TensorFlow 2.0 Examples

*** More examples to be added later... ***

0 - Prerequisite

- Introduction to Machine Learning.
- Introduction to MNIST Dataset.

1 - Introduction

- **Hello World** (notebook). Very simple example to learn how to print "hello world" using TensorFlow 2.0.
- **Basic Operations** (notebook). A simple example that cover TensorFlow 2.0 basic operations.

2 - Basic Models

- **Linear Regression** (notebook). Implement a Linear Regression with TensorFlow 2.0.
- **Logistic Regression** (notebook). Implement a Logistic Regression with TensorFlow 2.0.
- **Word2Vec (Word Embedding)** (notebook). Build a Word Embedding Model (Word2Vec) from Wikipedia data, with TensorFlow 2.0.
- **GBDT (Gradient Boosted Decision Trees)** (notebooks). Implement a Gradient Boosted Decision Trees with TensorFlow 2.0+ to predict house value using Boston Housing dataset.

3 - Neural Networks

Supervised

- **Simple Neural Network** (notebook). Use TensorFlow 2.0 'layers' and 'model' API to build a simple neural network to classify MNIST digits dataset.
- **Simple Neural Network (low-level)** (notebook). Raw implementation of a simple neural network to classify MNIST digits dataset.
- **Convolutional Neural Network** (notebook). Use TensorFlow 2.0 'layers' and 'model' API to build a convolutional neural network to classify MNIST digits dataset.
- **Convolutional Neural Network (low-level)** (notebook). Raw implementation of a convolutional neural network to classify MNIST digits dataset.
- **Recurrent Neural Network (LSTM)** (notebook). Build a recurrent neural network (LSTM) to classify MNIST digits dataset, using TensorFlow 2.0 'layers' and 'model' API.
- **Bi-directional Recurrent Neural Network (LSTM)** (notebook). Build a bi-directional recurrent neural network (LSTM) to classify MNIST digits dataset, using TensorFlow 2.0 'layers' and 'model' API.
- **Dynamic Recurrent Neural Network (LSTM)** (notebook). Build a recurrent neural network (LSTM) that performs dynamic calculation to classify sequences of variable length, using TensorFlow 2.0 'layers' and 'model' API.

Unsupervised

- **Auto-Encoder** (notebook). Build an auto-encoder to encode an image to a lower dimension and re-construct it.
- **DCGAN (Deep Convolutional Generative Adversarial Networks)** (notebook). Build a Deep Convolutional Generative Adversarial Network (DCGAN) to generate images from noise.

4 - Utilities

- **Save and Restore a model** (notebook). Save and Restore a model with TensorFlow 2.0.
- **Build Custom Layers & Modules** (notebook). Learn how to build your own layers / modules and integrate them into TensorFlow 2.0 Models.
- **Tensorboard** (notebook). Track and visualize neural network computation graph, metrics, weights and more using TensorFlow 2.0+ tensorboard.

5 - Data Management

- **Load and Parse data** (notebook). Build efficient data pipeline with TensorFlow 2.0 (Numpy arrays, Images, CSV files, custom data, ...).
- **Build and Load TFRecords** (notebook). Convert data into TFRecords format, and load them with TensorFlow 2.0.

- **Image Transformation (i.e. Image Augmentation)** (notebook). Apply various image augmentation techniques with TensorFlow 2.0, to generate distorted images for training.

Installation

To install TensorFlow 2.0, simply run:

```
pip install tensorflow==2.0.0
```

or (if you want GPU support):

```
pip install tensorflow_gpu==2.0.0
```