Intro to Machine Learning

From concept to implementation

About Me - goo.gl/M3QQwq

- 2 ½ Year IT Student
- Work at PopGun.ai
  - Went to TechStars Music 2017
- Languages
  - Haskell
  - Python
  - JavaScript
- Blockchain and FP enthusiast

Assumptions

[✔] How to read graphs

[✔] Know what functions are

Goals of the talk

Build geometric intuition

Avoid mathematical jargon

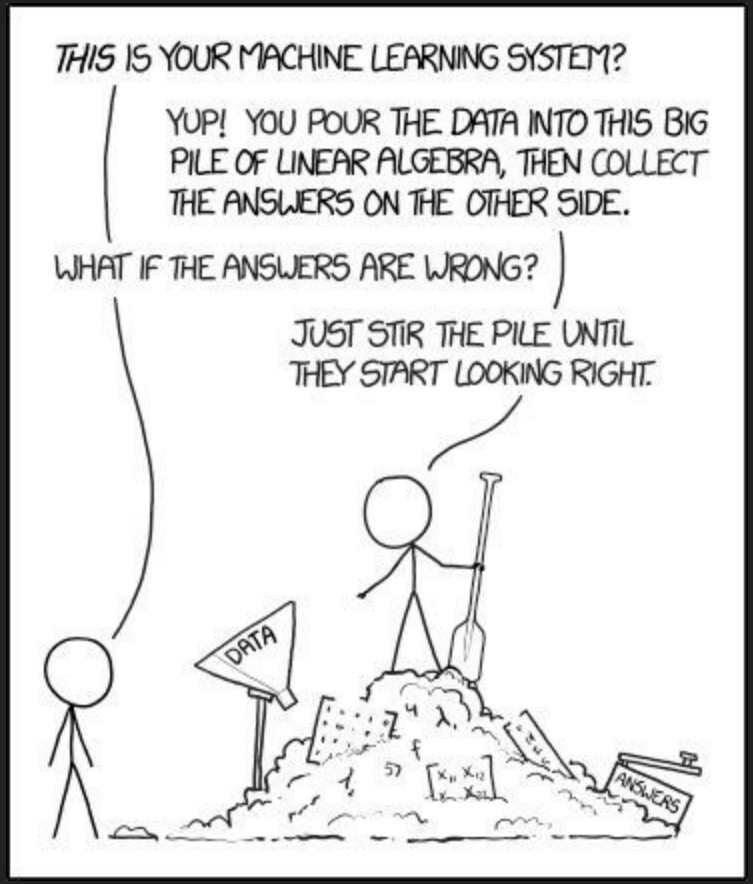
Learn to build your own models

Prelude

[✔] Couple of lies

What is Machine Learning?

“Any device whose actions are influenced by past experience”

