Data Science Intro for HackExtend

Dalya Gartzman

goo.gl/5PEv8A

PART I - The Intro to the Intro

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1. what is data science?
2. what is machine learning?
3. what is a neural network?

What is Data Science?

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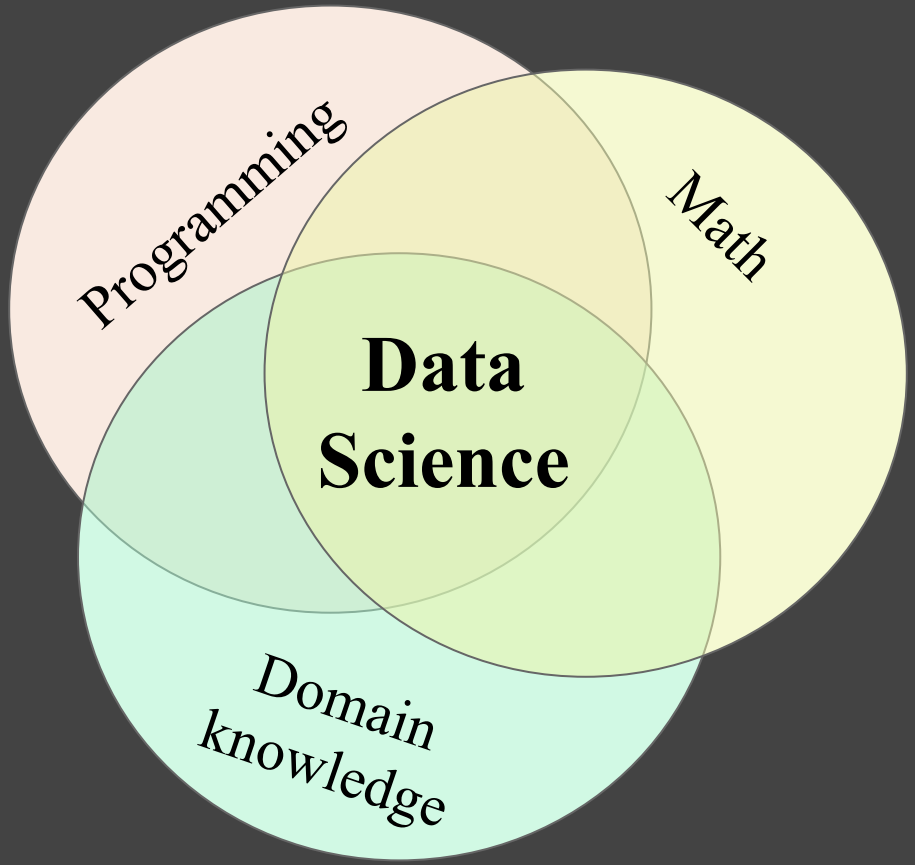

What is Data Science?

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What do I need in my backpack for a cool Data Science project?

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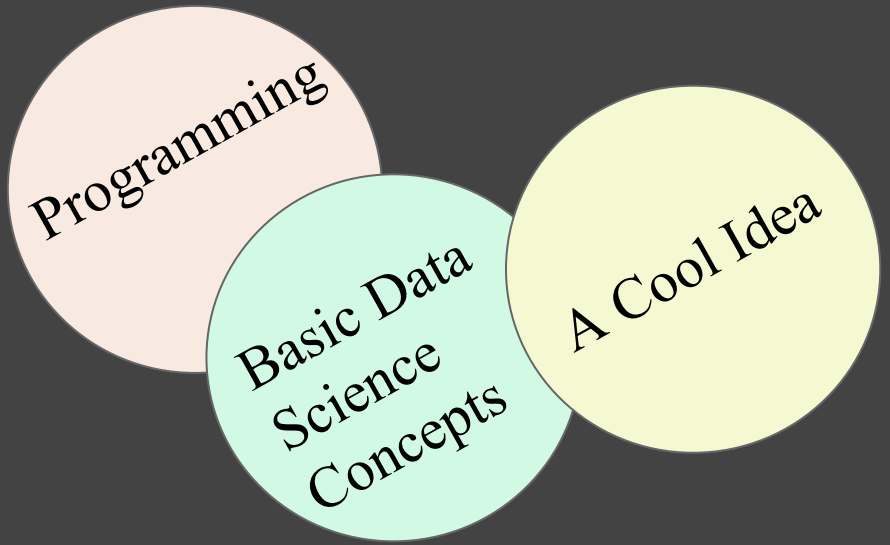

What is machine learning?

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human learning:

shape(●) = ?

What is machine learning?

human learning:

If (# ⌜) = 0
    return circle
If (# ⌜) = 4
    return square

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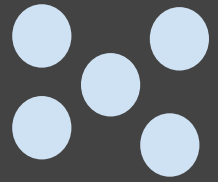
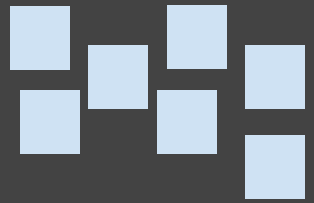
 = circle

 = square

shape(●) = ?

What is a neaural network?

