I have now finished the game of Connect4.

For this one however, I have identified numerous points in the code in which it can hit Connect4 and decided not to terminate as per requirements....

I have explained all the logic in the code...

Just to re-iterate, here are some illustrative examples which are always useful in understanding this. It is further useful, since it is easier to understand logic in event that I missed any scenarios.

Also, I am going to drive my test cases directly from the depictions.

I am expecting several logical errors, since there are quite a few test cases, several variables had to be reset. And also since I utilized further variables, chances of error are definitely heightened...

EACH SCENARIO WILL BE REPLICATED WITH SAME SCENARIO FOR BOTH PLAYERS. NOTE THIS IS ONLY POSSIBLE IF SAME CHIPS OF EACH COLOUR ON BOARD. AND REVERSE THE PLAYER THAT COMMENCES. But I expect no difference to test scenarios...

TEST CASE 1: - We know there are no exclusions on the column for this

<u>move</u>

A straight forward vertical count of connect 4. Red will go first...



*** OUTPUT ***

Welcome to Online IDE !! Happy Coding :)

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Enter name for Player 1:

Amit

Enter name for Player 2:

John

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

3

CHECK AVAILABILITY*

Chip: X will be placed into column: 3 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -] ***CHECK CONNECT FOUR**** **DIAGONAL CHECK 1** INSIDE D1 - Diagonal north east check 2 sc:1 **DIAGONAL CHECK 2** INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3 DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** John has been assigned: O chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, X, -, -, -, -]

John(O), Which column would you like to insert the chip?

4

CHECK AVAILABILITY*

Chip: O will be placed into column: 4 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, O, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

```
3
```

sc:1

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, O, -, -, -]

Amit(X), Which column would you like to insert the chip?

3

CHECK AVAILABILITY*

Chip: X will be placed into column: 3 row: 5

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

2

sc:1

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

```
***SELECT CHIP POSITION****
```

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

John(O), Which column would you like to insert the chip?

4

CHECK AVAILABILITY*

Chip: O will be placed into column: 4 row: 5

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, O, -, -, -]

[-, -, X, O, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

```
3
```

sc:1

DIAGONAL CHECK 2

 $\ensuremath{\mathsf{INSIDE}}\xspace$ D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -] [-, -, X, O, -, -, -] [-, -, X, O, -, -, -] Amit(X), Which column would you like to insert the chip?

3

CHECK AVAILABILITY*

Chip: X will be placed into column: 3 row: 4

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

[-, -, X, O, -, -, -]

CHECK CONNECT FOUR*

***2Congratulations Connect 4 in row:4

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

[-, -, X, O, -, -, -]

John(O), Which column would you like to insert the chip?

5

CHECK AVAILABILITY*

Chip: O will be placed into column: 5 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

[-, -, X, O, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, X, -, -, -, -]

[-, -, X, O, -, -, -]

[-, -, X, O, O, -, -]

Amit(X), Which column would you like to insert the chip?

3

```
***CHECK AVAILABILITY****
```

Chip: X will be placed into column: 3 row: 3

****CURRENT BOARD****

```
[-, -, -, -, -, -, -, -]
[-, -, X, -, -, -, -]
[-, -, X, -, -, -, -]
[-, -, X, 0, -, -, -]
[-, -, X, 0, 0, -, -]
```

CHECK CONNECT FOUR*

***1Congratulations Connect 4 in column:3

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3 INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** John has been assigned: O chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, X, -, -, -, -] [-, -, X, -, -, -, -] [-, -, X, O, -, -, -] [-, -, X, O, O, -, -] John(O), Which column would you like to insert the chip? ** Process Stopped **

Test Count 1a:

I will try again but this time, stack the four higher in the grid... This arrangement however is not possible. Please note it is test case that can not occur. Since the red has more chips on board (it went first), however you would have expected one of the reds to be at base level (row 1) or at row 2 (since not possible to stack first chip in mid board)... But I will simply create a better version in 1aV2.. Not issue with logic of my game, it's a poor devised test case.



Test Count 1aV2:



Test Count 1aV3:



*** OUTPUT ***

Welcome to Online IDE!! Happy Coding :)

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Enter name for Player 1:

Amit

Enter name for Player 2:

John

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: X will be placed into column: 2 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

```
***SELECT CHIP POSITION****
```

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

John(O), Which column would you like to insert the chip?

