Introduction to Tensorflow

Subtitle

Deep Learning Libraries

- Tensorflow (by Google)

- Keras (on Tensorflow, MXNet, DL4J, or Microsoft Cognitive Toolkit)

- PyTorch (by Facebook)

- Caffe (by Berkeley Vision and Learning Center)

- MXNet (by Amazon)

- Microsoft Cognitive Toolkit

- Deeplearning4J

- Caffe2 (by NVIDIA and Facebook)

Comparison of Deep Learning Libraries

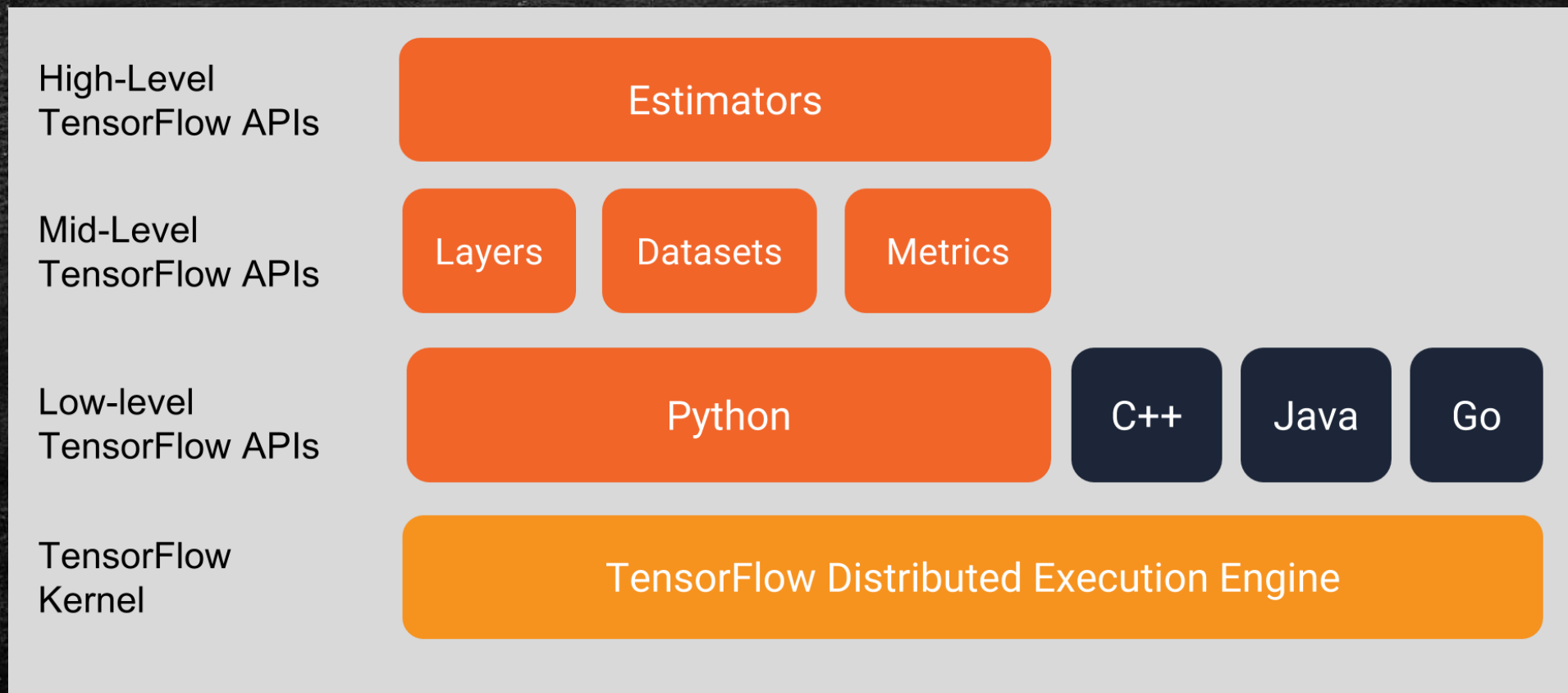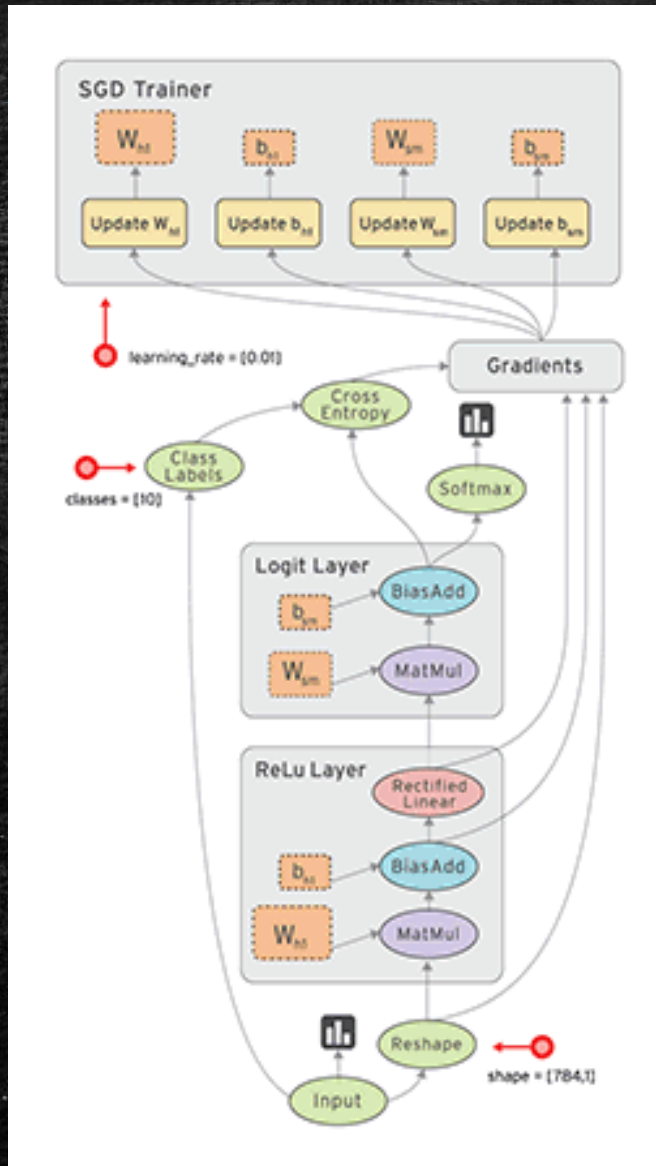|	User Community	Flexibility	Scalability	Performance	Deployment
Tensorflow	++++	+++	+++	++	++++
PyTorch	++	++++	++	++++	++
MXNet	++	++	++++	++++	+++
Caffe	+++	++	++	+++	+++
DL4J	+	+++	+++	+++	++++

