Artificial Intelligence

Lab Assignment-01

MENACE(Machine Educable Noughts And Crosses Engine)

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Problem Statement

Read the reference on MENACE by Michie and check for its implementations. Pick the one that you like the most and go through the code carefully. Highlight the parts that you feel are crucial. If possible, try to code the MENACE in any programing language of your liking.

Menace game

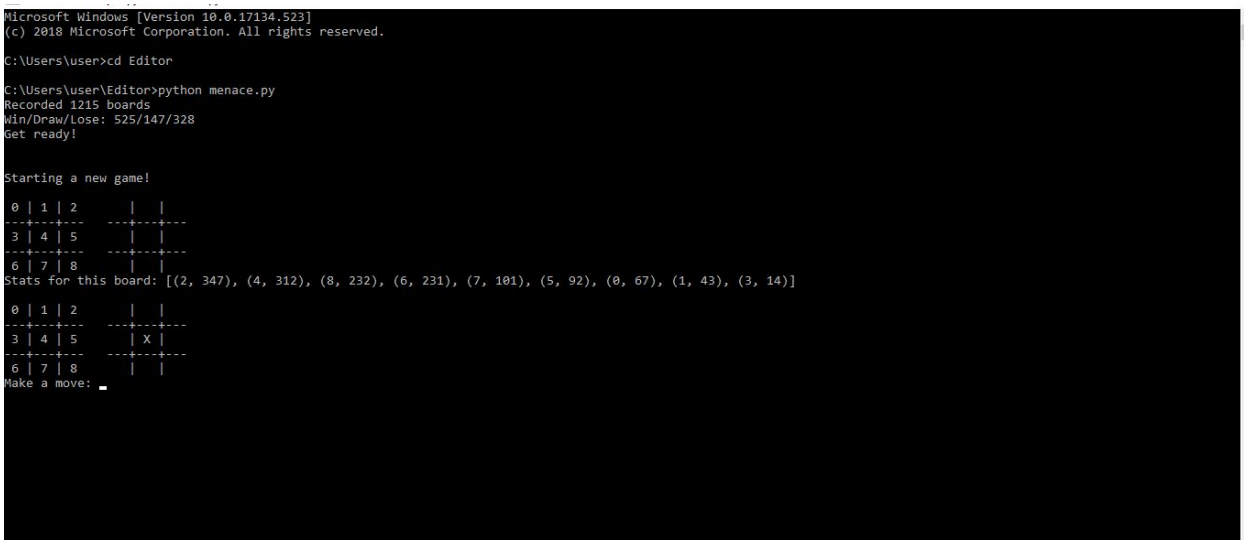
Donald Michie came up with Menace (the Machine Educable Noughts And Crosses Engine). Menace uses 304 matchboxes all filled with coloured beads in order to learn to play noughts and crosses. Menace “learns” to play noughts and crosses by playing the game repeatedly against user, each time refining its strategy until after having played a certain number of games it becomes almost perfect and its opponent is only able to draw or lose against it. The 304 matchboxes that make up Menace represent all the possible layouts of a noughts and crosses board it might come across while playing. During the game the machine displays a summary of the virtual beads in the boxes before it makes its choice.