5

CHECK AVAILABILITY*

Chip: O will be placed into column: 5 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, O, -, -]

5 ***CHECK AVAILABILITY**** Chip: X will be placed into column: 5 row: 5 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, X, -, -] [-, X, -, -, O, -, -] ***CHECK CONNECT FOUR**** DIAGONAL CHECK 1 INSIDE D1 - Diagonal north east check **DIAGONAL CHECK 2** INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3** INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** John has been assigned: O chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, X, -, -]

[-, X, -, -, O, -, -]

John(O), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: O will be placed into column: 2 row: 5

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, O, -, -, X, -, -] [-, X, -, -, O, -, -] ***CHECK CONNECT FOUR**** DIAGONAL CHECK 1 INSIDE D1 - Diagonal north east check DIAGONAL CHECK 2 INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3** INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, O, -, -, X, -, -] [-, X, -, -, O, -, -] Amit(X), Which column would you like to insert the chip? 2 ***CHECK AVAILABILITY**** Chip: X will be placed into column: 2 row: 4 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[-, X, -, -, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[-, X, -, -, O, -, -]

John(O), Which column would you like to insert the chip?

1

CHECK AVAILABILITY* Chip: O will be placed into column: 1 row: 6 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, X, -, -, -, -, -] [-, O, -, -, X, -, -] [O, X, -, -, O, -, -] ***CHECK CONNECT FOUR**** DIAGONAL CHECK 1 INSIDE D1 - Diagonal north east check **DIAGONAL CHECK 2 DIAGONAL CHECK 3 DIAGONAL CHECK 4** ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION**** ****CURRENT BOARD****

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, X, -, -, -, -, -] [-, 0, -, -, X, -, -] [0, X, -, -, 0, -, -] Amit(X), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: X will be placed into column: 2 row: 3

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, -, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, -, O, -, -]

John(O), Which column would you like to insert the chip?

CHECK AVAILABILITY*

Chip: O will be placed into column: 4 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, -]

Amit(X), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: X will be placed into column: 2 row: 2

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, -]

John(O), Which column would you like to insert the chip?

7

CHECK AVAILABILITY*

Chip: O will be placed into column: 7 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, O]

Amit(X), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: X will be placed into column: 2 row: 1

****CURRENT BOARD****

[-, <mark>X</mark>, -, -, -, -, -]

[-, <mark>X</mark>, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, -, -, X, -, -]

[O, X, -, O, O, -, O]

CHECK CONNECT FOUR*

***1Congratulations Amit(X) Connect 4 in column:2

DIAGONAL CHECK 1

DIAGONAL CHECK 2

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, X, -, -, -, -, -]

//I have now included better onscreen messages

[-, X, -, -, -, -, -] [-, O, -, -, X, -, -] [O, X, -, O, O, -, O] John(O), Which column would you like to insert the chip?

Test Count 1b:

I will try again but this time, stack the three reds higher with a broken sequence. I will also not copy the entire transaction since it can be extensive... Also it can be seen this I incorrectly have too many reds.. And I also know the pitfall from last time..



<u>Test1bV2</u> - Although all comments have been removed, there is no mention of congratulations, hence no Connect Four found as expected



*** OUTPUT ***

Welcome to Online IDE!! Happy Coding :)

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Enter name for Player 1:

Amit

Enter name for Player 2:

John

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

4

CHECK AVAILABILITY*

Chip: X will be placed into column: 4 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, X, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

ASSIGN CHIP*

John has been assigned: O chip

****CURRENT BOARD****

[-, X, -, -, -, -, -] [-, X, -, -, -, -, -] [-, X, -, -, -, -, -] [-, O, -, -, -, -, -] [-, X, -, -, -, -, -] [-, O, O, X, O, -, -]

John(O), Which column would you like to insert the chip?

** Process Stopped **

Test Case 2:

Simply checking to right....



*** OUTPUT ***

John(O), Which column would you like to insert the chip?

3 ***CHECK AVAILABILITY**** Chip: O will be placed into column: 3 row: 5 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, -, -, -, -] [-, O, O, -, X, X, X] ***CHECK CONNECT FOUR**** **DIAGONAL CHECK 1** INSIDE D1 - Diagonal north east check **DIAGONAL CHECK 2** INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3** INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, -, -, -, -] [-, O, O, -, X, X, X] Amit(X), Which column would you like to insert the chip?

4

CHECK AVAILABILITY*

Chip: X will be placed into column: 4 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, 0, -, -, -, -] [-, 0, 0, X, X, X, X] ***CHECK CONNECT FOUR**** ***2Congratulations Amit(X) Connect 4 in row:6

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, 0, -, -, -, -]

[-, O, O, X, X, X, X]

John(O), Which column would you like to insert the chip?

** Process Stopped **

<u>Test Case 2a: It would also be checking to left, knowing that are no reds on</u> <u>right</u>



*** OUTPUT ***

John(O), Which column would you like to insert the chip?

3 ***CHECK AVAILABILITY**** Chip: O will be placed into column: 3 row: 5 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, -, -, -, -] [-, O, O, X, X, X, -] ***CHECK CONNECT FOUR**** **DIAGONAL CHECK 1** INSIDE D1 - Diagonal north east check DIAGONAL CHECK 2 INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3** INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, -, -, -, -] [-, O, O, X, X, X, -]

Amit(X), Which column would you like to insert the chip?

7

CHECK AVAILABILITY*

Chip: X will be placed into column: 7 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, -, -, -, -] [-, 0, 0, X, X, X, X] ***CHECK CONNECT FOUR**** ***3Congratulations Amit(X) Connect 4 in row:6 ***ASSIGN CHIP**** John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, 0, -, -, -, -]

[-, O, O, X, X, X, X]

John(O), Which column would you like to insert the chip?

** Process Stopped **

Test Case 2b: It would also be checking to left, knowing that are reds on right



*** OUTPUT ***

John(O), Which column would you like to insert the chip?

4 ***CHECK AVAILABILITY**** Chip: O will be placed into column: 4 row: 5 ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, 0, -, -, -] [-, -, O, X, X, -, X] ***CHECK CONNECT FOUR**** **DIAGONAL CHECK 1** INSIDE D1 - Diagonal north east check DIAGONAL CHECK 2 INSIDE D2 - Diagonal south west check **DIAGONAL CHECK 3** INSIDE D3 - Diagonal south east check **DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, 0, -, -, -] [-, -, O, X, X, -, X]

Amit(X), Which column would you like to insert the chip?

6

CHECK AVAILABILITY*

Chip: X will be placed into column: 6 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, 0, -, -, -] [-, -, O, X, X, X, X] ***CHECK CONNECT FOUR**** ***4Congratulations Amit(X) Connect 4 in row:6 ***ASSIGN CHIP**** John has been assigned: O chip ***SELECT CHIP POSITION**** ****CURRENT BOARD**** [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, 0, 0, -, -, -] [-, -, O, X, X, X, X]

John(O), Which column would you like to insert the chip?

** Process Stopped **





Amit(X), Which column would you like to insert the chip?

2

CHECK AVAILABILITY*

Chip: X will be placed into column: 2 row: 5

****CURRENT BOARD****

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index -1 out of bounds for length 7

at ConnectFour.checkConnectFour(Main.java:508)

at PlayerOne.<init>(Main.java:73)

at PlayerTwo.<init>(Main.java:121)

at PlayerOne.<init>(Main.java:77)

at PlayerTwo.<init>(Main.java:121)

at PlayerOne.<init>(Main.java:77)

at PlayerTwo.<init>(Main.java:121)

at PlayerOne.<init>(Main.java:77)

at ConnectFour.<init>(Main.java:614)

at Main.main(Main.java:33)

For an unknown reason, it has given an error performing diagonal check when inserting this chip

[-, -, -, -, -, -, -, -] [-, -, -, -, -, -, -, -] [-, -, -, -, -, -, -, -] [-, -, -, -, -, -, -, -] [-, X, -, -, -, X, O] [-, O, X, -, -, O, X]

At this moment, it makes little sense since I would have envisaged a diagonal check in north west direction in several test cases...

I am going to quickly review my other test cases and then look at my code

In this test case, there are no issues. But it can be seen that the chip has been inserted at this point (in yellow).

Test Case 2b: It would also be checking to left, knowing that are reds on right



ASSIGN CHIP*

I have recreated the portion of the board and it can be seen that offset is 2. Also this proves there was not an issue in the Scanner taking input, since occasionally it can misinterpret a non-applicable keyboard entry.



This is resulting from the following code:



I checked all my code again in method check connect four and found following error: I am just not entirely sure if this was the cause of the issues, and perhaps if it was, it was undetected in all my existing test cases



The problem can be identified here immediately. In my code, I tried to keep some extra variables to accommodate for the dimension of the board...

But this in itself created additional thinking and room for error in the coding.

The reason for extra variables was as oppose to hardcoding numbers such as 7 for width or 6 for width (zero indexing) or 6 for height or 5 for height (zero indexing).

This was from perspective of playing the game on a variable sized board, although I am not sure if it exists in practice.

CHANGED TO below, however I am still unsure if this is the cause of all my issues..



THE ERROR HAS STILL PERSISTED.

I am glad I checked my code since I found the aforementioned issue. But the actual problem was simply due to incorrect logic as explained below:



So I am glad this issue has flared up. But it also demonstrates my weak test cases before to this...

But conversely, if I tried to fill more chips into the board (as per test cases), I had to perform the simulation of both players (as oppose to initialising the board as per test case). Otherwise I would not get the screen outputs as desired. This in itself is increasingly difficult since it is just not possible to put a red chip on row 2 if there is not a chip beneath it! I am now attempting this test case again...



Test Case 2cV2: Fixed errors in code - FAIL

[X, X, 0, X, -, -, 0]
[0, 0, X, X, -, -, X]
John(O), Which column would you like to insert the chip?
6
CHECK AVAILABILITY*
Chip: O will be placed into column: 6 row: 6
****CURRENT BOARD****
[-, -, -, -, -, -]
[-, -, -, -, -, -]
[-, -, -, -, -, -]
[0, -, -, -, -, -]
[X, X, 0, X, -, -, 0]
[0, 0, X, X, -, 0, X]
CHECK CONNECT FOUR*
DIAGONAL CHECK 1
INSIDE D1 - Diagonal north east check
This is the offset:0
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 7 out of bounds for length 7

It can be seen now that there is an issue with north east check...

Before there was an issue with north west on a different chip.

Good news is that the error has occurred on the final chip.

I am hoping I can resolve this quite quickly...

I have tried to simulate problem again but with less chips.

It can be seen that I have configured my code to not start check from certain constraints

```
L-, -, -, -, -, -, -]
[-, -, -, -, -, -]
[-, -, -, -, -, -, -]
[-, -, -, -, -, 0]
[-, X, 0, X, -, 0, X]
***CHECK CONNECT FOUR****
DIAGONAL CHECK 1
INSIDE D1 - Diagonal north east check
This is the offset:0
in row: 5
in column: 5
offset: 0
in row: 5
in column: 5
offset: 1
in row: 5
in column: 5
offset: 2
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 7 out of bounds for length 7
   at ConnectFour.checkConnectFour(Main.java:383)
```

(ie no north east check from - non zero index based row 1 or column 7).

I have a decision now.

I can either instruct the code (via try and catch) to handle this situation...

The other alternative would be a while loop...



And fortunately it has functioned...

Reason I am choosing while loop as oppose to try and catch is since the catch statement will contain no implementation..

Also, I am operating on a very small board, it appears to be unjust using try/catch.

CHECK CONNECT FOUR*
DIAGONAL CHECK 1
INSIDE D1 - Diagonal north east check
This is the offset:0
in row: 5
in column: 5
offset: 0
in row: 5
in column: 5
offset: 1
in row: 5
in column: 5
offset: 2
in row: 5
in column: 5
offset: 2
in row: 5
in column: 5
offset: 2
in row: 5
in column: 5

I am also sure there are other reasons in Java to determine trade off between the two techniques... But for now, I am going implement while loop across all my code. But for now, it has moved into north west (diagonal to the left, see above), so it seems functional. CHANGES COMPLETE:

```
DIAGONAL CHECK 2
DIAGONAL CHECK 3
DIAGONAL CHECK 4
INSIDE D4 - Diagonal north west check
This is the offset:0
****ASSIGN CHIP****
```

Also, the irony is, with exception of using while loop for tokenizers, I am yet to use it in any practice for iteration in absence of these scenarios.

Test Case 2cV3: Fixed errors in code

	<pre>NW while (columnChipPlacedZeroIndex-offset>=0) SW</pre>	
NIZ.	NE while (columnChipPlacedZeroIndex+offset<=boardWidthZ	CeroIndex)
	E W NO ADJUSTMENTS REQUIRED S	



*** OUTPUT ***

CHECK AVAILABILITY*

Chip: O will be placed into column: 5 row: 6

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[0, -, -, -, -, -, -]

[X, X, O, X, -, X, O]

[O, O, X, X, O, O, X]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

This is the offset:0

DIAGONAL CHECK 2

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

This is the offset:0

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[0, -, -, -, -, -, -]

[X, X, O, X, -, X, O]

[O, O, X, X, O, O, X]

Amit(X), Which column would you like to insert the chip?

5

CHECK AVAILABILITY*

Chip: X will be placed into column: 5 row: 5

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[O, -, -, -, -, -, -]

[x, x, o, x, X, x, o]

[O, O, X, X, O, O, X]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

This is the offset:0

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

This is the offset:0

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

value of offset: 1

value of offset: 2

value of offset: 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

This is the offset:0

ASSIGN CHIP*

John has been assigned: O chip

//it has performed all validation above and no issues

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [-, -, -, -, -, -, -] [0, -, -, -, -, -, -] [X, X, O, X, X, X, X, O]

[,, ,, 0, ,, , , , , , ,]

[O, O, X, X, O, O, X]

John(O), Which column would you like to insert the chip?

//ready for next chip insertion

Test Case 3: Performing a diagonal check in North east direction - FAIL



I am severely struggling to figure out if the grid is valid...

I am going to simplify the board to ensure I can perform test

I am now adding numbers on chips so I can replicate order in which chips were inserted.



This is perfectly valid but it has not found connect 4 in the south west direction from chip 12.

