

```
In [ ]: # Install TensorFlow
# !pip install -q tensorflow-gpu==2.0.0-beta1

try:
    %tensorflow_version 2.x # Colab only.
except Exception:
    pass

import tensorflow as tf
print(tf.__version__)
```

`%tensorflow_version` only switches the major version: 1.x or 2.x.
You set: `2.x` # Colab only.`. This will be interpreted as: `2.x`.

TensorFlow 2.x selected.
2.2.0-rc2

```
In [ ]: a = tf.constant(3.0)
b = tf.constant(4.0)
c = tf.sqrt(a**2 + b**2)
print("c:", c)

# if you use Python 3 f-strings it will print
# the tensor as a float
print(f"c: {c}")
```

c: tf.Tensor(5.0, shape=(), dtype=float32)
c: 5.0

```
In [ ]: # Get the Numpy version of a Tensor
c.numpy()
```

Out[]: 5.0

```
In [ ]: type(c.numpy())
```

Out[]: numpy.float32

```
In [ ]: a = tf.constant([1, 2, 3])
b = tf.constant([4, 5, 6])
print(f"b: {b}")
c = tf.tensordot(a, b, axes=[0,0])
print(f"c: {c}")
```

b: [4 5 6]
c: 32

```
In [ ]: a.numpy().dot(b.numpy())
```

```
In [ ]: import numpy as np
A0 = np.random.randn(3, 3)
b0 = np.random.randn(3, 1)
```

```
c0 = A0.dot(b0)
print(f"c0: {c0}")

A = tf.constant(A0)
b = tf.constant(b0)
c = tf.matmul(A, b)
print(f"c: {c}")
```

```
c0: [[ 1.13966116]
      [-0.31443995]
      [-0.78649886]]
c: [[ 1.13966116]
     [-0.31443995]
     [-0.78649886]]
```

In []:

```
# Broadcasting
A = tf.constant([[1,2],[3,4]])
b = tf.constant(1)
C = A + b
print(f"C: {C}")
```

```
C: [[2 3]
     [4 5]]
```

In []:

```
# Element-wise multiplication
A = tf.constant([[1,2],[3,4]])
B = tf.constant([[2,3],[4,5]])
C = A * B
print(f"C: {C}")
```

```
C: [[ 2  6]
     [12 20]]
```