Exercise: One-vs-all Logistic Regression

Overview:
In this exercise, you will implement the one-vs-all classification for the handwritten digit dataset.

List of Files for this assignment:
ex3.py - script that steps you through the exercise

ex3data1.mat - Training set of hand-written digits

ex3modules.py - the script that needs to be filled in by you for this assignment. It contains the following functions:
- `sigmoid`: Computes the sigmoid function
- `logRegCost`: Computes the logistic regression cost function
- `logRegGrad`: Computes the gradient of logistic regression cost function
- `trainOneVsAll`: train logistic regression classifiers with regularization parameter.
- `predictOneVsAll`: make predictions using the trained one-vs-all logistic regression parameters.

What you should do:
Note that the five functions declared in ex3modules.py are not yet implemented. Your task is to implement the three functions by filling in "YOUR CODE HERE" sections. After you have finished filling in your code, activate Miniconda, change directory to where your ex3.py is located, then type in following command and press Enter:

```
python ex3.py
```

This will run the ex3.py Python script. During the execution, you will see output text results in console and graphic results in a separate window. If your implementation is correct, the graphic results will be similar to what is shown on the "Sample Results" section of this instructions sheet, and the training accuracy of one-vs-all logistic regression will become higher than 95%.

Sample Results: