

2048 Game


Chandana Banur Kalmarudappa

Version 1- MinMax with Score Heuristic

Development Summary:

In this version I ran basic MinMax agent for the 2048 game using a score-based heuristic.

Testing Results:



A screenshot of a 2048 game window. The title bar says '2048'. The score is displayed as 'Score: 6040'. The game board is a 4x4 grid of tiles. The tiles are colored based on their value: 2 and 4 are light beige, 8 is light orange, 16 is orange, 32 is dark orange, 64 is red, 128 is yellow, 256 is dark yellow, and 512 is brown. The grid contains the following values:

4	2	4	8
64	128	64	4
2	16	512	16
8	128	4	2

- Final Score: 6040
- Time-limit:0.1
- Search depth: 10

Analysis:

- The current MinMax agent avoids invalid moves and plays okay.
- It mostly moves right or down
- It has bad score mostly because of bad tile placement
- Big tiles dont end up in the corners
- Score is not consistent, sometimes it stops around 2000-4000

Next improvement:

- Try to fit the highest tile stays in corner.
- Make it work good by adding penalty if sudden jump.
- Make score consistent.

Version 2- MinMax with an improved corner based heuristic

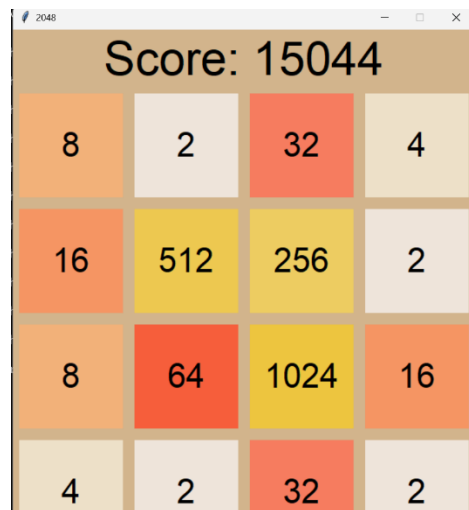
Development Summary:

In this version the goal is to keep the maximum tile in a corner and reward empty spaces. So the Highest tile won't fluctuate and gives higher score

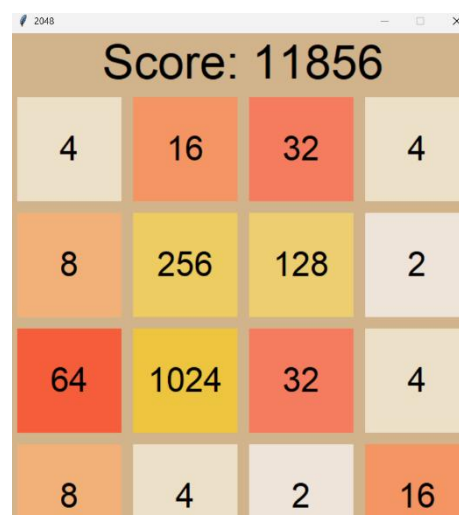
Testing Results:



Score: 8960			
512	16	8	4
8	128	64	2
16	512	16	4
4	8	4	2



Score: 15044			
8	2	32	4
16	512	256	2
8	64	1024	16
4	2	32	2



Score: 11856			
4	16	32	4
8	256	128	2
64	1024	32	4
8	4	2	16

- Maximum Score: 15044
- Average Score: 8000
- Time-limit: 0.1
- Max search depth: 108

Analysis:

- My Agent avoids bad moves.
- Max tile most of the time stays in a corner.
- Board has more empty tiles.
- Score is more consistent compared to version 1.

Next improvement:

- I will try to add snake pattern and make the tiles evaluated with descending order.
- And will try to keep the highest tile in right corner without moving