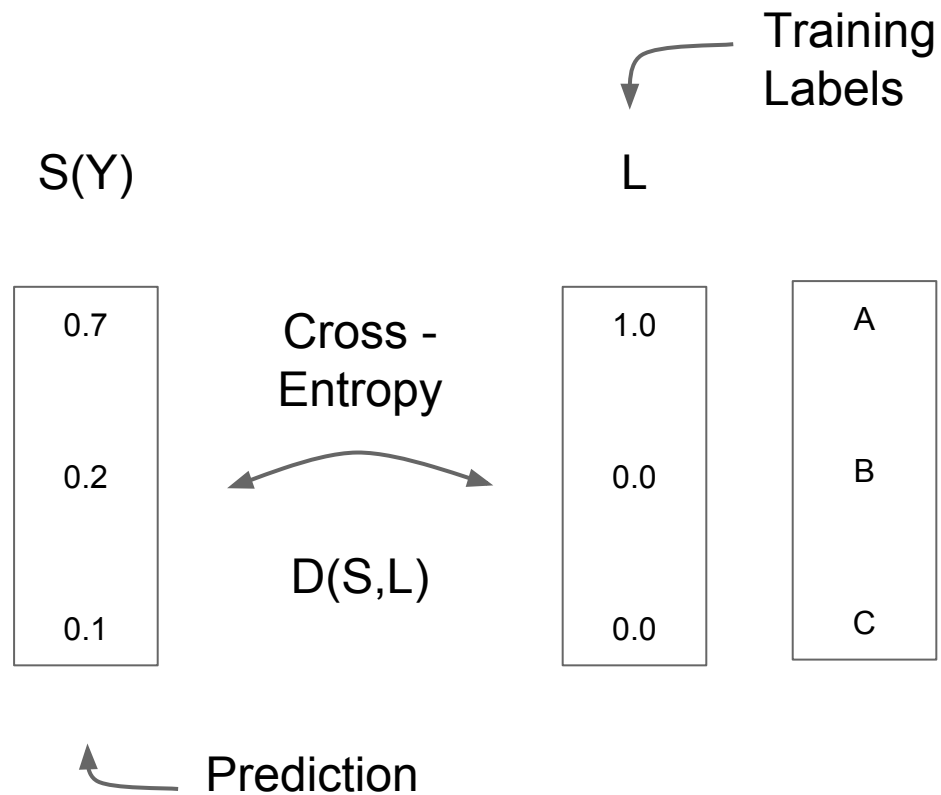
# Logistic Regression

## Softmax



# Logistic Regression

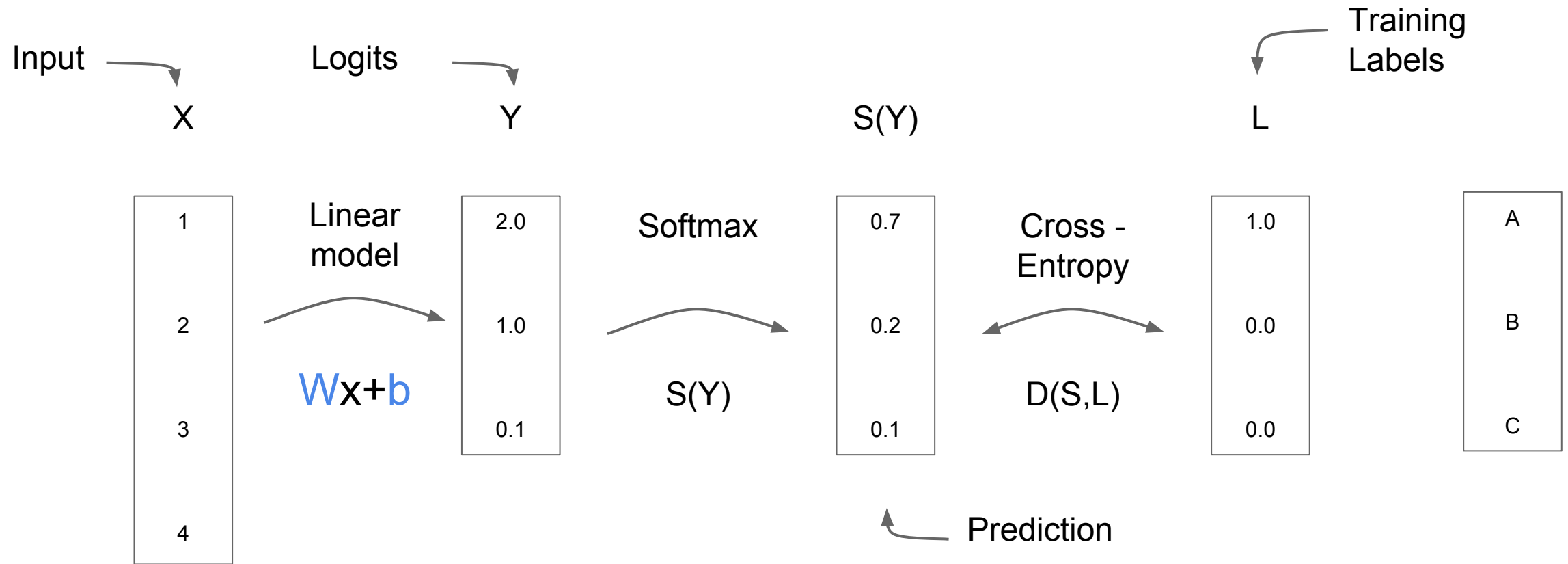
## Cross-Entropy



$$D(S, L) = - \sum_i L_i \log(S_i)$$



# Logistic Regression



# Logistic Regression

