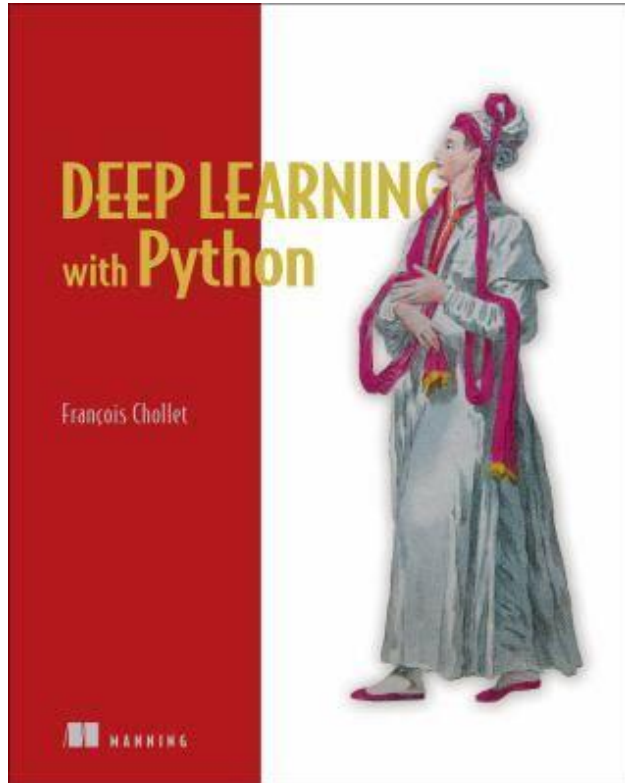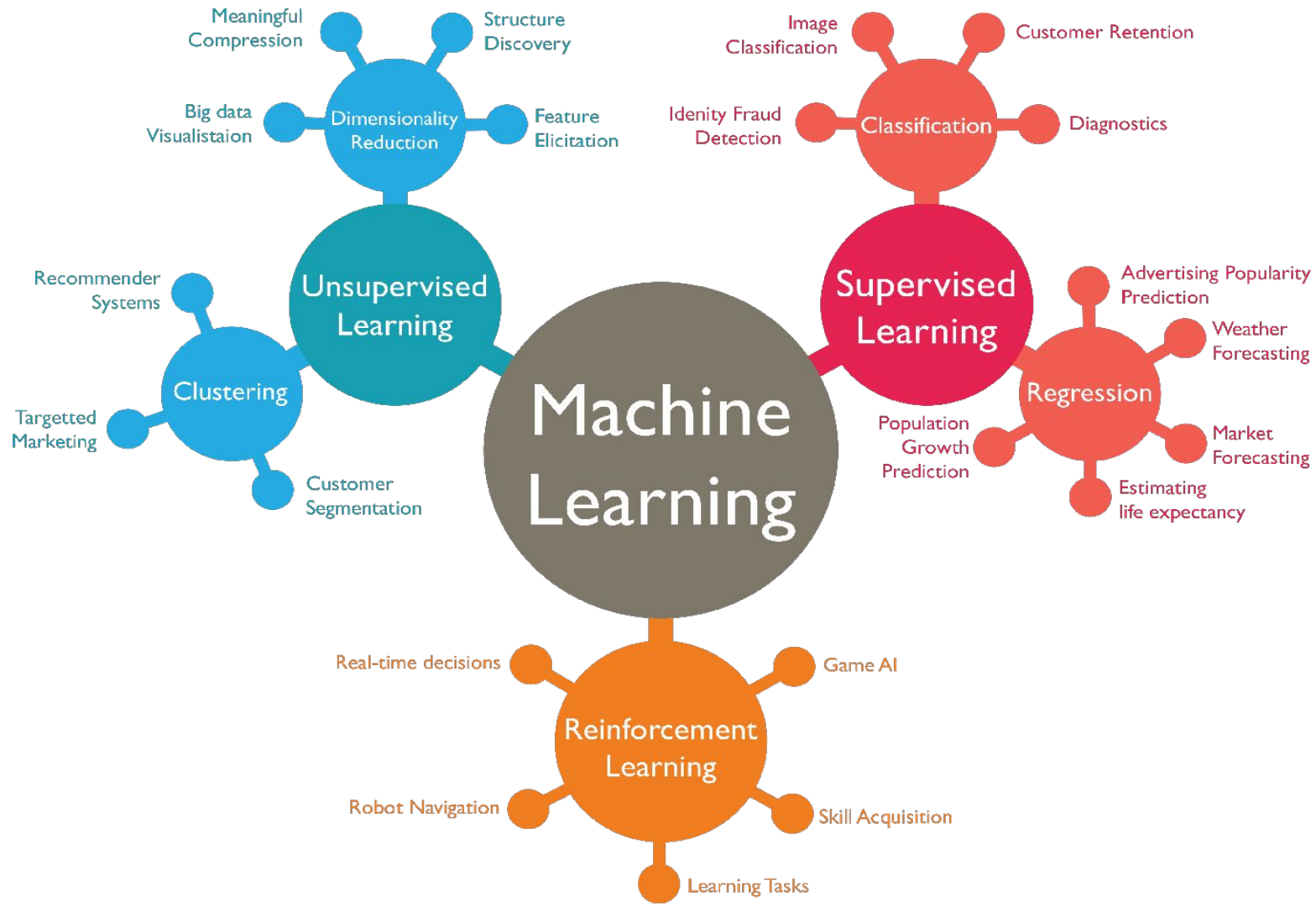# Deep Learning: Day 1

