Preparation for Deep Learning

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Previously

- **Github and markdown**
  version control, documentation≈
- **R for Data Science**
  data manipulation, visualization
- **Python for Big Data**
  more manual control in our analysis

We need ..

- More python practice
- Taste on Deep Learning

> But, we may need GPU resource?

> Google colab is a good resource

Why google colab?

- **Use Jupyter Notebook with Python**
- **Can use GPUs**
- **Good learning materials from google**

  https://www.tensorflow.org/tutorials?hl=ko

  https://developers.google.com/machine-learning/crash-course

Colab practice

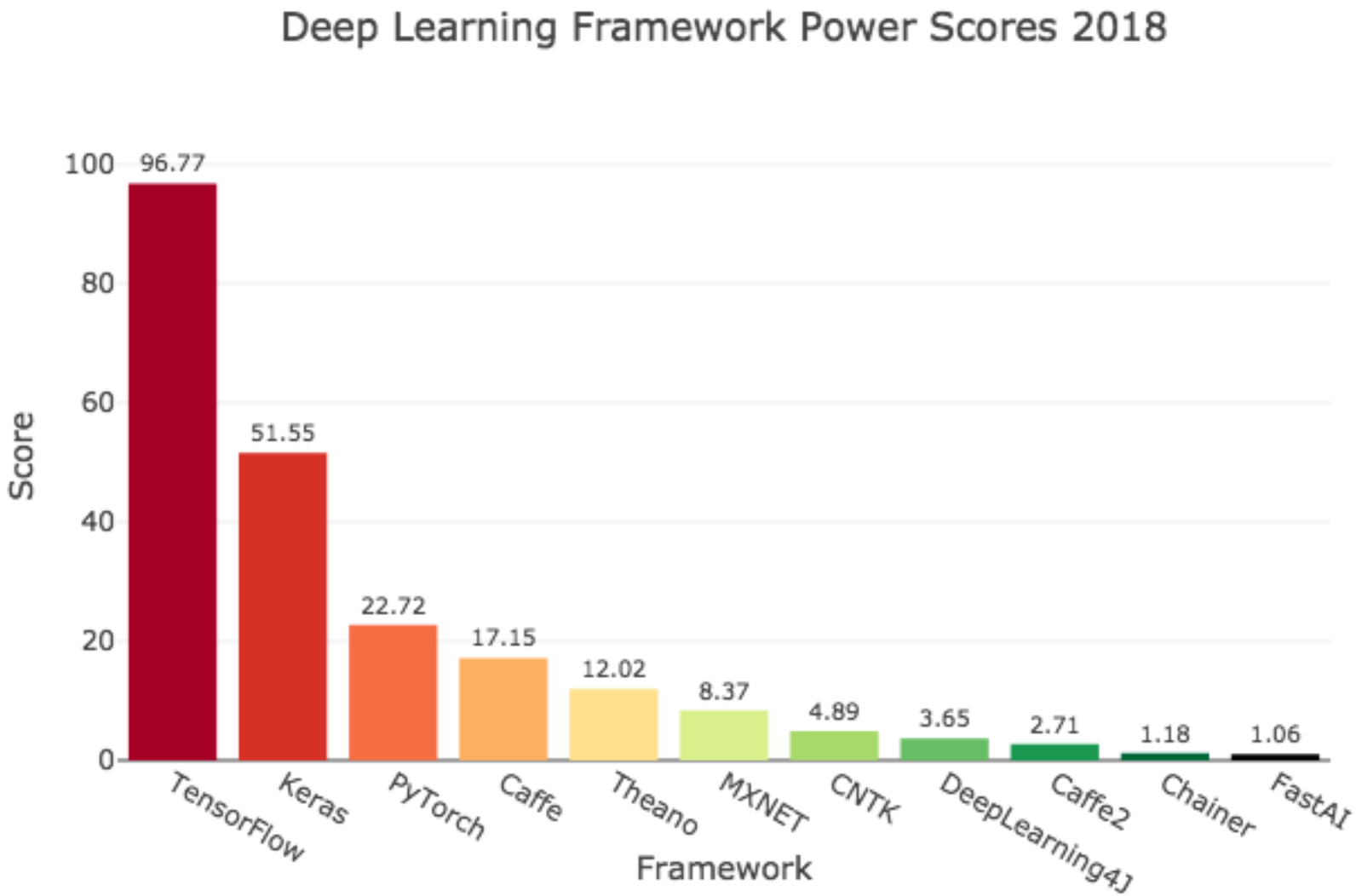
https://colab.research.google.com

Overview of colab, Intro to pandas

Why Keras?

