

# **USER GUIDE FOR OTHELLO**

**Developed by  
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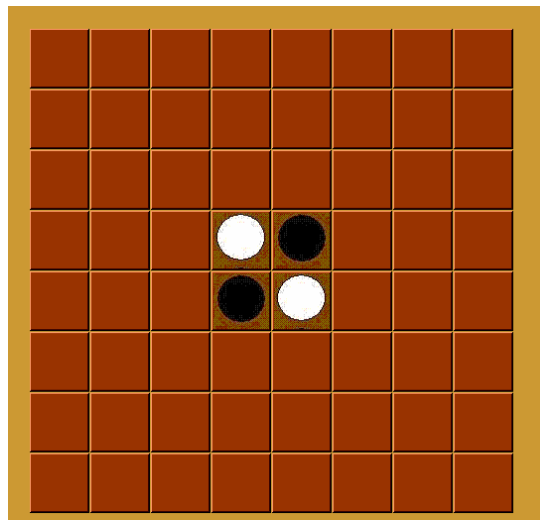


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## 1. Game Rules

- a. This is a two player game and the role of one player is taken by the computer.
- b. The game objective is to fill the board with majority of your coins.
- c. The game starts out with this set up and black moves first
- d. A move can be made by a player if and only if the player can outflank his/her opponent's coins. These coins in the middle are then flipped the player's coin color.
- e. To outflank your opponents coins means that if a coin is placed on the board, then all the other coins in all the eight directions that are bounded by the player's coin will be changed into the color of player coins
- f. The turn will be skipped if the player cannot out flank a coin (the game will end if both the players cannot do that)
- g. Game can also come to end if the board is filled with coins
- h. At the end of the game the number of coins on the board for each player is counted and the player with maximum number of coins is won. (can also look for a comprehensive list of rules at <http://www.rainfall.com/othello/rules/othellorules.asp>)



## 2. To Build and Launch the Application

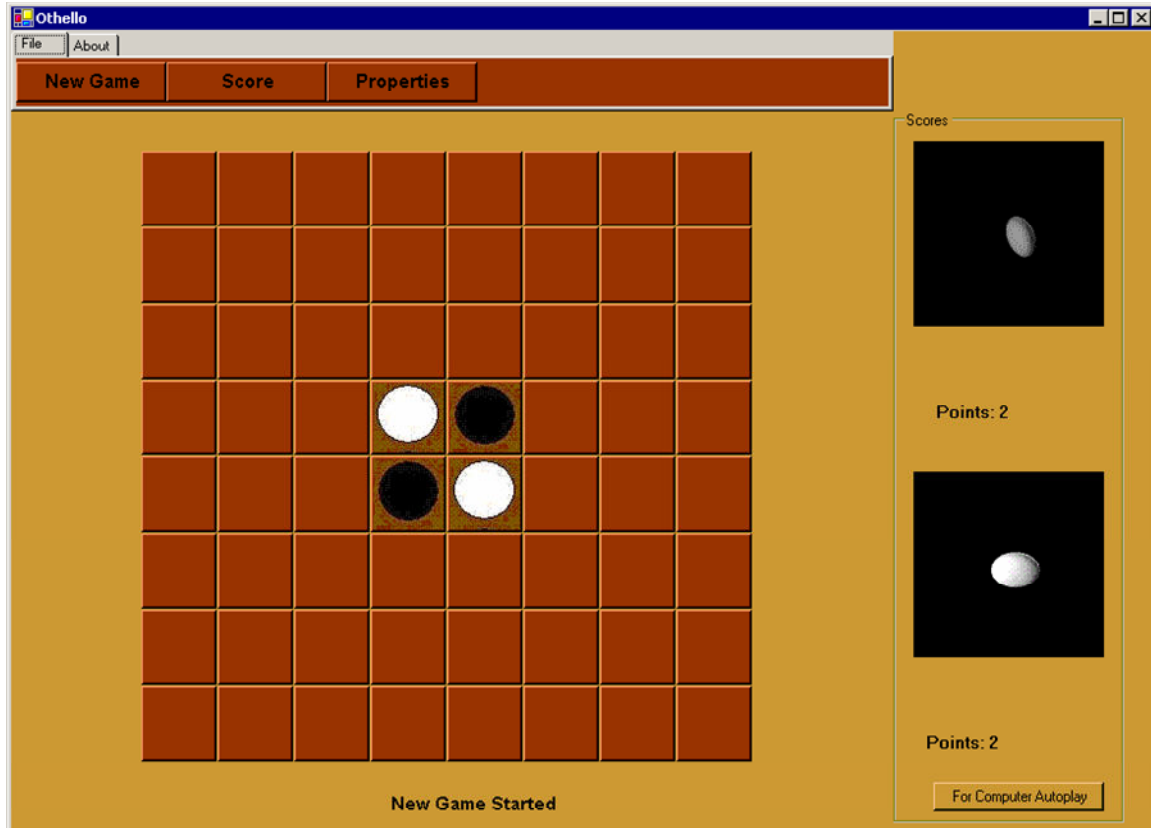
- a. Open RUSSIA.sln in Visual Studio 2003, version 7.1.3088.
- b. Have .Net 1.1 framework installed on the machine
- c. Do a CTRL+F5 and if the following dialog box appears click yes



