

TensorFlow Tutorial

Companies using TensorFlow



What is TensorFlow?

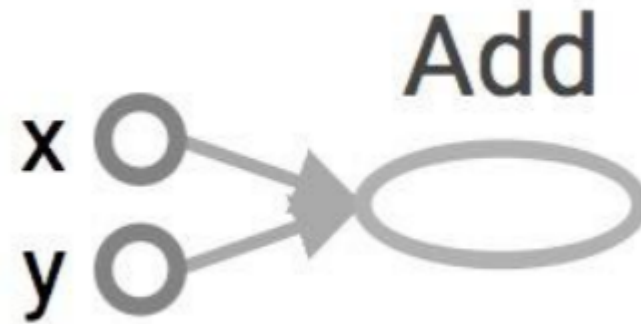
- Open source software library for numerical computation using data flow graphs
- Originally developed by Google Brain Team to conduct machine learning and deep neural networks research
- General enough to be applicable in a wide variety of other domains as well

Why TensorFlow?

- Python API
- Portability: deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API
- Flexibility: from Raspberry Pi, Android, Windows, iOS, Linux to server farms
- Visualization (TensorBoard)
- Checkpoints (for managing experiments)
- Auto-differentiation *autodiff* (no more taking derivatives by hand!)
- Large community (> 10,000 commits and > 3000 TF-related repos in 1 year)

The most important (and annoying) part of learning TensorFlow: Graphs

```
import tensorflow as tf  
a = tf.add(3, 5)
```

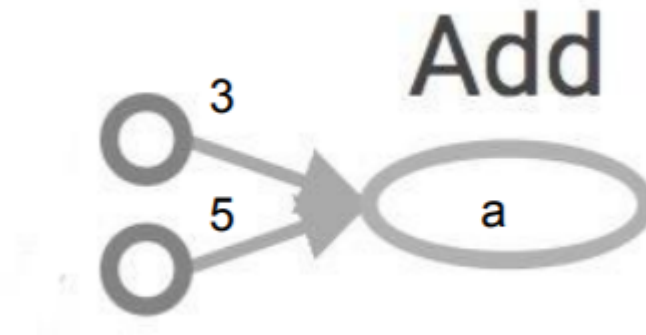


The most important (and annoying) part of learning TensorFlow: Graphs

```
import tensorflow as tf
```

```
a = tf.add(3, 5)
```

```
print(a)
```

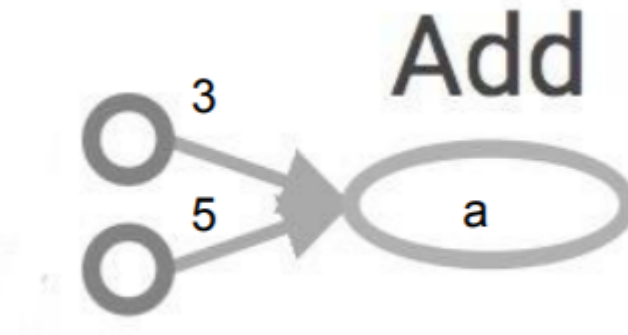


The most important (and annoying) part of learning TensorFlow: Graphs

```
import tensorflow as tf  
a = tf.add(3, 5)
```

```
print(a)
```

```
>>>Tensor("Add:0", shape=(), dtype=int32)
```



Tensorflow has only constructed the computational graph. No mathematical operation is executed yet.