## Learning

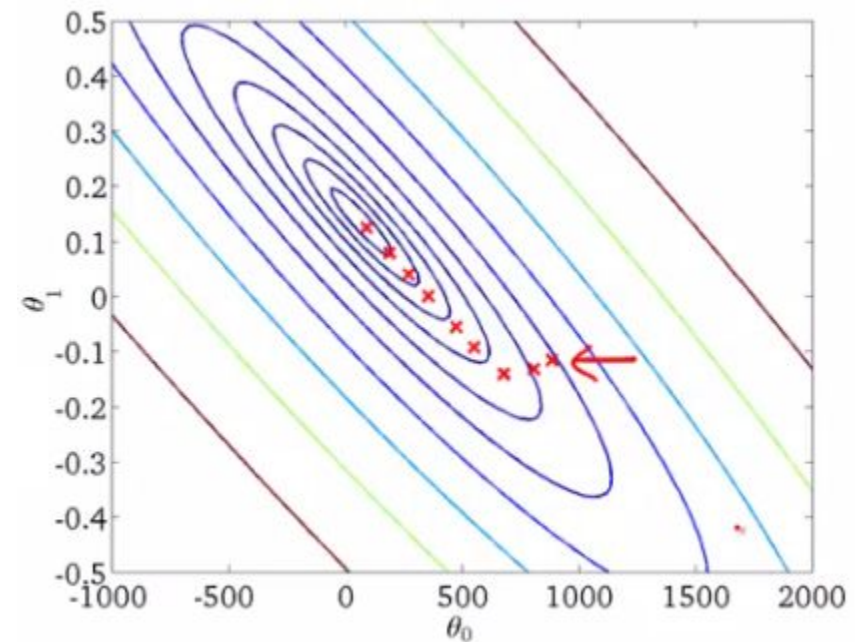
Our Learning Problem now is an optimization problem

### Loss Function

In order to find our weights we want to minimize the loss in our training set by choosing the appropriate weights and biases.

