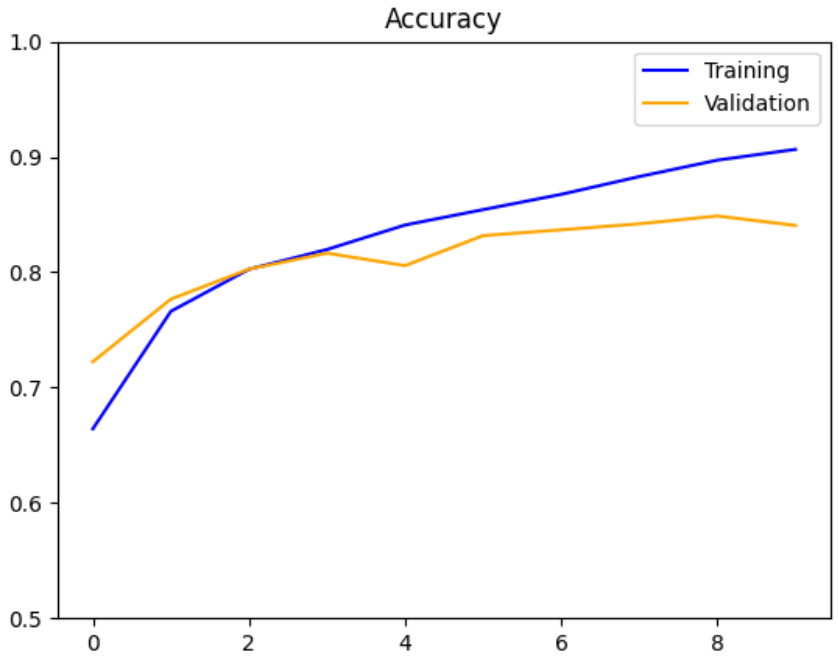
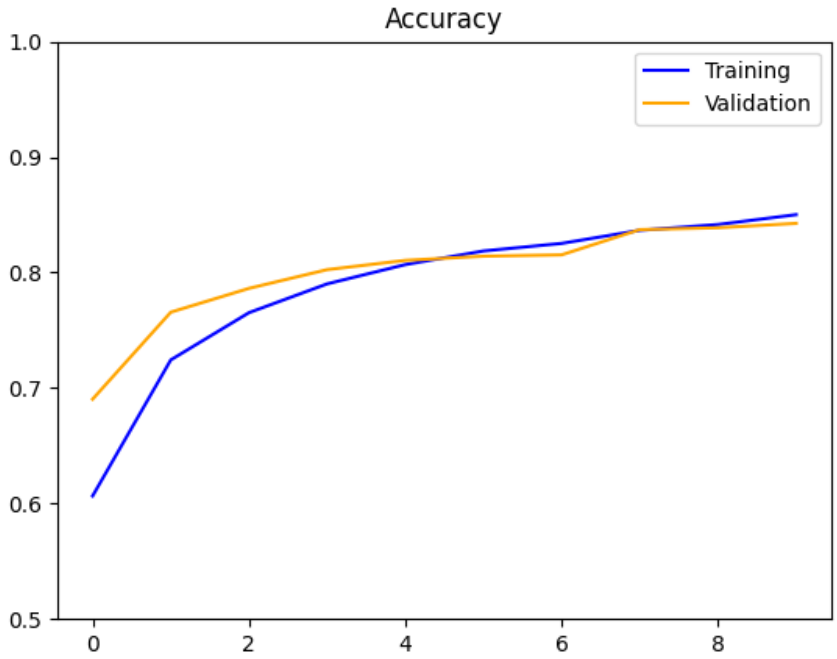
First Attempt:

Neural net with three convolutional and pooling layers, a 64-neuron fully connected layer, and two output neurons. After 10 epochs, the model is clearly overfitting.



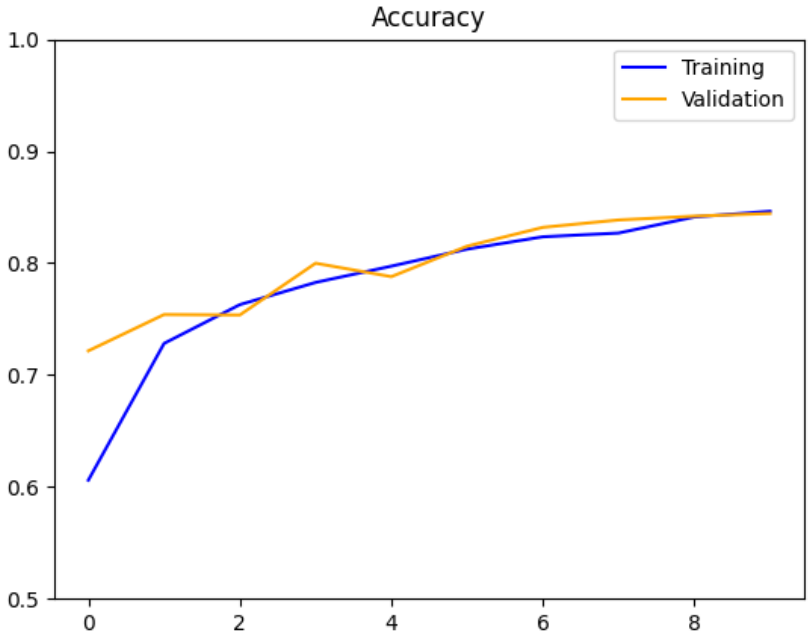
Second Attempt:

