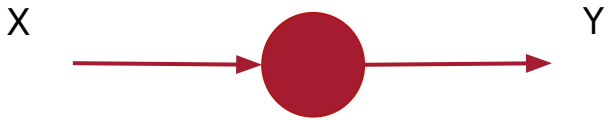
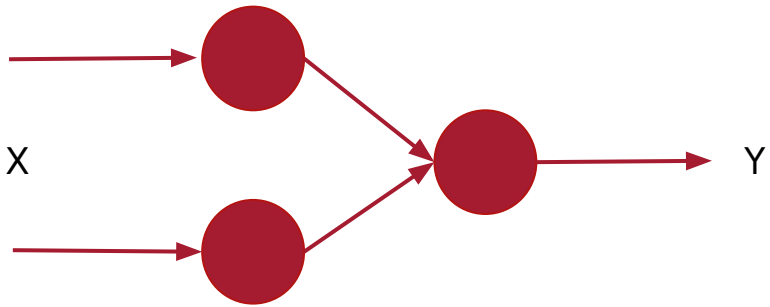
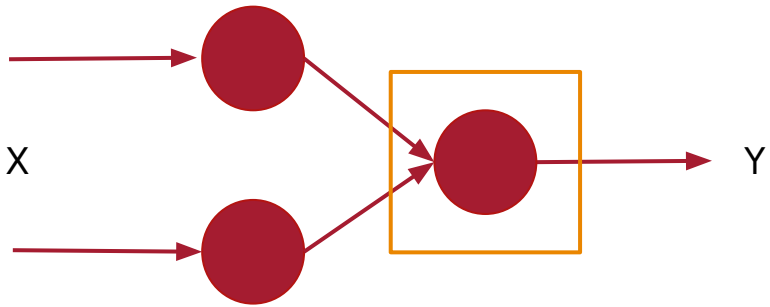
Going Further

