Brandon Percin and Darla Drenckhahn

CSC 440 – Intro To Artificial Intelligence

Final Project Proposal

**Project Description**

For our final project, we will be coding Minesweeper. Minesweeper is a single player puzzle (typically) computer game. The goal of Minesweeper is to clear a rectangular board containing hidden bombs (“mines”) without making any of the bombs go off. This is done with clues about the number of neighboring mines in each field. The problem of solving this is proven to be NP-Complete. Minesweeper is like Sudoku because your success can be greatly dependent on being able to eliminate possible answers until only one remains.

**Steps to Investigate Problem**

One thing we need to decide on is what difficulty levels we can implement (if not all of them). There are 3 general difficulty levels for Minesweeper which include beginner, intermediate and expert. The beginner level has 10 mines and is either 8x8, 9x9 or 10x10. So beginner only deals with square playing fields. Intermediate has 40 mines and could be 13x15 or 16x16. Expert has 99 mines and is always 16x30. We also could have an option to set custom game parameters (number of mines, grid).

Once we have some basics about how our game will be set up, we need to decide what algorithm approaches we will use to solve this. Do we want to implement more than one so we can compare results with different solvers? Or will getting one algorithm that works really well for this case be challenging enough that we won’t have time to implement a second (or more).

**Team Dynamic**

Team members include Brandon Percin (section 001) and Darla Drenckhahn (section 801). Since one of us is an online student and the other is in class – we will need to be diligent with our communication to ensure we complete the project on time and adequately. As it is harder to communicate with the professor as an online student with questions – if we are stuck on anything and need input, Brandon will probably take charge in asking the instructor after class one day or whenever most convenient.

Team Roles:

* Darla: code for minesweeper solver/project write up
* Brandon: code for minesweeper solver/project write up

**Steps to Complete Project**

Steps to completing the project include:

1. Figure out how we are taking in input of the minesweeper grids, decide what levels of difficulty we want to support (all of them?) and if we want to support custom game parameters. Also come up with example grids that we can test on. *Date to be completed:* Monday November 11th
2. Decide what algorithm(s) we want to implement and start the implementation of the minesweeper class we will need. *Date to be completed*: Monday November 25th
3. Implement heuristics which could help decide what cell to look at next and start comparing heuristics/algorithms on the run time and performance of the solver. *Date to be completed*: Monday December 9th
4. Do any remaining work and clean up and write final project report based on findings. *Date to be completed:* Tuesday December 17th