chyld @ galvanize

Topics

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- Join Slack & Github
- Deep Learning Book
- Machine Learning
- Supervised vs Unsupervised
- Mathematics
- High Level Deep Learning
- Gradient Descent
- Laptop Preparation
- Build Single Perceptron (Regression)
- Build Multilayer Perceptron (Regression)
- Keras and Tensorflow
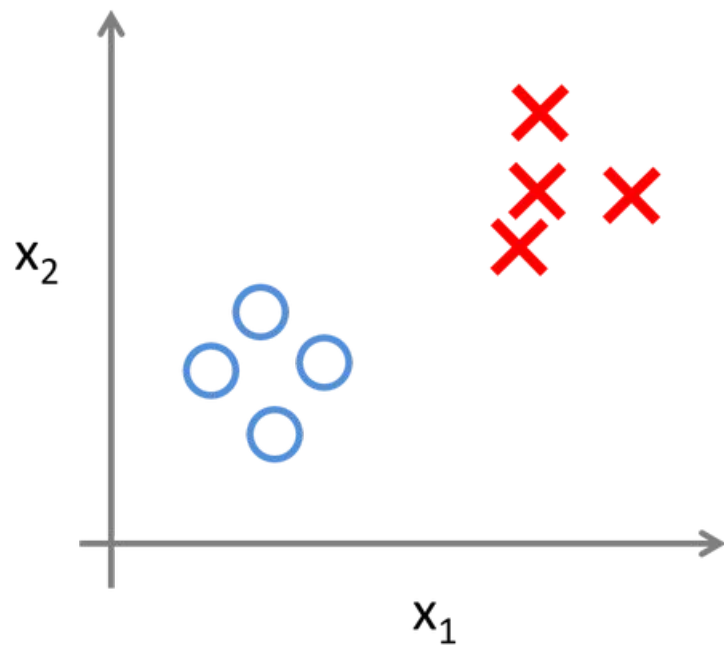- Simple Linear Regression with Keras

Join Slack & Github

- Slack
- http://bit.ly/2MBmC7m
- Github
- http://bit.ly/2MCnhWc

Deep Learning Book

Machine Learning

Unsupervised Learning

Dimensionality Reduction
- Meaningful Compression
- Structure Discovery
- Big data Visualistaion
- Feature Elicitation

Clustering
- Recommender Systems
- Targetted Marketing
- Customer Segmentation

Supervised Learning

Classification
- Image Classification
- Customer Retention
- Idenity Fraud Detection
- Diagnostics

Regression
- Advertising Popularity Prediction
- Weather Forecasting
- Market Forecasting
- Estimating life expectancy
- Population Growth Prediction

Reinforcement Learning
- Real-time decisions
- Game AI
- Robot Navigation
- Skill Acquisition
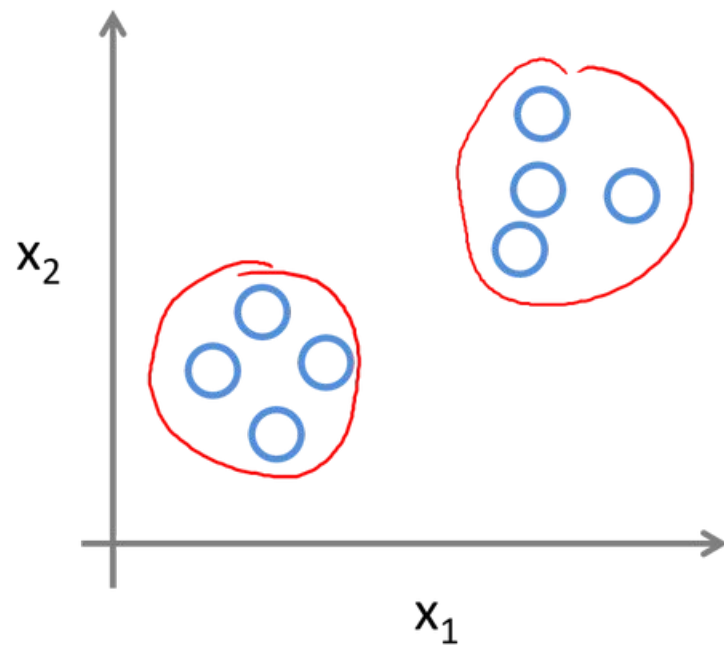- Learning Tasks

Supervised Learning — x_2 vs x_1
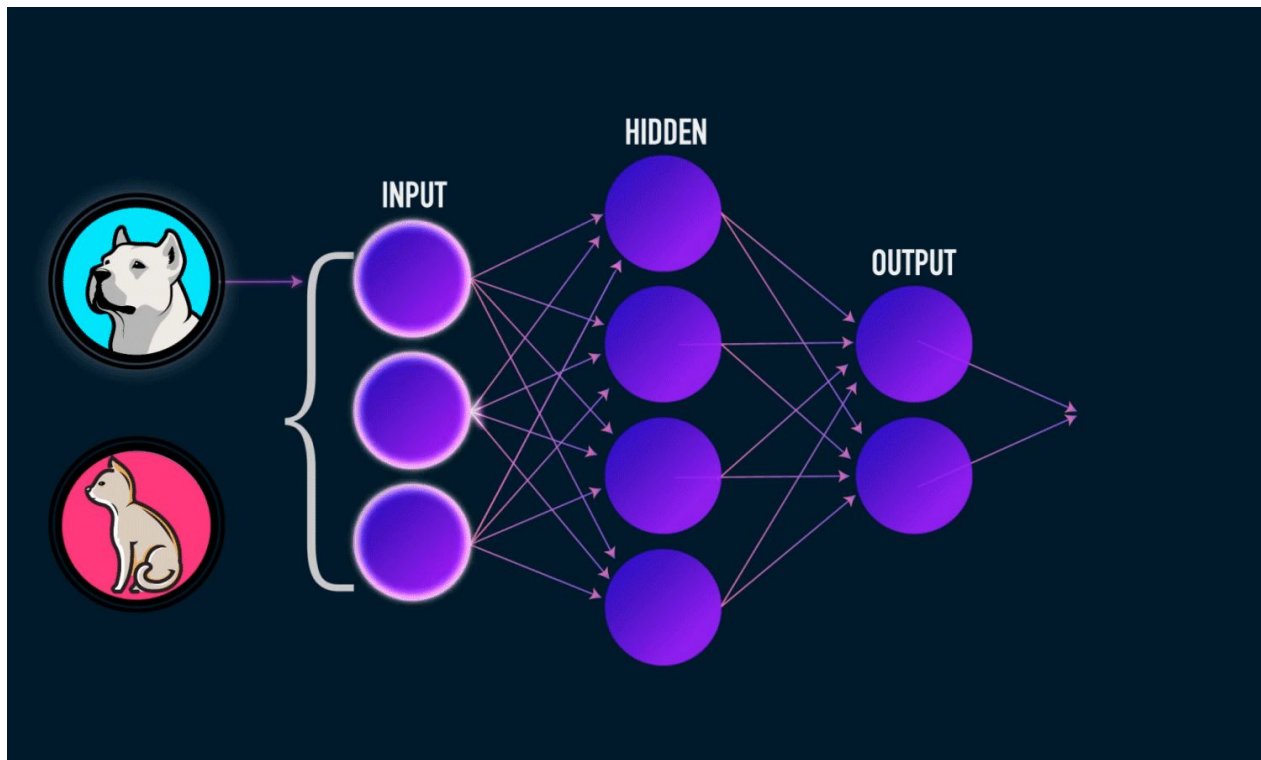
Unsupervised Learning — x_2 vs x_1

