Manasa Acharya

CPSC 5610 – Milestone 4

README

# How to run Acharya’s Milestone 4

**Make sure the following files are included in your directory:**

* main.py
* min\_max\_search.py
* 2048.in.txt
* board.py

\*The solution is printed in real time on the console.

With a starting empty board

1  
0,0,0,0  
0,0,0,0  
0,0,0,0  
0,0,0,0

Where the first number is the number of boards. Any text files following this format with the correct board format as well will run.

**To Run:**

To run the game for both searches, simply run main.py. Each search will get an empty board and add 2 random 2s to start.

**Explanation of Code:**

The MinMax Search is currently set to a depth of 3. This means that the first step will be a maximum move. The code looks at what the minimum board could be for each of 4 possible moves [L, U, R, D] and again the next maximum value from each of those minimum boards. There will be 1 minimum board per move (4 total) and there for 4 maximum next states. The starting move that leads to the highest maximum end is then chosen.

The code can be extended by adding more min & max searches, which can be seen in the extra credit submission.

**Example output:**

*Console:*

Playing minmax's round, moving L

[[ 4 16 2 4]

[ 8 4 8 0]

[ 4 0 0 0]

[ 8 0 0 0]]

Current score: 68

Now randomly adding 2 or 4

[[ 4 16 2 4]

[ 8 4 8 4]

[ 4 0 0 0]

[ 8 0 0 0]]

Playing minmax's round, moving D

[[ 4 0 0 0]

[ 8 0 0 0]

[ 4 16 2 0]

[ 8 4 8 8]]

Current score: 76

Now randomly adding 2 or 4

[[ 4 4 0 0]

[ 8 0 0 0]

[ 4 16 2 0]

[ 8 4 8 8]]

Playing minmax's round, moving R

[[ 0 0 0 8]

[ 0 0 0 8]

[ 0 4 16 2]

[ 0 8 4 16]]

Current score: 100

Now randomly adding 2 or 4

[[ 0 0 0 8]

[ 0 0 0 8]

[ 2 4 16 2]

[ 0 8 4 16]]

Playing minmax's round, moving D

[[ 0 0 0 0]

[ 0 0 0 16]

[ 0 4 16 2]

[ 2 8 4 16]]

Current score: 116

Now randomly adding 2 or 4

[[ 0 0 0 0]

[ 0 0 0 16]

[ 4 4 16 2]

[ 2 8 4 16]]

Playing minmax's round, moving R

[[ 0 0 0 0]

[ 0 0 0 16]

[ 0 8 16 2]

[ 2 8 4 16]]

Current score: 124

Now randomly adding 2 or 4

[[ 0 0 0 0]

[ 4 0 0 16]

[ 0 8 16 2]

[ 2 8 4 16]]

Playing minmax's round, moving D

[[ 0 0 0 0]

[ 0 0 0 16]

[ 4 0 16 2]

[ 2 16 4 16]]

Current score: 140

Now randomly adding 2 or 4

[[ 4 0 0 0]

[ 0 0 0 16]

[ 4 0 16 2]

[ 2 16 4 16]]

Playing minmax's round, moving D

[[ 0 0 0 0]

[ 4 0 0 16]

[ 4 0 16 2]

[ 2 16 4 16]]

Current score: 140

Now randomly adding 2 or 4

[[ 0 0 0 0]

[ 4 4 0 16]

[ 4 0 16 2]

[ 2 16 4 16]]

Playing minmax's round, moving L

[[ 0 0 0 0]

[ 8 16 0 0]

[ 4 16 2 0]

[ 2 16 4 16]]

Current score: 148

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\*Some output removed

Max moves reached. Game terminated with high score of: 888

Process finished with exit code 0