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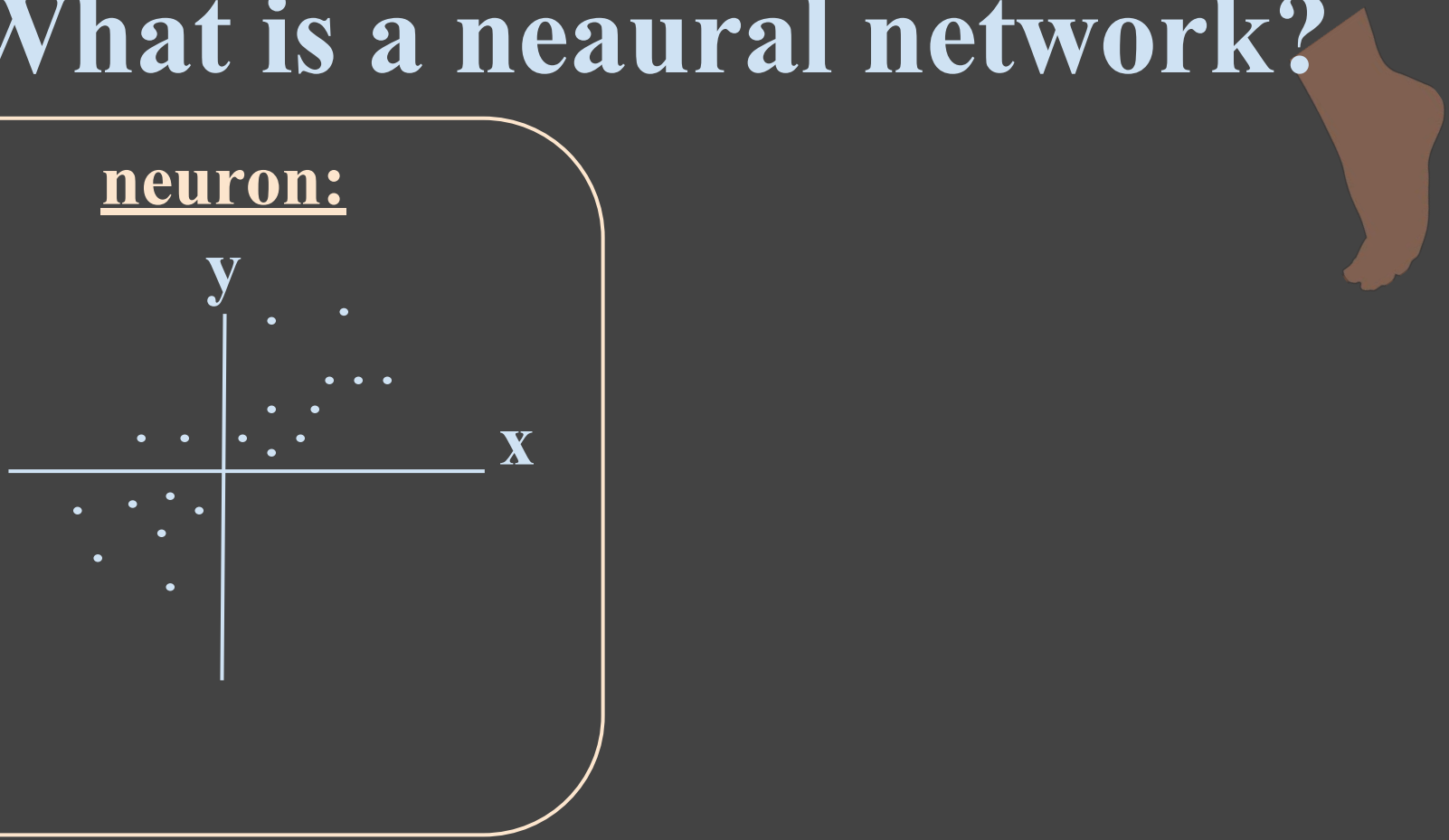
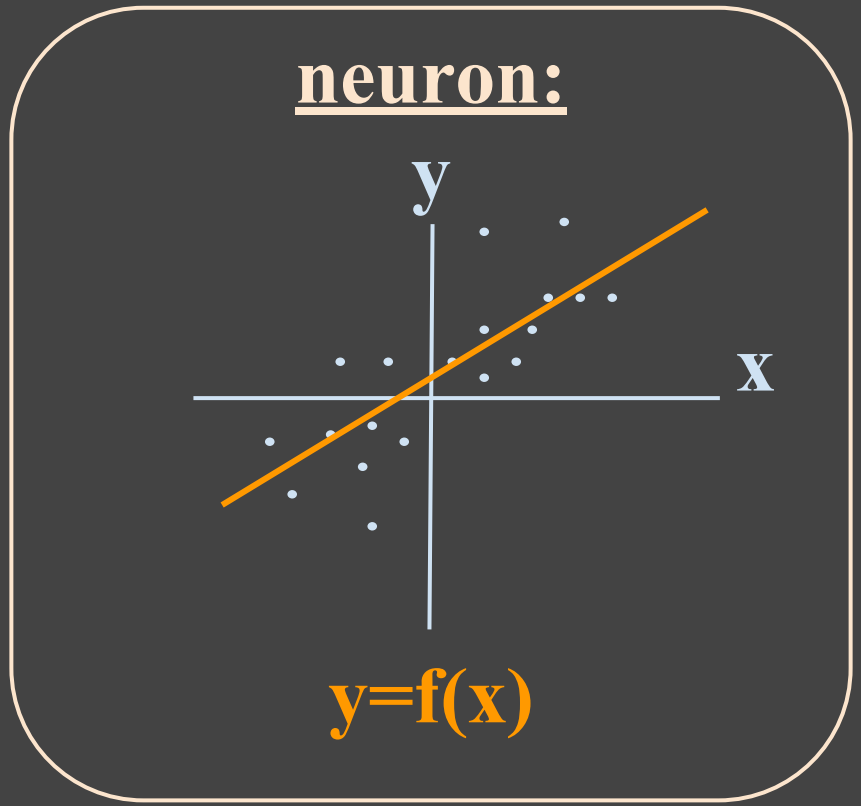
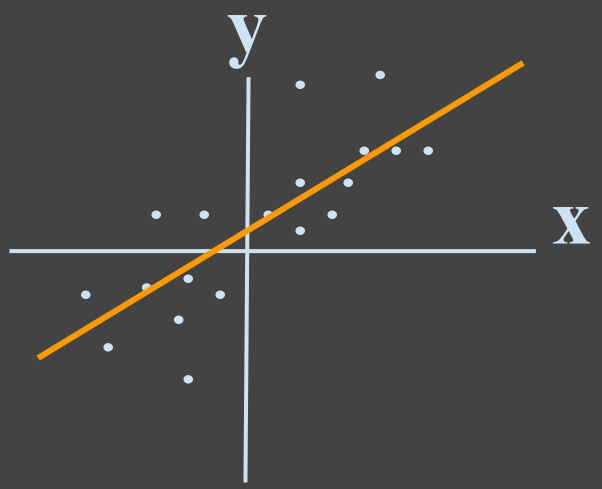