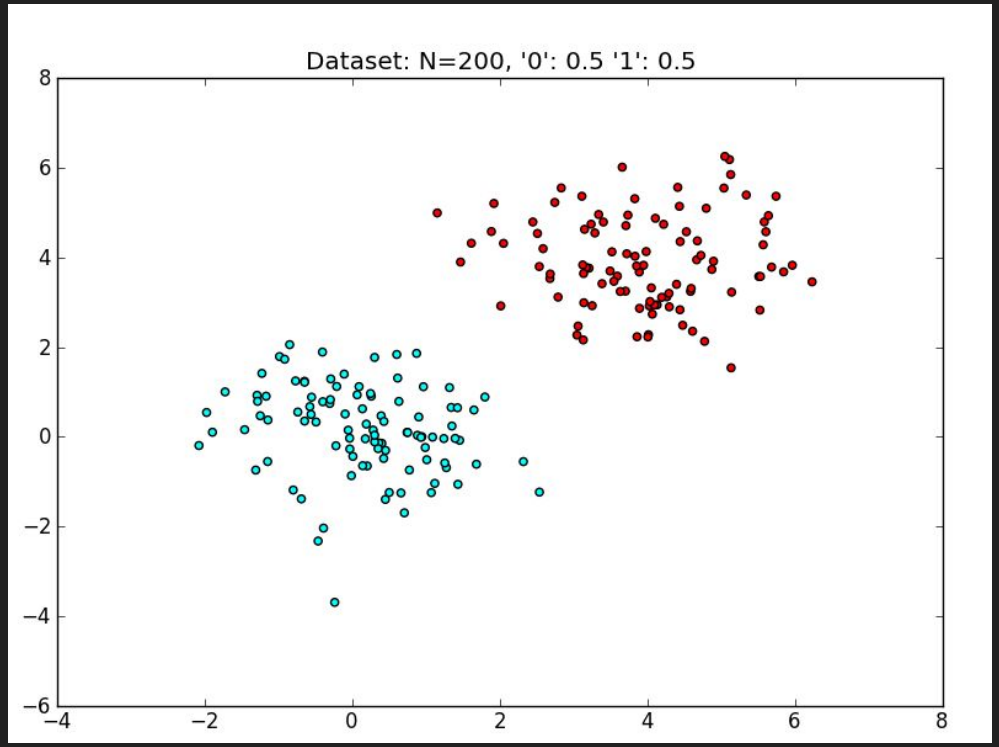

THIS IS YOUR MACHINE LEARNING SYSTEM?
YUP! YOU POUR THE DATA INTO THIS BIG PILE OF LINEAR ALGEBRA, THEN COLLECT THE ANSWERS ON THE OTHER SIDE.
WHAT IF THE ANSWERS ARE WRONG?
JUST STIR THE PILE UNTIL THEY START LOOKING RIGHT.
DATA
ANSWERS