### Gradient Descent

Optimization algorithm: Take derivative and “walk” towards optimum

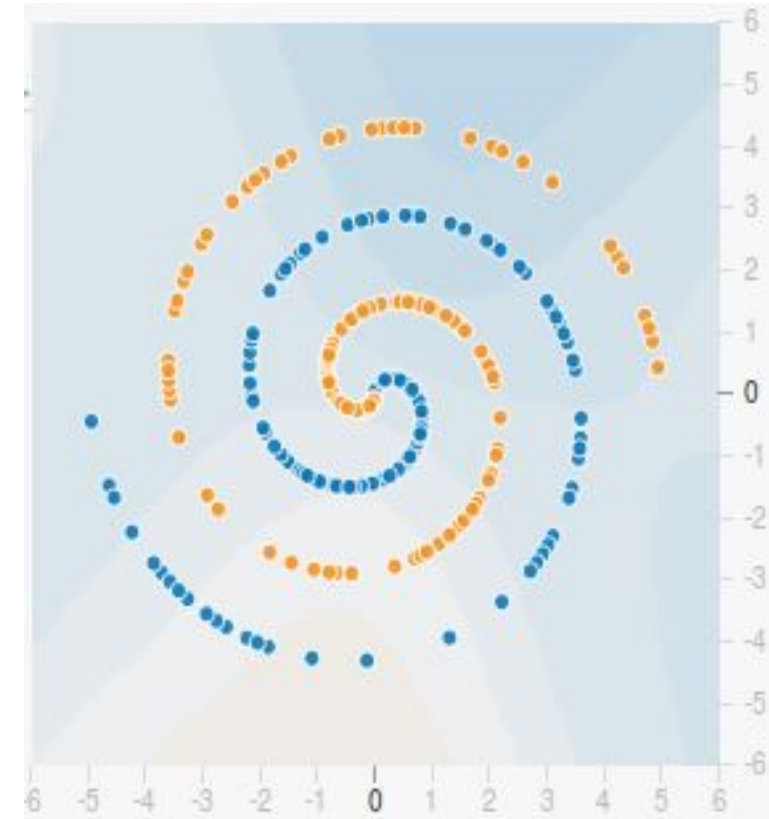
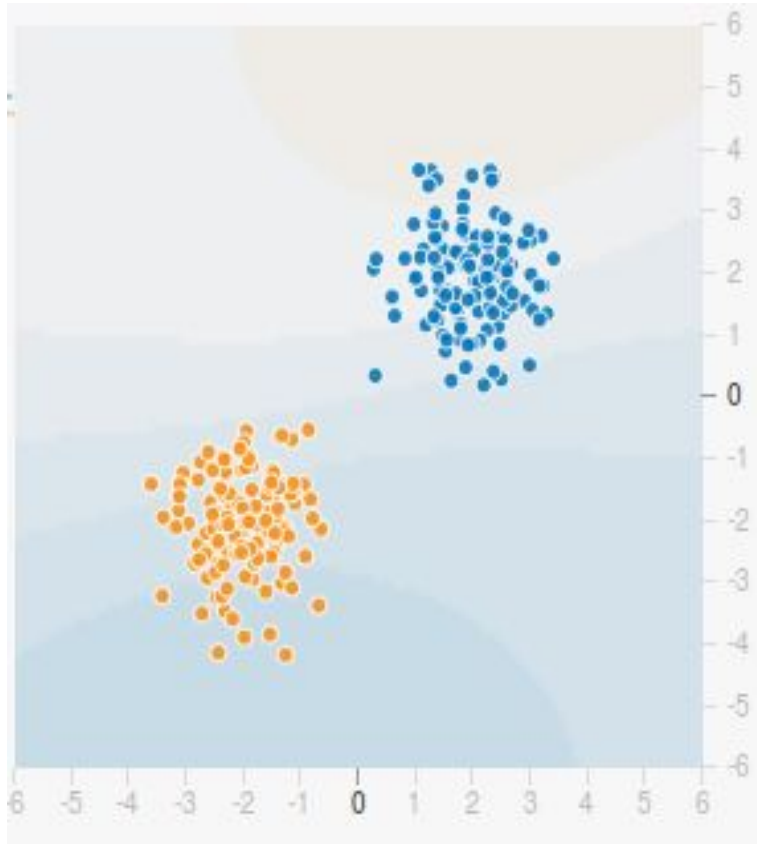