Mathematics

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- Algebra
  - Solving polynomial equations
- Linear Algebra
  - Scalars
  - Vectors
  - Matrices
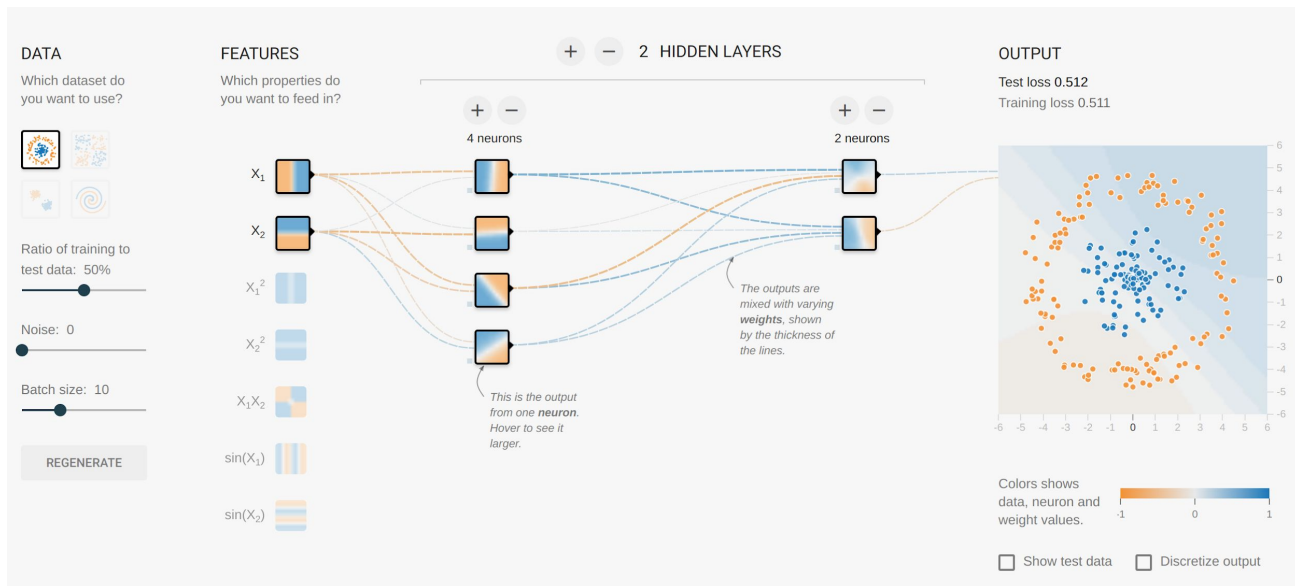 - Tensors
- Calculus
  - Derivatives
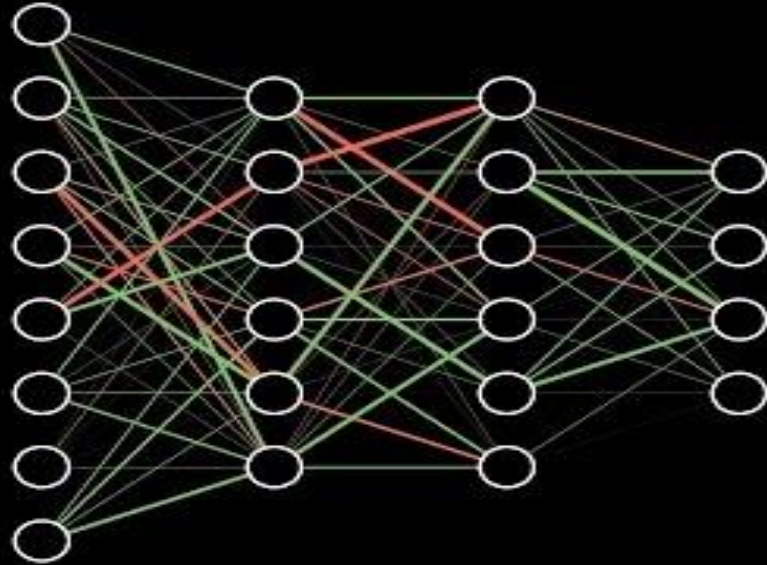 - Partial Derivatives

