DEEP LEARNING
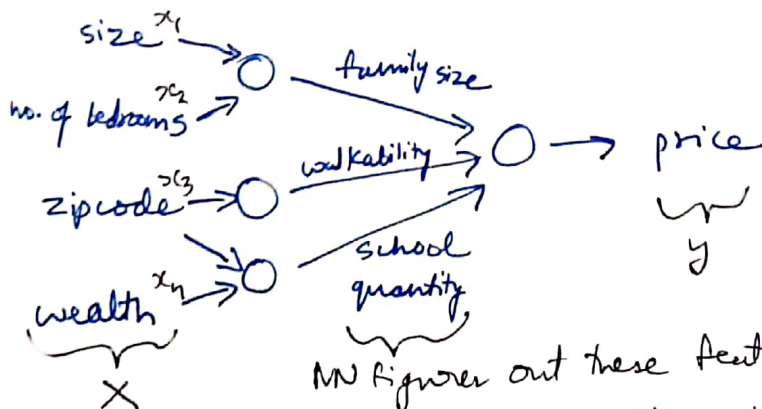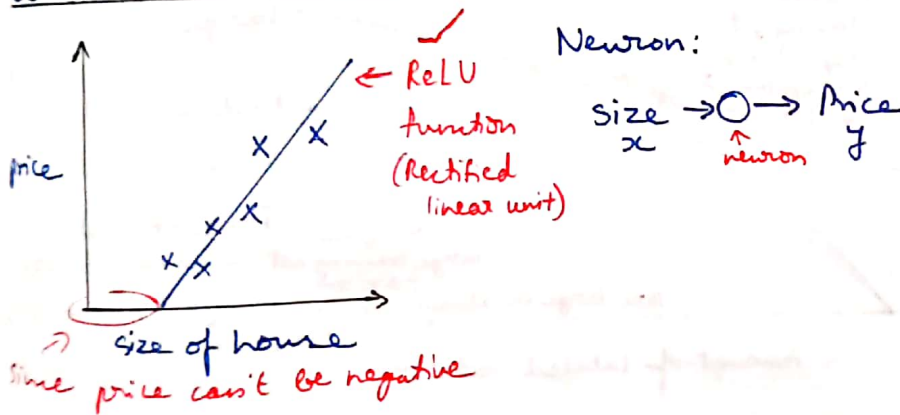
Courses:

1. Neural Networks and Deep Learning
2. Improving Deep Neural Networks: Hyperparameter tuning, regularization and optimization
3. Structuring Machine Learning Projects
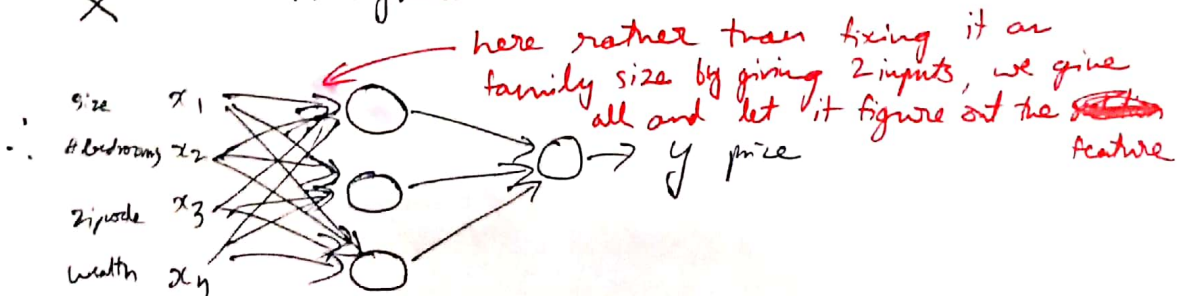4. Convolutional Neural Networks
5. Sequence Models

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Course 1: Neural Networks and Deep Learning

WEEK 1: INTRODUCTION

What is a neural network:

← ReLU function (Rectified linear unit)

Neuron:

size → O → Price
x ⤒neuron y

Size of house
Since price can't be negative

size x_1
no. of bedrooms x_2 → O — family size
zipcode x_3 → O — walkability → O → price
wealth x_n → O — school quantity

X

NN figures out these features on its own

here rather than fixing it as family size by giving 2 inputs, we give all and let it figure out the feature

size x_1
bedrooms x_2
zipcode x_3
wealth x_n
→ O → y price

Supervised learning with NN:

input (x)	Output (y)	Application	
1. Home features	Price	Real Estate	Standard NN
2. Ad, user info	Click on ad? (0/1)	Online Advertising	
3. Image	Object (1,...,1000)	Photo tagging	CNN
4. Audio	Text transcript	Speech recognition	RNN
5. English	Chinese	Machine translation	
6. Image, Radar info	Position of other cars	Autonomous driving	custom hybrid NN

Structured data: tables

Unstructured data: Audio, image, text

Why is Deep Learning taking off?

Note: If you want to use a large NN, make sure you have that much data.

Smaller training set region. Here it is uncertain. SVM can outperform a large NN

large NN

Medium NN

small NN

Traditional Learning algos (SVM, linear reg.,-)

large training set region. Here large NN always outperforms other NNs

Amount of labeled data (m)