

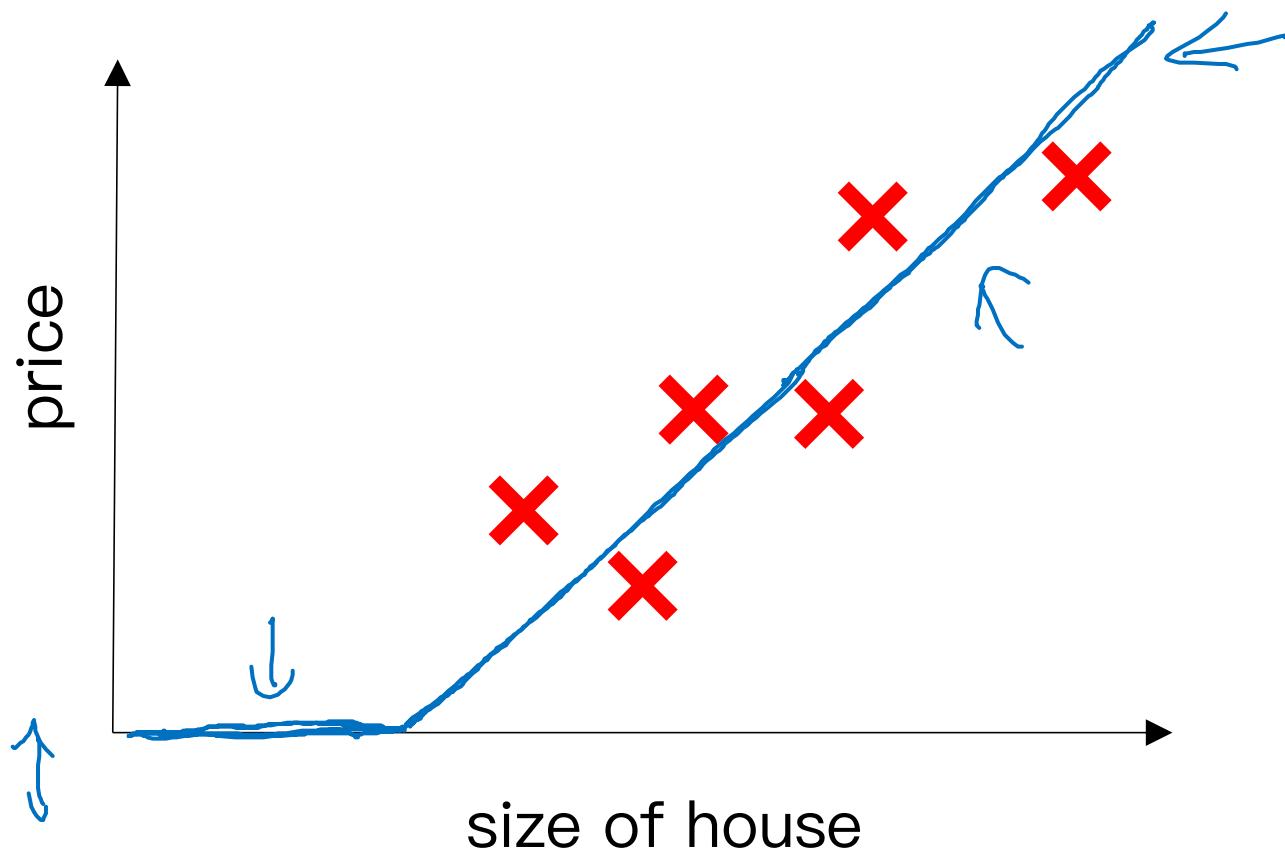


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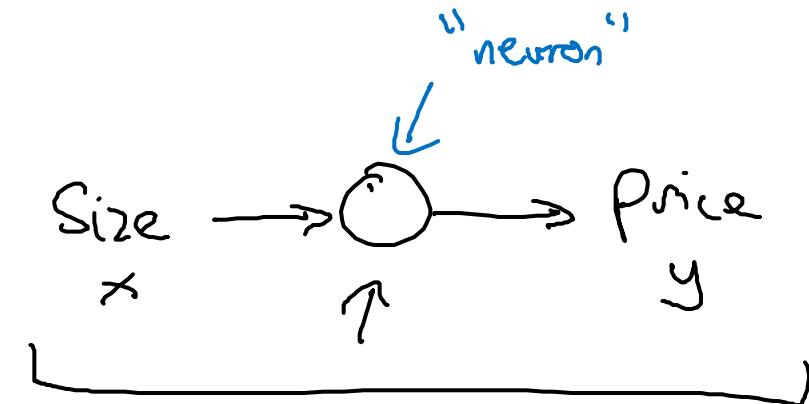
Introduction to Deep Learning

What is a Neural Network?

