



TensorFlow

Курс “Практическое применение по TensorFlow”

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TensorFlow installation

1. Install Anaconda <https://docs.anaconda.com/anaconda/install/#>



A screenshot of the Anaconda documentation website. The left sidebar shows a navigation menu with 'Anaconda Distribution' expanded, listing 'Installation', 'Installing on Windows', 'Installing on macOS' (highlighted), 'Installing on Linux', 'Installing on Linux POWER', 'Installing in silent mode', 'Verifying your installation', 'Anaconda installer file hashes', 'Updating from older versions', and 'Uninstalling Anaconda'. The main content area is titled 'Installing on macOS' and includes a hamburger menu icon. Below the title, it states: 'You can install Anaconda using either the graphical installer ("wi; unsure, choose the graphical install."). The section 'macOS graphical install' lists five steps: 1. Download the graphical macOS installer for your version of Py; 2. OPTIONAL: Verify data integrity with MD5 or SHA-256. For macOS verification?; 3. Double-click the downloaded file and click continue to start the; 4. Answer the prompts on the Introduction, Read Me, and Licens; 5. Click the Install button to install Anaconda in your home user c. At the bottom, there is a preview of the 'Install Anaconda3' window, showing 'Standard Install on "Macintosh HD"' and a warning: 'This will take 2.13 GB of space on your computer. Click Install to perform a standard installation of this software'.

Tensorflow installation

2. Create conda environment:

```
conda create -n tensorflow_1 python=3.x
```

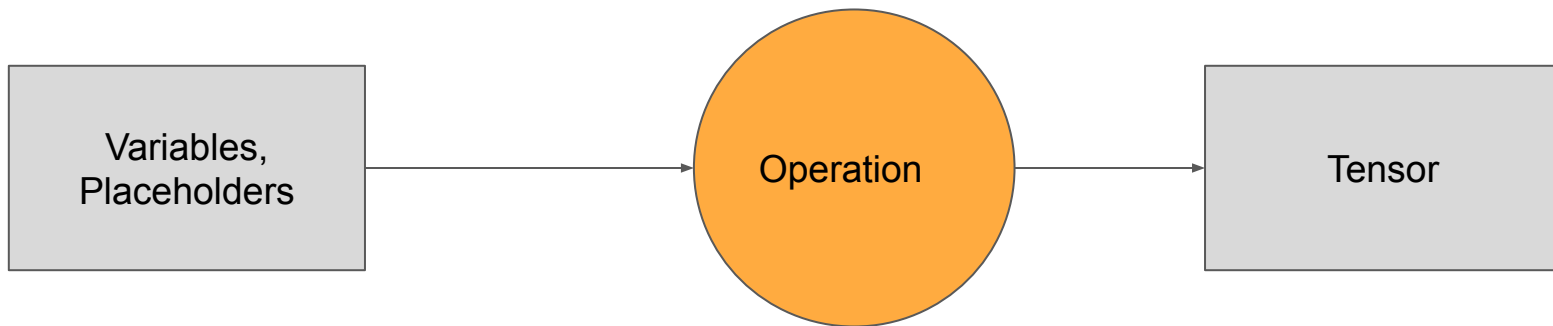
3. Install TensorFlow into created environment (tensorflow 1.15):

```
source activate tensorflow_1
```

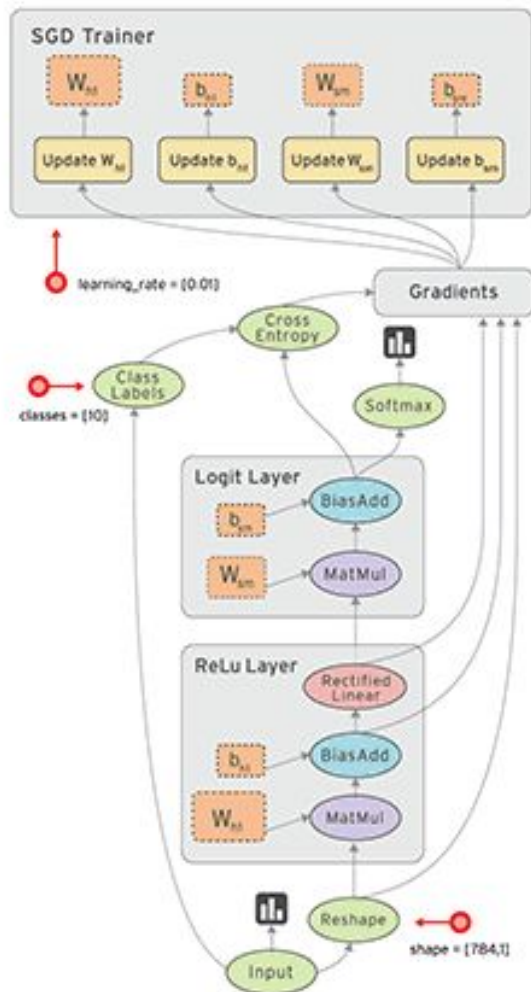
```
pip install tensorflow or pip install tensorflow-gpu
```

