CS 501-WS3 Final Project

CONNECT FOUR

Group Members:

1. Roushan Kumar
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Introduction:

Connect four is a two-player board game in which players alternately drop colored disks into a vertically hanging grid of eight columns and six rows. The user wins if they place 4 disks consecutively. This game helps in boosting strategic thinking capabilities.

Details of game:

In this game there will be 2 players who will be player red and player yellow in our case. First turn would be of player "red", and he/she will be asked to select a number between 0 to 7.

The goal of the game is to link four identically colored disks in a row, column, or diagonal before your opponent does so. The application instructs two players to alternately drop a red and yellow disk. The application redisplays the board on the console whenever a disk is dropped, and assesses the game's condition (win, draw, or continue).

How to play connect four:

If for example, user "red" starts and inserts 0 when the command is prompted. The letter "R" will be placed on the 0th column of the 0th row. Now, if user "yellow" selects 0 then as that position is already filled with "R", the letter "Y" will be placed on the row about it. So, it will be placed on 1st row of 0th column.

This way the user "red" and "yellow" can obstruct each other from creating 4 disks consecutively.

Test Cases:

For this project we will be implementing 5 test cases.

    i.   Vertical (|): If either of "Red" or "Yellow" form four disks of their same color consecutively in vertical direction, will be declared a winner. An example of 1st test case is shown below:

```
                    CONNECT FOUR GAME

Project Members:
1. Roushan Kumar - (CWID: 20009314)
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What is connect four?
 Connect four is a two-player board game in which players alternately drop colored
 disks into a vertically hanging grid of eight columns and six rows. The user wins
 if they place 4 disk's consecutively. This game helps in boosting strategic thinking
 capabilities.

How to Play Connect Four:
1. First select the player you would like to play as.
2. Player 1 is always going to be Red and player 2 as Yellow.
3. Inorder to win this game, either of the players need to create 4 disks
   consecutively and the disks can be formed Horizontally, Vertically or Diagonally.
4. If a user playing as player 'R' choose column 3 but, column 3 is already occupied
   by player 'Y', then the player 'R' would be automatically marked in the row above
   that column

Let's Begin !!
-------------------------------------------------------------------
Use 0-7 to select a column
01234567
........|
........
........
........
........
........
```

```
Player RED turn:
Use 0-7 to select a column
0
01234567
........
........
........
........
........
R.......


Player YELLOW turn:
Use 0-7 to select a column
1
01234567
........
........
........
........
........
RY......


Player RED turn:
Use 0-7 to select a column
0
01234567
........
........
........
........
R.......
RY......
```

```
Player YELLOW turn:
Use 0-7 to select a column
1
01234567
........
........
........
........
RY......
RY......


Player RED turn:
Use 0-7 to select a column
0
01234567
........
........
........
R.......
RY......
RY......


Player YELLOW turn:
Use 0-7 to select a column
1
01234567
........
........
........
RY......
RY......
RY......


Player RED turn:
Use 0-7 to select a column
0
01234567
........
........
R.......
RY......
RY......
RY......


Player RED is winner!

Enter 1 to continue the program
Enter any number except 1 to exit from program
```

ii.   Horizontal (--): If either of "Red" or "Yellow" form four disks of their same color consecutively in horizontal direction, will be declared a winner. An example of 2nd test case is shown below:

```
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   consecutively and the disks can be formed Horizontally, Vertically or Diagonally.
4. If a user playing as player 'R' choose column 3 but, column 3 is already occupied
   by player 'Y', then the player 'R' would be automatically marked in the row above
   that column

Let's Begin !!
-----------------------------------------------------------------------
Use 0-7 to select a column
01234567
........
........
........
........
........
........
```

```
Player RED turn:
Use 0-7 to select a column
0
01234567
........
........
........
........
........
R.......


Player YELLOW turn:
Use 0-7 to select a column
0
01234567
........
........
........
........
Y.......
R.......


Player RED turn:
Use 0-7 to select a column
1
01234567
........
........
........
........
Y.......
RR......
```

```
Player YELLOW turn:
Use 0-7 to select a column
1
01234567
........
........
........
........
YY......
RR......


Player RED turn:
Use 0-7 to select a column
2
01234567
........
........
........
........
YY......
RRR.....


Player YELLOW turn:
Use 0-7 to select a column
2
01234567
........
........
........
........
YYY.....
RRR.....
```

```
Player RED turn:
Use 0-7 to select a column
3
01234567
........
........
........
........
YYY.....
RRRR....


Player RED is winner!

Enter 1 to continue the program
Enter any number except 1 to exit from program
```