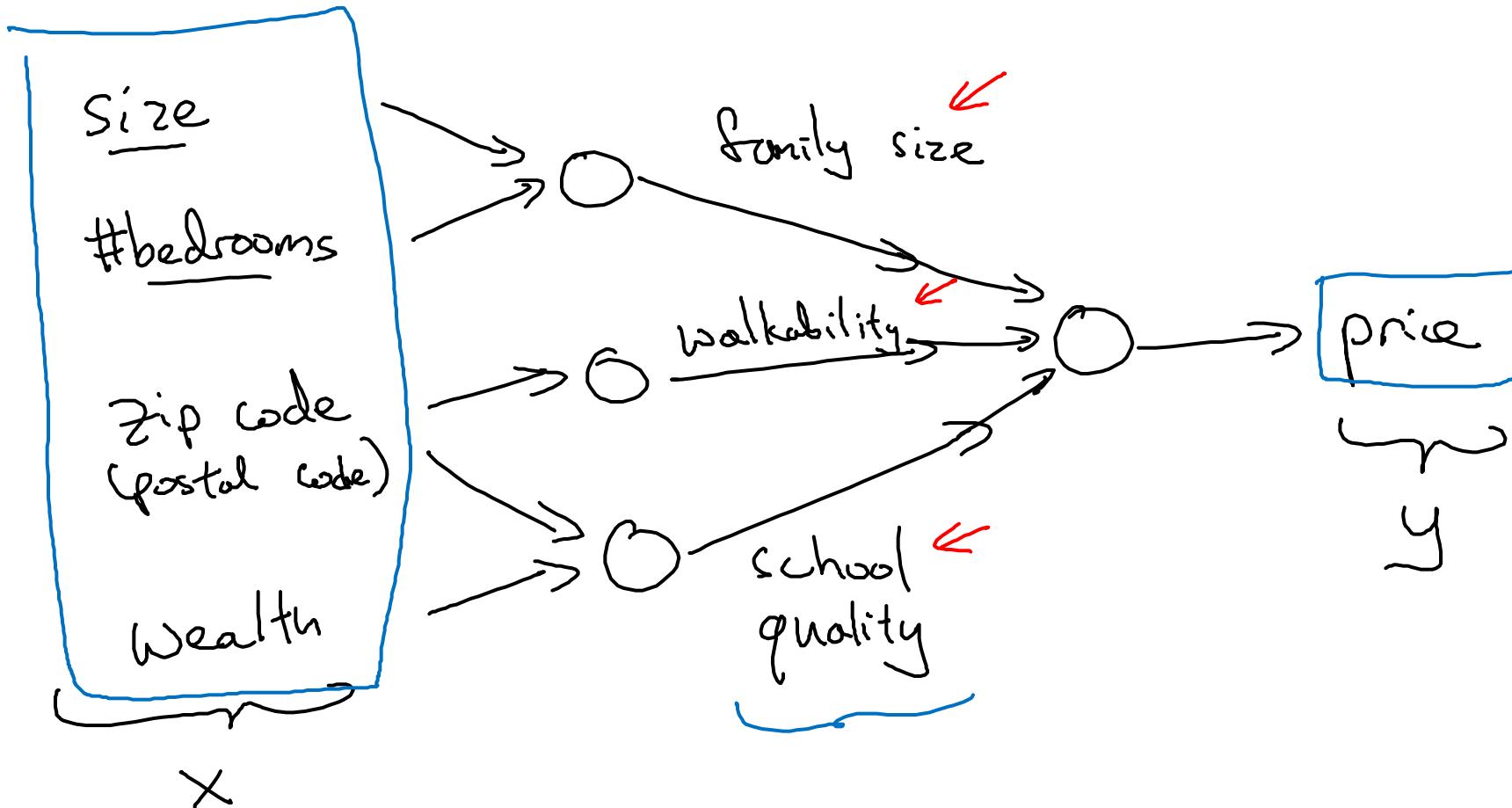
Housing Price Prediction



ReLU
Rectified
Linear
Unit

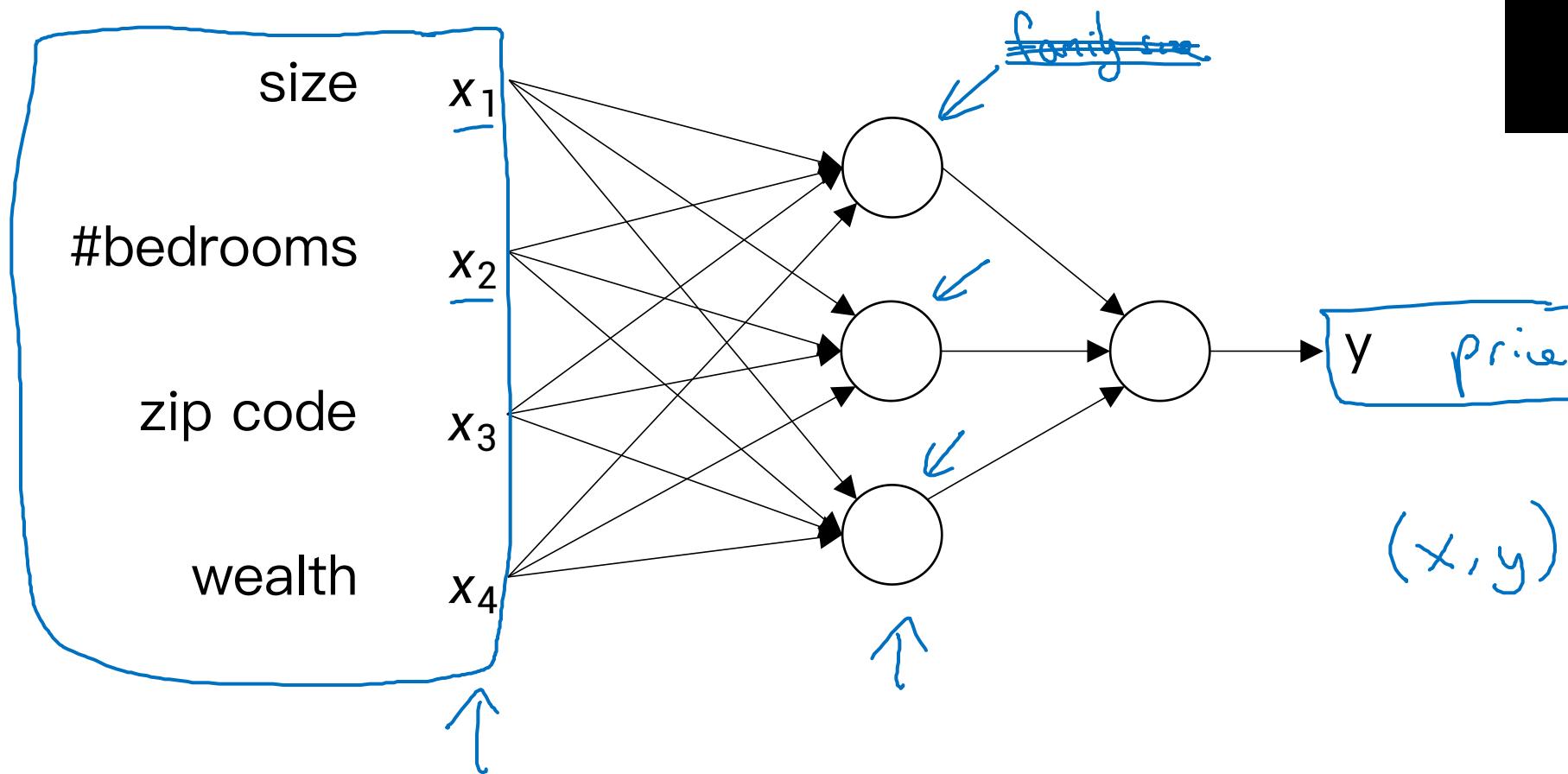


Housing Price Prediction



Housing Price Prediction

Drawing of
previous Image





Introduction to Deep Learning

Supervised Learning with Neural Networks

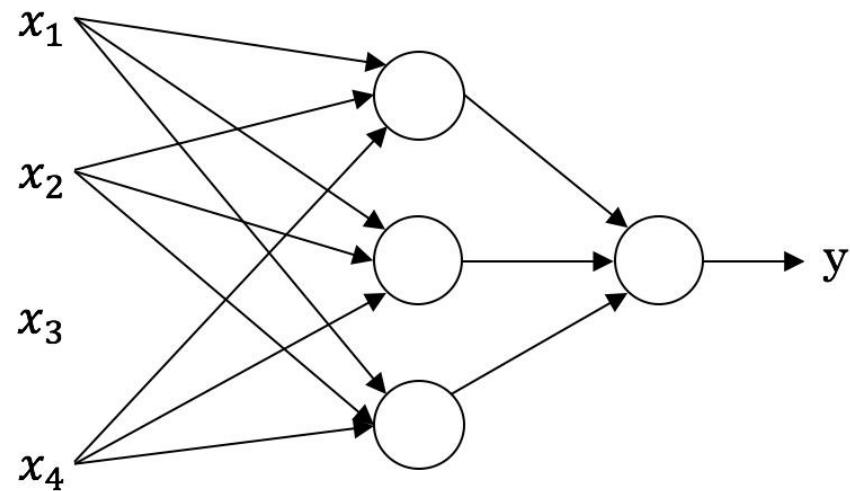
Supervised Learning

Input(x)	Output (y)	Application
Home features	Price	Real Estate
Ad, user info	Click on ad? (0/1)	Online Advertising
Image	Object (1,...,1000)	Photo tagging
Audio	Text transcript	Speech recognition
<u>English</u>	Chinese	Machine translation