<https://www.tensorflow.org/install/pip>

Static graph



Dataflow



Static graph

```
graph = tf.Graph()  
with graph.as_default():  
    tmp = tf.constant(5.)  
  
assert tmp.graph is graph
```

```
tmp = tf.constant(5.)  
assert tmp.graph is tf.get_default_graph()
```

Session

```
tmp = tf.multiply(2, 3)
```

```
session = tf.Session()  
output = session.run(tmp)
```

```
print(output) # 6
```

```
graph = tf.Graph()  
with graph.as_default():  
    tmp = tf.multiply(2, 3)
```

```
session = tf.Session(graph=graph)  
output = session.run(tmp)
```

```
print(output) # 6
```

CPU / GPU config

```
session_conf = tf.ConfigProto(  
    device_count={'CPU': 1, 'GPU': 0},  
    allow_soft_placement=True,  
    log_device_placement=True  
)
```

```
gpu_options = tf.GPUOptions(per_process_gpu_memory_fraction=1.0)  
session_conf = tf.ConfigProto(allow_soft_placement=True,  
                               log_device_placement=True,  
                               gpu_options=gpu_options)
```

```
session = tf.Session(graph=graph, config=session_conf)
```


Placeholder

```
tmp = tf.placeholder(dtype=tf.int32, shape=(None), name='temp_variable')
out = tf.matmul(tmp, tmp)

session = tf.Session()
output = session.run(out, feed_dict={tmp: np.ones((2, 2))})

print(output)  #[[2 2] [2 2]]
```

Variable

```
temp = tf.Variable(initial_value=5., dtype=tf.float32,  
                   trainable=False, name='temp')  
  
output_op = tf.multiply(temp, temp)  
  
print(output_op) # Tensor("Mul:0", shape=(), dtype=float32)
```

How to run Variable

1. Initialize all variables in graph

```
init_variables_op = tf.initialize_all_variables()
```

2. Run init operation via Session

```
session.run(init_variables_op)
```

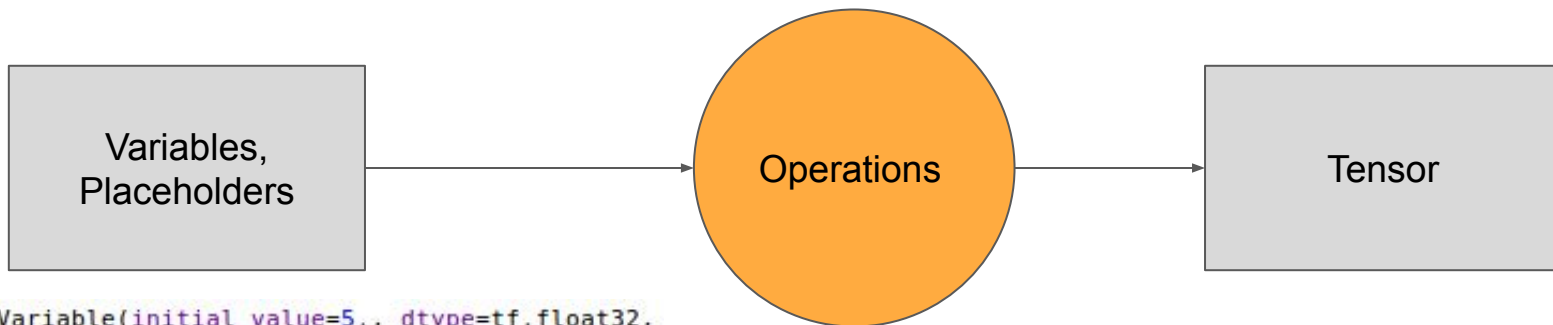
3. After that run needed graph's operations (as was done before)

```
output_op = session.run(output_op)
```

```
print(output_op) # 25.0
```

Tensor

```
output = tf.multiply(temp, temp)
```



```
temp = tf.Variable(initial_value=5., dtype=tf.float32,  
                  trainable=False, name='temp')
```