A 20% dropout was added after each pooling layer. The result is that overfitting was removed, but the maximum accuracy remained the same.



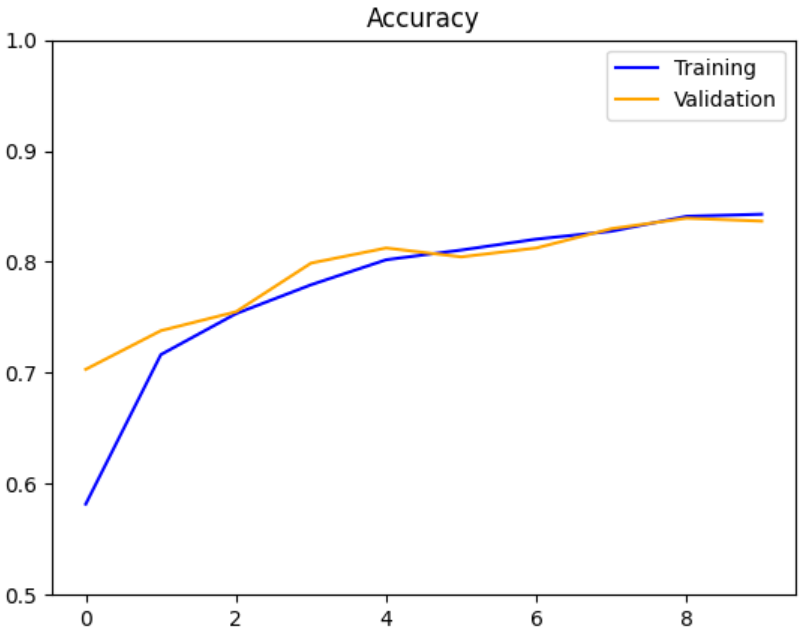
Third Attempt:

An extra, 32-neuron, fully connected layer was added before the two output neurons. No real change was found in the results.



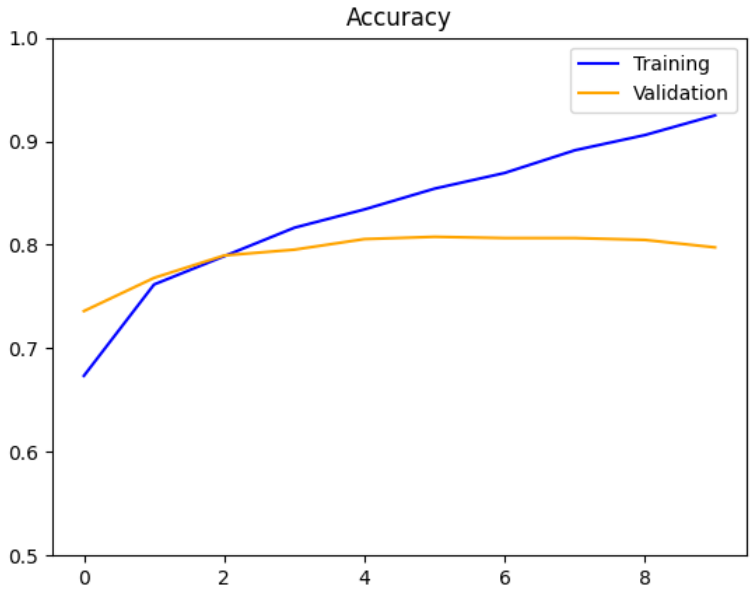
Fourth Attempt:

The fully connected layer was reduced from 64 to 32 neurons. There was little resulting change in maximum accuracy, demonstrating that a smaller fully connected layer is sufficient.