<u>Image, Radar info</u>	Position of other cars	Autonomous driving

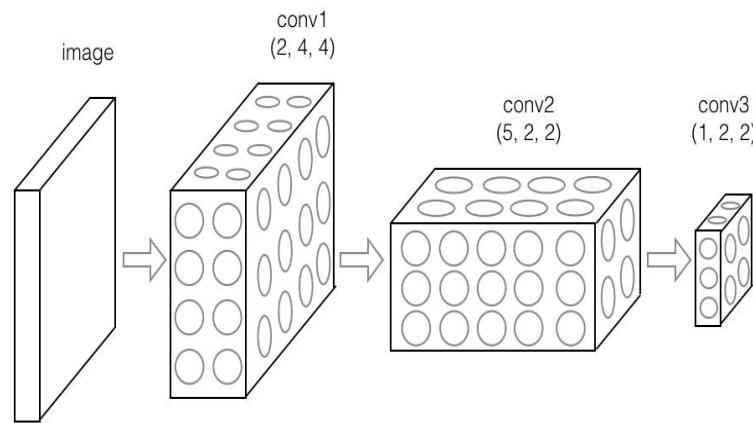
Annotations:

- A blue arrow points from "Input(x)" to "Home features".
- A blue arrow points from "Input(x)" to "Ad, user info".
- A blue arrow points from "Input(x)" to "Image".
- A blue arrow points from "Input(x)" to "Audio".
- A blue arrow points from "Input(x)" to "English".
- A blue arrow points from "Input(x)" to "Image, Radar info".
- A blue arrow points from "Output (y)" to "Price".
- A blue arrow points from "Output (y)" to "Click on ad? (0/1)".
- A blue arrow points from "Output (y)" to "Object (1,...,1000)".
- A blue arrow points from "Output (y)" to "Text transcript".
- A blue arrow points from "Output (y)" to "Chinese".
- A blue arrow points from "Output (y)" to "Position of other cars".
- A blue brace groups "Real Estate" and "Online Advertising" under the heading "Standard NN".
- A blue brace groups "Photo tagging" and "Speech recognition" under the heading "CNN".
- A blue brace groups "Machine translation" and "Autonomous driving" under the heading "RNN".
- A blue brace groups "Autonomous driving" and "Custom Hybrid" under the heading "Custom Hybrid".

