ECE421: Lab 2 Q&A

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Hidden layer sizes = (5, 5)

```
Training Accuracy: 0.5250
Testing Accuracy: 0.4000
Confusion Matrix from Part 1b is: [[ 8  0]
 [12  0]]
```

We see that with too few hidden layers, there aren't enough parameters for the model to learn very well, and we severely underfit the data.

Hidden layer sizes = (10, 10)

```
Training Accuracy: 0.9625
Testing Accuracy: 0.9500
Confusion Matrix from Part 1b is: [[ 7  1]
 [ 0 12]]
```

By increasing the hidden layers and giving more parameters, we significantly improve both training and testing accuracy.

Hidden_layer sizes = (30, 10)

With an even higher number of hidden Layers, we observe the Training Accuracy is equivalently high as Hidden layer sizes = (10, 10), while the testing accuracy drops. It is because as model complexity/capacity increases, the model tends to memorize the samples/data, resulting in overfitting.

```
Training Accuracy: 0.9625
Testing Accuracy: 0.9000
Confusion Matrix from Part 1b is: [[ 7  1]
 [ 1 11]]
```