***	*CUI	RREI	NT I	BOAI	RD*	***
[-,	-,	-,	-,	-,	-,	-]
[-,	-,	-,	-,	-,	-,	-]
[-,	-,	-,	-,	-,	-,	0]
[-,	-,	-,	-,	-,	0,	X]
[-,	-,	-,	-,	0,	х,	0]
[-,	х,	х,	0,	х,	х,	0]

*** OUTPUT ***

John(O), Which column would you like to insert the chip?

<u>7</u>

CHECK AVAILABILITY*

Chip: O will be placed into column: 7 row: 3

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, O]

```
[-, -, -, -, <mark>-</mark>, <mark>O</mark>, X]
```

[-, X, X, <mark>O</mark>, X, X, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

This is the offset:0

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

This is the offset:0

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

<u>[-, -, -, -, -, -, -]</u>

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, 0]

<u>[-, -, -, -, -, O, X]</u>

[-, -, -, -, O, X, O]

[-, X, X, O, X, X, O]

Amit(X), Which column would you like to insert the chip?

I have enabled screen outputs in various junctions and it can be seen as below. It can be seen that it entered inside if four times, so I expected one of these conditions to evaluate successfully.



Also we know that it has not performed DIAGONAL 1 (south east) as expected....

So, it suggests mishandling of the variable... I will run the code again, and this time enable the state of the variables (sameColourTotal and runningTotalSameColour)

<u>***OUTPUT***with more screen outputs for error tracking</u> INSIDE D2 - Diagonal south west check

This is the offset:0

column chip placed:6

Inside while

Inside if

Inside while

column chip placed:6

Inside while

Inside if

Inside while

column chip placed:6

Inside while

Inside if

Inside while

column chip placed:6

Inside while

Inside if

Inside while

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

This is the offset:0

OUTPUTwith even more screen outputs for error tracking
INSIDE D2 - Diagonal south west check
This is the offset:0
value of sameColourTotal should be 0:0 //as expected
value of runningTotalSameColour should be 0:0 //as expected
column chip placed:6

Inside while

Inside if	
NEW value of sameColourTotal:1	//as expected
NEW value of runningTotalSameColour:	0 //as expected
Inside while	
column chip placed:6	
Inside while	
Inside if	
NEW value of sameColourTotal:1 //I w st	as expecting an increment here, but it has ayed same value
NEW value of runningTotalSameColour:	0 //as expected
Inside while	
column chip placed:6	
Inside while	
Inside if	
NEW value of sameColourTotal:1	//same issue as above
NEW value of runningTotalSameColour:	0 //as expected
Inside while	
column chip placed:6	
Inside while	
Inside if	
NEW value of sameColourTotal:1	
NEW value of runningTotalSameColour:	<u>0</u>
Inside while	
DIAGONAL CHECK 3	
DIAGONAL CHECK 4	
INSIDE D4 - Diagonal north west check	
This is the offset:0	
ASSIGN CHIP*	
Amit has been assigned: X chip	

It has taken this much effort to figure out that the logic is totally against my intention. Examining the green highlights above, it can be seen that it enters the while and on some occasions it enters the while and if statement. This erratic behaviour is causing it to enter the else section and reset the variable back to 0. Hence the output NEW value of sameColourTotal:1 remains as this...

It clearly shows the while statement was a poor choice, but it also worth understanding the logic flow. I am running the code again and pasting the south west section again... I will try my best to analyse it...

<u>***OUTPUT***w</u>	ith even more screen outputs for error tracking	
INSIDE D2 - Diag	gonal south west check	
CHECK CON	NECT FOUR*	
DIAGONAL CHE	CK 1	
DIAGONAL CHE	CK 2	
INSIDE D2 - Diag	gonal south west check	
This is the offset	:0	
value of sameCo	olourTotal should be 0:0	
value of running	TotalSameColour should be 0:0	
column chip pla	ced:6	
value of count:2	//this is the row, so this is ok	
Inside while	//This is all ok	
Inside if	<pre>//board[count][columnChipPlacedZeroIndex-offset] //board[2][6-0] = [2][6]</pre>	
NEW value of sa	meColourTotal:1	
NEW value of ru	nningTotalSameColour:0	
Inside while	//it has entered here again, but the count is still 2, offset is equal to 1	
Inside else	<pre>// so the if part would be //board[count][columnChipPlacedZeroIndex-offset] // board[2][6-1] = board[2][5] //it has not moved row down since not hit the for loop.</pre>	

//perhaps it needed an if loop as oppose to while introduced!

column chip placed:6 value of count:3 Inside while Inside if NEW value of sameColourTotal:1 NEW value of runningTotalSameColour:0 Inside while Inside else column chip placed:6 value of count:4 Inside while Inside if NEW value of sameColourTotal:1 NEW value of runningTotalSameColour:0 Inside while Inside else column chip placed:6 value of count:5 Inside while Inside if NEW value of sameColourTotal:1 NEW value of runningTotalSameColour:0 Inside while Inside else **DIAGONAL CHECK 3 DIAGONAL CHECK 4** INSIDE D4 - Diagonal north west check This is the offset:0 ***ASSIGN CHIP**** Amit has been assigned: X chip ***SELECT CHIP POSITION****

I have now changed the while to an if.

if (columnChipPlacedZeroIndex-offset>=0)
{
 System.out.println("Inside while");

<u>Test Case 3v2: Performing a diagonal check – south west (changed while to if).</u>

If this test succeeds, I will do the same for all while loops introduced

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, O, X]

[-, -, -, -, O, X, O]

[-, X, X, O, X, X, O]

John(O), Which column would you like to insert the chip?

7

```
***CHECK AVAILABILITY****
```

Chip: O will be placed into column: 7 row: 3

```
****CURRENT BOARD****
```

```
[-, -, -, -, -, -, -]
```

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, O]

[-, -, -, -, -, O, X]

[-, -, -, -, O, X, O]

[-, X, X, O, X, X, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

This is the offset:0

value of sameColourTotal should be 0:0

value of runningTotalSameColour should be 0:0

column chip placed:6

value of count:2

Inside while

Inside if

NEW value of sameColourTotal:1

NEW value of runningTotalSameColour:0

column chip placed:6

value of count:3

Inside while

Inside if

NEW value of sameColourTotal:2

NEW value of runningTotalSameColour:0

column chip placed:6

value of count:4

Inside while

Inside if

NEW value of sameColourTotal:3

NEW value of runningTotalSameColour:0

column chip placed:6

value of count:5

Inside while

Inside if

NEW value of sameColourTotal:4

NEW value of runningTotalSameColour:0

***6Congratulations John(O) Connect 4 in diagonal

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -, -] [-, -, -, -, -, -, -, -] [-, -, -, -, -, -, O] [-, -, -, -, -, O, X] [-, -, -, -, -, O, X, O]

```
[-, X, X, <mark>O</mark>, X, X, O]
```

Amit(X), Which column would you like to insert the chip?

** Process Stopped **

I am hoping all my issues are now over. It was a misjudgement of trying a while loop for the first time and not understanding impact.

I also think while loop was extremely hazardous when the code relied on the outer for loop to count the rows.



column 5,5,5,4,4,6,6,7,6,1,6,1,3

(this informs end user of order to insert chips)

*** OUTPUT ***

Amit(X), Which column would you like to insert the chip?

3

```
***CHECK AVAILABILITY****
```

Chip: X will be placed into column: 3 row: 6

```
****CURRENT BOARD****
```

```
[-, -, -, -, -, -, -]
[-, -, -, -, -, -, -]
[-, -, -, -, -, X, -]
[-, -, -, -, X, X, -]
[O, -, -, X, O, X, -]
[O, -, X, O, X, O, O]
```

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

This is the offset:0

***5Congratulations Amit(X) Connect 4 in diagonal

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

- [-, -, -, -, -, -, -]
- [-, -, -, -, -, -, -]
- [-, -, -, -, -, X, -]
- [-, -, -, -, X, X, -]
- [O, -, -, X, O, X, -]
- [O, -, X, O, X, O, O]

John(O), Which column would you like to insert the chip?

** Process Stopped **



Test Case 3b: Performing a diagonal check in both directions

Column 3,1,1,1,4,2,2,2,4,5,7,6,6,5,7,6,6,7,5

*** OUTPUT ***

Amit(X), Which column would you like to insert the chip?

5

CHECK AVAILABILITY*

Chip: X will be placed into column: 5 row: 4

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, -, -, -, -, X, -]

[O, O, -, -, X, O, O]

[X, X, -, <mark>X</mark>, O, X, X]

[O, O, <mark>X</mark>, X, O, O, X]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

***7CongratulationsAmit(X) Connect 4 in diagonal

ASSIGN CHIP*

John has been assigned: O chip





Columns: 1,2,1,2,3,1,5,4,5,4,5,7,6,6,7,7,6,7,7,5,6,

*** OUTPUT ***

Chip: X will be placed into column: 6 row: 3

```
****CURRENT BOARD****
```

```
[-, -, -, -, -, X]
```

```
[-, -, -, -, O, <mark>X</mark>, O]
```

[O, -, -, -, X, X, O]

[X, O, -, O, X, O, X]

[X, O, <mark>X</mark>, O, X, X, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check DIAGONAL CHECK 3 INSIDE D3 - Diagonal south east check value of offset: 1 DIAGONAL CHECK 4 INSIDE D4 - Diagonal north west check This is the offset:0 ***ASSIGN CHIP**** John has been assigned: O chip ***SELECT CHIP POSITION****



Test 4: Similar to Test 3 but in the opposite diagonal... (South East)

Columns 7,5,6,6,5,4,5,4,7,3,3,3,2,2,2,1,1,1,1,2

*** OUTPUT ***

John(O), Which column would you like to insert the chip?