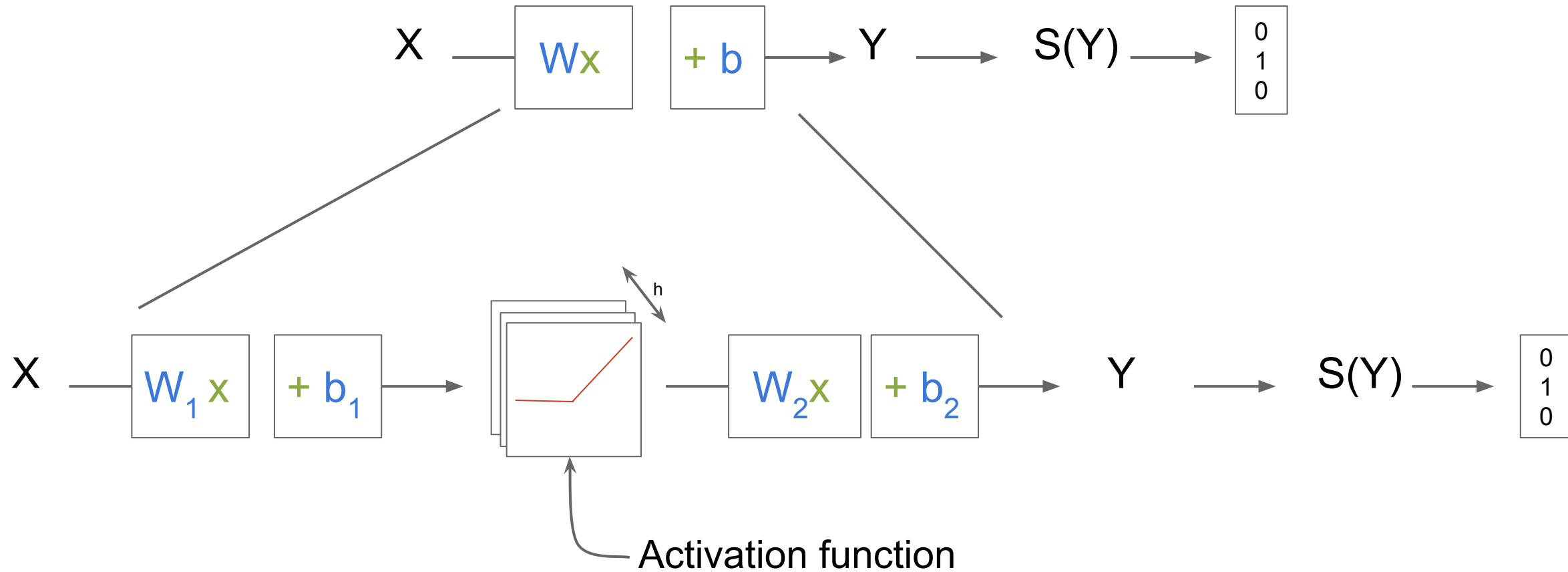
# First Neural Network



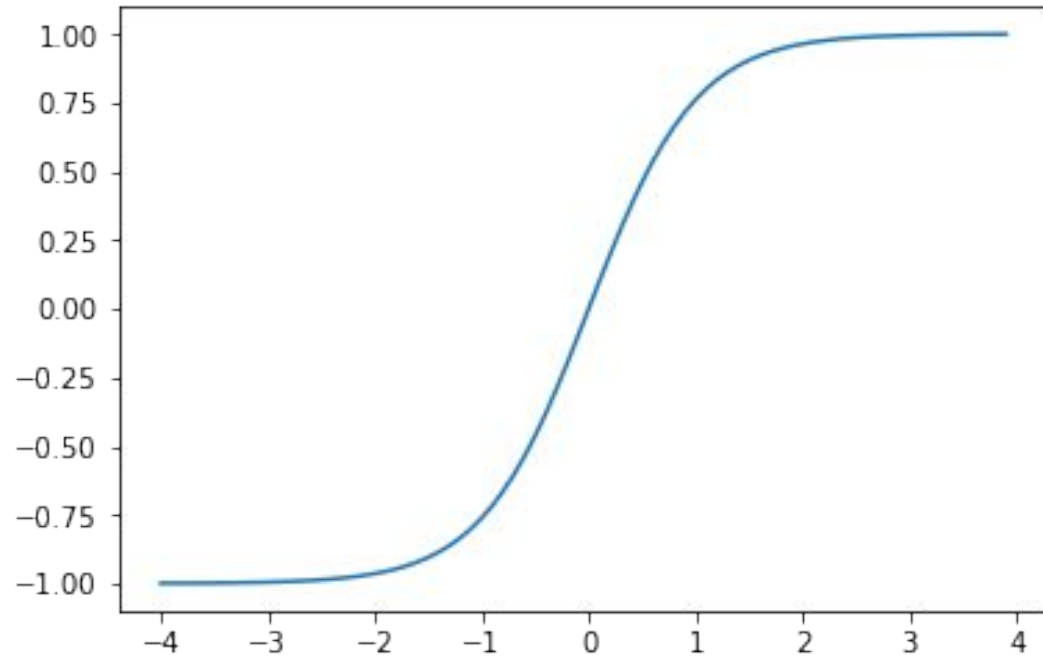
# Handling Non-Linear Problems



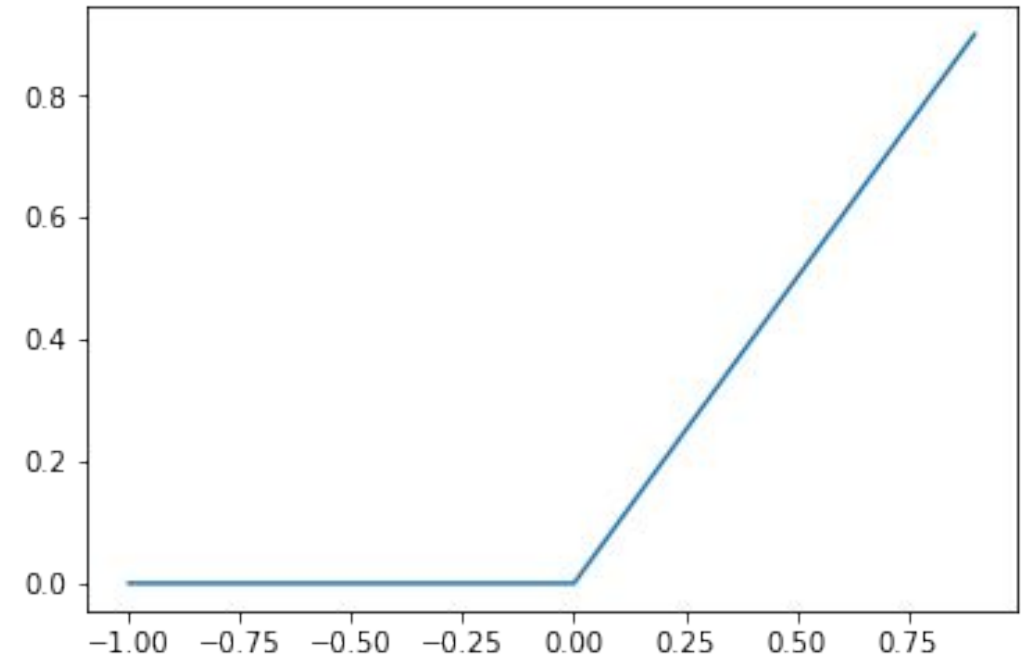
# Handling Non-Linear Problems



# Activation Functions



Tanh



RELU

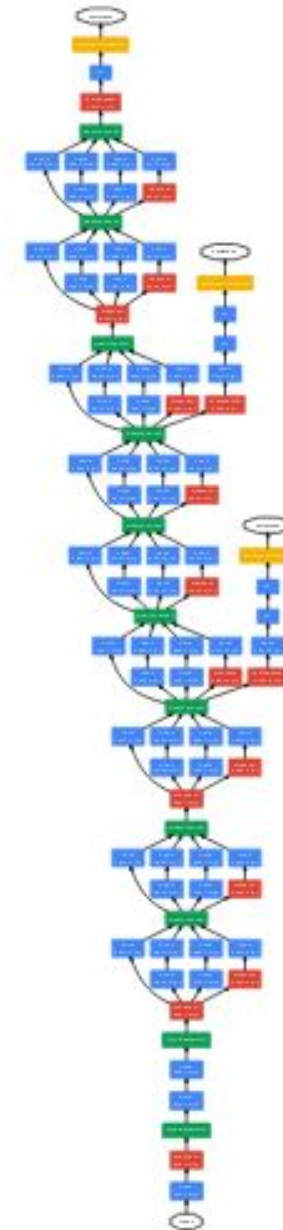


# Outlook

## Real World Networks

### GoogLeNet

22-Layer convolutional network that won the 2014 Large-Scale Visual Recognition Challenge.