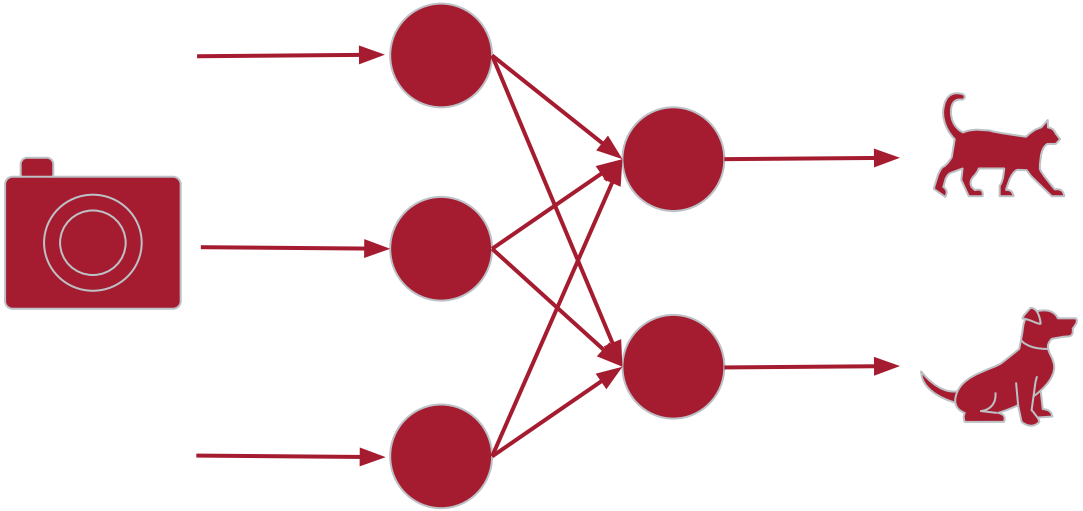
From regression to classification

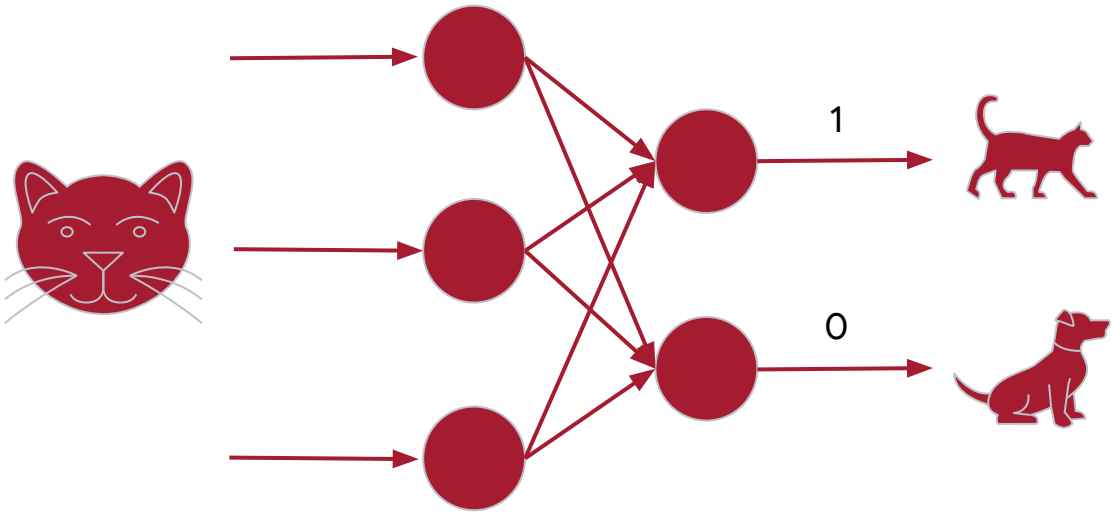
Laurence Moroney, Google


X
Y


X
Y


X
Y

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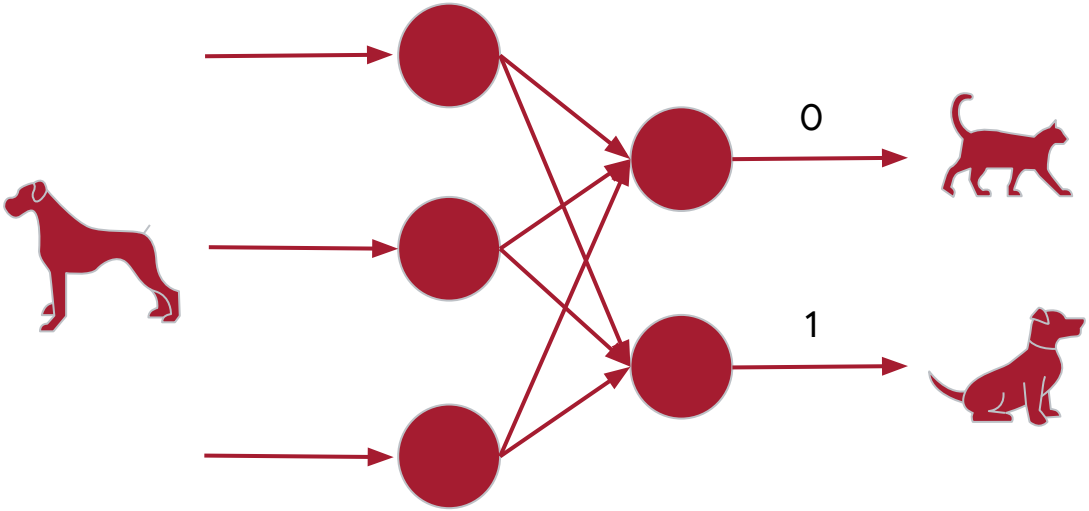
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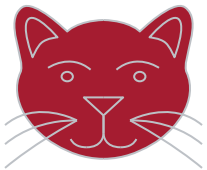
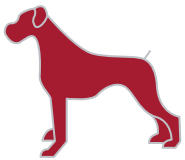
1

Data	Label
	[1, 0]
	[0, 1]

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8	[0, 0, 0, 0, 0, 0, 0, 0, 1, 0]
9	[0, 0, 0, 0, 0, 0, 0, 0, 0, 1]

```
import tensorflow as tf

data = tf.keras.datasets.mnist
(training_images, training_labels), (val_images, val_labels) = data.load_data()

training_images  = training_images / 255.0
val_images = val_images / 255.0

model = tf.keras.models.Sequential(
    [tf.keras.layers.Flatten(input_shape=(28,28)),
     tf.keras.layers.Dense(20, activation=tf.nn.relu),
     tf.keras.layers.Dense(10, activation=tf.nn.softmax)])
```