iii. Back Slash Diagonal (\): Can also be termed as Diagonal left. If either of "Red" or "Yellow" form four disks of their same color consecutively diagonally towards the left, will be declared a winner. An example of 3rd test case is shown below:

```
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4. If a user playing as player 'R' choose column 3 but, column 3 is already occupied
   by player 'Y', then the player 'R' would be automatically marked in the row above
   that column

Let's Begin !!
-------------------------------------------------------------------------
Use 0-7 to select a column
01234567
........
........
........
........
........
........
```

```
Player RED turn:
Use 0-7 to select a column
7
01234567
........
........
........
........
........
.......R


Player YELLOW turn:
Use 0-7 to select a column
6
01234567
........
........
........
........
........
......YR


Player RED turn:
Use 0-7 to select a column
6
01234567
........
........
........
........
......R.
......YR
```

```
Player YELLOW turn:
Use 0-7 to select a column
5
01234567
........
........
........
........
......R.
.....YYR


Player RED turn:
Use 0-7 to select a column
5
01234567
........
........
........
........
.....RR.
.....YYR


Player YELLOW turn:
Use 0-7 to select a column
4
01234567
........
........
........
........
.....RR.
....YYYR
```

```
Player RED turn:
Use 0-7 to select a column
5
01234567
........
........
........
.....R..
.....RR.
....YYYR


Player YELLOW turn:
Use 0-7 to select a column
4
01234567
........
........
........
.....R..
....YRR.
....YYYR


Player RED turn:
Use 0-7 to select a column
4
01234567
........
........
........
....RR..
....YRR.
....YYYR
```

```
Player YELLOW turn:
Use 0-7 to select a column
5
01234567
........
........
.....Y..
....RR..
....YRR.
....YYYR


Player RED turn:
Use 0-7 to select a column
4
01234567
........
........
....RY..
....RR..
....YRR.
....YYYR


Player RED is winner!

Enter 1 to continue the program
Enter any number except 1 to exit from program
```

iv. Forward Slash Diagonal (/): Can also be termed as Diagonal right. If either of "Red" or "Yellow" form four disks of their same color consecutively diagonally towards the right, will be declared a winner. An example of 4th test case is shown below:

```
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4. If a user playing as player 'R' choose column 3 but, column 3 is already occupied
   by player 'Y', then the player 'R' would be automatically marked in the row above
   that column

Let's Begin !!
-------------------------------------------------------------------------
Use 0-7 to select a column
01234567
........
........
........
........
........
........
```

```
Player YELLOW turn:
Use 0-7 to select a column
2
01234567
........
........
........
........
.R......
RYY.....


Player RED turn:
Use 0-7 to select a column
2
01234567
........
........
........
........
.RR.....
RYY.....


Player YELLOW turn:
Use 0-7 to select a column
3
01234567
........
........
........
........
.RR.....
RYYY....
```

```
Player RED turn:
Use 0-7 to select a column
2
01234567
........
........
........
..R.....
.RR.....
RYYY....


Player YELLOW turn:
Use 0-7 to select a column
3
01234567
........
........
........
..R.....
.RRY....
RYYY....


Player RED turn:
Use 0-7 to select a column
2
01234567
........
........
..R.....
..R.....
.RRY....
RYYY....
```

```
Player YELLOW turn:
Use 0-7 to select a column
3
01234567
........
........
..R.....
..RY....
.RRY....
RYYY....


Player RED turn:
Use 0-7 to select a column
4
01234567
........
........
..R.....
..RY....
.RRY....
RYYYR...


Player YELLOW turn:
Use 0-7 to select a column
4
01234567
........
........
..R.....
..RY....
.RRYY...
RYYYR...
```

```
Player RED turn:
Use 0-7 to select a column
1
01234567
........
........
..R.....
.RRY....
.RRYY...
RYYYR...


Player YELLOW turn:
Use 0-7 to select a column
4
01234567
........
........
..R.....
.RRYY...
.RRYY...
RYYYR...
```

```
Player RED turn:
Use 0-7 to select a column
3
01234567
........
........
..RR....
.RRYY...
.RRYY...
RYYYR...


Player RED is winner!

Enter 1 to continue the program
Enter any number except 1 to exit from program
```

v.   Restarting game: If neither player "Red" nor player "Yellow" can form four disks of the same color consecutively then the game will result in a draw and the console will ask the user to restart the game and both players will have to start playing the game again. An example of 5th test case is shown below:

```
Player RED turn:
Use 0-7 to select a column
7
01234567
YRYRYR.R
YRYRYRYR
YRYRYRYR
RYRYRYRY
RYRYRYRY
RYRYRYRY


Player YELLOW turn:
Use 0-7 to select a column
6
01234567
YRYRYRYR
YRYRYRYR
YRYRYRYR
RYRYRYRY
RYRYRYRY
RYRYRYRY

Game over. No winner. Try again!

Enter 1 to continue the program
Enter any number except 1 to exit from program
```