What is a neaural network?



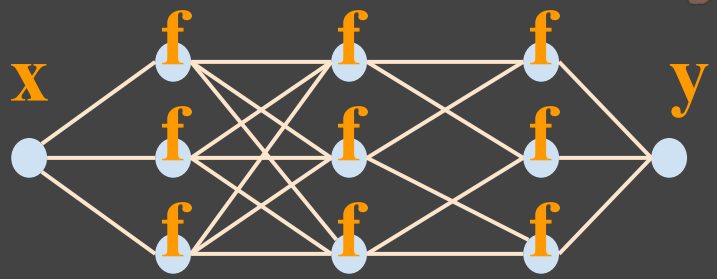
What is a neaural network?

neuron:



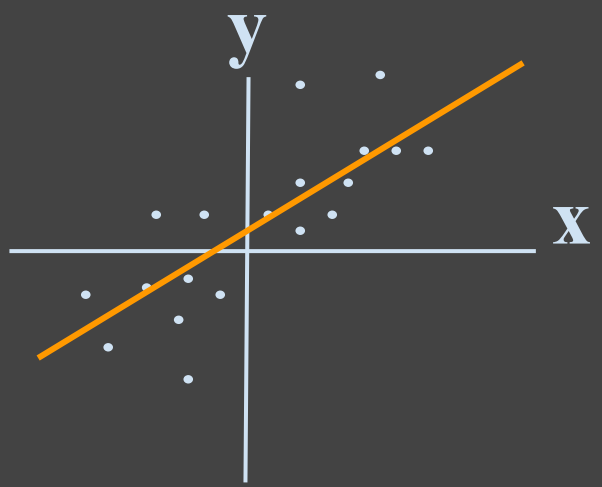
y=f(x)

neural network:



What is a neaural network?

neuron:



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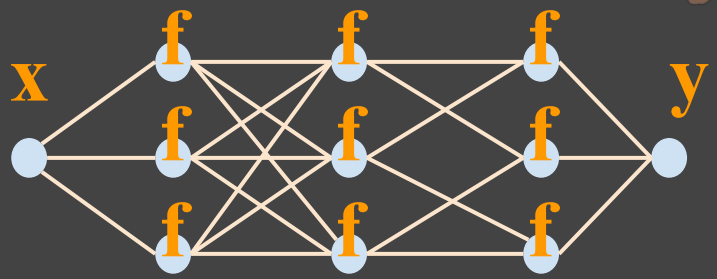
neural network:



- architechture
- what are “f ”?
- more stuff...

PART I Recap

PART II - so what can I do?

