

1. Our current heuristic, average number wrong (number out of place / 6), is not admissible. To be admissible, it must **never** overestimate the cost to reach the goal. A universal such as this can be easily disproved by identifying at least one counter example, such as: rotate a single face on a solved Rubik's cube once thus displacing 12 blocks in 1 move. Our heuristic would say this has a cost of  $12 / 6 = 2$  whereas the actual cost is 1.
2. In terms of admissibility, a better heuristic would be (number out of place / 12). This should never overestimate the cost to reach the goal, because each action can displace at most 12 blocks. However, it does appear to lead to a lot more paths searched when implemented in the A\* code.