Neutreeko

Intermediate Report

Mestrado Integrado em Engenharia Informática e Computação

Programação em Lógica

Grupo Neutreeko: 1
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1 Neutreeko

Neutreeko is a simple game played on a board with 5×5 squares.

It's a two-player abstract board game invented by Jan Kristian Haugland in 2001 and is a portmanteau of Neutron and Teeko, two games on which it is based.

Each player starts with three pieces each, as shown in the figure.

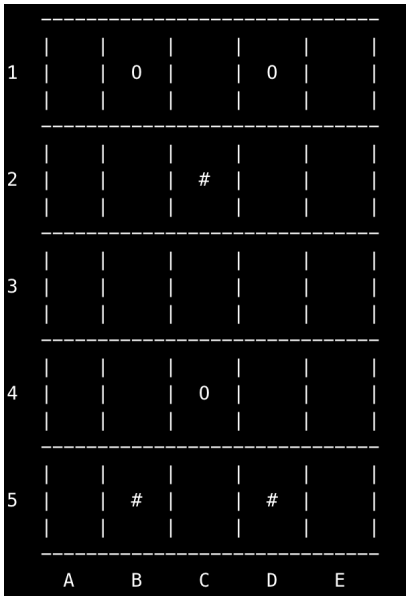

Figure 1: Initial State of Neutreeko.

Rules:

- Black always moves first.
- A piece slides orthogonally or diagonally until stopped by an occupied square or the border of the board.

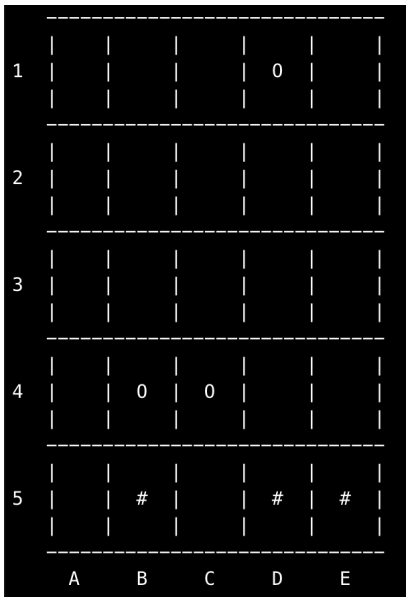

Figure 2: Example of Intermediate State of Neutreeko.

- The goal of Neutreeko is to place three of your own checkers in a row, orthogonally or diagonally. The row must be connected.
- The game is declared a draw if the same position occurs three times.

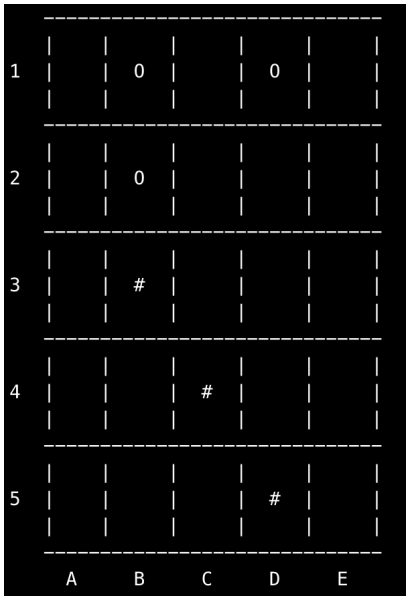

Figure 3: Example of Final State of Neutreeko.

References

http://www.neutreeko.net/neutreeko.htm
http://www.iggamecenter.com/info/en/neutreeko.html

2 Game State Representation

We have implemented the following predicate:

```
initialBoard([
  [emptyCell,whiteCell,emptyCell,whiteCell,emptyCell],
  [emptyCell,emptyCell,blackCell,emptyCell,emptyCell],
  [emptyCell,emptyCell,emptyCell,emptyCell,emptyCell],
  [emptyCell,emptyCell,whiteCell,emptyCell,emptyCell],
  [emptyCell,blackCell,emptyCell,blackCell,emptyCell]
  ]).
```

This predicate contains a list of lists, in which each sublist represents a line of the board, and each element of that same sublist represents a position on the line (column).

All predicates constructed for manipulation of the list have as input the letter and number coordinates, starting with A and 1.

To represent the parts in the list, each atom of the sublists can have the following value:

- emptyCell - Empty Cell;
- blackCell - Black Piece;
- whiteCell - White Piece;

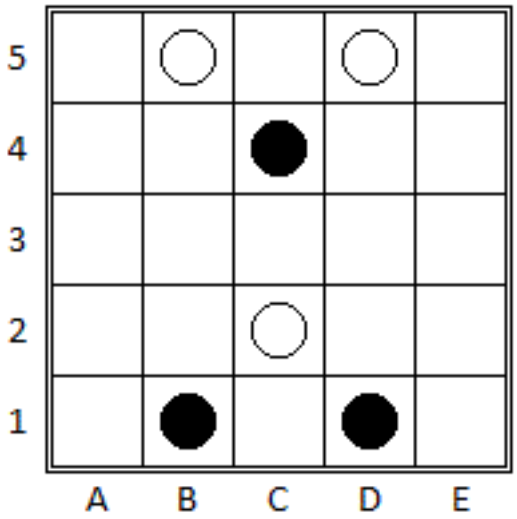

Figure 4: Example of Neutreeko Game.

3 Visualização do Tabuleiro

The display_game / 1 predicate is used to represent the board in the console. This predicate is implemented as follows:

```
display_game(Board):-
  display_board(Board, 0),
  write_line, nl,
  write_letters.
```

This predicate begins by writing the board by going to display_board /2. Then it goes to the write_line predicate and finally to write_letters to get the representation of the coordinates.

The remaining recursive predicates are represented here:

```
display_board([],_).
display_board([Line|Tail], Y):-
  write_line, nl,
  write_spaces, nl,
  Y1 is Y+1,
  display_line(Line, Y1), nl,
  write_spaces, nl,
  display_board(Tail, Y1).

display_line(Line, Y):-
  write(Y), write(' |'),
  display_line_aux(Line).

display_line_aux([]).
display_line_aux([Cell|Tail]):-
  get_cell_symbol(Cell,Symbol),
  write(' '), write(Symbol), write(' | '),
  display_line_aux(Tail).
```

Since we are sending each row of the array to this predicate, we simply check the type of part and write the representation of the part to the screen, according to the following conversion:

- emptyCell - ' ';
- blackCell - #;
- whiteCell - O;