Q. What is Neural Network?

Price

Price vs size of house

size of house

size $\xrightarrow{X}$ ⬤ $\xrightarrow{Y}$ price } Single Neuron Network
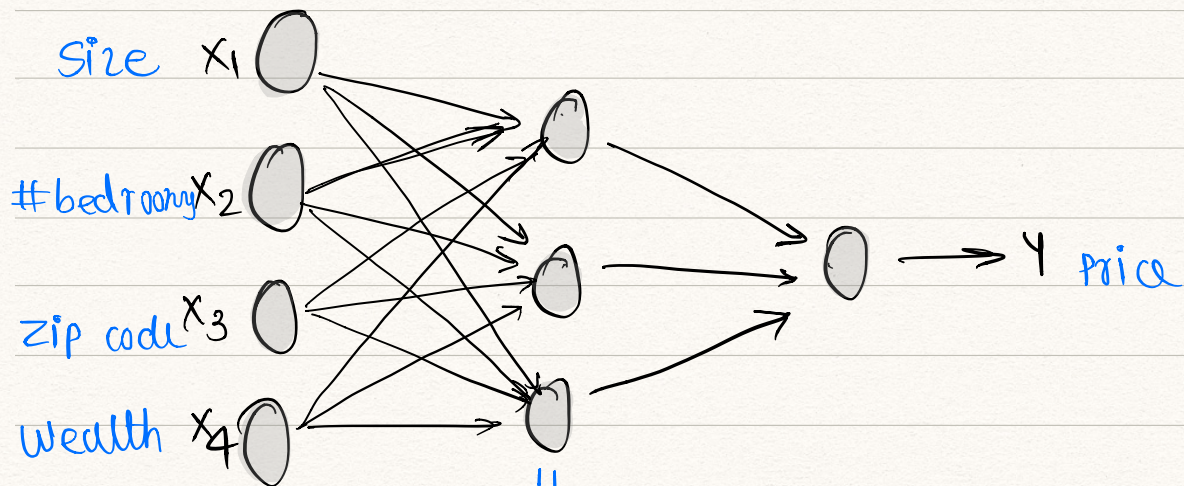
Neuron

} goes to zero sometimes & takes off as st. line.

⇩

ReLU Function
Rectified linear unit

Size
# of bedrooms → ⬤ → size of family

zip code → ⬤ → Price

(postal code) $\longrightarrow$ O $\longrightarrow$ walkability

wealth $\longrightarrow$ O $\longrightarrow$ School Quality

X
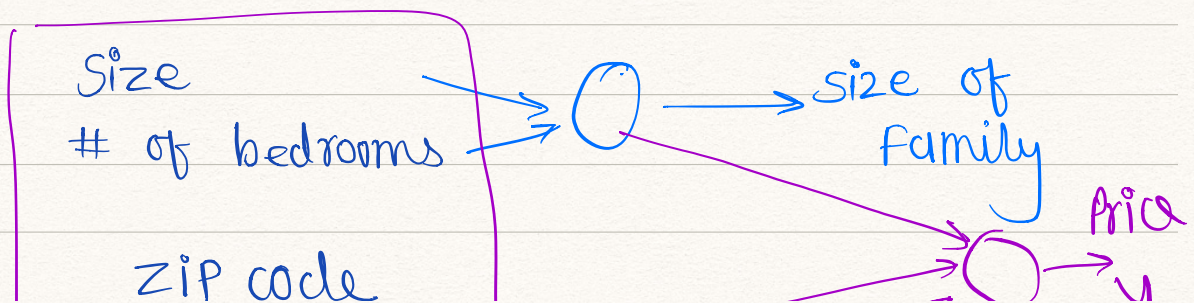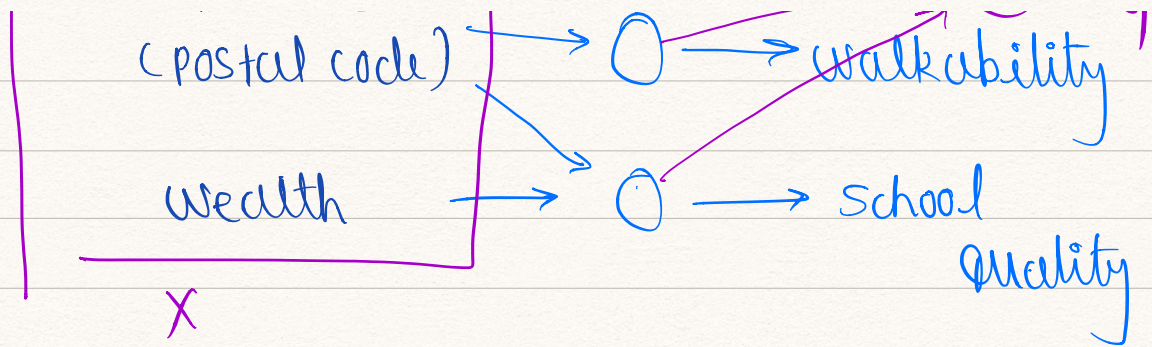
give x & y, Network will figure out middle Neurons.

