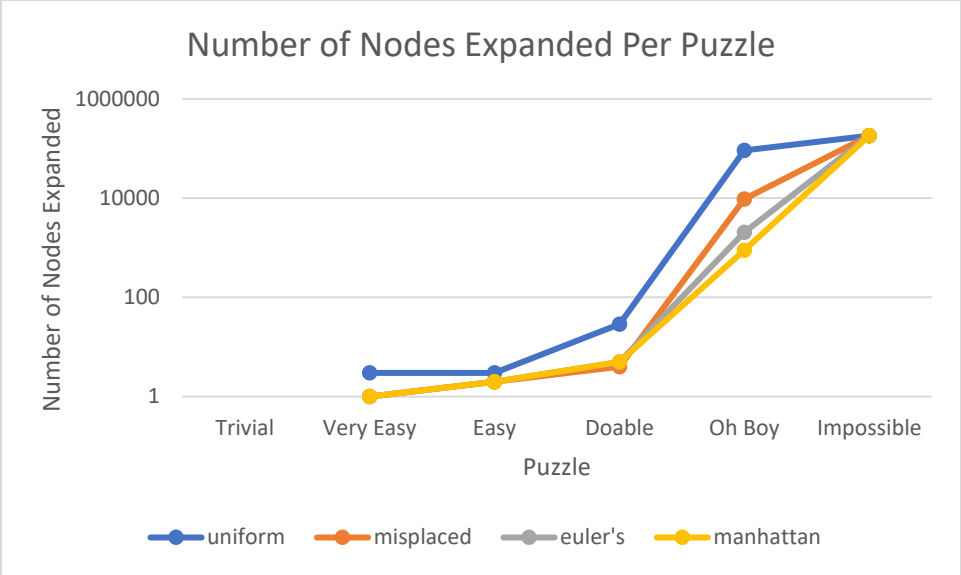
- Challenges
    - Creating valid puzzles
        - Solved by creating solved puzzles of a given size and then moving the blank randomly 100,000 times
- Design
    - Class puzzles
        -
    - Struct node
        - The puzzle in its current state
        - The location of the blank in the current state
        - The previous operation
        - The cost so far
        - The heuristic of the current state
        - The moves to get to the current puzzle state
- Optimizations
    - search
        - Replaced goal check with check for state heuristic == 0
    - stateExists
        - only compares the current state against states with the same heuristic score
    -
- Graph search
    -
- Heuristic Compare

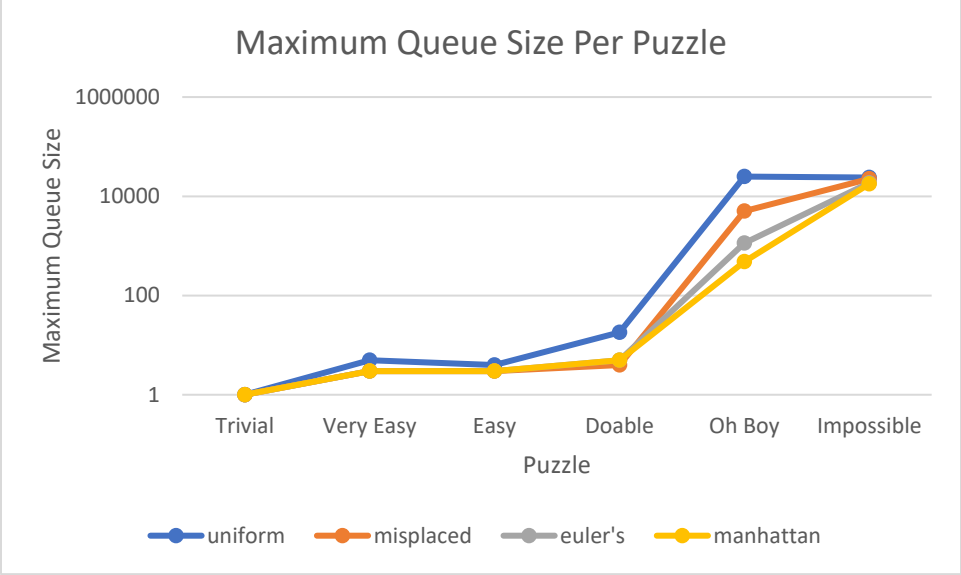
Number of Nodes Expanded

	Uniform	Misplaced	Euler's	Manhattan
Trivial	0	0	0	0
Very Easy	3	1	1	1
Easy	3	2	2	2
Doable	29	4	5	5
Oh Boy	91120	9582	2052	894
Impossible	181400	181400	181400	181400

Maximum Queue Size

	Uniform	Misplaced	Euler's	Manhattan
Trivial	1	1	1	1
Very Easy	5	3	3	3
Easy	4	3	3	3
Doable	18	4	5	5
Oh Boy	24983	5015	1139	479
Impossible	24054	22464	18605	17737


Number of Nodes Expanded Per Puzzle
Number of Nodes Expanded
1000000
10000
100
1
Trivial
Very Easy
Easy
Doable
Oh Boy
Impossible
Puzzle
uniform
misplaced
euler's
manhattan


Maximum Queue Size Per Puzzle
Maximum Queue Size
1000000
10000
100
1
Trivial
Very Easy
Easy
Doable
Oh Boy
Impossible
Puzzle
uniform
misplaced
euler's
manhattan