- User friendly API design
- Reduce cognitive load
- Good for testing multiple models with divers ranges of parameters
- Easy to turn models into products

Why Keras?


Deep Learning Framework Power Scores 2018
Score
100
80
60
40
20
0
96.77
51.55
22.72
17.15
12.02
8.37
4.89
3.65
2.71
1.18
1.06
TensorFlow
Keras
PyTorch
Caffe
Theano
MXNET
CNTK
DeepLearning4J
Caffe2
Chainer
FastAI
Framework

What is Keras

- **API for specifying & training differentiable programs**

  TensorFlow, CNTK, MXNet, Theano, …

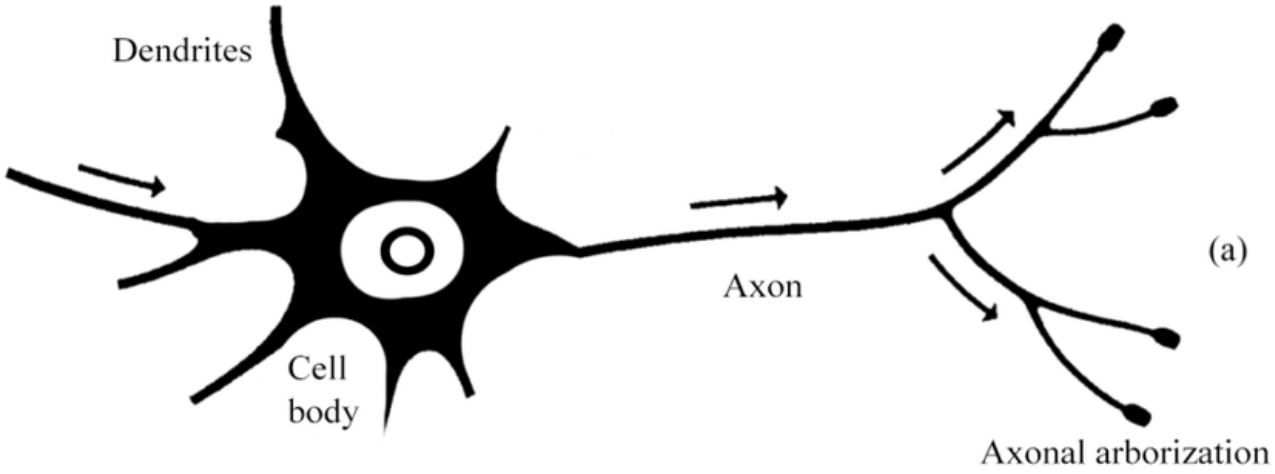
- **Official high-level API of TensorFlow**

