



deeplearning.ai

# Programming Frameworks

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## TensorFlow

# Motivating problem

$$\begin{aligned} J(w) &= \boxed{w^2 - 10w + 25} \\ &\quad \uparrow \\ &\quad (w-5)^2 \\ &\quad w=5 \end{aligned}$$

$$\begin{aligned} J(w, b) \\ \uparrow \quad \uparrow \end{aligned}$$

# Code example

```
import numpy as np
import tensorflow as tf
```

```
coefficients = np.array([[1], [-20], [25]])
```

```
w = tf.Variable([0], dtype=tf.float32)
```

```
x = tf.placeholder(tf.float32, [3,1])
```

```
cost = x[0][0]*w**2 + x[1][0]*w + x[2][0] # (w-5)**2
```

```
train = tf.train.GradientDescentOptimizer(0.01).minimize(cost)
```

```
init = tf.global_variables_initializer()
```

```
session = tf.Session()
```

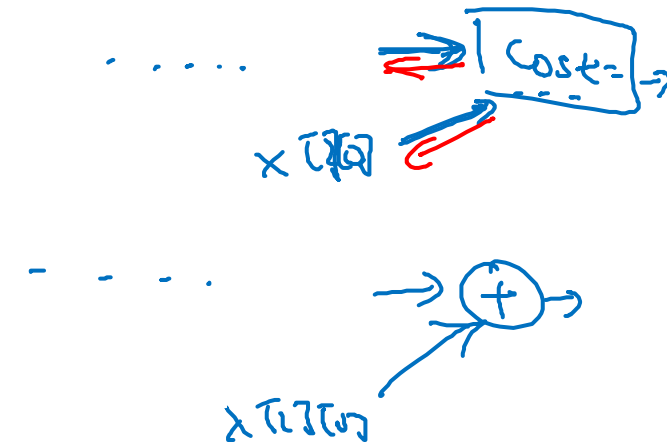
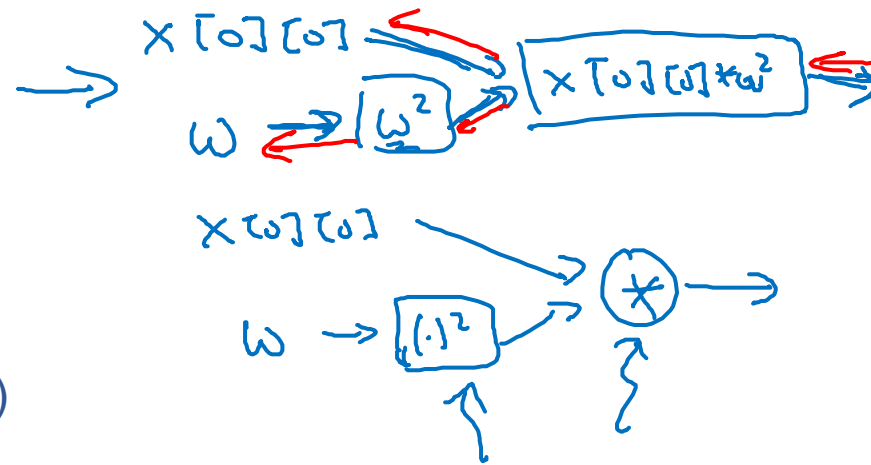
```
session.run(init)
```

```
print(session.run(w))
```

```
for i in range(1000):
```

```
    session.run(train, feed_dict={x:coefficients})
```

```
print(session.run(w))
```



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

```
    session.run(init)
```

```
    print(session.run(w))
```