## 3.1 Tensor Flow

What is a computation graph?

In traditional graph theory, a graph consists of vertices and edges. In tensor flow, the edges correspond to Tensors which are values flowing between vertices (primarily you would think of it as flowing through layers of a multi-layer neural network). Finally, the vertices are considered Operations, which indicate the mathematical functions which are run on values input through tensors to produce output tensors. Building a computation graph appears similar to a mathematical equation, but instead of producing an output, building a computation graph simply produces the steps to be used by a mathematical equation. After building the steps (computation graph), this computation graph must be run in a session.

What are Variables in TensorFlow?

Variables are tensors which should exist outside a given session. Remember, the construction of a computation graph describes only the computations (or mathematical equations) which should be run during the session. However, after a session is completed, no memory is stored by default and the computation graph remains as it was initially.

What are Placeholders in TensorFlow?

Placeholders in TensorFlow denote input which will be added to the computation graph at session run time. This allows a single computation graph to be used with a variety of data input to produce unique output, thus allowing reuse.