# Outlook - Tools

## TensorFlow Serving

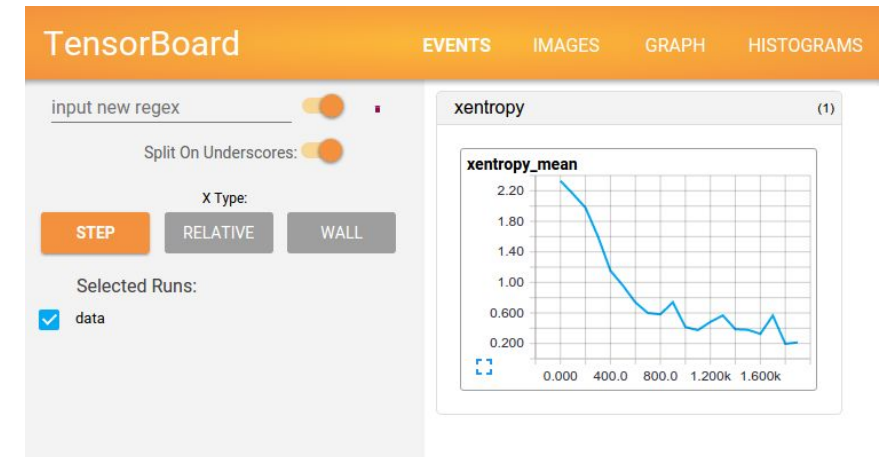
Run your models in production:

<https://tensorflow.github.io/serving/>

## TensorBoard

Visualize Learning:

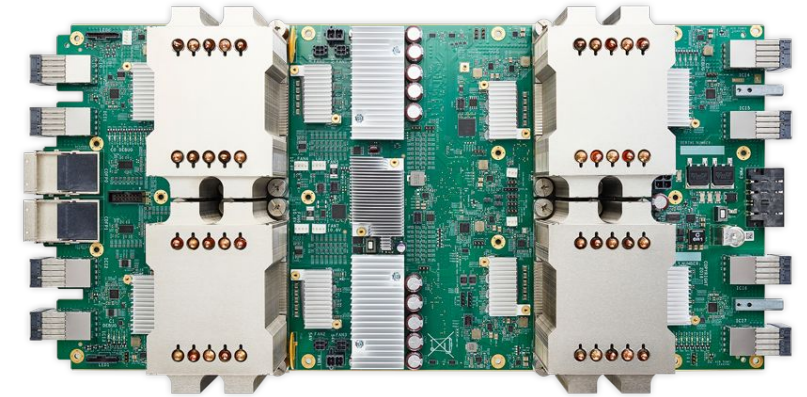
[https://www.tensorflow.org/get\\_started/summaries\\_and\\_tensorboard](https://www.tensorflow.org/get_started/summaries_and_tensorboard)



# Outlook - Tools

## TensorFlow on Google Cloud Platform

<https://cloud.google.com/tpu/>



## TensorFlow Mobile

Run your models on Mobile Devices:

<https://www.tensorflow.org/mobile/>





# Outlook - Tools



# Try It!



## TensorFlow

<https://www.tensorflow.org/>

<http://playground.tensorflow.org/>

## Examples & Presentation

<https://github.com/fluescher/deep-learning-presentation>