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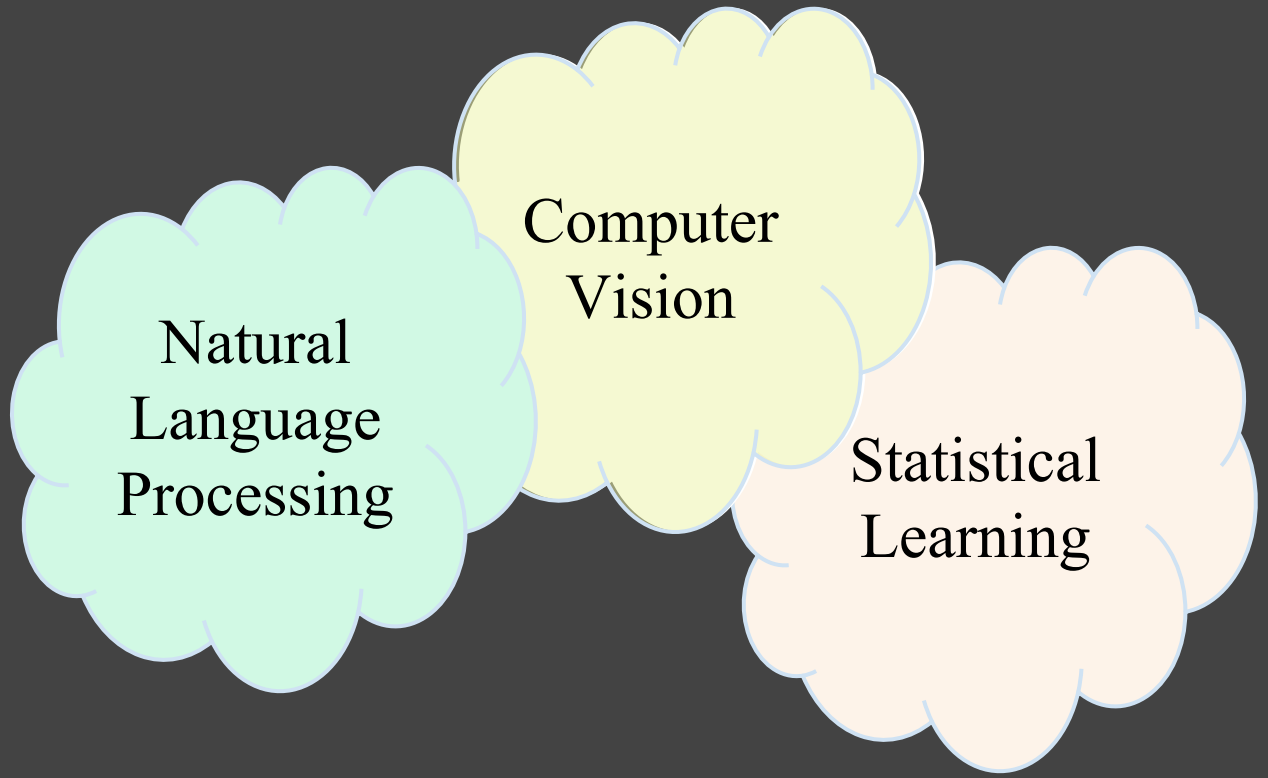
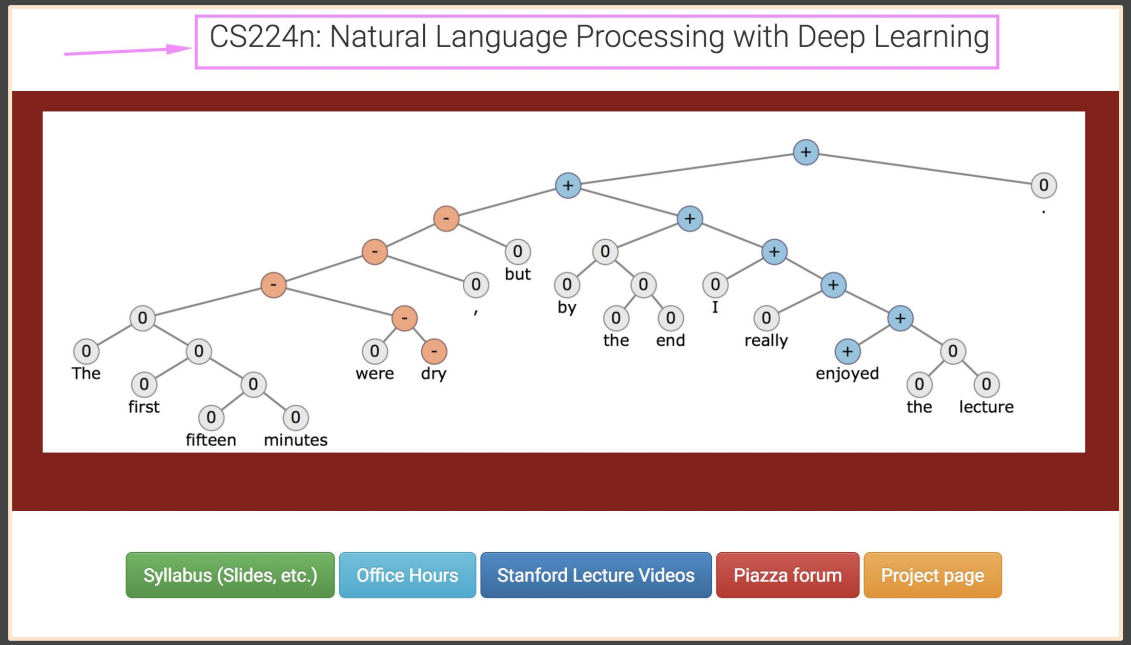


