Capstone Project Readme

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Files/Directories

- capstone.py
    - Main Python project code. This code along with the two weight files listed below should all be in the same directory.
- graph_utils.py
    - Set of graphing functions to output metric visualizations. This should be place in the same directory as the capstone.py file.
- benchmark_dqn.h5
    - Weights file for optimized benchmark NN.
- solution_dqn.h5
    - Weights file for optimized solution NN.
- saved_models
    - <u>Required</u> directory to store periodic weight files. This directory can be initially empty.
- Images
    - Directory that holds all the generated images and screenshots used in the report. This isn't a required directory, but it was added for further reference.
- project_report.pdf
    - The capstone project's report.
- proposal.pdf
    - The capstone proposal document.

Required Packages

- Python 3.6.1
    - The project was created with Anaconda 3
- Keras 2.1.2
- TensorFlow 1.12.0
- Numpy 1.14.0
- Matplotlib 2.1.2
- gym.spaces

How to Run

Call capstone.py from a command line:

```
> Python captone.py
```

In its current default settings, it will run the 100 tests against both the benchmark and solution trained DQNs by pulling in the benchmark_dqn.h5 and solution_dqn.h5 files and render the images. If you want to adjust from the default you can adjust a few variables to run various options. At the bottom of the file you will see these variables and their current settings:

```
run_benchmark_multiple_tests = False
run_solution_multiple_tests = False
run_benchmark_test = False
run_solution_test = False
run_benchmark_100_test = True
run_solution_100_test = True
```

run_*_multiple will run various tests on parameter settings (This takes about 24-48 hours to run). run_*_test will run a training session on the parameter settings that I found to be the most optimal for both the benchmark and solution. run_*_100_test will load the *_dqn.h5 weights files and run 100 tests against the trained NN. This last set of variables is currently set to True; however, you can change the other ones, but they will take a long time to complete.