High Level Deep Learning

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High Level Deep Learning

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- https://playground.tensorflow.org/
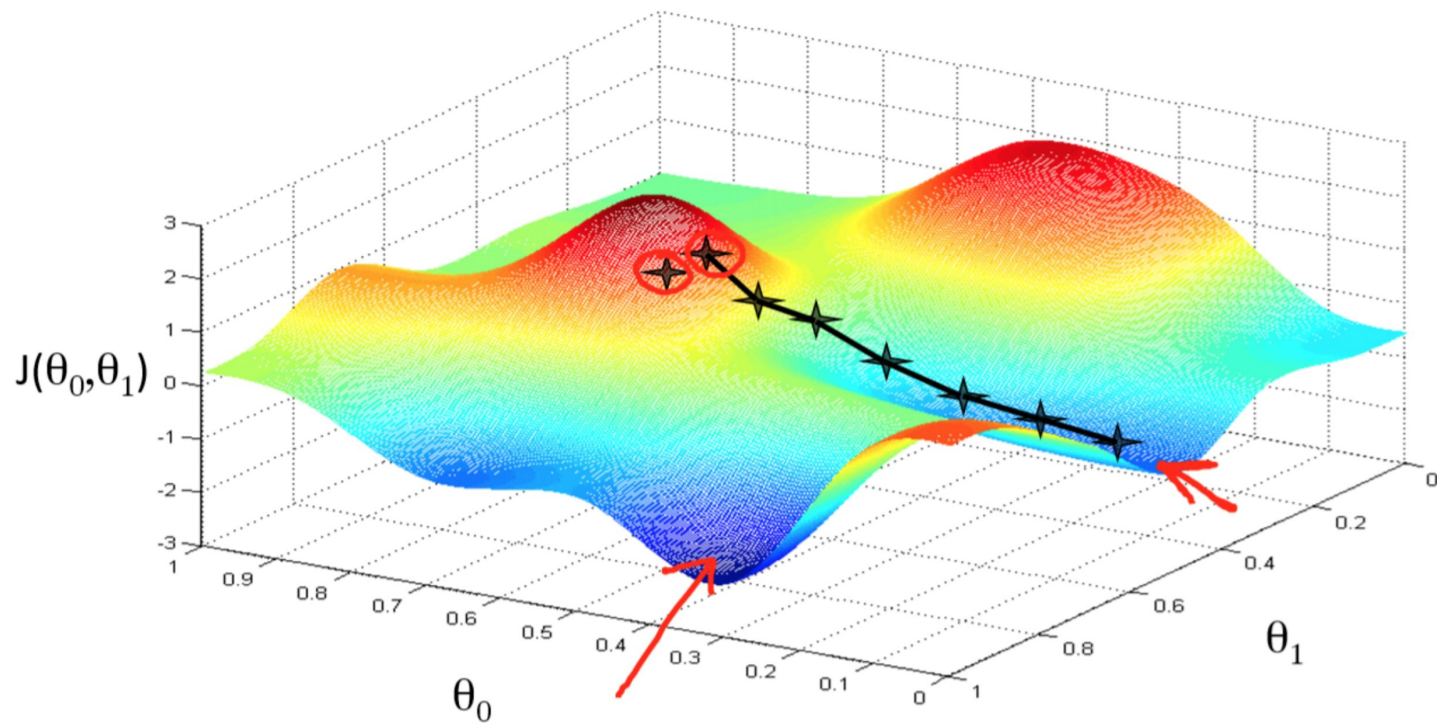
https://www.youtube.com/watch?v=aircAruvnKk