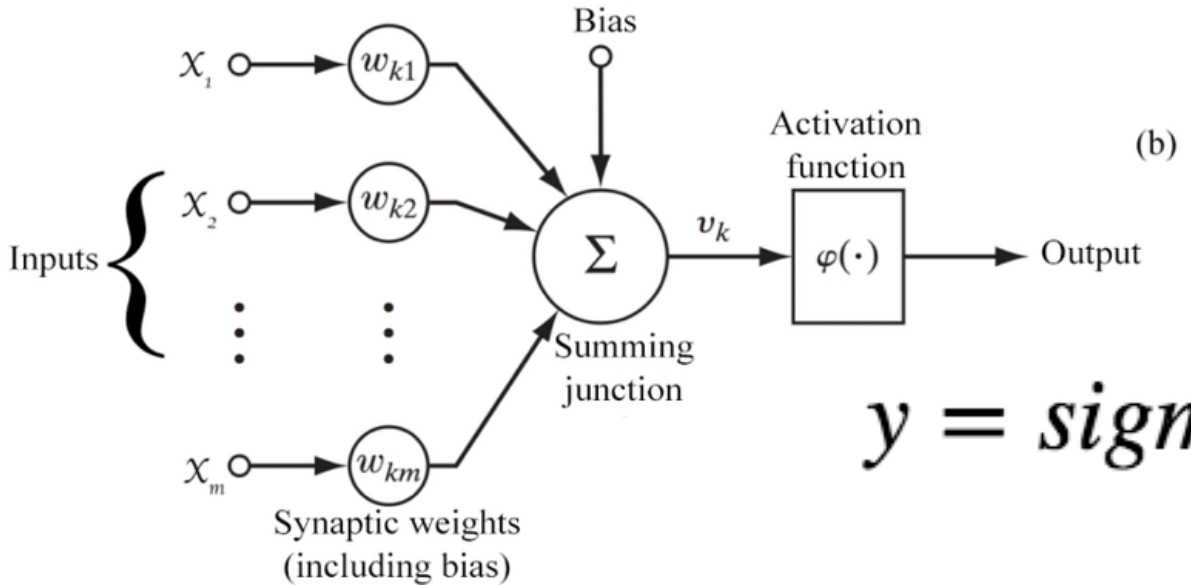
  Part of core TensorFlow since v1.4

- **Big tech giants are contributing it**

  Google, Microsoft, Nvidia, Amazon AWS, …

Artificial Neuron

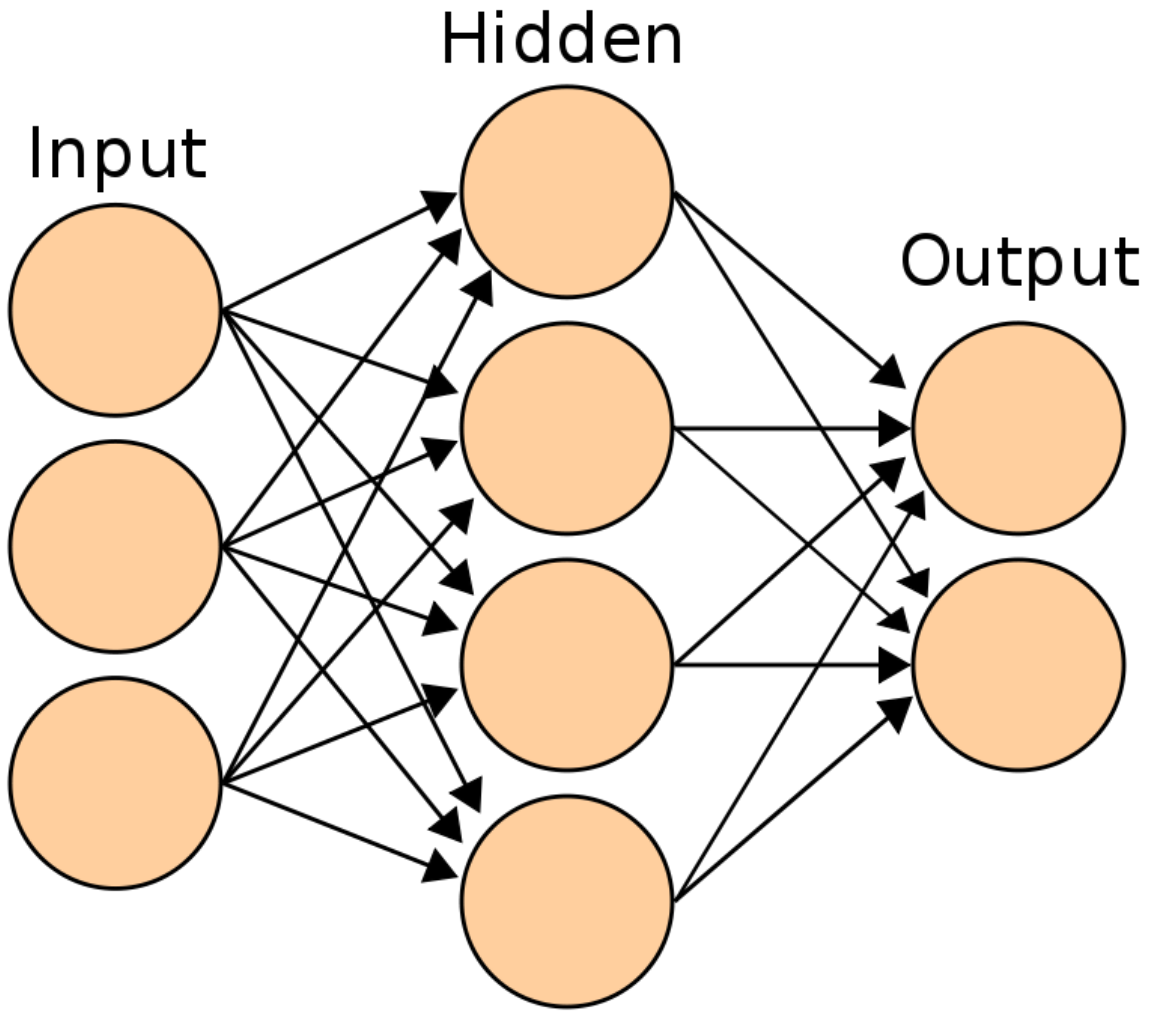




$$y = sigmoid(WX + b)$$

Artificial Neural network

$$y = sigmoid(W_2 relu(W_1 X + b_1) + b_2)$$



Why Neural network?

https://playground.tensorflow.org

- **Modeling non linear structure**

Practice

https://www.tensorflow.org/tutorials

Thank you!
Q & A