Tensorflow

What is tensorflow?

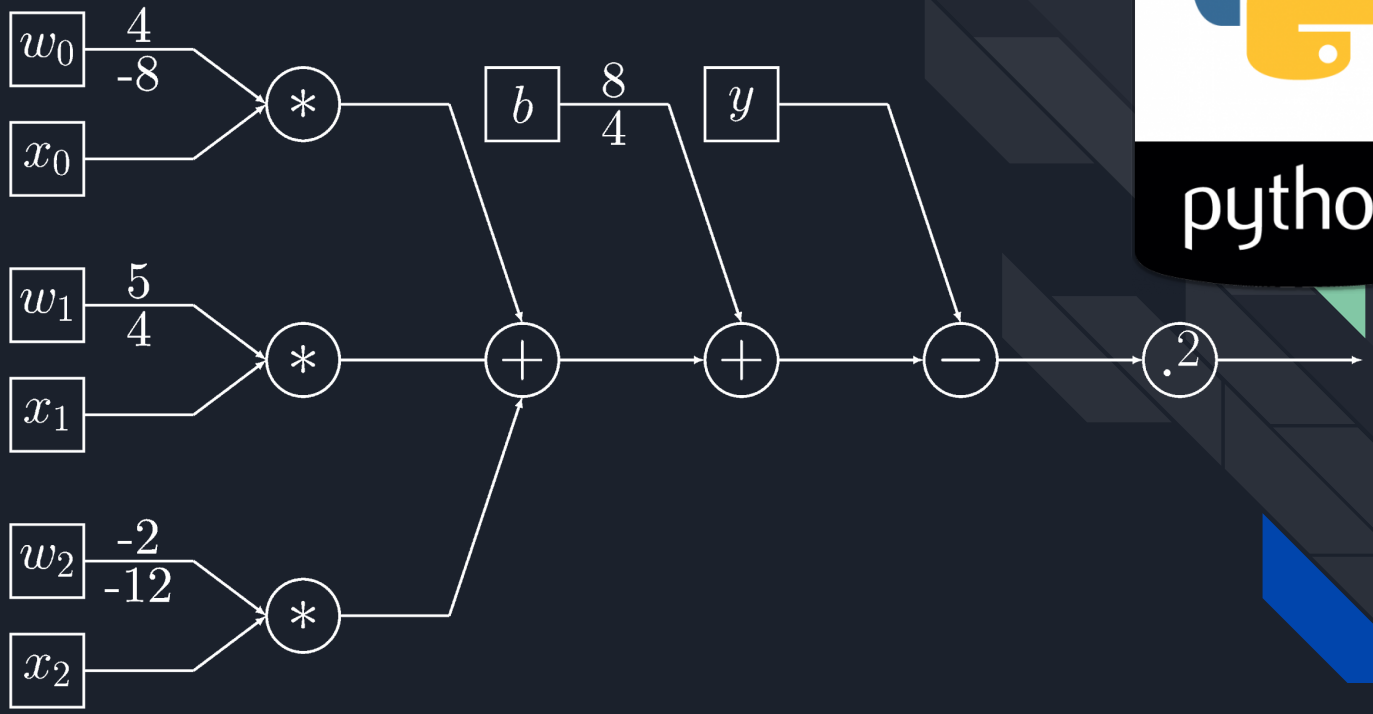
TensorFlow is an end-to-end open source platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries, and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML-powered applications.