Size x_1

#bedrooms x_2

Zip code x_3

wealth x_4

$\longrightarrow$ y price

⇓

— Takes all four features as input

— Densly connected

☆ Supervised Learning:

X	Y	Application	
Home features	Price	Real Estate	Std NN
Ad, User info	Click on Ad? (0|1)	Online Advertising	

Image	Object	Photo tagging CNN
Audio	Text Transcript	Speech recognition
English	Chinese	Machine Translation } RNN
Image, Radar info	Position of other Car	Autonomous driving)

cluster/ hybrid

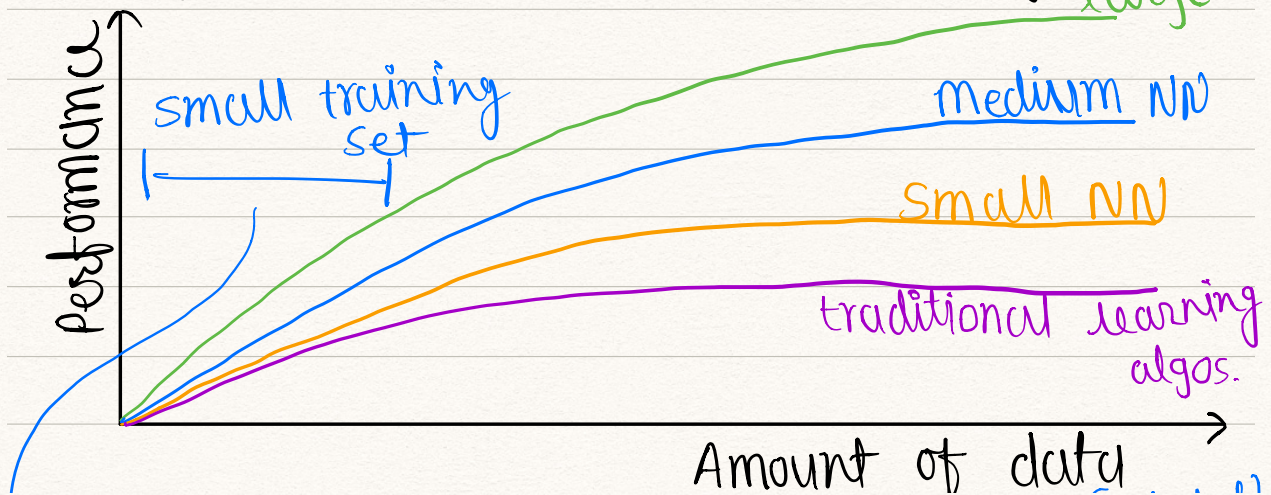## Structured Data
→ Organised tabular

Unstructured Data
- Audio
- Image
- Text
↓
Hard for computer
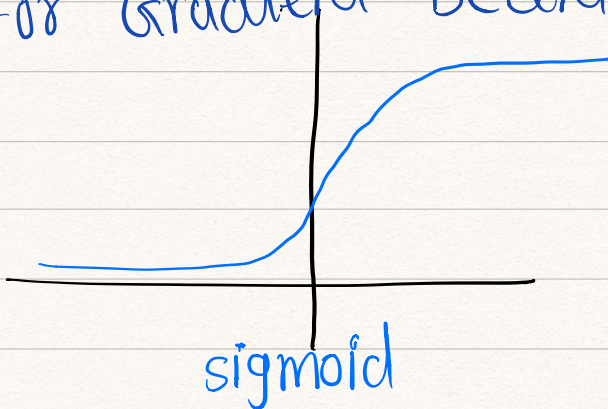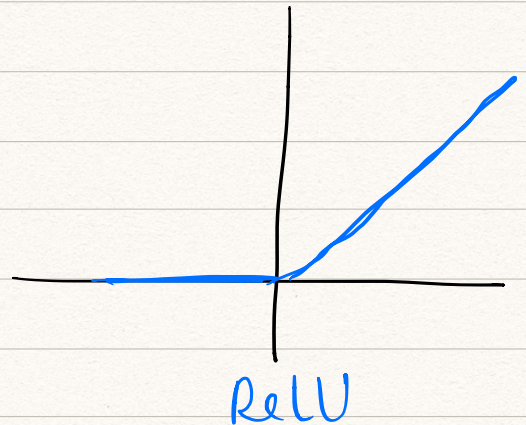
Why Deep learning is taking of?

Performance vs Amount of data

- small training set
- large NN (green)
- Medium NN (blue)
- small NN (orange)
- traditional learning algos. (purple)

$\rightarrow$ Scale drives Deep Learning (labeled)
Progress

$\rightarrow$ Position of NN is not clearly
defined.

For Gradient Decent

sigmoid

ReLU

Decay of learning
rate as we go
forward.

No decay of learning
rate

$\hookrightarrow$ Change in Algorithms.

$\Rightarrow$ Advances in Computation.