CMSC 135: Computer Organization and Architecture

Second Semester AY 2022-2023

Laboratory Machine Problem

"Isagani Game"

Objective: Create a terminal input-based program that simulates the "Isagani Game" previously discussed and demonstrated on our April 17, 2023, laboratory session. If you can recall, the game is like a mixture of tic-tac-toe and checkers. Take note that the user player is O (also always the first player to move), while the AI player is X.

Sample Gameplay:

Sequence 1.

```
    a.   b.   c.
1. [X]-\-[X]-/-[X]
    |    |    |
2. [ ]----[ ]----[ ]
    |    |    |
3. [O]-/-[O]-\-[O]
```

Your move.
From: b3
To: b2
Press enter…

Sequence 2.

```
    a.   b.   c.
1. [X]-\-[X]-/-[X]
    |    |    |
2. [ ]----[O]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[O]
```

AI moves from a1 to a2.
Press enter…

Sequence 3.

```
    a.   b.   c.
1. [ ]-\-[X]-/-[X]
    |    |    |
2. [X]----[O]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[O]
```

Your move.
From: b2
To: a1
Press enter…

Sequence 4.

```
    a.   b.   c.
1. [O]-\-[X]-/-[X]
    |    |    |
2. [X]----[ ]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[O]
```

AI moves from b1 to b2.
Press enter…

Sequence 5.

```
    a.   b.   c.
1. [O]-\-[ ]-/-[X]
    |    |    |
2. [X]----[X]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[O]
```

Your move.
From: c3
To: c2
Press enter...

Sequence 6.

```
    a.   b.   c.
1. [O]-\-[ ]-/-[X]
    |    |    |
2. [X]----[X]----[O]
    |    |    |
3. [O]-/-[ ]-\-[ ]
```

AI moves from c1 to b1.
Press enter...

Sequence 7.

```
    a.   b.   c.
1. [O]-\-[X]-/-[ ]
    |    |    |
2. [X]----[X]----[O]
    |    |    |
3. [O]-/-[ ]-\-[ ]
```

Your move.
From: c2
To: c1
Press enter...

Sequence 8.

```
    a.   b.   c.
1. [O]-\-[X]-/-[O]
    |    |    |
2. [X]----[X]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[ ]
```

AI moves from b2 to c3.
Press enter...

Sequence 9.

```
    a.   b.   c.
1. [O]-\-[X]-/-[O]
    |    |    |
2. [X]----[ ]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[X]
```

Your move.
From: a1
To: b2
Press enter...

Sequence 10.

```
    a.   b.   c.
1. [ ]-\-[X]-/-[O]
    |    |    |
2. [X]----[O]----[ ]
    |    |    |
3. [O]-/-[ ]-\-[X]
```

Congratulations! You win!
Number of moves: 5

MP Rubric

I. Testing #1 (subtotal: **20pts**)

A. Gameplay movement of X (subtotal: **10pts**).
   1. If there are no errors in movement: **10pts**.
   2. If there are one to three errors in movement: **5pts**.
   3. If it does not display "AI moves from XX to YY" but moves correctly: **5pts**.
   4. If there are four or more errors in movement: **0pt**.
   5. If there is no movement at all: **0pt**.

B. Gameplay movement of O (subtotal: **10pts**).
   1. If there are no errors in movement: **10pts**.
   2. If there are one to three errors in movement: **5pts**.
   3. If there are four or more errors in movement: **0pts**.
   4. If it does not ask user input move: **0pt**.
   5. If there is no movement at all: **0pt**.

II. Testing #2 (subtotal: **20pts**)

A. Gameplay movement of X (subtotal: **10pts**).
   1. If there are no errors in movement: **10pts**.
   2. If there are one to three errors in movement: **5pts**.
   3. If it does not display "AI moves from XX to YY" but moves correctly: **5pts**.
   4. If there are four or more errors in movement: **0pt**.
   5. If there is no movement at all: **0pt**.

B. Gameplay movement of O (subtotal: **10pts**).
   1. If there are no errors in movement: **10pts**.
   2. If there are one to three errors in movement: **5pts**.
   3. If there are four or more errors in movement: **0pts**.
   4. If it does not ask user input move: **0pt**.
   5. If there is no movement at all: **0pt**.

III. UI/UX Requirements (subtotal: **20pts**):

A. There is a prompt message greeting whoever wins the game: **5pts**.
B. The correct number of moves of the winner is also displayed after the game: **5pts**.
C. The three-by-three board is rendered with 1, 2, 3 and a, b, c markers: **5pts**.
D. The program does not crash at all: **5pts**.

Total: 60pts.

Bonus: During testing, if the AI defeats Sir Timi and all of its moves are valid, then the MP Grade will be automatically graded perfect.