Lets get started… with some Maths

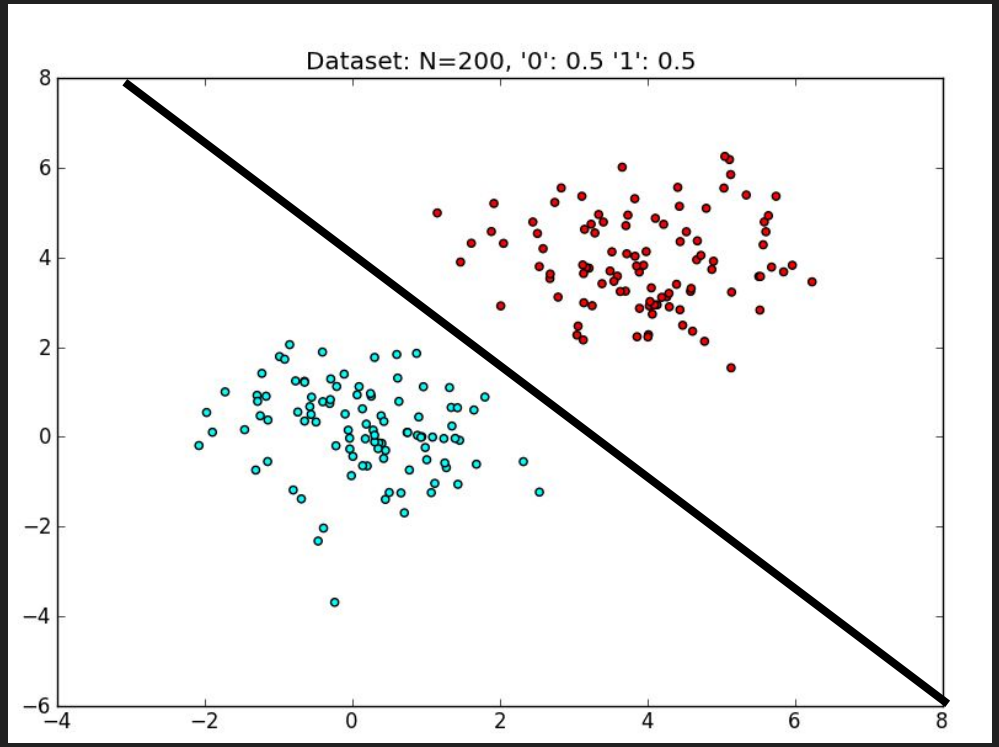
$$F(x) \Rightarrow y$$

$$y = mx + c$$

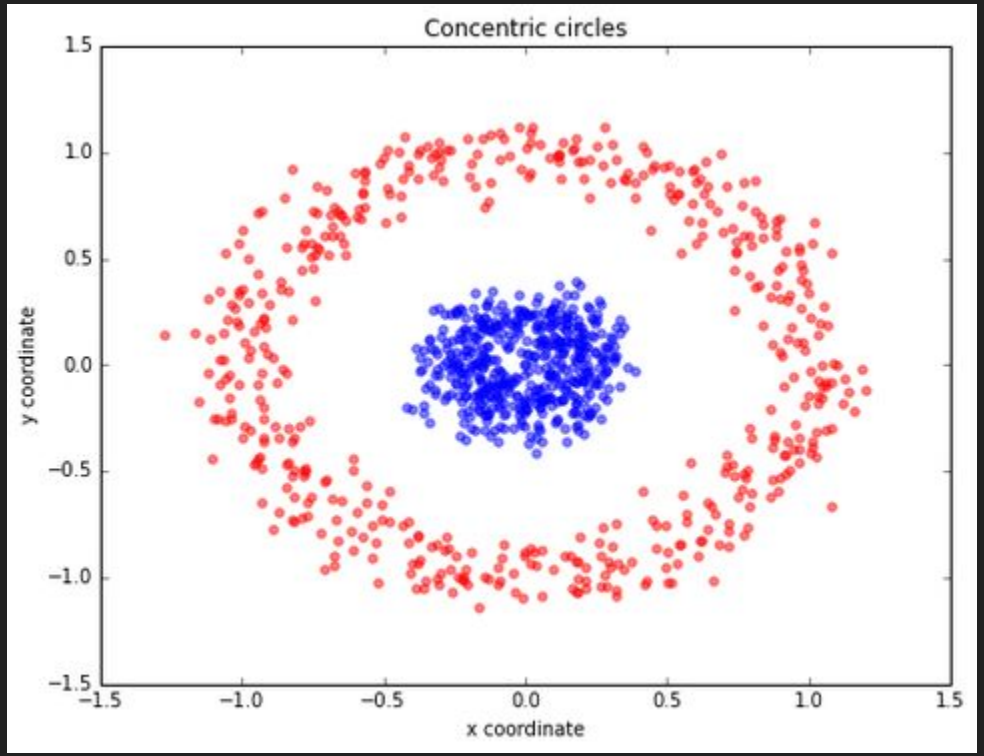
Problem 1 - How do we separate it?



