

- a. A formula I'll be using is  $2 * (\text{Math.abs}(x1 - x2) + \text{Math.abs}(y1 - y2))$ .

This is a heuristic based on Manhattan distance, which is then multiplied by 2.

The formula will give an estimate of how many steps it will take to reach the goal moving up, down, left, or right, and it will multiply by 2 since Plains, the cheapest terrain, has a cost of 2.

No diagonals will be performed.

- b. I went with this heuristic because it works well with grid-based movement and does not overestimate the cost, which is crucial for A\* to work correctly.

I also multiply the distance by 2 to match the cheapest terrain cost, plains, so the estimate stays at a realistic level.

I don't try to guess terrain types ahead of time since that could lead to an inaccurate estimate. This enables the heuristic to operate in a simple, no-frills fashion and aims to point A\* towards our goal.