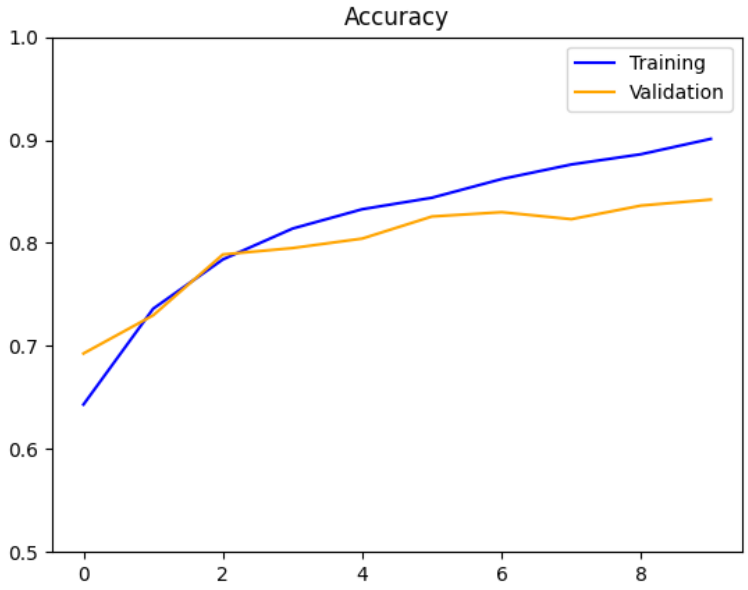
Fifth Attempt:

The number of convolutional layers was reduced from 3 to 2 (no dropout, 64 fully connected neurons). Overfitting becomes much more obvious. Negative improvement.



Sixth Attempt:

Image size was increased from 64x64 pixels to 128x128 pixels (3 convolutional layers, 20% dropout, 64 fully connected neurons). Once again, no improvement.



Example Log from Attempt Three:

```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 62, 62, 32)        896

 max_pooling2d (MaxPooling2D  (None, 31, 31, 32)       0
 )

 dropout (Dropout)           (None, 31, 31, 32)        0

 conv2d_1 (Conv2D)           (None, 29, 29, 32)        9248

 max_pooling2d_1 (MaxPooling  (None, 14, 14, 32)       0
 2D)

 dropout_1 (Dropout)         (None, 14, 14, 32)        0

 conv2d_2 (Conv2D)           (None, 12, 12, 32)        9248

 max_pooling2d_2 (MaxPooling  (None, 6, 6, 32)         0
 2D)

 dropout_2 (Dropout)         (None, 6, 6, 32)          0

 flatten (Flatten)           (None, 1152)              0

 dense (Dense)               (None, 64)                73792

 dense_1 (Dense)             (None, 32)                2080

 dense_2 (Dense)             (None, 2)                 66

=================================================================
Total params: 95,330
Trainable params: 95,330
Non-trainable params: 0
_________________________________________________________________
```

```
Found 20000 images belonging to 2 classes.
Found 5000 images belonging to 2 classes.
Epoch 1/10
625/625 [==============================] - 49s 77ms/step - loss: 0.6409 - accuracy: 0.6059 - val_loss: 0.5550 - val_accuracy: 0.7216
Epoch 2/10
625/625 [==============================] - 48s 77ms/step - loss: 0.5384 - accuracy: 0.7282 - val_loss: 0.5050 - val_accuracy: 0.7540
Epoch 3/10
625/625 [==============================] - 48s 77ms/step - loss: 0.4905 - accuracy: 0.7628 - val_loss: 0.4962 - val_accuracy: 0.7536
Epoch 4/10
625/625 [==============================] - 49s 78ms/step - loss: 0.4615 - accuracy: 0.7827 - val_loss: 0.4311 - val_accuracy: 0.7999
Epoch 5/10
625/625 [==============================] - 48s 77ms/step - loss: 0.4304 - accuracy: 0.7972 - val_loss: 0.4428 - val_accuracy: 0.7879
Epoch 6/10
625/625 [==============================] - 49s 78ms/step - loss: 0.4083 - accuracy: 0.8124 - val_loss: 0.4167 - val_accuracy: 0.8151
Epoch 7/10
625/625 [==============================] - 49s 78ms/step - loss: 0.3905 - accuracy: 0.8235 - val_loss: 0.3737 - val_accuracy: 0.8319
Epoch 8/10
625/625 [==============================] - 48s 78ms/step - loss: 0.3798 - accuracy: 0.8268 - val_loss: 0.3726 - val_accuracy: 0.8385
Epoch 9/10
625/625 [==============================] - 48s 77ms/step - loss: 0.3566 - accuracy: 0.8412 - val_loss: 0.3564 - val_accuracy: 0.8419
Epoch 10/10
625/625 [==============================] - 48s 77ms/step - loss: 0.3449 - accuracy: 0.8463 - val_loss: 0.3489 - val_accuracy: 0.8444
```