Natural Language Processing

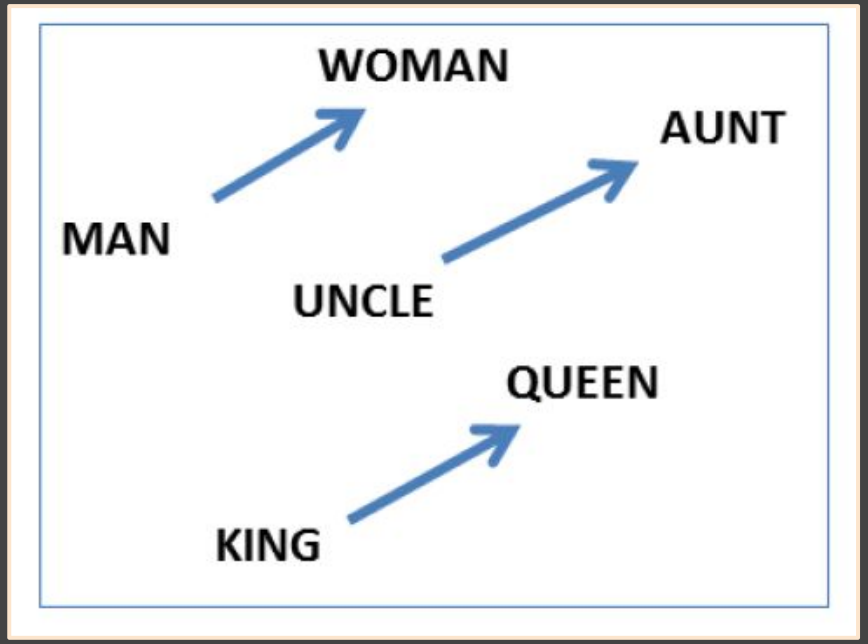
Natural Language Processing

1. how i started



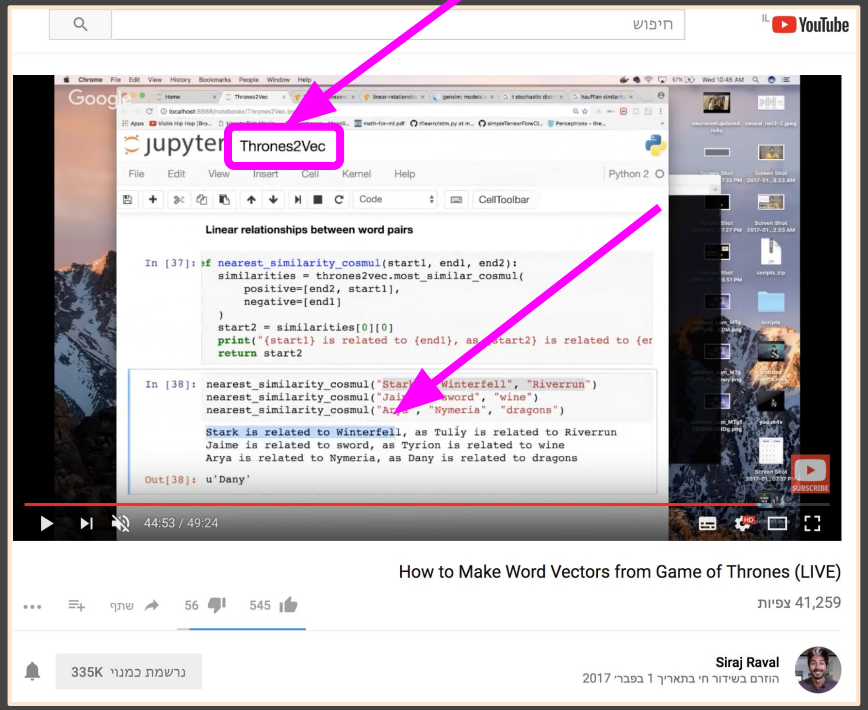
Natural Language Processing

1. how i started
2. what i learned



Natural Language Processing

1. how i started
2. what i learned
3. inspiration



Natural Language Processing

1. how i started
2. what i learned
3. inspiration
4. implementation

Ender2Vec

```
In [43]: nearest_similarity_cosmul("Ender", "Valentine", "Bean")
         # interesting: http://enderverse.wikia.com/wiki/Suriyawong

         Ender is related to Valentine, as Suriyawong is related to Bean

Out[43]: 'Suriyawong'

In [44]: nearest_similarity_cosmul("Peter", "Valentine", "Locke")
         # amazing!!

         Peter is related to Valentine, as Demosthenes is related to Locke

Out[44]: 'Demosthenes'

In [61]: nearest_similarity_cosmul("run", "slow", "fight")

         run is related to slow, as survive is related to fight

Out[61]: 'survive'

In [64]: nearest_similarity_cosmul("love", "hate", "formics")

         love is related to hate, as officers is related to formics

Out[64]: 'officers'

In [ ]:
```

