In this project, we were assigned to make a solver for the 2048 game. A variant of Dijkstra’s algorithm was used to come to the solution. A graph was made, where each vertex represented a state of the game i.e. the configuration of each of its tiles. An edge represented a move to reach from the on state to another. The graph was to find the maximum score up to different depths ranging from 0 to 6. The propagation style was also varied, one for maximized score at each node, and other for the average score.

A Python script was used to run multiple cases. The propagation method was varied from maximum to average, the maximum node depth was also varied from 0 to 6 and finally, 50 cases were taken from each of the cases to minimize randomness. The average score below represents the average value taken of the 50 tests from the raw CSV data.

**Average Propagation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Depth | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Average Score | 1029.44 | 4071.84 | 7842.32 | 9877.04 | 8192.8 | 7612.16 | 6021.84 |

**Maximized Propagation:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Depth | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Average Score | 1117.28 | 2794.72 | 7807.6 | 7702.48 | 9254.96 | 8240.48 | 7616.08 |