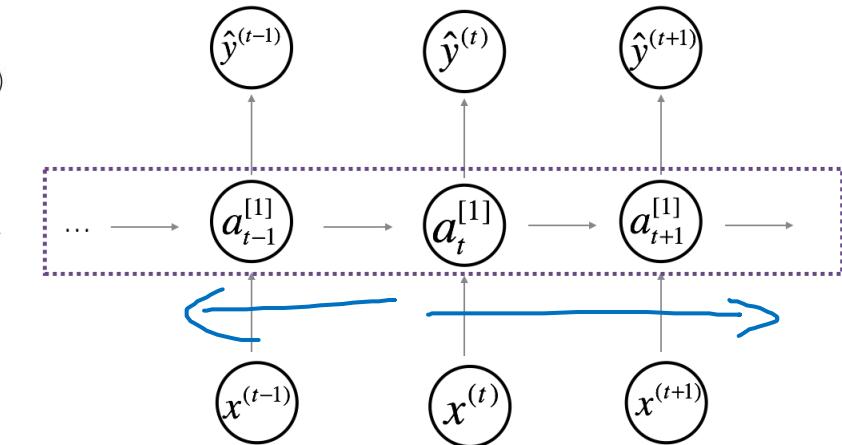
Neural Network examples



Standard NN



Convolutional NN



Recurrent NN

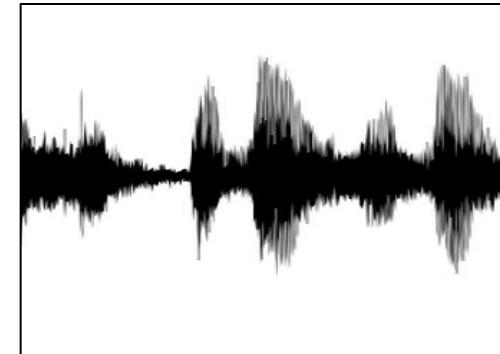
Supervised Learning

Structured Data

Size	#bedroom	...	Price (1000\$)
2104	3		400
1600	3		330
2400	3		369
:	:		:
3000	4		540

User Age	Ad Id	...	Click
41	93242		1
80	93287		0
18	87312		1
:	:		:
27	71244		1

Unstructured Data



Audio



Image

Four scores and seven years ago...