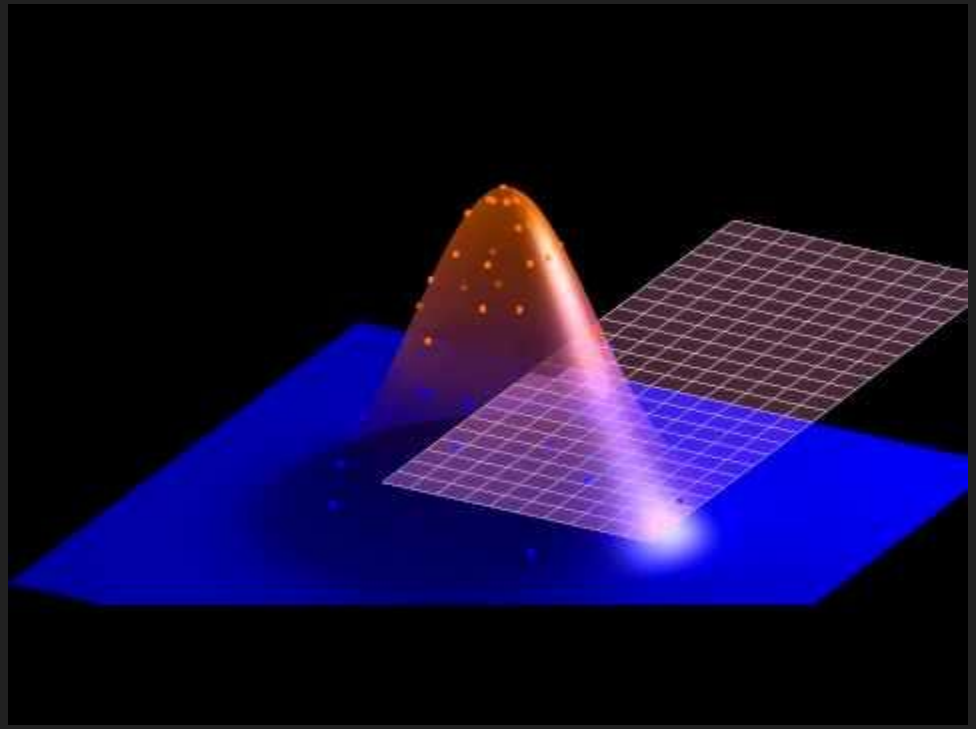
Problem 1 - Draw a line through it



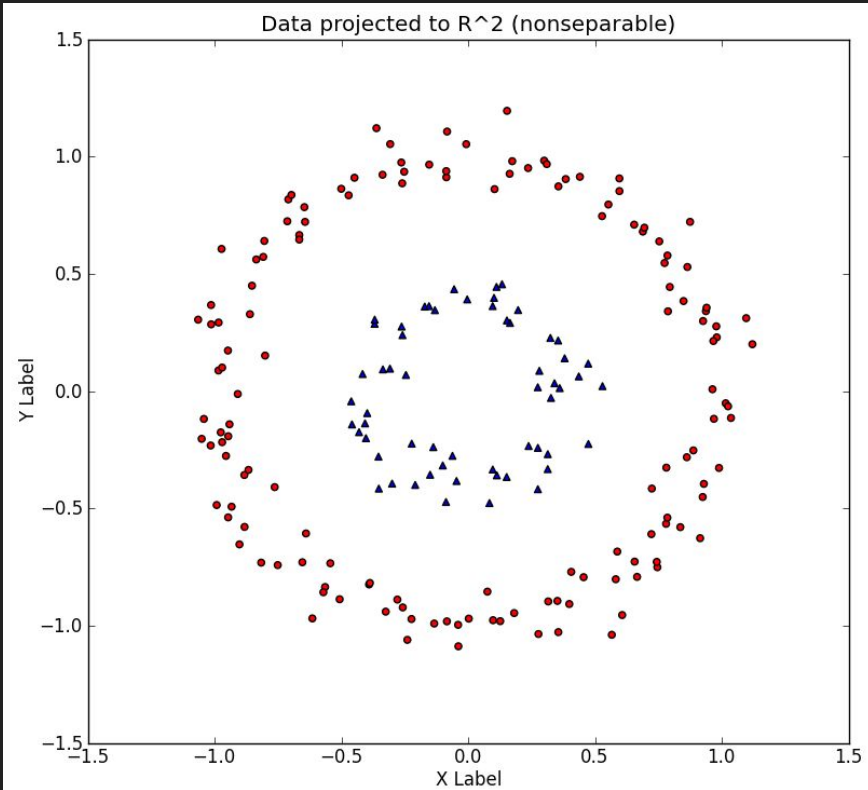
Problem 2 - How do we separate it?