The most important (and annoying) part of learning TensorFlow: Graphs

```
import tensorflow as tf
```

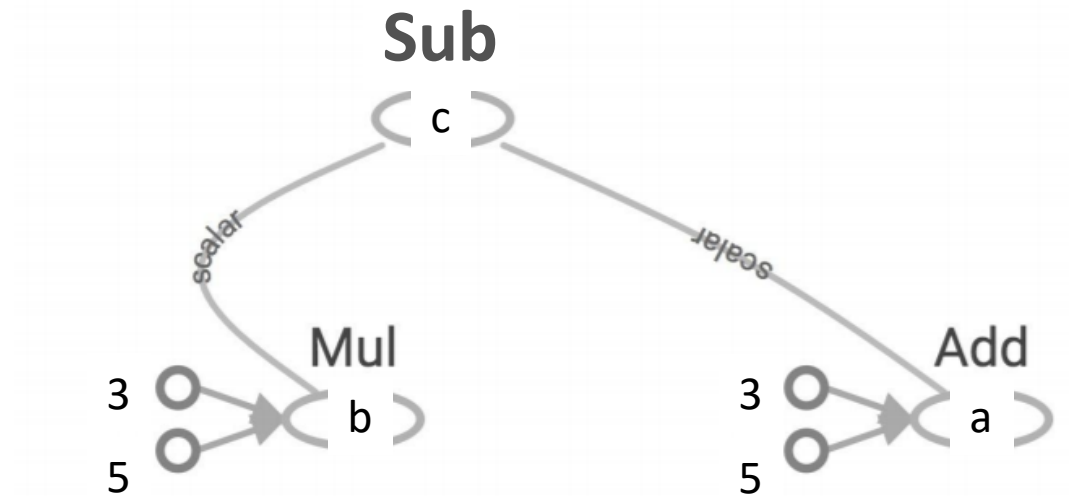
```
a = tf.add(3,5)
```

```
b = tf.multiply(3,5)
```

```
c = tf.subtract(a,b)
```

```
print(c)
```

```
>>>Tensor("Pow_1:0", shape=(), dtype=int32)
```



The most important (and annoying) part of learning TensorFlow: Graphs

```
import tensorflow as tf
```

```
a = tf.add(3,5)
```

```
b = tf.multiply(3,5)
```

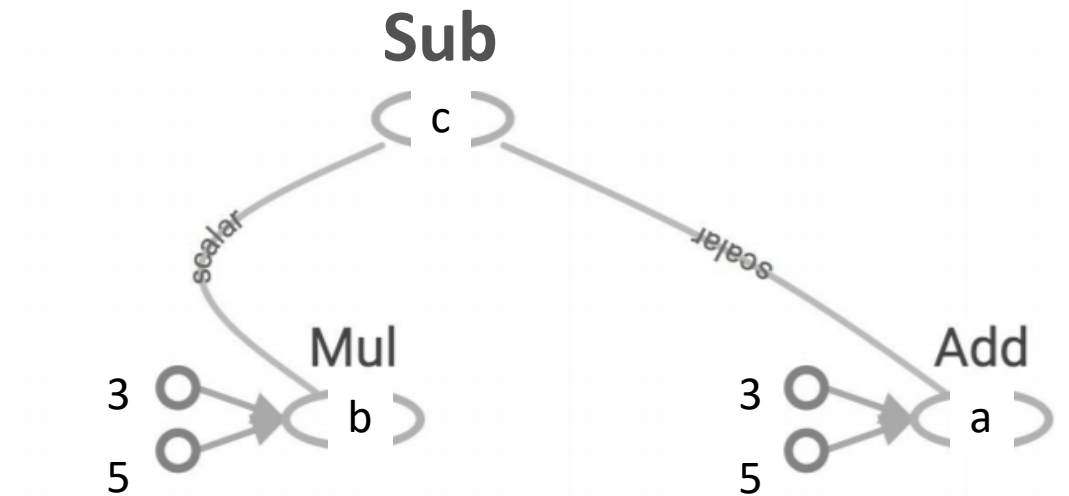
```
c = tf.subtract(a,b)
```

```
with tf.Session() as sess:
```

```
    the_real_c = sess.run(c)
```

```
    print(the_real_c)
```

```
>>> -7
```



Why Graphs?

Because of parallel computing...

Say you want to compute:

$$f(x, y) = x^2 y + y + 2$$