Text

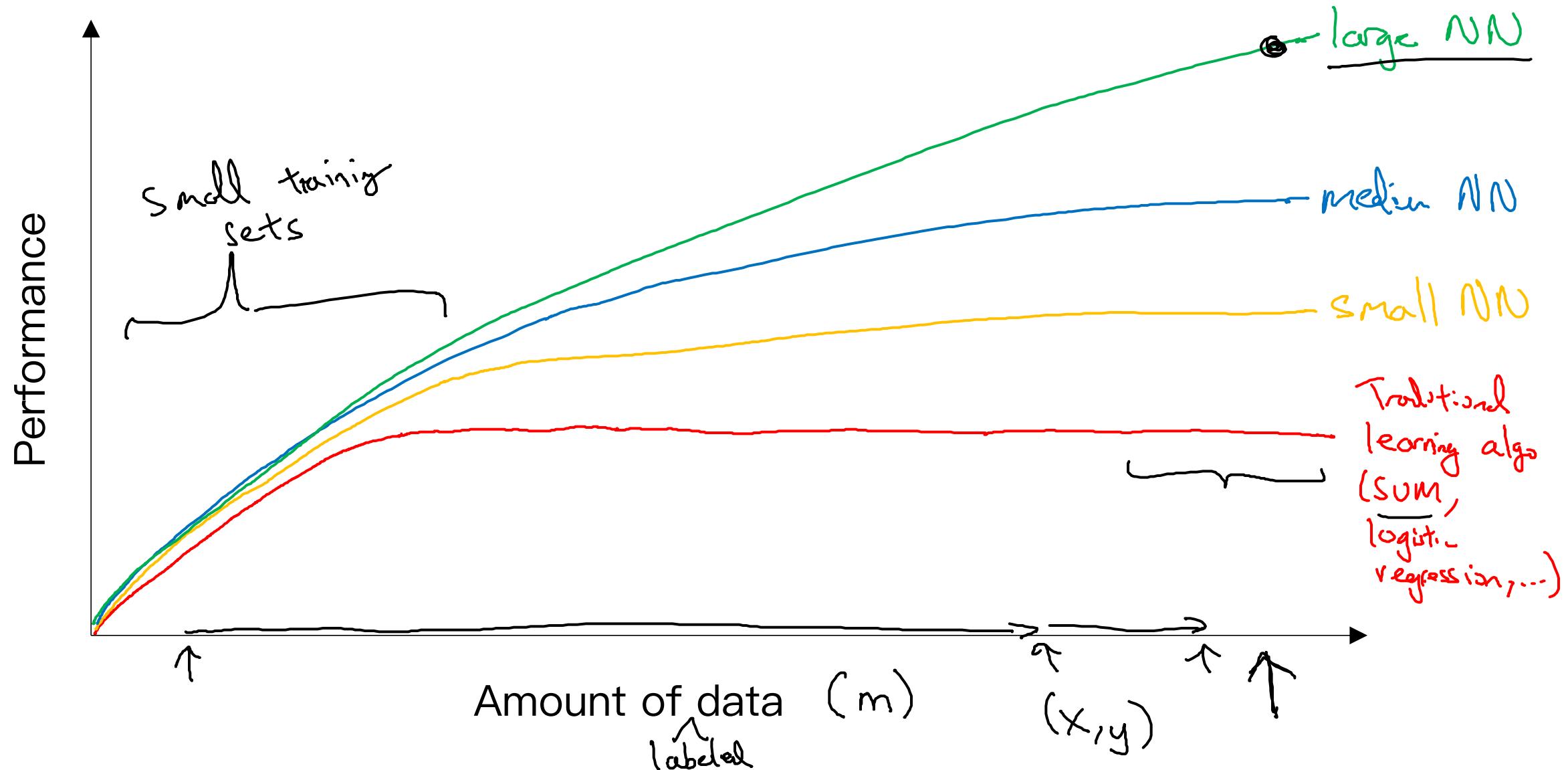


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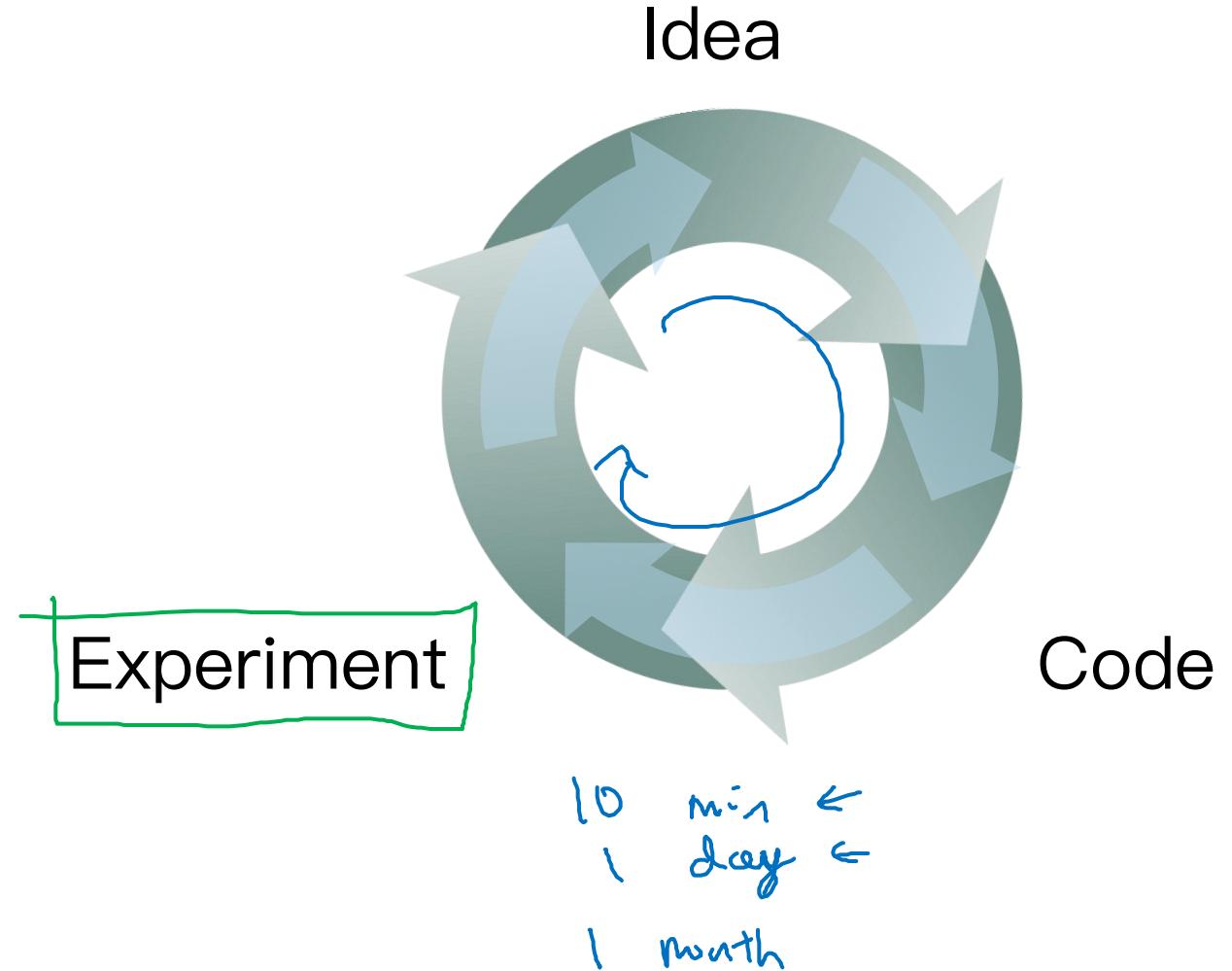
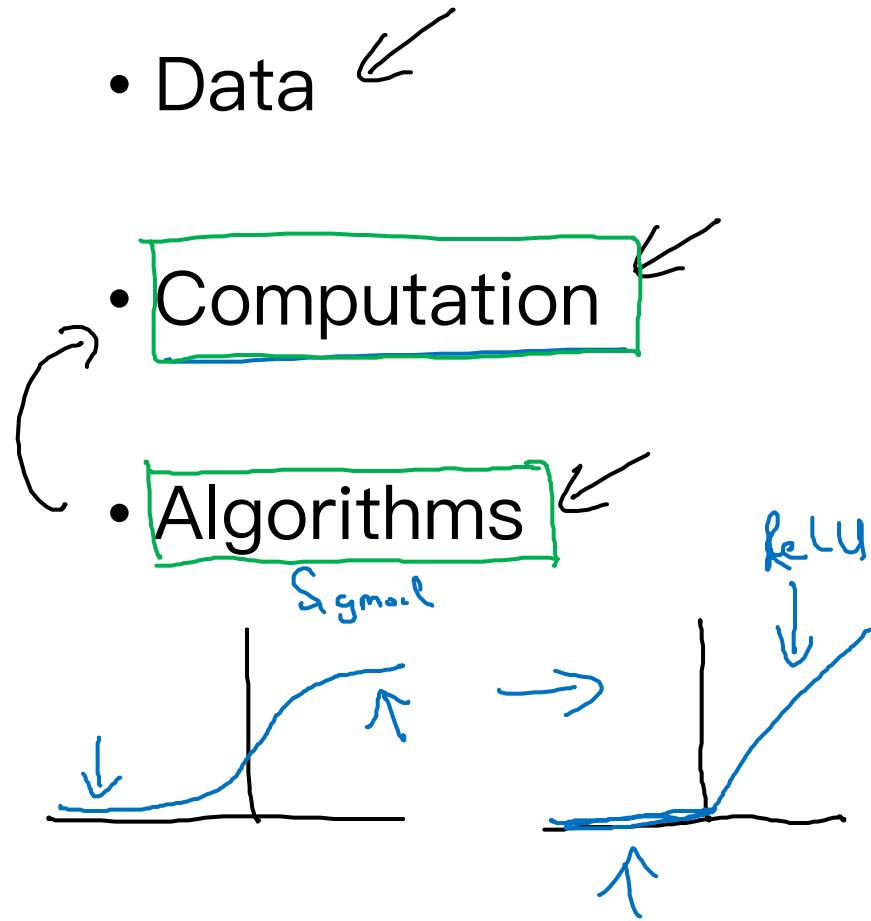
Introduction to Neural Networks

Why is Deep Learning taking off?

Scale drives deep learning progress



Scale drives deep learning progress





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Introduction to Neural Networks

About this Course

Courses in this Specialization

1. Neural Networks and Deep Learning
2. Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
3. Structuring your Machine Learning project
4. Convolutional Neural Networks
5. Natural Language Processing: Building sequence models

Outline of this Course

Week 1: Introduction

Week 2: Basics of Neural Network programming

Week 3: One hidden layer Neural Networks

Week 4: Deep Neural Networks