60,000 Labelled Training Examples
10.000 Labelled Validation Examples

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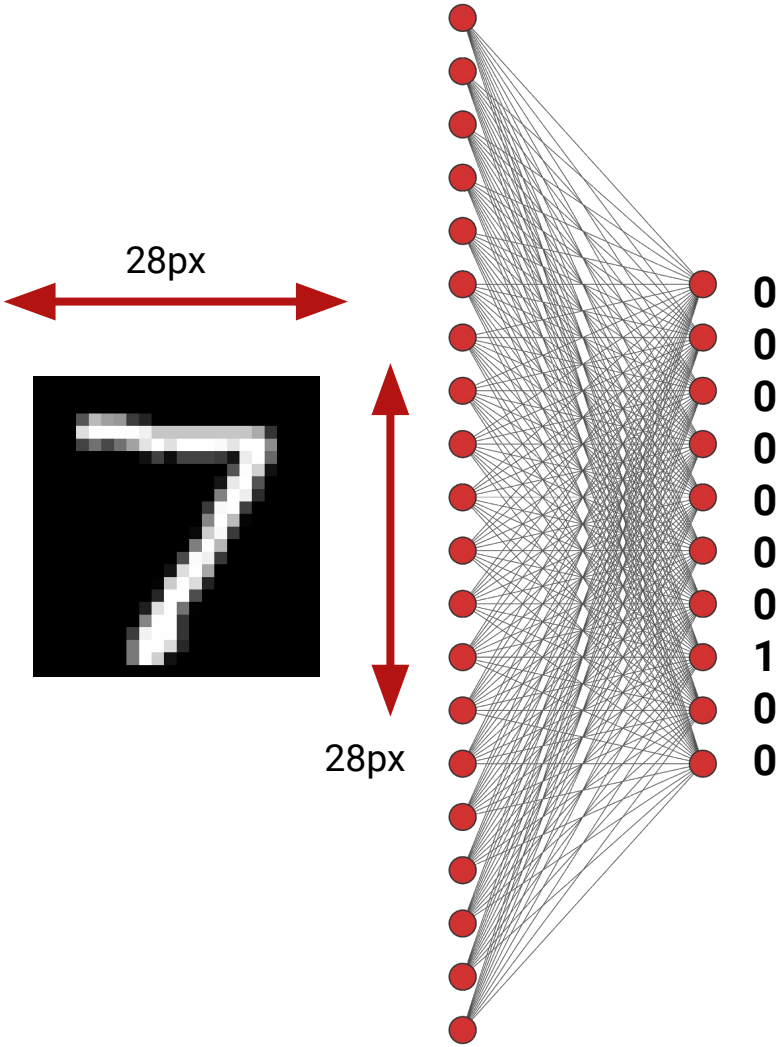
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28px
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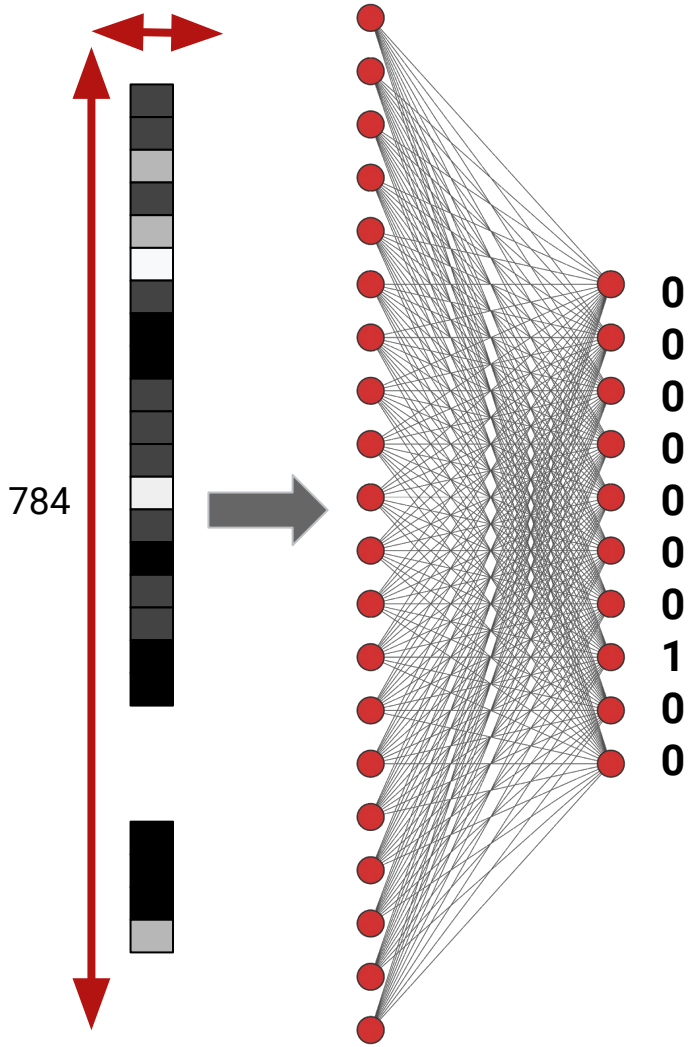
0
0
0
0
1
0
0


784
0
0
0
0
0
0
0
1
0
0

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```
model.compile(optimizer='adam',
              loss='sparse_categorical_crossentropy',
              metrics=['accuracy'])

model.fit(training_images, training_labels, epochs=20)
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```

```
classifications = model.predict(val_images)

print(classifications[0])

print(test_labels[0])
```

```
[2.4921512e-09 1.3765138e-10 8.8281205e-08
1.0477231e-03 2.8455029e-12 4.0820678e-06
2.0070659e-16 9.9894780e-01 1.0296049e-07
2.9972372e-07]


7
```

Your turn!