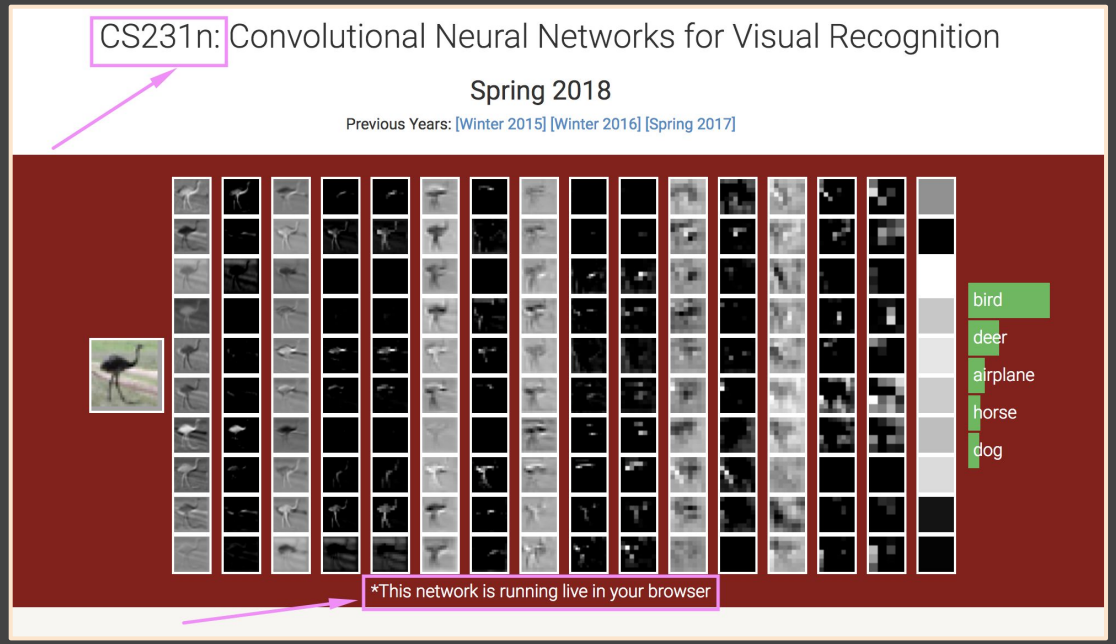
Natural Language Processing

1. how i started => web.stanford.edu/class/cs224n/
2. what i learned => www.tensorflow.org/tutorials/word2vec
3. inspiration => www.youtube.com/watch?v=pY9EwZ02sXU
4. implementation => github.com/DalyaG/Ender2Vec

Computer Vision

Computer Vision

1. some background



Computer Vision

1. some background
2. useful tools

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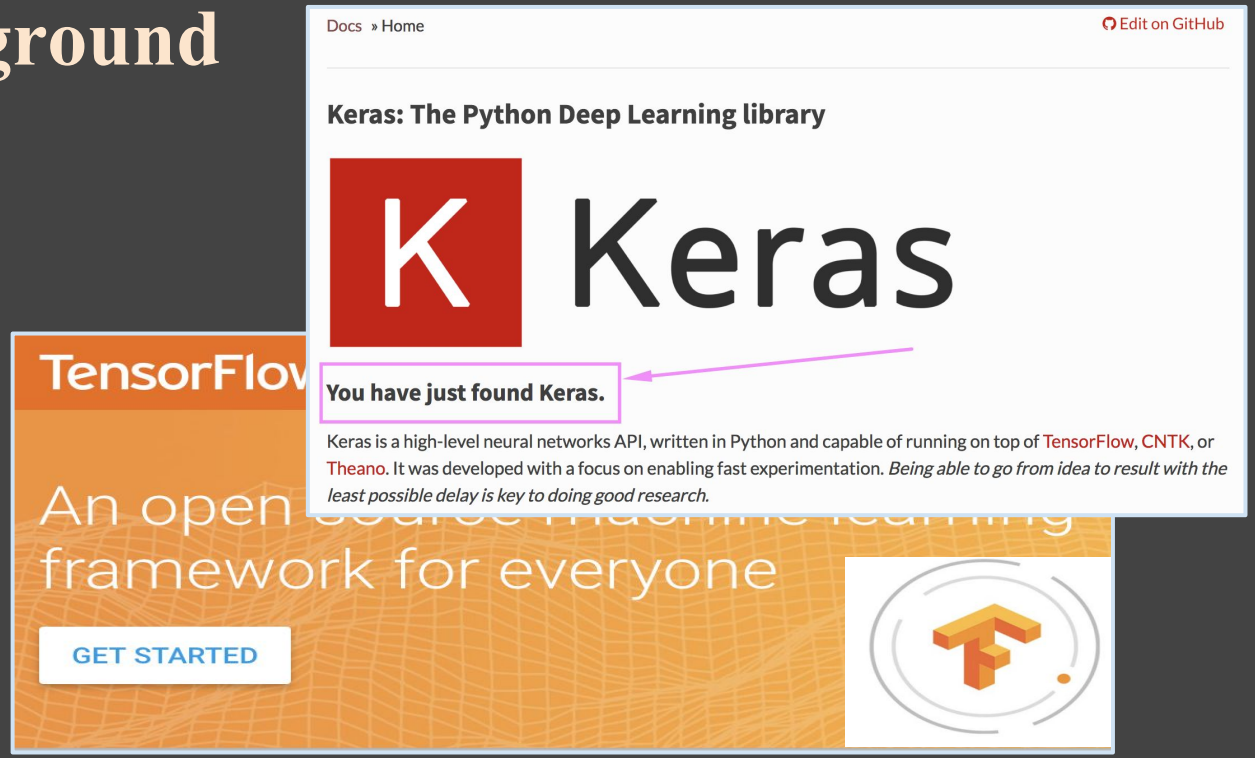