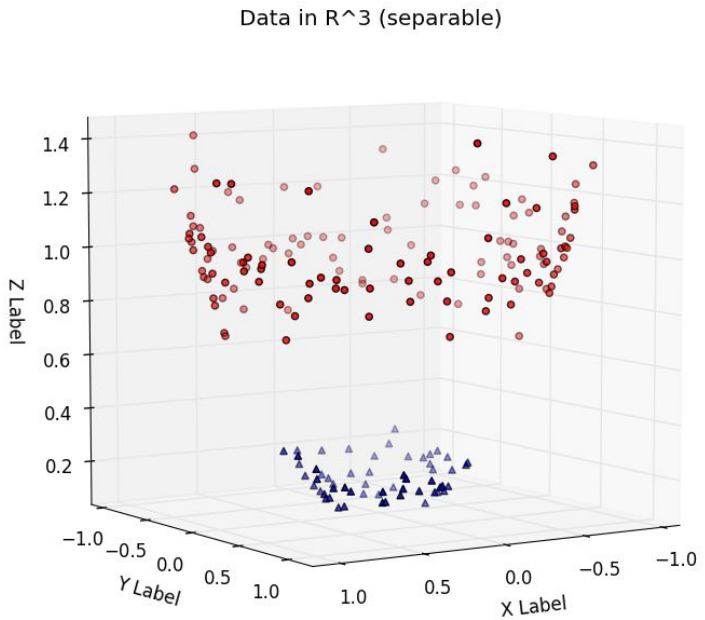


Non Linear Separation



What's happening here?





More Maths!

