

PLOG 2020/2021 - TP1

Group: Jin_Li_2

Turma 3

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Jin Li

Jin Li is a strategy game for 2 players. The players each control two fish in a pond (7x7 board), either two red fish (RF) or two yellow fish (YF). Besides the fishes each player also has 10 stones stored on the right side of the board. Players take turns during the game moving their fish. - On his turn, a player must either swim one of his fish and drop a stone or jump over a stone. - A fish swims to an empty square adjacent (ortogonally or diagonally) to its current location. The stones are placed in any empty square. If a player has run out of stones then he does not drop after swimming. - When jumping over a stone the jump must be along a straight line (ortogonally or diagonally).

After his turn the player scores one point for each other fish adjacent to his fish new location (the player can score 0, 1, 2 or 3 points on one turn). Keep track of the score using the scoring tracks placed on top and bottom of the board. The first player to score 10 poits wins.

Some alternative rules: - Start the Koi one square diagonally inset from the corners. - Give each player 6 stones instead of 10 - After a player drops his last stone, the other player removes one stone from the board and gives it to that player to use next turn.

[Source](#), [Rules](#)

Internal representation of the GameState

Initial Situation:

```

initialBoard([
[0,0,0,0,0,0,0,0,0,0,emptyS,emptyS],
[rs,emptyS,10],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[emptyS,emptyS,red,empty,empty,empty,empty,empty,empty,red,emptyS,emptyS,ss],
[emptyS,emptyS,empty,empty,empty,empty,empty,empty,empty,empty,emptyS,emptyS,t],
[emptyS,emptyS,empty,empty,empty,empty,empty,empty,empty,empty,emptyS,emptyS,o],
[emptyS,emptyS,empty,empty,empty,empty,empty,empty,empty,empty,emptyS,emptyS,n],
[emptyS,emptyS,empty,empty,empty,empty,empty,empty,empty,empty,emptyS,emptyS,e],
[emptyS,emptyS,empty,empty,empty,empty,empty,empty,empty,empty,emptyS,emptyS,ss],
[emptyS,emptyS,yellow,empty,empty,empty,empty,empty,yellow,emptyS,emptyS,emptyS],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[ys,emptyS,10],
[0,0,0,0,0,0,0,0,0,0,emptyS,emptyS]
]).

```

```

|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- | -- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|           RED SCORE           |-- |10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |RF |  |  |  |  |  |RF |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  |  |  |  |  |  |-- |-- | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  |  |  |  |  |  |-- |-- | O |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  |  |  |  |  |  |-- |-- | N |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  |  |  |  |  |  |-- |-- | E |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  |  |  |  |  |  |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |YF |  |  |  |  |  |YF |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|           YELLOW SCORE           |-- |10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|

```

Intermediate Situation:

```

intermediateBoard([
[1,2,3,0,0,0,0,0,0,emptyS,emptyS],
[rs,emptyS,4],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[emptyS,emptyS,empty,empty,empty,stone,empty,empty,empty,emptyS,emptyS,ss],
[emptyS,emptyS,empty,empty,empty,stone,stone,empty,empty,emptyS,emptyS,t],
[emptyS,emptyS,empty,empty,red,empty,empty,empty,stone,emptyS,emptyS,o],
[emptyS,emptyS,empty,stone,yellow,red,empty,stone,empty,emptyS,emptyS,n],
[emptyS,emptyS,stone,empty,stone,stone,empty,yellow,empty,emptyS,emptyS,e],
[emptyS,emptyS,empty,empty,stone,empty,stone,empty,empty,emptyS,emptyS,ss],
[emptyS,emptyS,empty,empty,empty,stone,empty,empty,empty,emptyS,emptyS,emptyS],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[ys,emptyS,4],
[1,2,0,0,0,0,0,0,0,emptyS,emptyS]
])).

```

```

|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -- | -- |
|---|---|---|---|---|---|---|---|---|---|---|
|           RED SCORE           |-- | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  | 0 |  |  | |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  | 0 | 0 |  | |-- |-- | T |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  | RF |  |  | 0 |-- |-- | 0 |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- | 0 | YF | RF |  | 0 | |-- |-- | N |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- | 0 |  | 0 | 0 |  | YF | |-- |-- | E |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  | 0 |  | 0 |  | |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  |  | 0 |  |  | |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|
|           YELLOW SCORE           |-- | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|