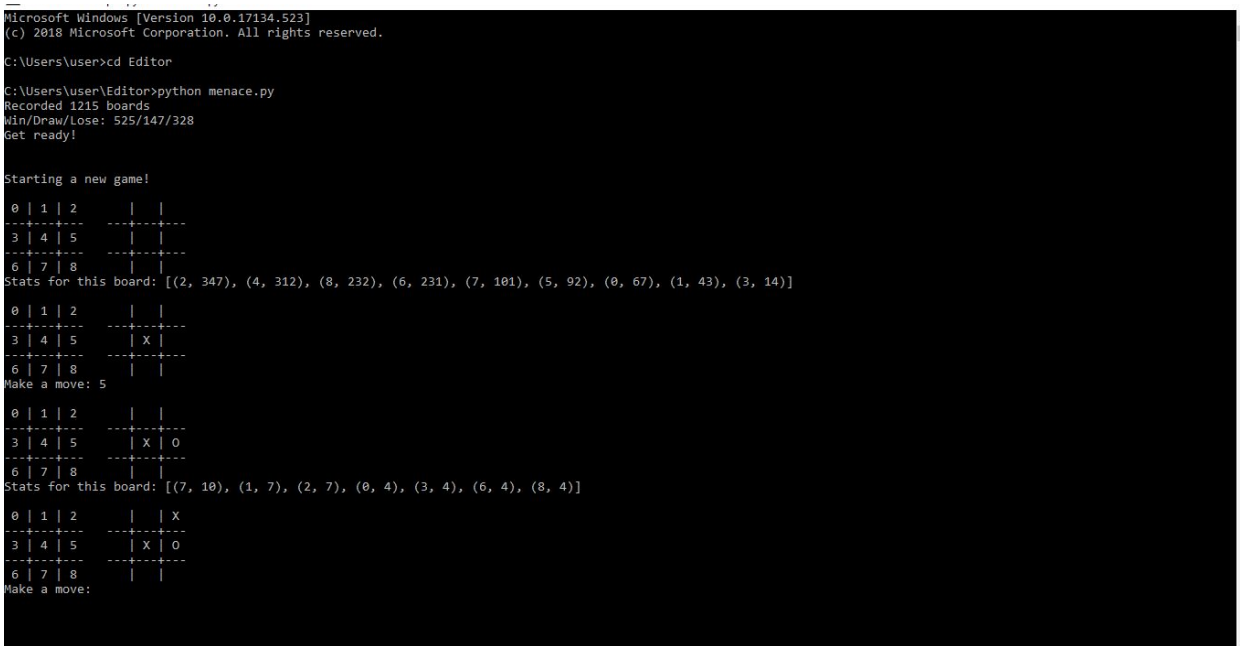
At the end of the game, beads are added or removed from all matchboxes involved:

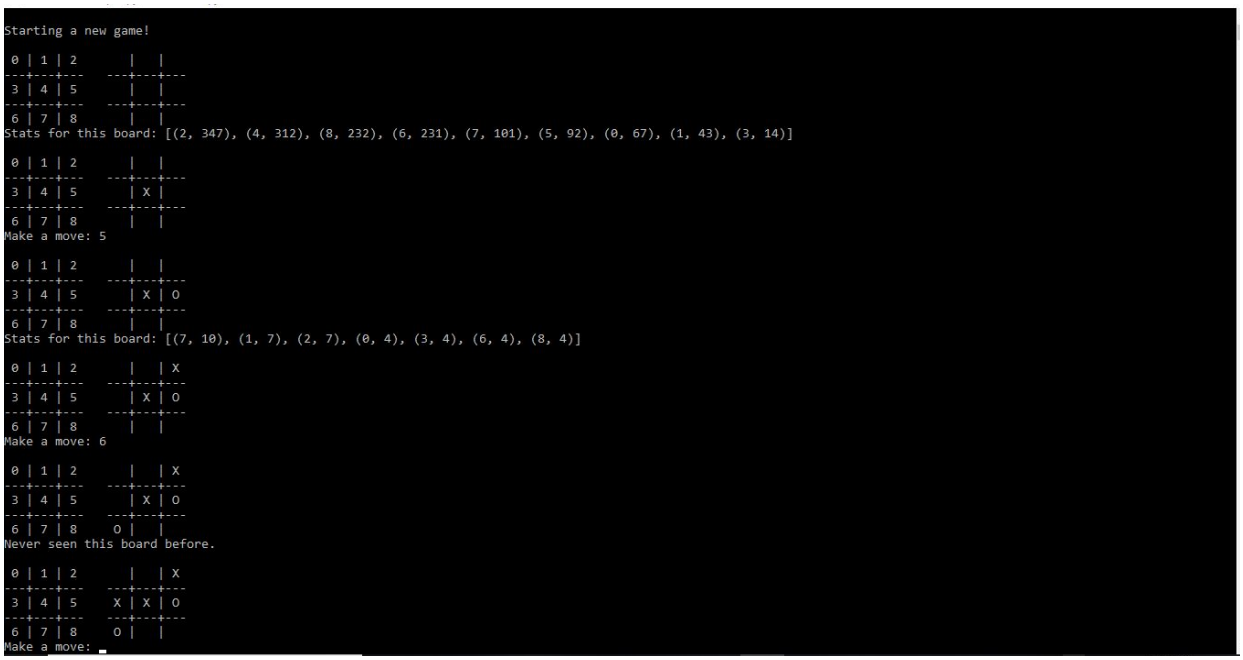
If menace win, it will add three more beads of the colour, for a draw it will add one more bead of the colour and, for loss it will remove a bead of the colour. This means that if Menace played badly, it will have a smaller chance of playing the same game next time. However, if Menace played well, it is more likely to follow the same route the next time and win again. When playing against Menace, Menace always starts, otherwise the number of matchboxes needed would be greatly increased.

