Software Engineering Project 1

(Comp 10050)

Assignment 2 – the Othello/Reversi Game

Aim: to create a program that implements the Othello game (https://en.wikipedia.org/wiki/Reversi)

<u>You are expected to perform this assignment in a group</u>

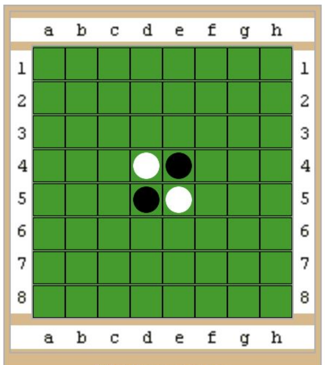
A. The Reversi game

Game Components

Reversi is a strategy board **game** for two players, played on an 8×8 board.
There are 64 identical **game pieces** called disks. Each player can move 1 disk at a time in turns.
In the original game to recognize the disks moved by each player a different colour is used (black and white).

Start

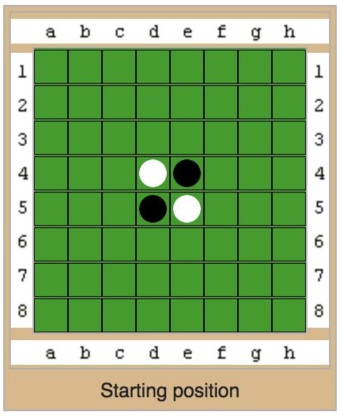
The game begins with four disks placed in a square in the middle of the grid, two facing white side up, two pieces with the dark side up, with same-colored disks on a diagonal with each other.



Starting position

Turns

The dark player moves first.
Each player can only move in such a position that there exists at least one straight (horizontal, vertical, or diagonal) occupied line between the new piece and another dark piece, with one or more contiguous light pieces between them.


Starting position

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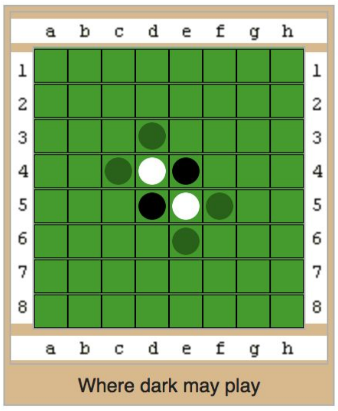
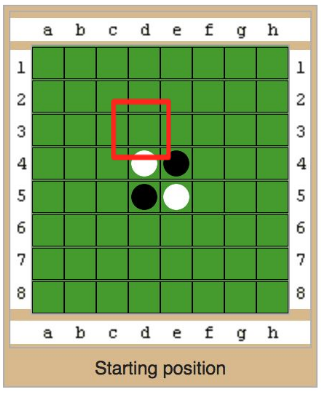

Where dark may play

After placing the piece, dark turns over (flips, captures) all light pieces lying on a straight line between the new piece and any anchoring dark pieces.


Starting position

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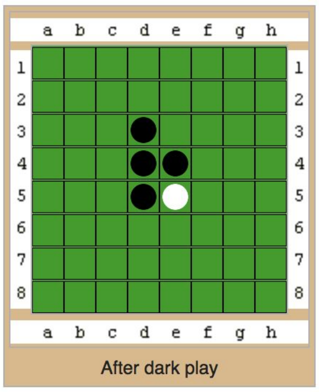
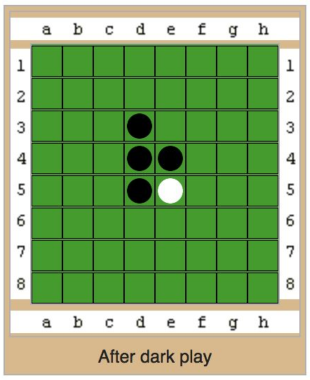

After dark play

Now light plays. This player operates under the same rules, with the roles reversed: light lays down a light piece, causing a dark piece to flip. Possibilities at this time appear thus (indicated by transparent pieces):


