CIS*6020: Assignment 1

Total Marks: 15 – [X] indicates marks for each question. (X) indicates breakdown of marks.

Files to edit and submit:

searchAgents.py – Where your search agents will end up. (foodHeuristic is what you will fill in)

Important files to look at:

search.py – Search algorithms are located here.

util.py – Useful data structures and utility functions.

Might be useful to look at:

pacman.py – Main files that run the game.

game.py – Logic for the game, and supporting data structures.

Not so useful to look at:

Everything else

To submit:

i. **Your version of searchAgents.py**
   searchAgents.py
ii. **A pdf format file with your explanation of why your heuristic is consistent**.

Name your files as follows:

searchAgents.py
yourlastname_yourfirstname_a1.pdf

Submit the above files to the CourseLink dropbox as a .zip file.

A1 Questions: (Written and Programming)

1. [12] Write a **consistent** (and non-trivial) heuristic within foodHeuristic that solves the problem of eating all of the dots in a maze.

   python pacman.py -l testSearch -p AStarFoodSearchAgent
   python pacman.py -l tinySearch -p AStarFoodSearchAgent
   python pacman.py -l trickySearch -p AStarFoodSearchAgent

   (5) Finds optimal path for tinySearch, trickySearch, any other search task
   (2) Nodes Expanded for trickySearch is less than 15000
   (2) Nodes Expanded for trickySearch is less than 12000
   (1) Nodes Expanded for trickySearch is less than 9000
   (1) Nodes Expanded for trickySearch is less than 7000
   (1) Nodes Expanded for trickySearch is less than 6000
   Note that the maximum is 5 if your heuristic is not consistent – so be careful!

2. [3] Explain/justify briefly why your chosen heuristic is consistent in a separate pdf file. Ideally this should be in the form of a proof.