Output

Output recorded number of games performed and number of winning boards, draw boards and loss boards. When the game start it shows stats for every move in the board.






Starting a new game!
0 | 1 | 2 | |
3 | 4 | 5 | |
6 | 7 | 8 | |
Stats for this board: [(2, 347), (4, 312), (8, 232), (6, 231), (7, 101), (5, 92), (0, 67), (1, 43), (3, 14)]
0 | 1 | 2 | |
3 | 4 | 5 | X |
6 | 7 | 8 | |
Make a move: 5
0 | 1 | 2 | |
3 | 4 | 5 | X | O
6 | 7 | 8 | |
Stats for this board: [(7, 10), (1, 7), (2, 7), (0, 4), (3, 4), (6, 4), (8, 4)]
0 | 1 | 2 | | X
3 | 4 | 5 | X | O
6 | 7 | 8 | |
Make a move: 6
0 | 1 | 2 | | X
3 | 4 | 5 | X | O
6 | 7 | 8 | O | |
Never seen this board before.
0 | 1 | 2 | | X
3 | 4 | 5 | X | X | O
6 | 7 | 8 | O | |
Make a move:


3 | 4 | 5 | O | |
6 | 7 | 8 | X | | O
Stats for this board: [(7, 5), (4, 2), (5, 2)]
0 | 1 | 2 | O | X | X
3 | 4 | 5 | O | |
6 | 7 | 8 | X | X | O
Make a move: 5
0 | 1 | 2 | O | X | X
3 | 4 | 5 | O | | O
6 | 7 | 8 | X | X | O
Stats for this board: [(4, 4)]
0 | 1 | 2 | O | X | X
3 | 4 | 5 | O | X | O
6 | 7 | 8 | X | X | O
You lose.
Get ready!
Starting a new game!
0 | 1 | 2 | |
3 | 4 | 5 | |
6 | 7 | 8 | |
Make a move:


---+---+--- ---+---+---
 3 | 4 | 5   O | |
---+---+--- ---+---+---
 6 | 7 | 8   X | | O
Stats for this board: [(7, 5), (4, 2), (5, 2)]
 0 | 1 | 2   O | X | X
---+---+--- ---+---+---
 3 | 4 | 5   O | |
---+---+--- ---+---+---
 6 | 7 | 8   X | X | O
Make a move: 5
 0 | 1 | 2   O | X | X
---+---+--- ---+---+---
 3 | 4 | 5   O | | O
---+---+--- ---+---+---
 6 | 7 | 8   X | X | O
Stats for this board: [(4, 4)]
 0 | 1 | 2   O | X | X
---+---+--- ---+---+---
 3 | 4 | 5   O | X | O
---+---+--- ---+---+---
 6 | 7 | 8   X | X | O
You lose.
Get ready!
Starting a new game!
 0 | 1 | 2 | |
---+---+--- ---+---+---
 3 | 4 | 5 | |
---+---+--- ---+---+---
 6 | 7 | 8 | |
Make a move: