

## 라이브러리 import 하기

```
import tensorflow.compat.v1 as tf
tf.disable_v2_behavior()
```

```
import numpy as np
import matplotlib.pyplot as plt
```

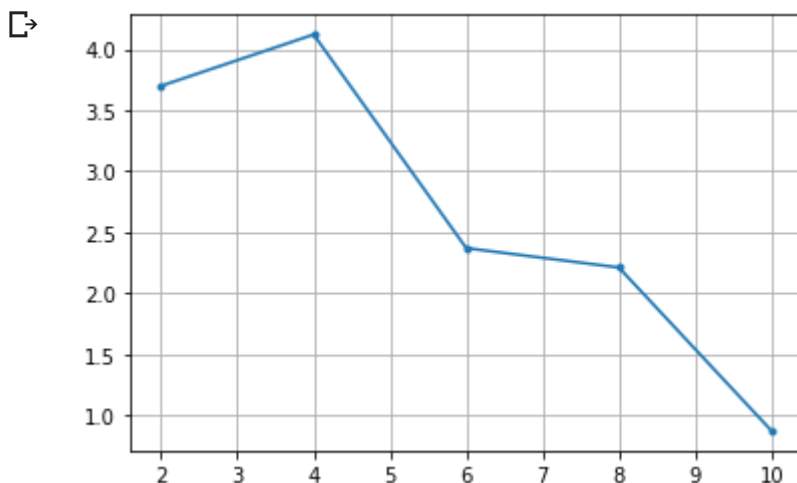
⚠ WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/compat/v2\_cc  
Instructions for updating:  
non-resource variables are not supported in the long term

## X and Y data(given)

```
x_train = [2, 4, 6, 8, 10]
y_train = [5, 4, 3, 2, 1]
signal_length = len(x_train)
y_noise = np.random.normal(0,1,signal_length)
```

```
y_train = y_train + y_noise
```

```
plt.plot(x_train, y_train, '-.')
plt.grid()
```



## initalization

```
w = tf.Variable(tf.random_normal([1]), name='weight')
b = tf.Variable(tf.random_normal([1]), name='wbias')
```

```
w0 = 9.0;
b0 = 4.0;
```

```
w = tf.Variable(w0*tf.ones([1]), name='weight')
b = tf.Variable(b0*tf.ones([1]), name='baias')
```

```
hyporthesis = x_train * w + b
```

```
loss = tf.reduce_mean(tf.square(hyporthesis - y_train))
```

## Optimizer

```
optimizer = tf.train.GradientDescentOptimizer(learning_rate=0.01)
train = optimizer.minimize(loss)
```

## Launch the graph in a session

```
sess = tf.Session()
```

## Initializes global variables in the graph.

```
sess.run(tf.global_variables_initializer())
```

```
nb_epoch = 2001
```

```
for step in range(nb_epoch):
    sess.run(train)
```

```
    if step % 200 == 0:
        w1 = sess.run(w)[0]
        b1 = sess.run(b)[0]
        print(step, sess.run(loss), w1, b1)
```

```
➦ 0 41.432655 0.8582796 2.8931143
   200 0.39634684 -0.23312217 3.8661864
   400 0.24244113 -0.30690777 4.405086
   600 0.20562634 -0.34299526 4.668654
   800 0.19682005 -0.36064538 4.797563
  1000 0.19471374 -0.36927742 4.8606076
  1200 0.19420974 -0.37349918 4.8914423
  1400 0.19408944 -0.3755638 4.906521
  1600 0.19406047 -0.37657356 4.913896
  1800 0.19405352 -0.37706748 4.9175034
  2000 0.19405195 -0.37730896 4.919267
```

## 학습완료

```
w1 = sess.run(w)[0]
b1 = sess.run(b)[0]
```

## 출력해보기

```
print(w1, b1)
```

```
↳ -0.37730896 4.919267
```

```
str1 = 'y =' + str(w1) + 'x +' + str(b1)
print(str1)
```

```
↳ y =-0.37730896x +4.919267
```

```
plt.figure(figsize=(6,4))
plt.plot(x_train, y_train, 'o')
```

```
x1 = np.linspace(np.min(x_train)-1, np.max(x_train)+1)
y1 = w1*x1 + b1
plt.plot(x1, y1)
```

```
plt.grid()
plt.title(str1)
```

```
↳ Text(0.5, 1.0, 'y =-0.37730896x +4.919267')
```