```

Final Situation:

```
finalBoard([
[1,2,3,4,5,6,7,8,9,10,emptyS,emptyS],
[rs,emptyS,0],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[emptyS,emptyS,empty,yellow,empty,stone,empty,empty,empty,emptyS,emptyS,ss],
[emptyS,emptyS,empty,stone,yellow,stone,stone,red,red,emptyS,emptyS,t],
[emptyS,emptyS,empty,empty,stone,stone,stone,stone,stone,emptyS,emptyS,o],
[emptyS,emptyS,empty,stone,stone,empty,empty,stone,stone,emptyS,emptyS,n],
[emptyS,emptyS,stone,empty,stone,stone,stone,empty,empty,emptyS,emptyS,e],
[emptyS,emptyS,empty,empty,stone,empty,stone,empty,empty,emptyS,emptyS,ss],
[emptyS,emptyS,empty,empty,empty,stone,empty,empty,empty,emptyS,emptyS,emptyS],
[emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS,emptyS],
[ys,emptyS,0],
[1,2,3,4,5,6,7,8,9,0,emptyS,emptyS]
]).
```

```
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |10| -- | -- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|          RED SCORE          |--| 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |  YF |   0 |   |   |   |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |   0 |YF| 0 | 0 |RF| RF |-- |-- | T |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |   |   0 | 0 | 0 | 0 | 0 |-- |-- | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |   | 0 | 0 |   |   | 0 | 0 |-- |-- | N |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- | 0 |   | 0 | 0 | 0 |   |   |-- |-- | E |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |   |   0 |   | 0 |   |   |-- |-- | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |   |   |   0 |   |   |   |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
|          YELLOW SCORE          |--| 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |-- |-- |
|---|---|---|---|---|---|---|---|---|---|---|---|
```

Atoms

Code	Meaning
code(empty, '')	<i>Empty square of the board</i>
code(emptyS, '-')	<i>Board</i>
code(red, 'RF')	<i>Red Fish</i>
code(yellow, 'YF')	<i>Yellow Fish</i>
code(stone, 'O')	<i>Stone</i>
code(0, '0')	<i>Number 0 - for score and nr stones</i>
code(1, '1')	<i>Number 1 - for score and nr stones</i>
code(2, '2')	<i>Number 2 - for score and nr stones</i>

Code	Meaning
<code>code(3, '3')</code>	<i>Number 3 - for score and nr stones</i>
<code>code(4, '4')</code>	<i>Number 4 - for score and nr stones</i>
<code>code(5, '5')</code>	<i>Number 5 - for score and nr stones</i>
<code>code(6, '6')</code>	<i>Number 6 - for score and nr stones</i>
<code>code(7, '7')</code>	<i>Number 7 - for score and nr stones</i>
<code>code(8, '8')</code>	<i>Number 8 - for score and nr stones</i>
<code>code(9, '9')</code>	<i>Number 9 - for score and nr stones</i>
<code>code(10, '10')</code>	<i>Number 10 - for score and nr stones</i>
<code>code(ss, 'S')</code>	<i>Letter S</i>
<code>code(t, 'T')</code>	<i>Letter T</i>
<code>code(o, 'O')</code>	<i>Letter O</i>
<code>code(n, 'N')</code>	<i>Letter N</i>
<code>code(e, 'E')</code>	<i>Letter E</i>
<code>code(rs, 'RED SCORE')</code>	<i>Score Text</i>
<code>code(ys, 'YELLOW SCORE')</code>	<i>Score Text</i>

GameState Visualization

In order to have a user friendly game visualization, we decided to represent the game pieces with some symbols: **RF** for red fishes, **YF** for yellow fishes, **O** for stones and **'** for empty spaces. To do it, we use a predicate called `code(Value, Symbol)`. To print the board, we use the predicates:

- `print_board(X)` - prints the superior limit of the table and calls the function `print_tab`;
- `print_tab(List)` - calls the function `print_line`, draws a separator between lines and calls itself;
- `print_line(List)` - calls `print_cell` and next calls itself;
- `print_cell(List)` - calls `code` function to get the symbol of the cell and prints that on the screen.

The first and the last board lines represent a scorer for each player. As the players score points, the points appear registered in places where initially are only 0's. In the last column, there is a counter of the remaining stones that each player has.

Initial game visualization example: □

Intermediate game visualization example: □

Final game visualization example: □

Notes:

To run the game: * Open SICStus; * File -> Working Directory -> src; * Consult -> `jin.li.pl`; * Type `jin.li.` in console.

To check the different GameStates examples, you only have to uncomment the line of the board you want to see in [initial\(GameState\)](#).