**There are 2 items in the report analyse:**

1. **5%: How does the turn-cost affects the path and the explored area for each search. To better see the effects feel free to play with the turncost factor, which currently set at 0.5.**

Lets test the Turn cost being on and off with the UCS (For testing purposes we increased the Turn cost to 2.0 )

**With it turned on**

A screenshot of a crossword puzzle

Description automatically generated

**With it turned off**

A screenshot of a crossword puzzle

Description automatically generated

Explored Area: We can see that the explored areas when its turned on is much more linear in the sense that the agent explores in the North direction in a straight line much more because it costs it to turn hence it will just choose paths that don’t involve any turnings. Hence its exploration strategy will be changed with fewer turns hence neglecting parts of the environment that require more turns

Path: With the turn cost enabled we can see that the agent takes the path of least number of turns hence this can result in longer paths because our agent will favour straight paths rather than taking turns to get to the goal in a shorter amount of time

1. **5%: Imagine it is going to cost twice as much to climb up the vertical than moving horizontal. How would you go about incorporating this into current implementation, and where and which functions would be affected? How many different ways this goal can be achieved and what are the benefits and weaknesses of each solution.**

To incorporate this into the current implementation

1. We would change the path cost function and add another function to computer move cost and if the action == ‘ UP ‘ or == ‘DOWN’ return 2 ; otherwise return 1 this way the costs of moving up or down will be twice as much
2. Modify the cost calculations directly where the cost is calculated based on the action’s direction where the vertical are 2 times the cost of horizontal

Benefits and weaknesses.

1. Separate function – adds complexity to the implementation but allows for better organization
2. Changing the cost calculations directly It might be more confusing to directly change the path\_cost function