Goals:

Create at least two different “bot” agents for the PlanetWars simulation.

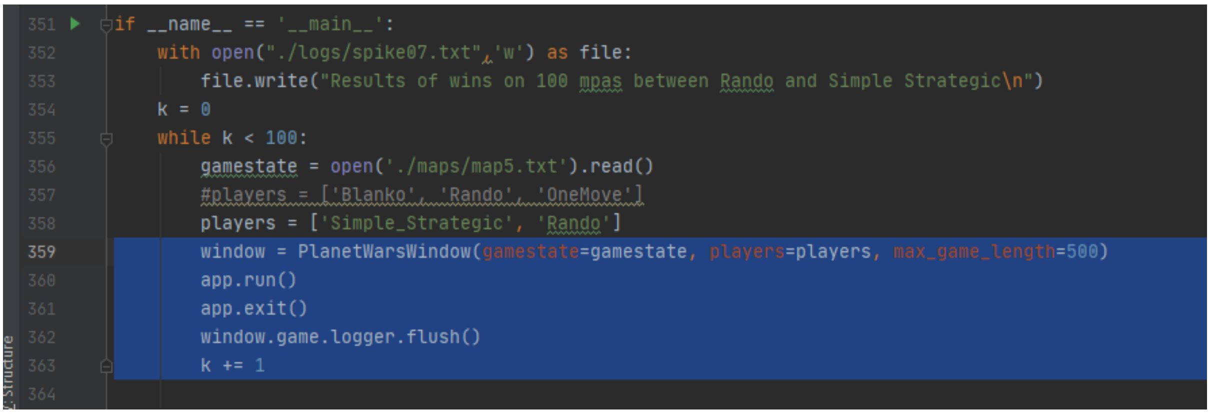
- One of your bots must utilise tactical analysis to inform its decisions. Examples:
  - Simple: include attacking “weakest”, “strongest”, “closest” or most productive planet.
  - Complex: include event detection (“fleet leaving planet vulnerable”), scouting or fog-of-war deception.
- Numerically compare each bots’ performance and present the results of the both performances over multiple maps.

Technologies, Tools, and Resources used:

- Python IDE (PyCharm) with Python 3 installed
- Pyglet Documentation here: http://pyglet.readthedocs.io/en/pyglet-1.3-maintenance/
- Help from peers.
- Python 3 Documentation http://docs.python.org/
- The Lab 04 work was used as a base for the spike
  - One of the bots from this work “Simple_Stratigic.py” is used as one of the bots as it uses simple analysis to determine the planet to attack
  - The other bot used is the “Rando.py” which just attacks randomly

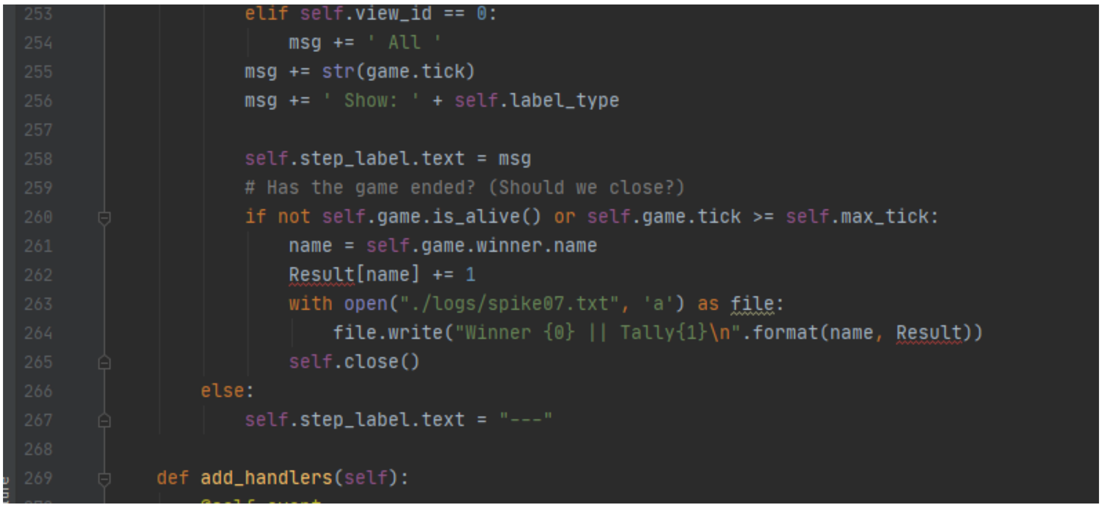
Task done:

1. Got the main function to run for a set number of times for testing the bots and getting the number of wins for each.



```
if __name__ == '__main__':
    with open("./logs/spike07.txt",'w') as file:
        file.write("Results of wins on 100 mpas between Rando and Simple Strategic\n")
    k = 0
    while k < 100:
        gamestate = open('./maps/map5.txt').read()
        #players = ['Blanko', 'Rando', 'OneMove']
        players = ['Simple_Strategic', 'Rando']
        window = PlanetWarsWindow(gamestate=gamestate, players=players, max_game_length=500)
        app.run()
        app.exit()
        window.game.logger.flush()
        k += 1
```

2. Updated the update function in main to amend the text file to record wins and name.

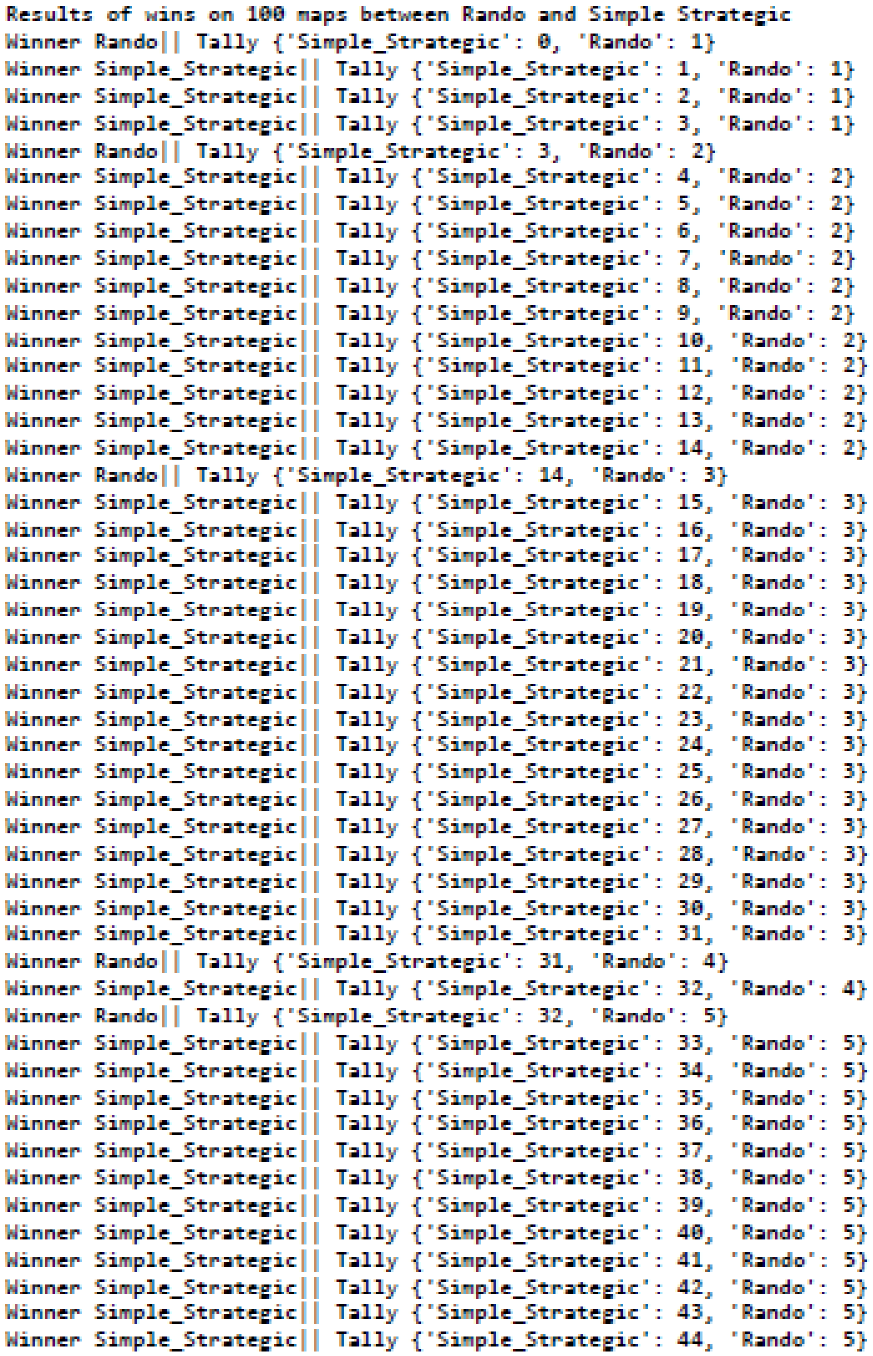


```
            elif self.view_id == 0:
                msg += ' All '
            msg += str(game.tick)
            msg += ' Show: ' + self.label_type

            self.step_label.text = msg
            # Has the game ended? (Should we close?)
            if not self.game.is_alive() or self.game.tick >= self.max_tick:
                name = self.game.winner.name
                Result[name] += 1
                with open("./logs/spike07.txt", 'a') as file:
                    file.write("Winner {0} || Tally{1}\n".format(name, Result))
                self.close()
        else:
            self.step_label.text = "---"

    def add_handlers(self):
```