- Tensorflow github

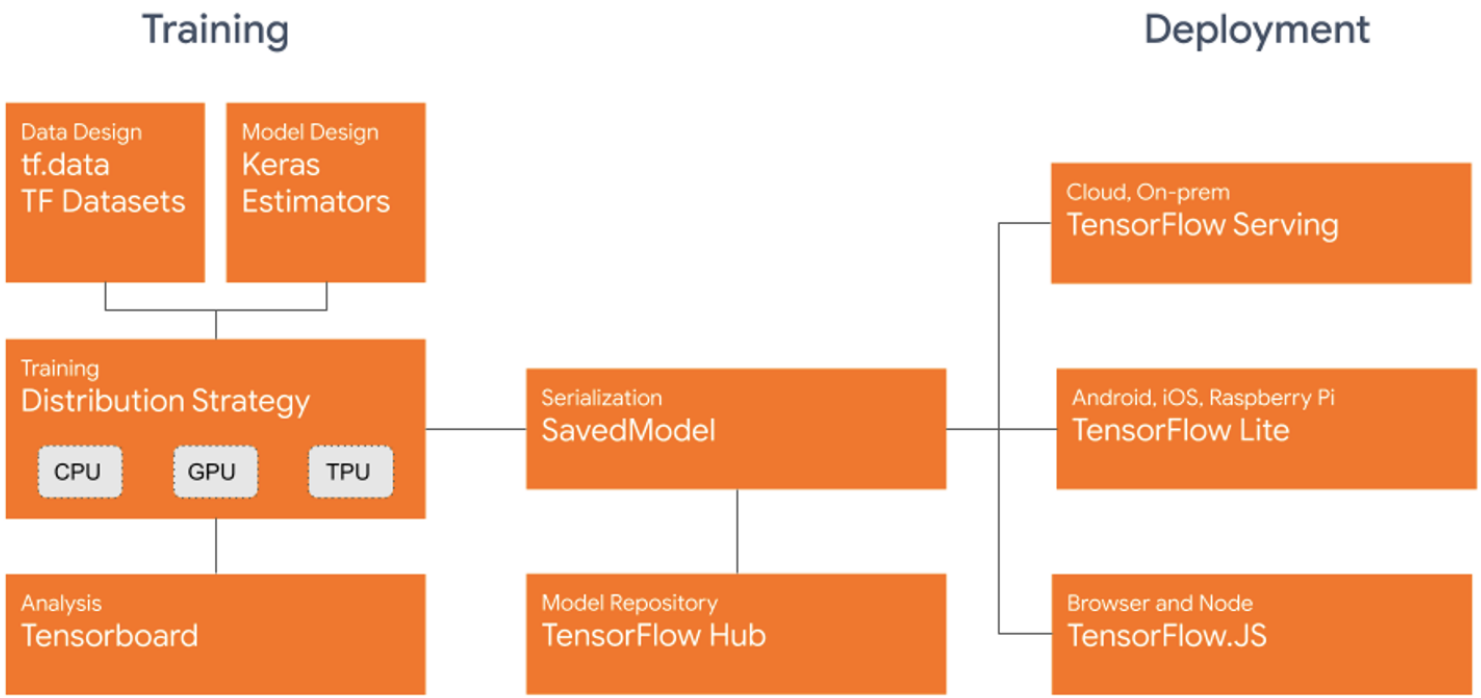
Basics

- Tensor
- Variable
- Constant

Python+Dataflow Programming



Basic components

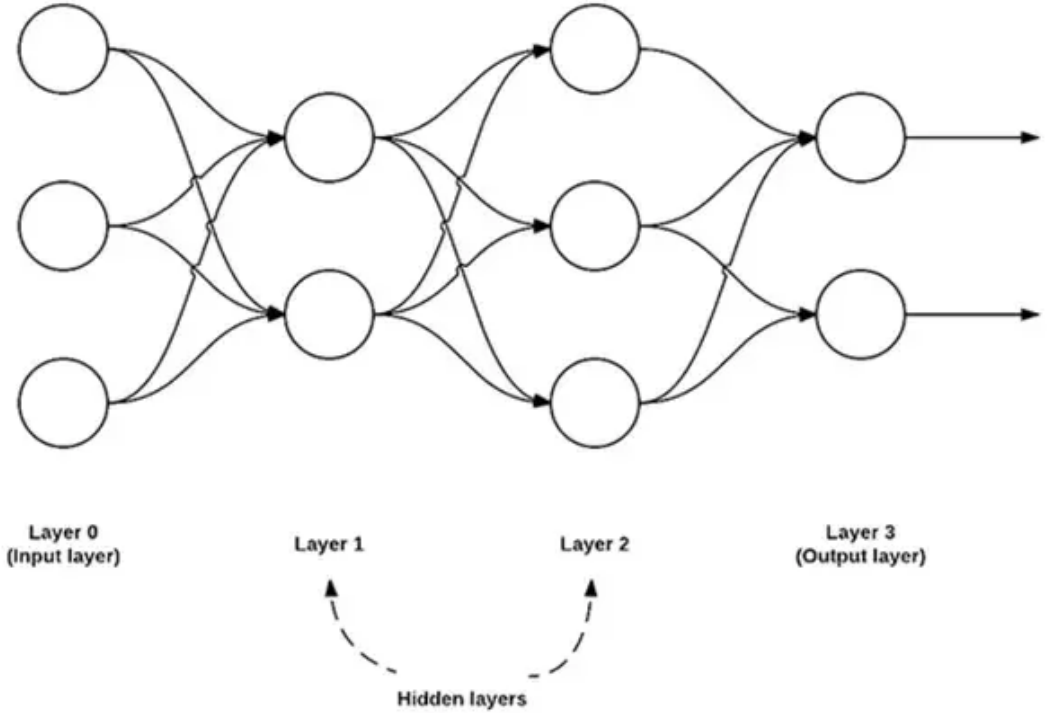


tf.Data

- The tf.data API enables you to build complex input pipelines from simple, reusable pieces.
- Makes it possible to handle large amounts of data, read from different data formats, and perform complex transformations.
- Optimization of pipeline makes training much quicker on GPU and distributed systems since there is a large amount of memory transfer required

Basic Model layers

Dense layer and Dropout layer



Optimizers and Loss Functions

- Optimizers: The optimizers are used for improving speed and performance for training a specific model
  - Some of the optimizers are:
    - Adagrad
    - Adam
- Loss Functions: Used to determine how far the predicted values deviate from the actual values in the training data

Let’s look at an example!

How to deploy?

- Train a model
- Save a model and its variables in a folder
- Clone the tensorflow serving git repo
- Create the Tensorflow serving docker image with the saved model
- Deploy the container to wherever you want!
- You get a simple REST API to make predictions
- Refer here for further details :)

TensorFlow
Ecosystem

TensorFlow Core	tf.keras	TensorFlow Probability	Nucleus
TensorFlow.js	tf.data	Tensor2Tensor	TensorFlow Federated
TensorFlow Lite	TF Runtime	TensorFlow Agents	TensorFlow Privacy
TensorFlow Lite Micro	CoLab	Dopamine	Fairness Indicators
TensorBoard	TensorFlow Research Cloud	TRFL	Sonnet
TensorBoard.dev	MLIR	Mesh TensorFlow	Neural Structured Learning
TensorFlow Hub	TensorFlow Lattice	Ragged Tensors	JAX
TensorFlow Extended	Model Optimization Toolkit	TensorFlow Ranking	TensorFlow Quantum
Swift for TensorFlow	TensorFlow Graphics	Magenta	I/O and Addons

Bibliography

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