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CS 470, section 001

Programming Assignment (Optimization Search)

1.

heuristics used:	none	mrv	mrv+degree
none	Solved 1 puzzles in 23.1216079 seconds. Average Solve Time = 23.1216079 seconds.	Solved 100 puzzles in 101.5457793 seconds. Average Solve Time = 1.015457793 seconds.	Solved 100 puzzles in 34.6135085 seconds. Average Solve Time = 0.346135085 seconds.
lcv	Solved 1 puzzles in 24.1852308 seconds. Average Solve Time = 24.1852308 seconds.	Solved 100 puzzles in 185.9759925 seconds. Average Solve Time = 1.859759925 seconds.	Solved 100 puzzles in 40.6070621 seconds. Average Solve Time = 0.406070621 seconds.

The fastest heuristic combo is the mrv+degree (with no lcv) combo.

2.
What I learned:
-How to implement a Sudoku-solving algorithm:
--How to implement a forward check function:
---How to implement a normal (removing) forward check function.
---How to implement a counting forward check function.
--How to implement a constraint-counting function.
--How to implement a minimum remaining values heuristic function.
--How to implement a least-constraining value heuristic-based ordering function.
--How to implement a backtracking search algorithm for Sudoku using various functions.
-How to alter a Sudoku-solving algorithm:
--How to alter a Sudoku-solving algorithm to use/not_use an MRV heuristic function.
--How to alter a Sudoku-solving algorithm to use/not_use a degree heuristic function.
--How to alter a Sudoku-solving algorithm to use/not_use an LCV heuristic function.
-How well different versions of a Sudoku-solving algorithm perform:
--LCV performs the worst.
--No heuristics is in 5th place.
--MRV+LCV is in 4th place.
--MRV is in 3rd place.
--MRV+degree+LCV is in 2nd place.
--MRV+degree performs the best.