

CSE537 Project report #2: Connect Four

Vivek Tiwari ID: 110310824

Caleb Andrade ID: 110071013

The stats below are produced by uncommenting the indicated lines in **lab3.py**

QUESTION 2a (new_player, basic_player)

Uncomment line 48

Minimax new_player (X)

Expanded nodes: 4123

Running time: 50.0860383093

Minimax basic_player (O)

Expanded nodes: 4067

Running time: 52.6855686267

Tie!

```
  0 1 2 3 4 5 6
0  O O X O X X O
1  X X X O O O X
2  O X O X X X O
3  X O O X O O X
4  X X O O O X O
5  O X X X O O X
```

QUESTION 3a (alpha-beta, basic_player)

Uncomment line 160

Alpha-Beta player (X)

Expanded nodes: 1730

Running time: 12.0684675706

Minimax basic_player (O)

Expanded nodes: 4067

Running time: 53.2934710976

Tie!

```
  0 1 2 3 4 5 6
0  O O X O X X O
1  X X X O O O X
2  O X O X X X O
3  X O O X O O X
4  X X O O O X O
5  O X X X O O X
```

QUESTION 2b (basic_player, new_player)

Uncomment line 49

Minimax basic_player (X)

Expanded nodes: 3789

Running time: 45.030425515

Minimax new_player (O)

Expanded nodes: 3545

Running time: 43.2598493663

Win for O!

```
  0 1 2 3 4 5 6
0      X X
1      O O O
2      X O O
3      O X X
4  X O X O O X
5  X X X O O O X
```

QUESTION 3b (basic player, alpha-beta)

Uncomment line 161

Minimax basic_player (X)

Expanded nodes: 3789

Running time: 50.2742969428

Alpha-Beta player (O)

Expanded nodes: 2068

Running time: 16.9314178897

Win for O!

```
  0 1 2 3 4 5 6
0      X X
1      O O O
2      X O O
3      O X X
4  X O X O O X
5  X X X O O O X
```

The way to call connectK is:

```
# Uncomment line 162 in lab3.py
```

```
run_game(alpha_beta_player, human_player, num_to_win=5)
```

In this case, k=5, i.e the one who is first to 5 continuous chain will win. If you do not pass this attribute at all it will default to 4

The way to call longest streaks is:

```
# Uncomment line 163 in lab3.py
```

```
run_game(alpha_beta_player, human_player, longest_chain_wins=True)
```

In this case, the game will continue to run till 20 total moves, and will calculate at the end, the winner.