Gradient Descent

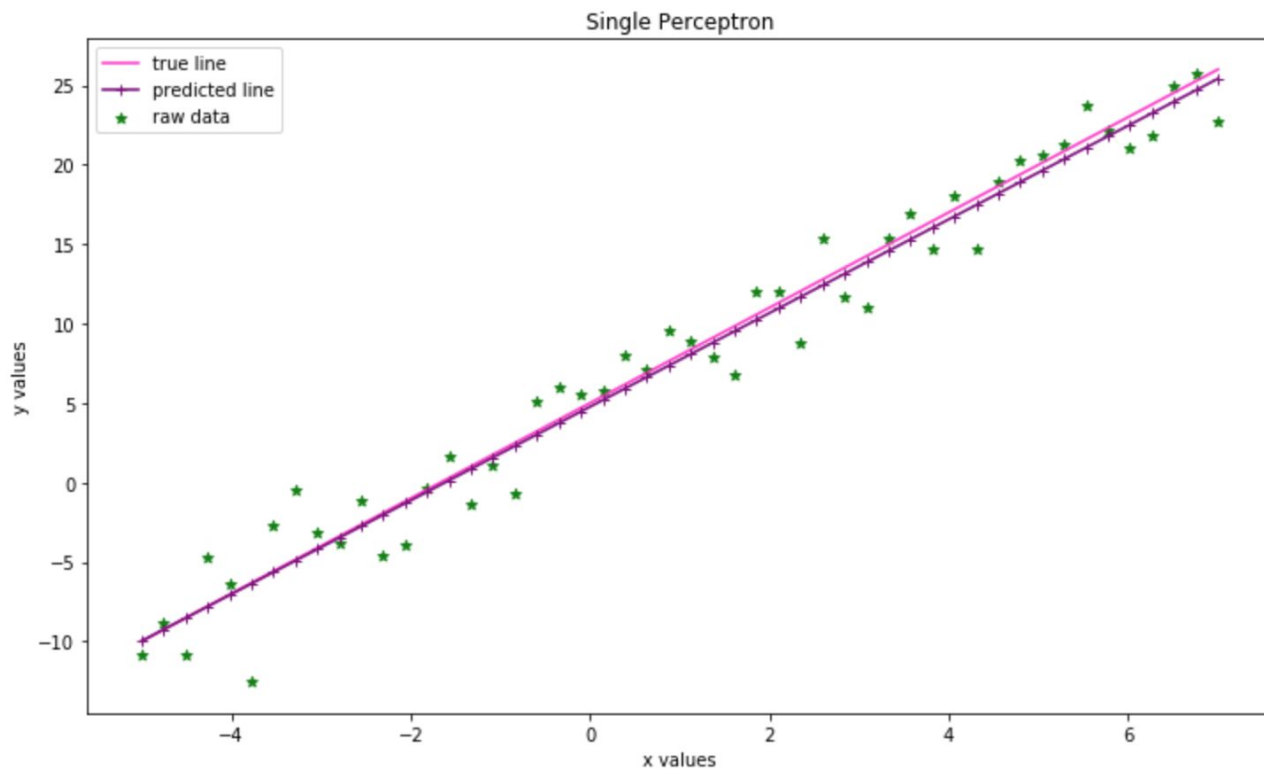# Laptop Preparation

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- Laptop
  - Preferably Mac or Linux
  - Windows with a Linux Virtual Machine
  - Windows 10 with Bash
- Python 3.6
  - https://conda.io/miniconda.html
  - conda install numpy pandas matplotlib jupyter jupyterlab
- Code editor
  - https://code.visualstudio.com/
- Terminal
  - https://hyper.is/
- CPU vs GPU vs TPU