Why Tensorflow ?

- Large user community

- Plenty of online learning material

- Lots of examples on Github

- Lots of pre-trained models

- Easily deployed to different devices
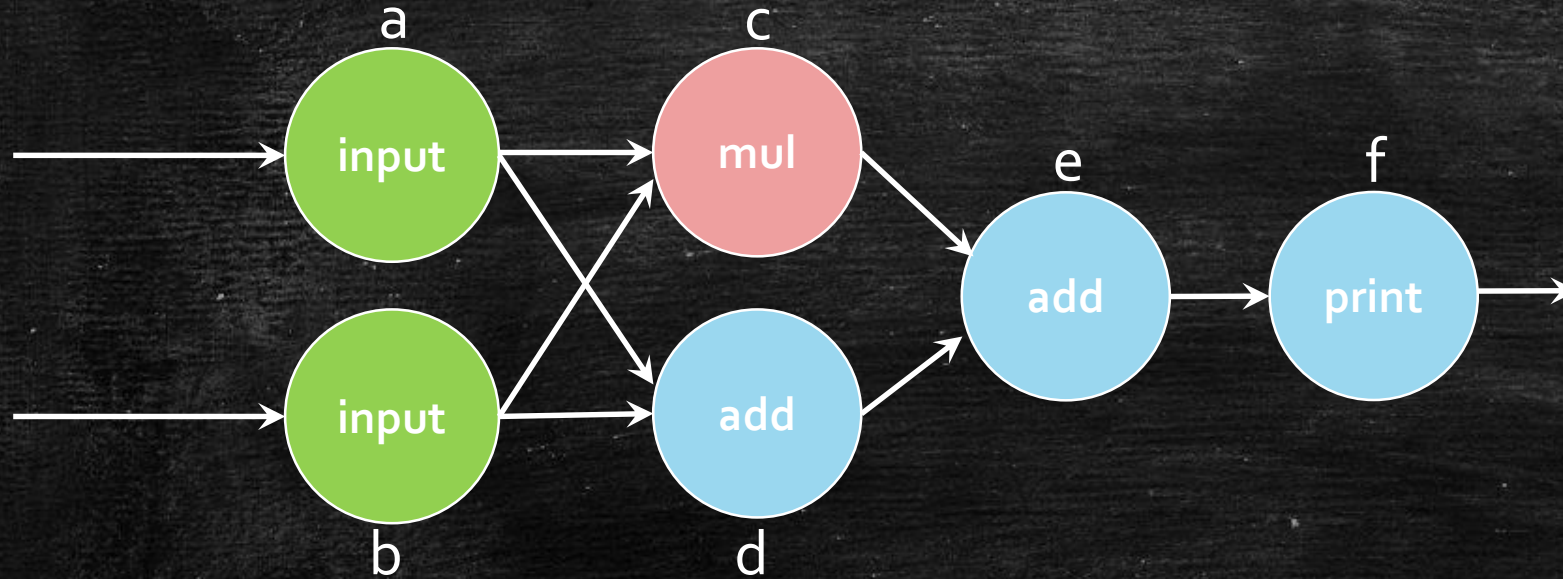
Tensorflow programming environment

Dataflow graph in Tensorflow

- Advantages of a dataflow model
  - Parallelism
  - Distributed execution
  - Compilation
  - Portability

An example of Tensorflow Graph


```
a = tf.placeholder(tf.float32, None, name='a')
b = tf.placeholder(tf.float32, None, name='b')
c = tf.multiply(a,b)
d = tf.add(a, b)
e = tf.add(c, d)
f = tf.Print(e, [a, b, c, d, e])
```

If we run f :
with tf.Session() as sess:
    sess.run(f, feed_dict={a:1, b:2})
We'll see in *stderr*:
[1][2][2][3][5]

If we run c :
with tf.Session() as sess:
    print(sess.run(c, feed_dict={a:1, b:2}))
We'll see:
2