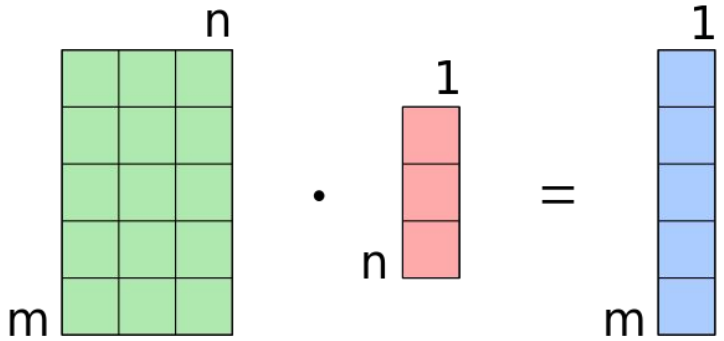
Introduction to Tensorflow

Galvanize Deep Learning Workshop

Tensorflow

- TensorFlow is a general-purpose system for graph-based computation.
- “Tensor” + “flow”
- **Tensor:**
  - arrays of arbitrary dimensionality.
  - 1-D vector is a 1st order tensor
  - 2-D matrix is a 2nd order tensor
  - in TF, a placeholder for holding data of a certain size
- **Flow**:
  - Computation “flowing” through a computational graph.



Computational graph

Computational graph: a series of calculations

$$c = a + b$$

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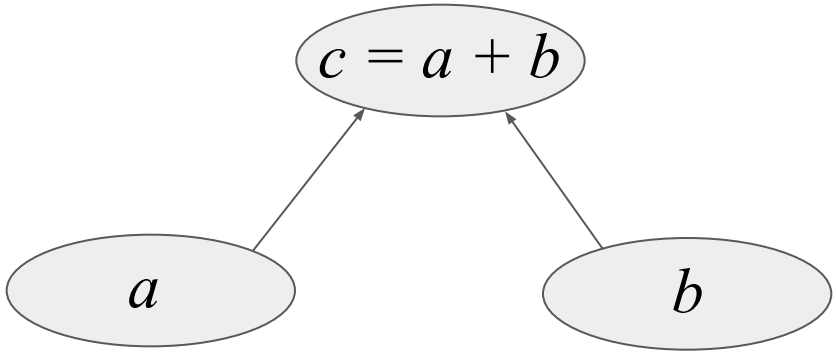

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Computational graph: a series of calculations

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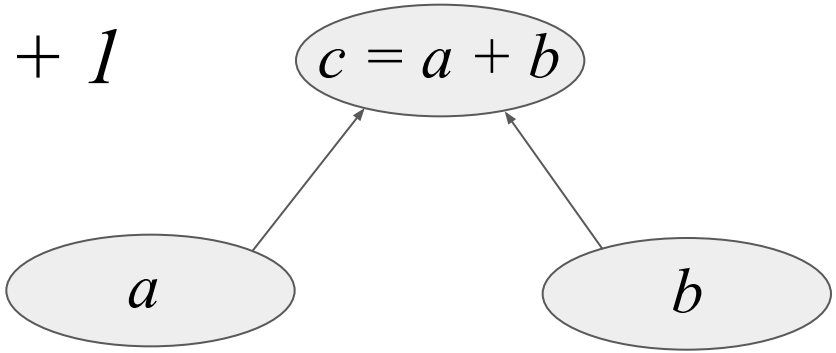
$$e = c * d$$
$$d = b + 1$$



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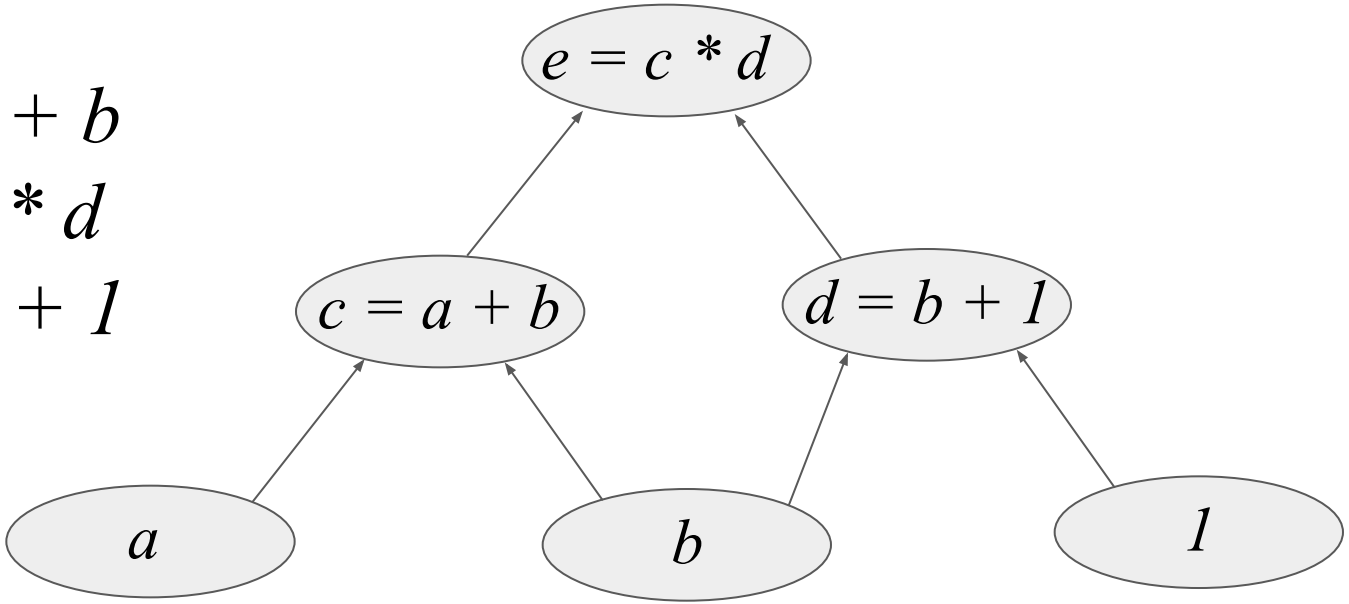

Tensorflow workflow

1. Define your tensors

2. Define your computational graph (your series of calculations)
   - Tensorflow isn't executing while you do this - it's "lazy"
   - But lazy for a reason - allows optimization of the calculations later
   - in code, a `tf.Session()` holds your tensors and graph
3. Evaluate/run your graph for results
   - Tensorflow optimizes how

Link to Tensorflow documentation