F (x, y) => z

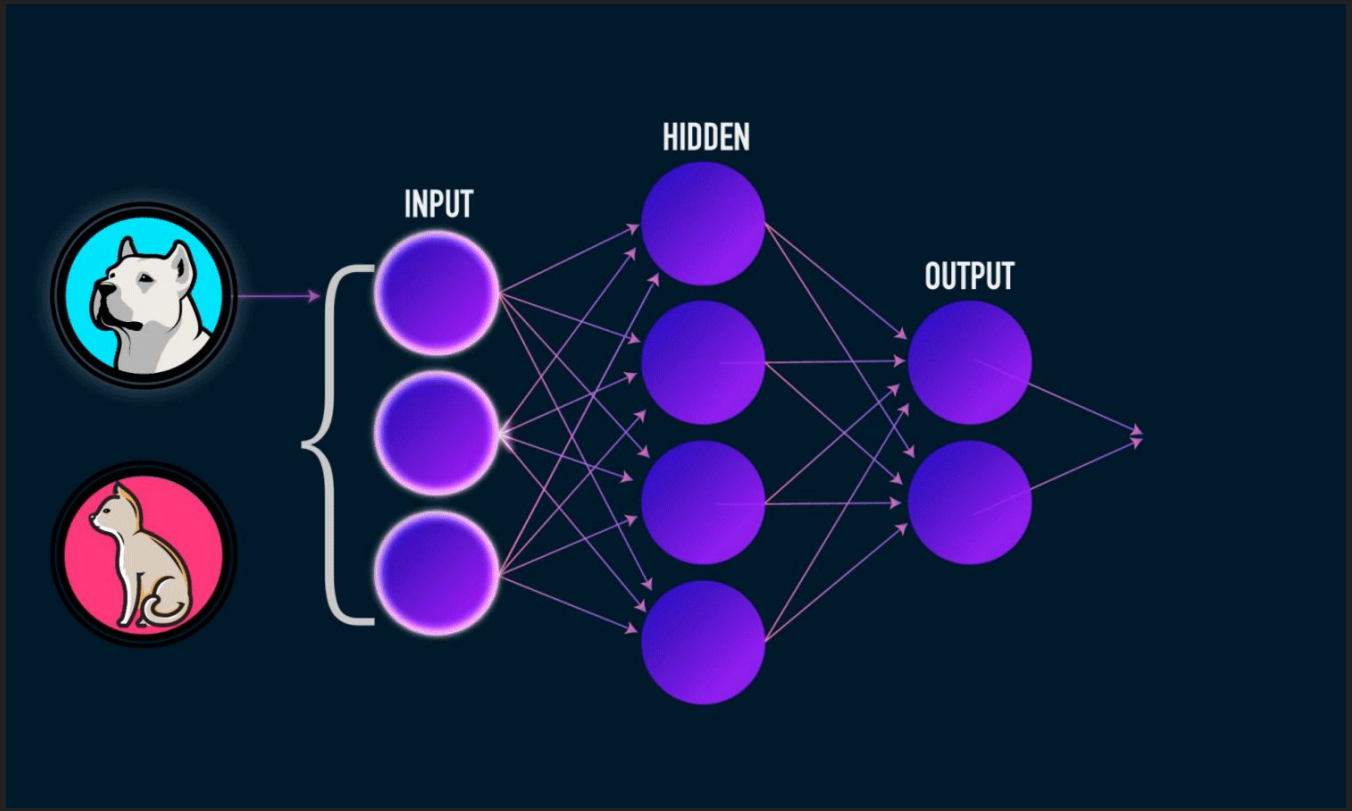
z = x^2 + y^2

What Machine Learning is: TL;DR

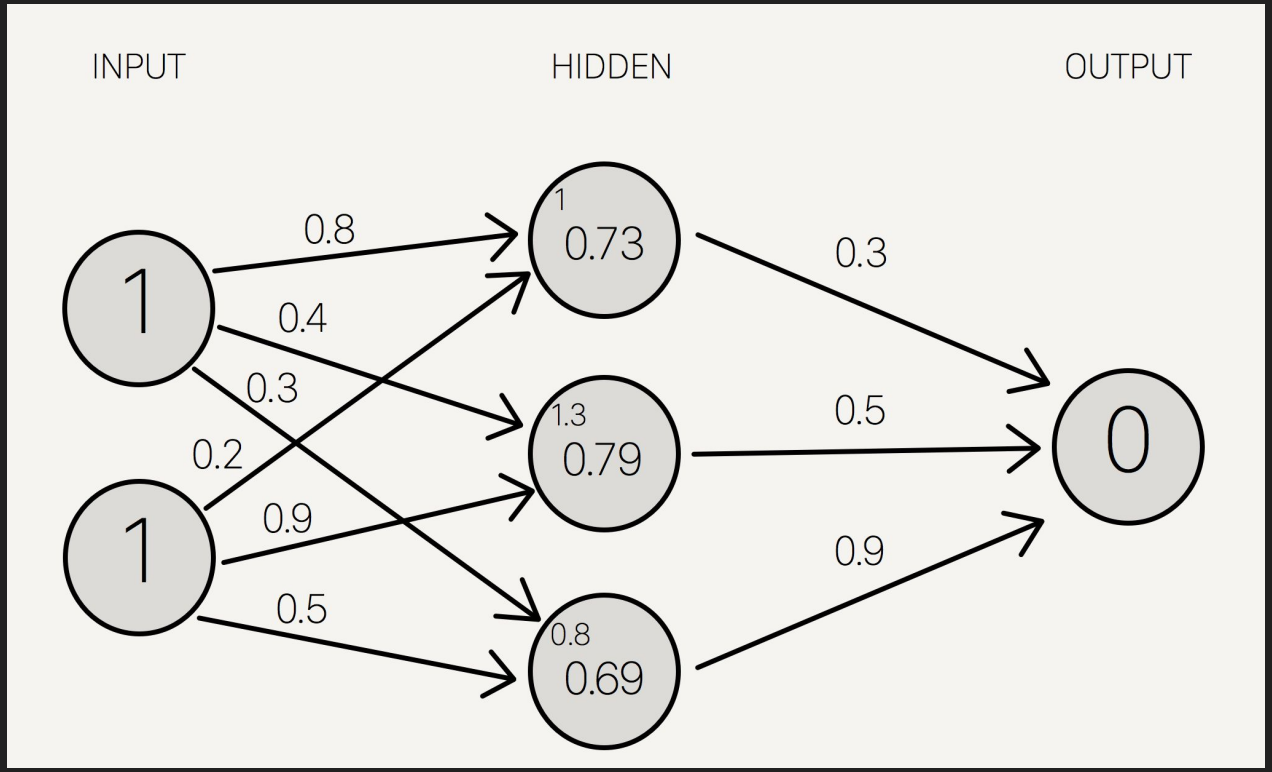
A function that maps an input space to (desired) output space

