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CS205 Project 1: 8 Puzzle

**Overview**

The project was created in Python 3 and tested using Python 3.8. As reference the Python v3.1.4 documentation: <https://docs.python.org/3.1/index.html> was used to help with specific data structures. In this case, the PriorityQueue was used to queue nodes and a custom Node object was created that could hold heuristic and cost parameters. Along with the Python documentation an 8-Puzzle solver: <https://8puzzlesolver.com/index.php#step3> was used to check accuracy of the algorithms for shortest path. The code for the completed project can be found: <https://github.com/pyuvaraj37/CS205_Project_1>

**Introduction**

![Graphical user interface, application

Description automatically generated]()![Graphical user interface, application

Description automatically generated]() To test three different search algorithms, an 8-Puzzle toy was used. “The 8-Puzzle consist of a 3x3 board with eight numbered tiles and a blank space. A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state.” [1]. While there are many ways to represent operators to transform states, the simplest representation is to move the blank space. Fig 1 shows a scrambled 8-Puzzle, and Fig 2 shows the goal state that is trying to be achieved by the algorithms. The operators are moving the blank space up, down, left, and right without making any illegal moves such as moving the blank out of bounds.

Figure

Figure

**Analysis**

**Conclusion**