In this part, the original code from part b was used to test 12000 samples from 60000 pictures. Using this code, it will be assumed that the overall accuracy will change. In the design, the pictures are shuffled and the then using the same ratio from the original code, 5/6 of the overall pictures, 10000 pictures will be used for training and the 2000 different pictures will be used as testing.

Initial tests:

For the final results, the amount of accuracy lowered significantly. The overall accuracy was 0.70 down from the original data which was 0.80. The reason why is that with lower testing data there was a lower accuracy is that there is lower variance in the pictures.

```
                                        shuffle=False),
                                    steps=x_test.shape[0] // batch_size,
                                    workers=4)
```

```
Model Accuracy = 0.73
```

In [14]:

```
for predict_index, predicted_y in enumerate(predict_gen):
    actual_label = labels['label_names'][np.argmax(y_test[predict_index])]
    predicted_label = labels['label_names'][np.argmax(predicted_y)]
    print('Actual Label = %s vs. Predicted Label = %s' % (actual_label,
                                                          predicted_label))
    if predict_index == num_predictions:
        break
```

```
Actual Label = automobile vs. Predicted Label = automobile
Actual Label = horse vs. Predicted Label = deer
Actual Label = bird vs. Predicted Label = frog
Actual Label = airplane vs. Predicted Label = ship
Actual Label = ship vs. Predicted Label = ship
Actual Label = dog vs. Predicted Label = dog
Actual Label = horse vs. Predicted Label = horse
Actual Label = cat vs. Predicted Label = dog
Actual Label = horse vs. Predicted Label = horse
Actual Label = horse vs. Predicted Label = horse
Actual Label = automobile vs. Predicted Label = automobile
Actual Label = automobile vs. Predicted Label = automobile
Actual Label = horse vs. Predicted Label = horse
Actual Label = horse vs. Predicted Label = horse
Actual Label = truck vs. Predicted Label = truck
Actual Label = dog vs. Predicted Label = bird
Actual Label = deer vs. Predicted Label = deer
Actual Label = automobile vs. Predicted Label = automobile
Actual Label = horse vs. Predicted Label = horse
Actual Label = dog vs. Predicted Label = dog
Actual Label = truck vs. Predicted Label = truck
```

Increased Epochs:

After tweaking many variables, it seemed like increasing the epochs did the increase the accuracy the most. The total accuracy was 0.73 from 0.7 Using the previous other variables that were used before, the epochs was increased to 200. As shown, it seems like the accuracy was increased. However, as a of this increase, there seems to take many more seconds compared to lower epochs.