Output we found out:



```
Results of wins on 100 maps between Rando and Simple Strategic
Winner Rando|| Tally {'Simple_Strategic': 0, 'Rando': 1}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 1, 'Rando': 1}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 2, 'Rando': 1}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 3, 'Rando': 1}
Winner Rando|| Tally {'Simple_Strategic': 3, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 4, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 5, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 6, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 7, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 8, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 9, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 10, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 11, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 12, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 13, 'Rando': 2}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 14, 'Rando': 2}
Winner Rando|| Tally {'Simple_Strategic': 14, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 15, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 16, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 17, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 18, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 19, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 20, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 21, 'Rando': 3}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 22, 'Rando': 3}
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Winner Rando|| Tally {'Simple_Strategic': 31, 'Rando': 4}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 32, 'Rando': 4}
Winner Rando|| Tally {'Simple_Strategic': 32, 'Rando': 5}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 33, 'Rando': 5}
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Winner Simple_Strategic|| Tally {'Simple_Strategic': 42, 'Rando': 5}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 43, 'Rando': 5}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 44, 'Rando': 5}
```

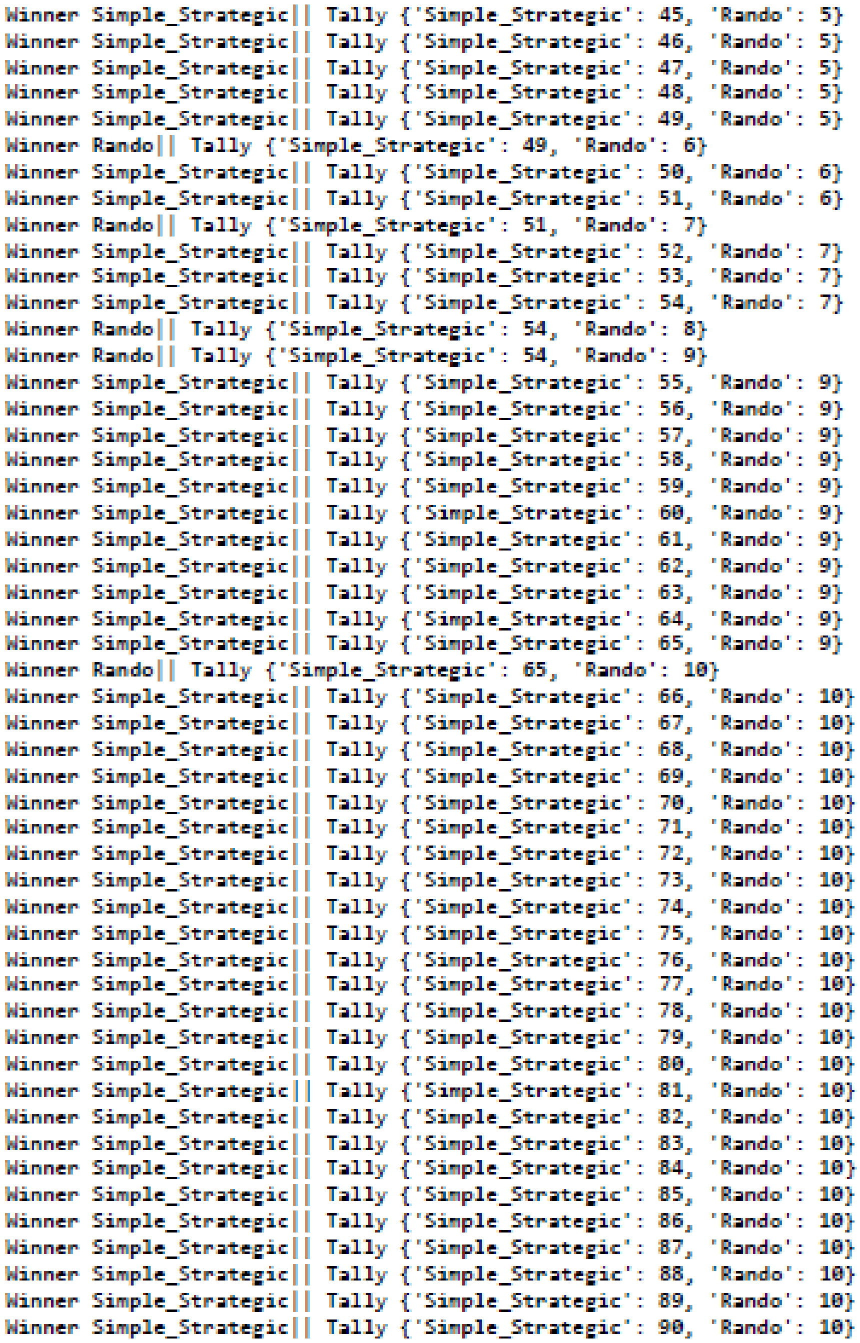

```
Winner Simple_Strategic|| Tally {'Simple_Strategic': 45, 'Rando': 5}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 46, 'Rando': 5}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 47, 'Rando': 5}
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Winner Rando|| Tally {'Simple_Strategic': 51, 'Rando': 7}
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Winner Rando|| Tally {'Simple_Strategic': 54, 'Rando': 8}
Winner Rando|| Tally {'Simple_Strategic': 54, 'Rando': 9}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 55, 'Rando': 9}
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Winner Simple_Strategic|| Tally {'Simple_Strategic': 57, 'Rando': 9}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 58, 'Rando': 9}
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Winner Simple_Strategic|| Tally {'Simple_Strategic': 63, 'Rando': 9}
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Winner Simple_Strategic|| Tally {'Simple_Strategic': 74, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 75, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 76, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 77, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 78, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 79, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 80, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 81, 'Rando': 10}
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Winner Simple_Strategic|| Tally {'Simple_Strategic': 88, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 89, 'Rando': 10}
Winner Simple_Strategic|| Tally {'Simple_Strategic': 90, 'Rando': 10}
```

These above results are from running this game a set number of times as stated in the code, the results can be clearly seen that the strategic bot hat more than 80% win rate as compared to rando which was a random bot so the results would be a little non-deterministic despite that simple strategic were generally good with many maps.