<u>2</u>

CHECK AVAILABILITY*

Chip: O will be placed into column: 2 row: 3

****CURRENT BOARD****

```
[-, -, -, -, -, -, -]
```

[-, -, -, -, -, -, -, -] [X, O, -, -, -, -, -] [O, X, O, -, X, -, -] [X, O, X, O, X, O, X] [O, X, O, O, O, X, X] $^{***}CHECK CONNECT FOUR^{****}$ DIAGONAL CHECK 1
INSIDE D1 - Diagonal north east check
DIAGONAL CHECK 2
INSIDE D2 - Diagonal south west check
DIAGONAL CHECK 3
INSIDE D3 - Diagonal south east check
***8Congratulations John(O) Connect 4 in diagonal

Test 4a: Similar to Test 3b but in the opposite diagonal... (north west)



Columns: 4,7,3,6,1,1,1,4,4,2,2,2,3,3,7,2,1,5

*** OUTPUT ***

Amit(X), Which column would you like to insert the chip?

CHECK AVAILABILITY*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[O, X, <mark>X</mark>, O, -, -, -]

[X, O, O, <mark>X</mark>, -, -, -]

[O, X, O, X, <mark>X</mark>, X, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

DIAGONAL CHECK 3

DIAGONAL CHECK 4

INSIDE D4 - Diagonal north west check

This is the offset:0

***10CongratulationsAmit(X) Connect 4 in diagonal

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

Test 4b: Performing a check in both diagonal directions



Column: 3,7,4,1,2,1,2,2,2,6,6,7,5,3,3,5,4

*** OUTPUT ***

Amit(X), Which column would you like to insert the chip?

<u>4</u>

CHECK AVAILABILITY*

Chip: X will be placed into column: 4 row: 5

****CURRENT BOARD****

- [-, -, -, -, -, -, -]
- [-, -, -, -, -, -, -]
- [-, X, -, -, -, -, -]
- [-, O, X, -, -, -, -]
- [O, X, O, <mark>X</mark>, O, X, O]
- [O, X, X, X, <mark>X</mark>, O, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

INSIDE D2 - Diagonal south west check

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

value of offset: 1

***8Congratulations Amit(X) Connect 4 in diagonal

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[-, -, -, -, -, -, -]

[-, X, -, -, -, -, -]

[-, O, X, -, -, -, -]

[O, X, O, X, O, X, O]

[O, X, X, X, X, O, O]

John(O), Which column would you like to insert the chip?

** Process Stopped **



Test 4c: Checking a break in the consecutive reds.. Ensuring it is functional

Column: 3,7,4,1,2,1,2,2,2,6,6,7,5,3,3,5,1,4,1,3,1

*** OUTPUT ***

CHECK AVAILABILITY*

Chip: X will be placed into column: 1 row: 2

****CURRENT BOARD****

[-, -, -, -, -, -, -]

[X, -, -, -, -, -, -]

[X, X, O, -, -, -, -]

[X, O, X, -, -, -, -]

[O, X, O, O, O, X, O]

[O, X, X, X, X, O, O]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

value of offset: 1

value of offset: 2

value of offset: 3

DIAGONAL CHECK 4

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

Test 5: Inserting chip in an already full column



I am going to simplify this since exhausted lots of test cases...

I am just going to fill three columns to the limit and try to insert it into each one at time. Then I will insert into vacant column

NOTE: I have completed almost none of this implementation on this, so will just remediate as per test case

At the moment, it can be seen that it is alternating turns... When the person attempts to put chip into column (even if it doesn't make transaction), it processes usual routine. And flips turn. This is not correct.

*** OUTPUT ***

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

- [<u>O, X, O, -, -, -, -]</u>
- [<u>O, X, O, -, -, -, -]</u>

[X, X, X, -, -, -, -]

[<u>O, O, O, -, -, -, -]</u>

[X, X, X, -, -, -, -]