Build Single Perceptron (Regression)

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Build Multilayer Perceptron (Regression)

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Keras and Tensorflow

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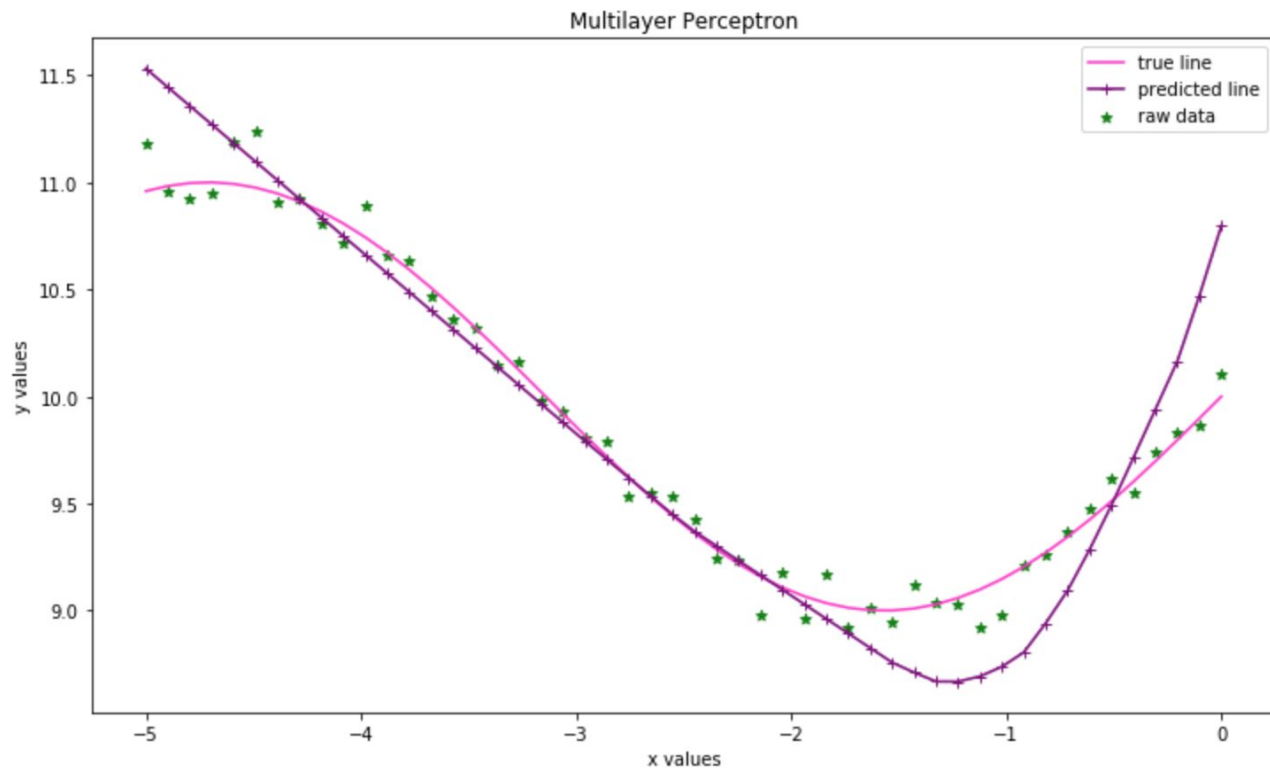
- https://www.tensorflow.org/
- An open source machine learning framework for everyone
- https://keras.io/
- Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow, CNTK, or Theano. It was developed with a focus on enabling fast experimentation.

Simple Linear Regression with Keras