Neural Networks
(a.k.a How to land a 6 figure job)

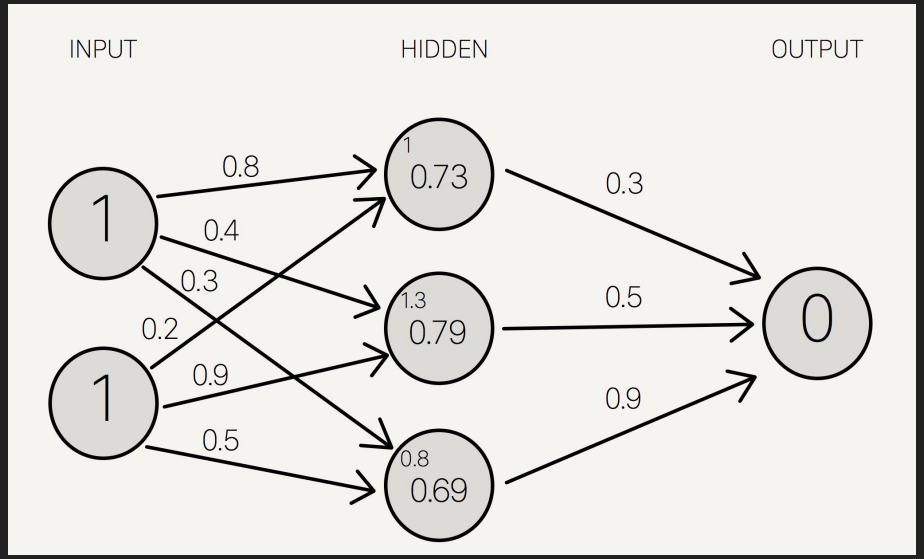
What is a Neural Network?

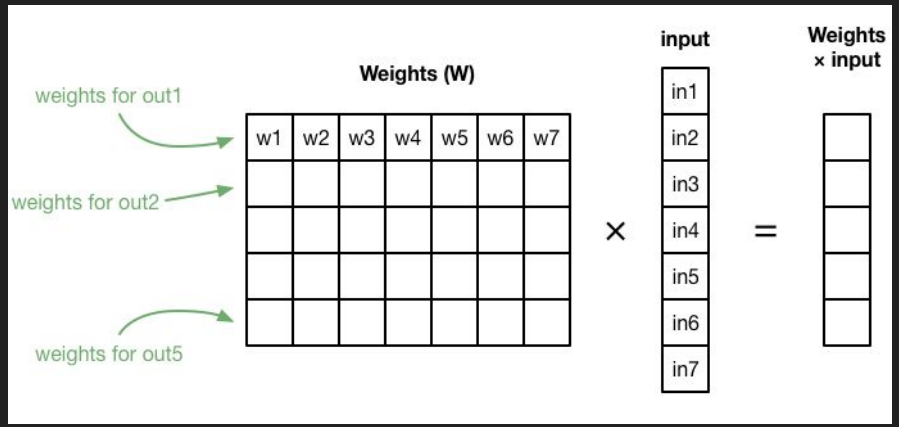


How do they work?