[X, O, O, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

CHECK AVAILABILITY*

****CURRENT BOARD****

- [O, X, <mark>O</mark>, -, -, -, -]
- [O, X, <mark>O</mark>, -, -, -, -]
- [X, X, <mark>X</mark>, -, -, -, -]
- [<u>O, O, O, -, -, -, -]</u>
- [X, X, <mark>X</mark>, -, -, -, -]
- [X, O<mark>, O</mark>, -, -, -, -]
- ***CHECK CONNECT FOUR****
- DIAGONAL CHECK 1
- DIAGONAL CHECK 2
- INSIDE D2 Diagonal south west check
- DIAGONAL CHECK 3
- INSIDE D3 Diagonal south east check
- **DIAGONAL CHECK 4**
- ***ASSIGN CHIP****
- John has been assigned: O chip
- ***SELECT CHIP POSITION****
- ****CURRENT BOARD****
- [O, X, O, -, -, -, -]
- [O, X, O, -, -, -, -]
- [X, X, X, -, -, -, -]
- [0, 0, 0, -, -, -, -]
- [X, X, X, -, -, -, -]
- [X, O, O, -, -, -, -]
- John(O), Which column would you like to insert the chip? //it now flips to other player, which is not correct
- It requires intervention in:
- cf.checkAvailability(cf.inputAsIntegerZeroIndex,yellowValue);

<u>3</u>

I have introduced much better logic now. I also included information on the last player to put chip in.

I found this was the only technique to ensure that if end user was placing chip in a full column, he was still the active player.

*** OUTPUT ***

Amit(X), Which column would you like to insert the chip?

1

CHECK AVAILABILITY*Board height: 6 board Width:7

Chip: X will be placed into column: 1 row: 2

WHAT IS AVAILABILITY: true

****CURRENT BOARD****

[-, -, -, -, -, -, -, -]

[X, -, -, -, -, -, -]

[0, -, -, -, -, -, -]

[X, -, -, -, -, -, -]

<u>[0, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

CHECK CONNECT FOUR*

DIAGONAL CHECK 1

INSIDE D1 - Diagonal north east check

DIAGONAL CHECK 2

DIAGONAL CHECK 3

INSIDE D3 - Diagonal south east check

value of offset: 1

DIAGONAL CHECK 4

ASSIGN CHIP*

John has been assigned: O chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[<u>-, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[O, -, -, -, -, -, -, -] [X, -, -, -, -, -, -] [O, -, -, -, -, -, -, -] [X, -, -, -, -, -, -]

John(O), Which column would you like to insert the chip?

1

CHECK AVAILABILITY*Board height: 6 board Width:7

Chip: O will be placed into column: 1 row: 1

WHAT IS AVAILABILITY: false

Column: 1 is full. Try alternate

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[O, -, -, -, -, -, -]

[X, -, -, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

1

CHECK AVAILABILITY*Board height: 6 board Width:7

WHAT IS AVAILABILITY: false

Column: 1 is full. Try alternate

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[O, -, -, -, -, -, -] [X, -, -, -, -, -, -] [O, -, -, -, -, -, -] [X, -, -, -, -, -, -] Amit(X), Which column would you like to insert the chip?

<u>1</u>

CHECK AVAILABILITY*Board height: 6 board Width:7

WHAT IS AVAILABILITY: false

Column: 1 is full. Try alternate

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[0, -, -, -, -, -, -]

```
[X, -, -, -, -, -, -]
```

Amit(X), Which column would you like to insert the chip?

<u>1</u>

CHECK AVAILABILITY*Board height: 6 board Width:7

WHAT IS AVAILABILITY: false

Column: 1 is full. Try alternate

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[<u>O, -, -, -, -, -, -]</u>

[X, -, -, -, -, -, -]

[O, -, -, -, -, -, -, -] [X, -, -, -, -, -, -] [O, -, -, -, -, -, -] [X, -, -, -, -, -, -]

Amit(X), Which column would you like to insert the chip?

<u>2</u>

CHECK AVAILABILITY*Board height: 6 board Width:7 Chip: X will be placed into column: 2 row: 6 WHAT IS AVAILABILITY: true ****CURRENT BOARD**** [0, -, -, -, -, -, -] [X, -, -, -, -, -, -] [0, -, -, -, -, -, -] [0, -, -, -, -, -, -] [X, X, -, -, -, -, -]

Test 6: Inserting chip in an already full board



Again, I am just going to fill the entire board.. My program is not designed at the moment so that it is terminating at Connect four.. But it will undoubtedly perform a System.exit(0) on a full board...

CHECK AVAILABILITY*Board height: 6 board Width:7

Chip: O will be placed into column: 7 row: 1

Column: 7 is NOW full.

AVAILABILITY: Total of 7 columns filled

Last chip inserted O by: John(Player 2)

ASSIGN CHIP*

Amit has been assigned: X chip

SELECT CHIP POSITION*

****CURRENT BOARD****

[X, O, O, X, O, X, O]

[X, O, X, O, X, O, X]

[O, X, O, X, O, X, O]

[X, O, X, O, X, O, X]

[O, X, O, X, O, X, O]

[X, O, X, O, X, O, X]

Amit(X), Which column would you like to insert the chip?

1

CHECK AVAILABILITY*Board height: 6 board Width:7

GAME OVER - NO WINNER