Computer Vision

1. some background
2. useful tools
3. don’t sweat it

Usage examples for image classification models

Classify ImageNet classes with ResNet50

```
from keras.applications.resnet50 import ResNet50
from keras.preprocessing import image
from keras.applications.resnet50 import preprocess_input, decode_predictions
import numpy as np

model = ResNet50(weights='imagenet')

img_path = 'elephant.jpg'
img = image.load_img(img_path, target_size=(224, 224))
x = image.img_to_array(img)
x = np.expand_dims(x, axis=0)
x = preprocess_input(x)

preds = model.predict(x)
# decode the results into a list of tuples (class, description, probability)
# (one such list for each sample in the batch)
print('Predicted:', decode_predictions(preds, top=3)[0])
# Predicted: [(u'n02504013', u'Indian_elephant', 0.82658225), (u'n01871265', u'tusker', 0.1122357), (u
```

Computer Vision

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2. useful tools
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Usage examples for image class

Classify ImageNet classes with ResNet

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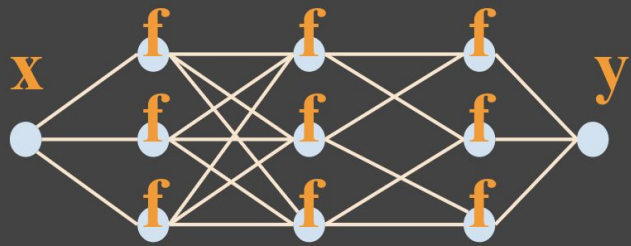
neural network:



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- what are "f "?
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Computer Vision

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2. useful tools
3. don’t sweat it
4. here’s one idea:

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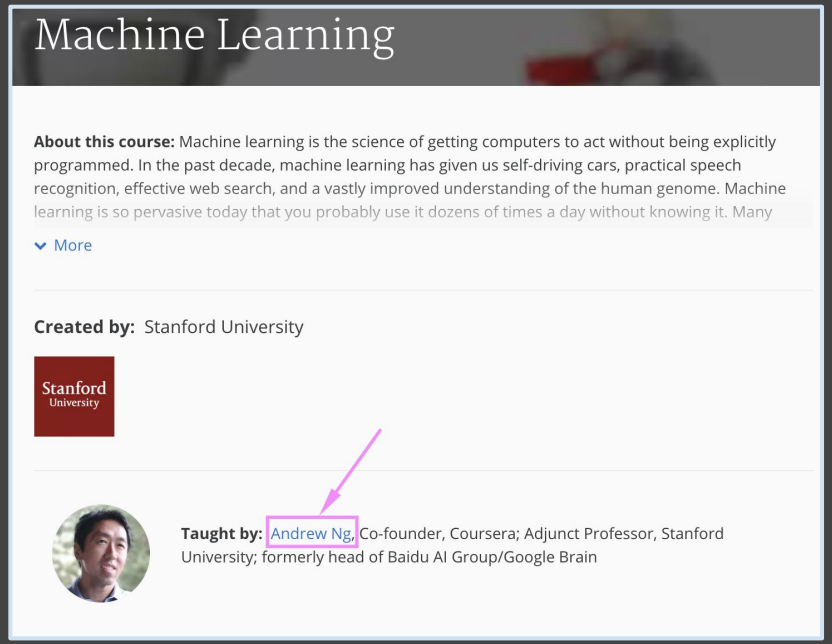
Computer Vision

1. some background => cs231n.stanford.edu/
2. useful tools => www.tensorflow.org keras.io
3. don’t sweat it => keras.io/applications

Statistical Learning

Statistical Learning

1. some background



Statistical Learning

1. some background
2. useful tools

Statistical Learning

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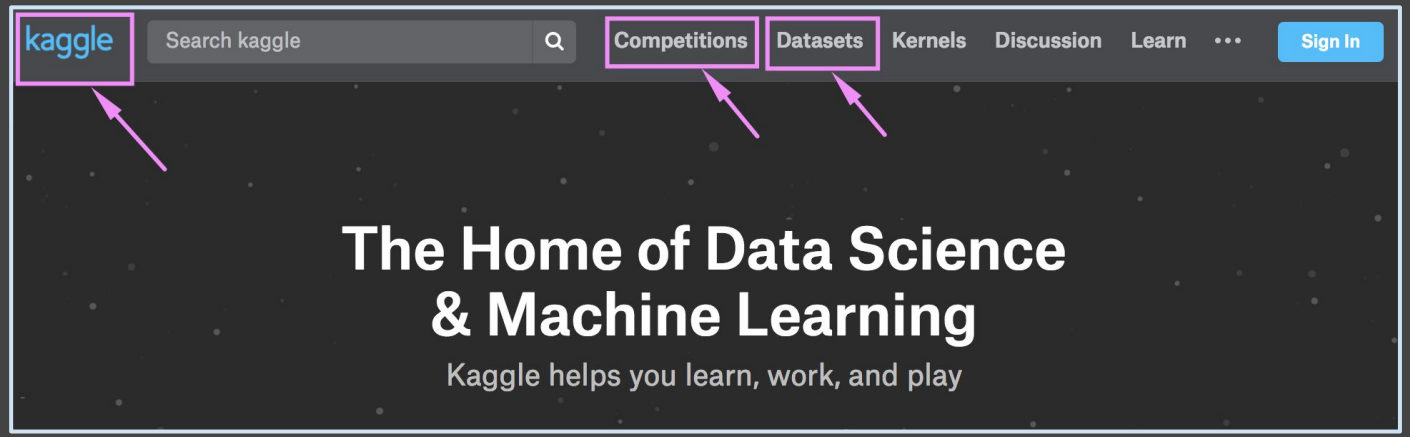
3. challenge yourself!