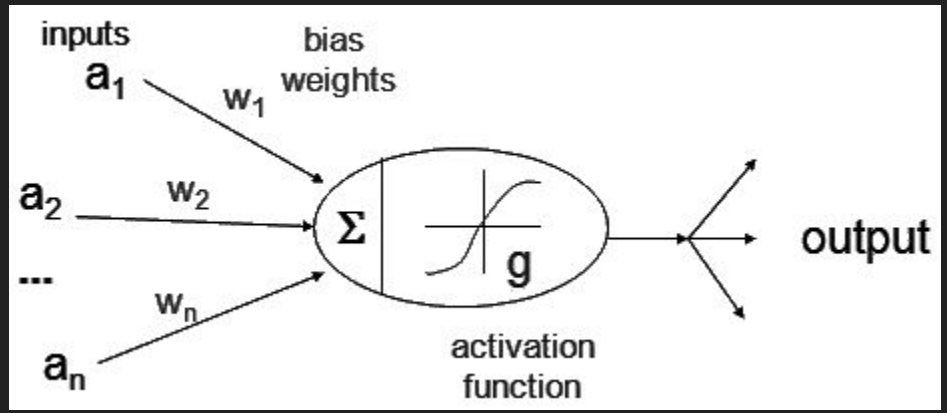
Neural Networks = Matrix Multiplication



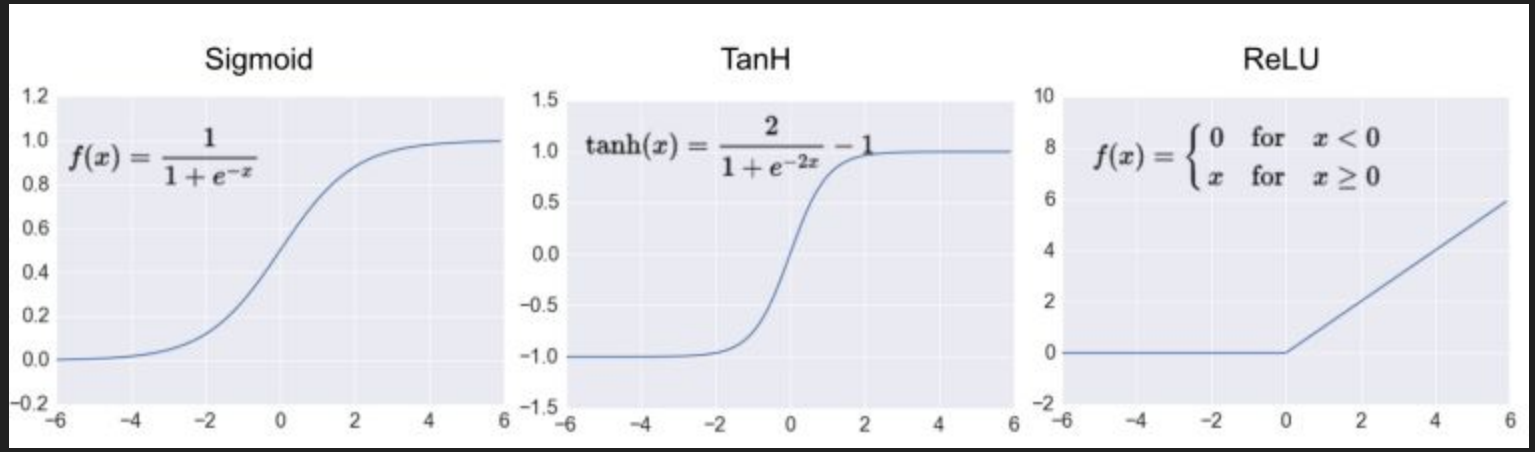


Matrix Multiplication = Linear, no?

We can use activation functions to introduce non linearity



Activation Functions



Live Demo - Multi-Layered Perception

Tools, Environment, Process

Pytorch + iPython Notebook

Visualization

https://cs.stanford.edu/people/karpathy/convnetjs//demo/classify2d.html

Credits

1. Colah (Images) - http://colah.github.io/
2. Team Grizzly (Animation) - https://www.youtube.com/watch?v=9NrALgHFwTo
3. Andrey Kaparthy (Visualization) - https://cs.stanford.edu/people/karpathy/convnetjs//demo/classify2d.html

More Info

Learn You A PyTorch: https://www.youtube.com/watch?v=ICMsWq7c5Z8

GitHub: https://github.com/kendricktan/intro_to_ml

Questions?

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