After dark play

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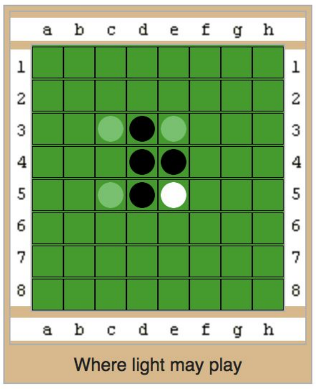
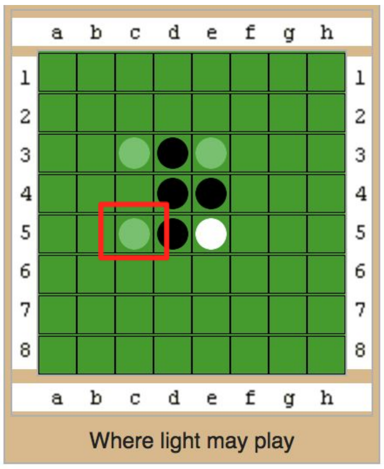

Where light may play

Light takes the bottom left option and reverses one piece.



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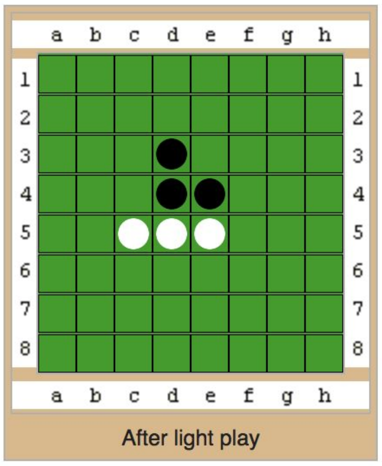

Players take alternate turns. If one player can not make a valid move, play passes back to the other player. When neither player can move, the game ends.

The winner is the player who has more disks on the board.

You can also try the rules of the game online
http://www.webgamesonline.com/reversi/

Requirements:

1. Create 1 Git project for your second assignment (1 project for each team)
2. Collaboratively with your teammate create the game components (players, boards, disks)

In your main function, declare variables to represent:

- The Board: 2-dimensional array (8 x 8) of disks; the position in the array will indicate where the disks are placed on the board
- The total number of remaining disks that can be placed on the board
- The players

Use structs to represent players and disks.
Each player should be characterized by:

- Name (max 20 characters)
- Type of disk s/he can play with (black or white)
- Number of disks of its associated colour placed on the board

Each disk should be characterized by:

- Type (e.g., black or white)

- The position in which the disk is placed on the board (number of row and number of column)

Your program should execute the following functionality:
- Ask players to provide their name as input and assign it to the players
- Assign players a disk type
- Initialize the game components as indicated in the start of the game, i.e. initialize the cells of the board, initialize the total number of disks that can be placed on the board, initialize
- Print the board on the console. For example like this:

```
   1  2 3  4  5  6  7  8
1 | x | x | x | x | x | x | x | x |
2 | x | x | x | x | x | x | x | x |
3 | x | x | x | x | x | x | x | x |
4 | x | x | x | 1 | 0 | x | x | x |
5 | x | x | x | 0 | 1 | x | x | x |
6 | x | x | x | x | x | x | x | x |
7 | x | x | x | x | x | x | x | x |
8 | x | x | x | x | x | x | x | x |
```

The board cells printed on the console have the following meaning
1: a dark disk is placed on the board cell
0: a white disk is placed on the board cell
X: the cell is empty

Code Design Requirements:

- Comment your code.
- Place the data structures representing disks and players in a separate library, i.e. separate your code into independent modules

Submission:

- Add me as a collaborator on your GitLab project (use my username liliana.pasquale)
- In your repository include a text file describing
    - How you decided to implement the board, the disks and the players
    - How did you divide the work (e.g., who did what)?

Evaluation Criteria

A mark [0-100] will be give according to the following criteria
- The code is well commented and appropriately divided into modules (15 points)

- Work is appropriately distributed and placed in the Git repository (25 points)
- The submitted text file describes your design choices appropriately (5 points)
- Players implementation (15)
- Disks implementation (15)
- Board and total disk number implementation (10)
- Initialization of the game elements (10 points)
- The board is printed correctly (5 points)