Statistical Learning

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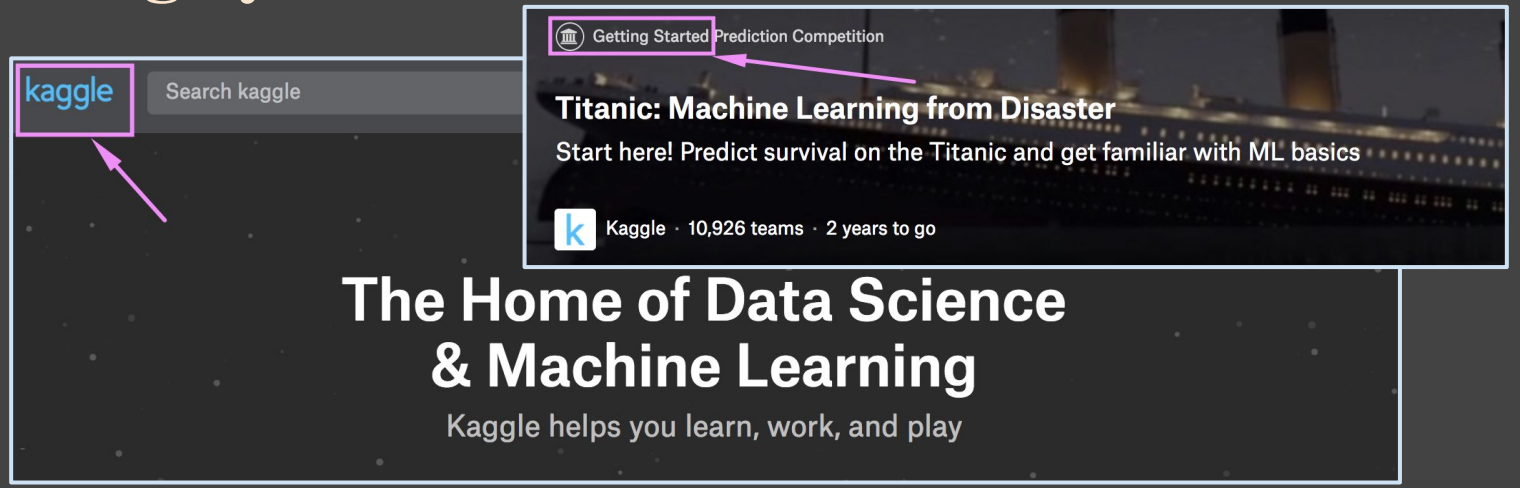

Statistical Learning

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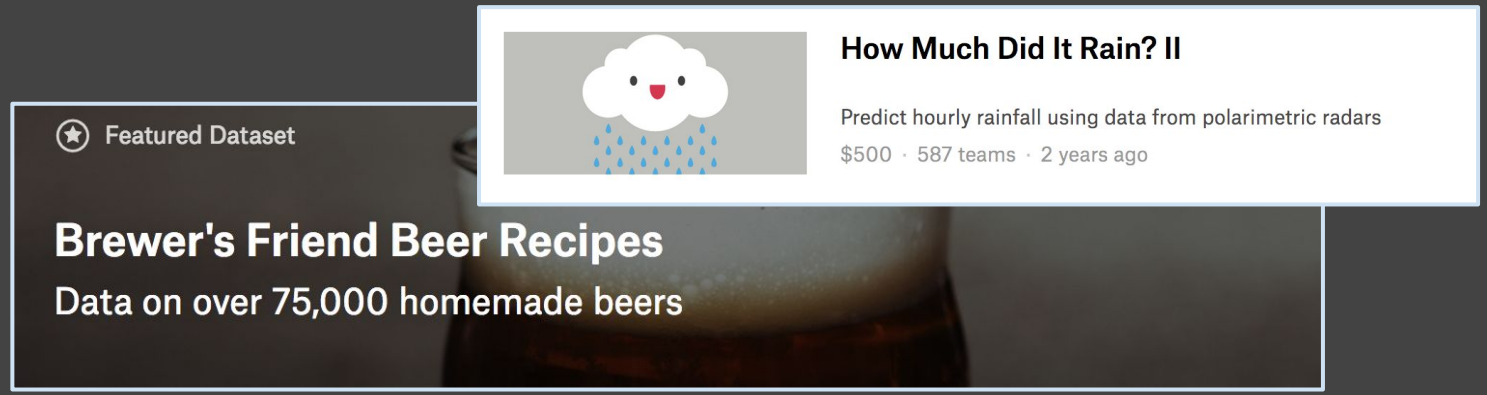

Statistical Learning

1. some background => www.coursera.org/learn/machine-learning
2. useful tools => pandas.pydata.org scikit-learn.org/
3. challenge yourself! => www.kaggle.com www.kaggle.com/c/titanic
4. here's some ideas => www.kaggle.com/jtrofe/beer-recipes
   www.kaggle.com/c/how-much-did-it-rain-ii

PART II Recap

PART III - Team Up!

PART III - Team Up!

DATA

INSTALLLATIONS

SOLUTIONS

TOOLS

ANALYSIS

Take Home Message

Thank you :)

Questions?

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