# A TensorFlow Tutorial
## Email Classification with Logistic Regression

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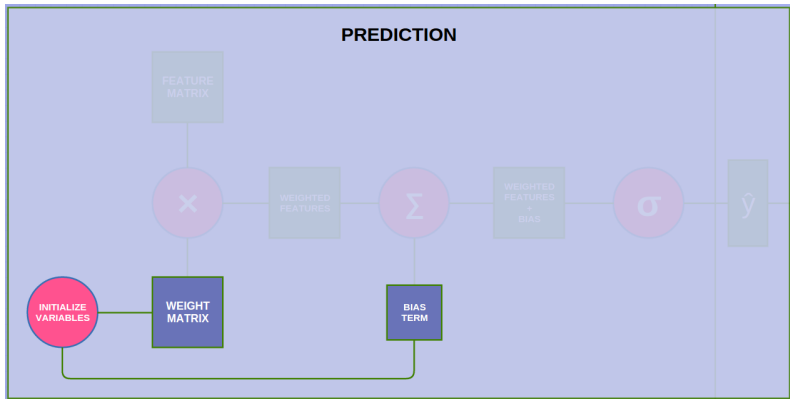[1]University of Arizona

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# The *Flow* of TensorFlow

# Initialize Weights & Bias Terms

```
#################
### VARIABLES ###
#################

# all values are randomly assigned:
# sqrt(6 / (numInputNodes + numOutputNodes + 1))

weights = tf.Variable(tf.random_normal([numFeatures,numLabels],
          mean=0,
          stddev=(np.sqrt(6/numFeatures+numLabels+1)),
          name="weights"))

bias = tf.Variable(tf.random_normal([1,numLabels],
       mean=0,
       stddev=(np.sqrt(6/numFeatures+numLabels+1)),
       name="bias"))


# INITIALIZE our weights and biases
init_OP = tf.initialize_all_variables()
```
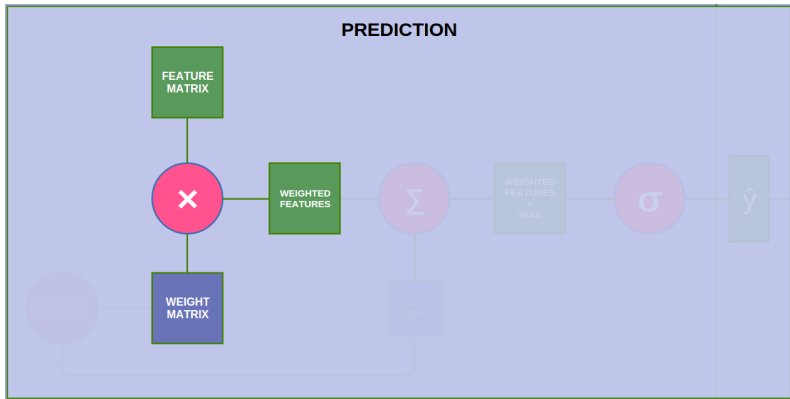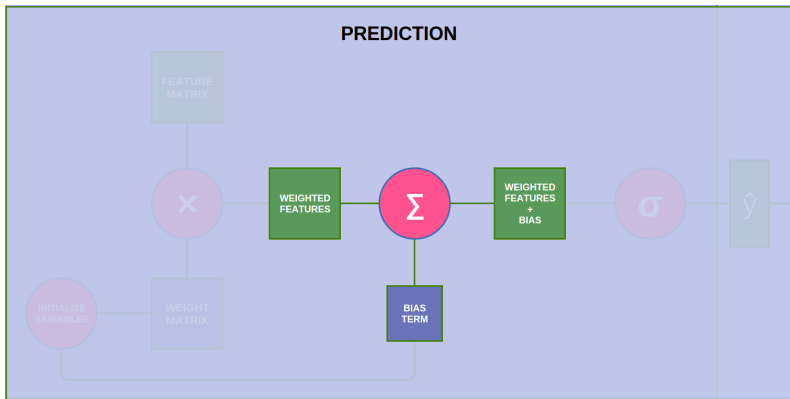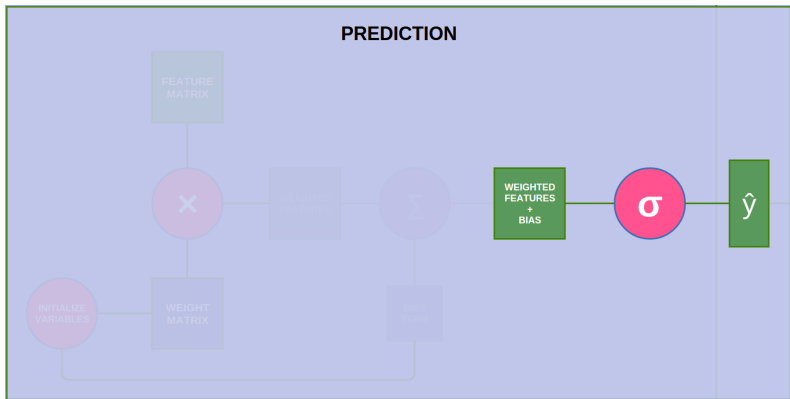
# Apply Weights to Features

```
apply_weights_OP = tf.matmul(X, weights, name="apply_weights")
```
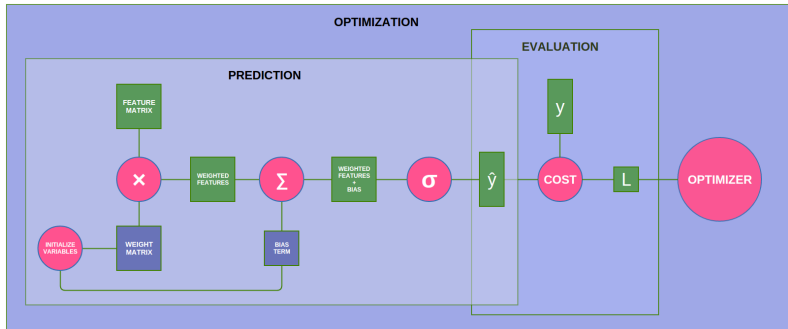
# Add Bias to Weighted Features

```
add_bias_OP = tf.add(apply_weights_OP, bias, name="add_bias")
```

# Apply Sigmoid Activation

```
activation_OP = tf.nn.sigmoid(add_bias_OP, name="activation")
```

# Full Computational Graph

Thank you!