- d. This will build and launch the application

**To Directly Start the Application**  
Double click on RUSSIA.exe inside the .\RUSSIA\RUSSIA\Debug folder to launch the application.

- e. Once the application is launched it will look like this:

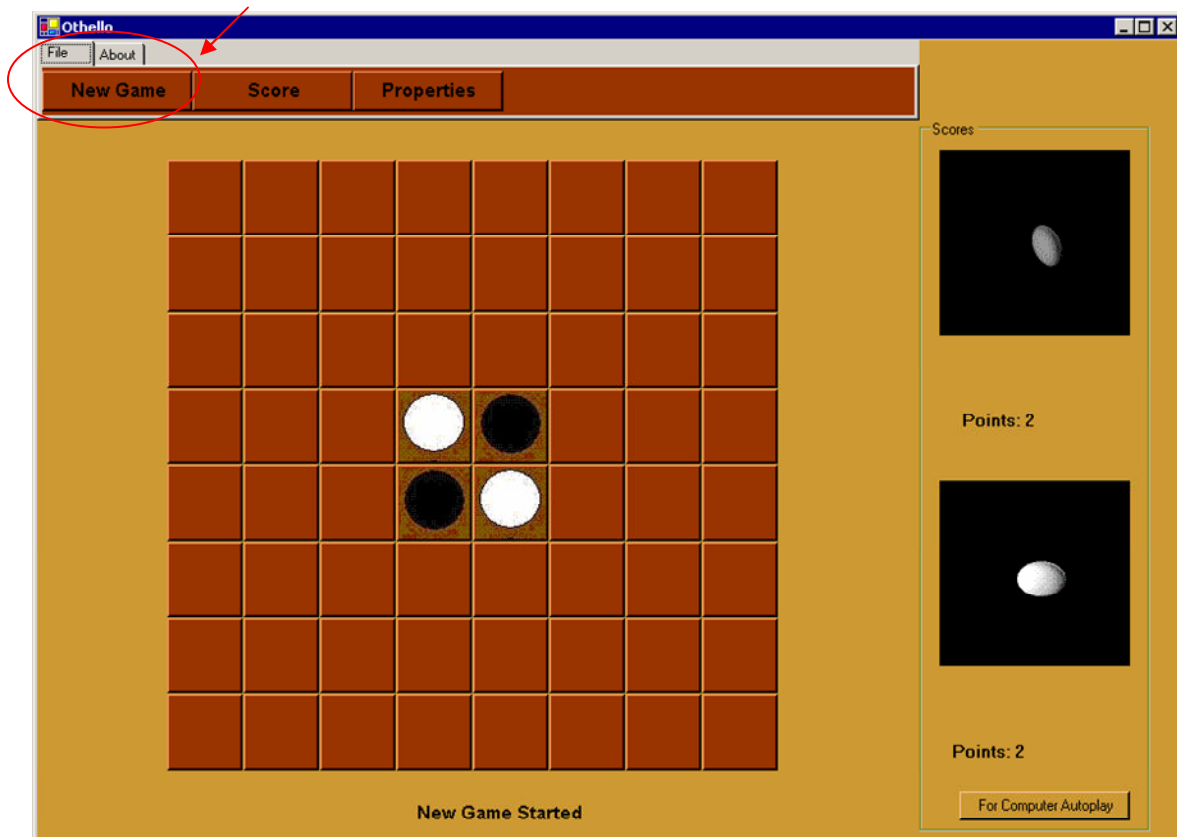


- f. In default mode the application starts out in the user vs computer mode, however you can enable the computer vs computer play as discussed in same named section.

**Click on the board buttons to make a move and start playing the game with your computer.**

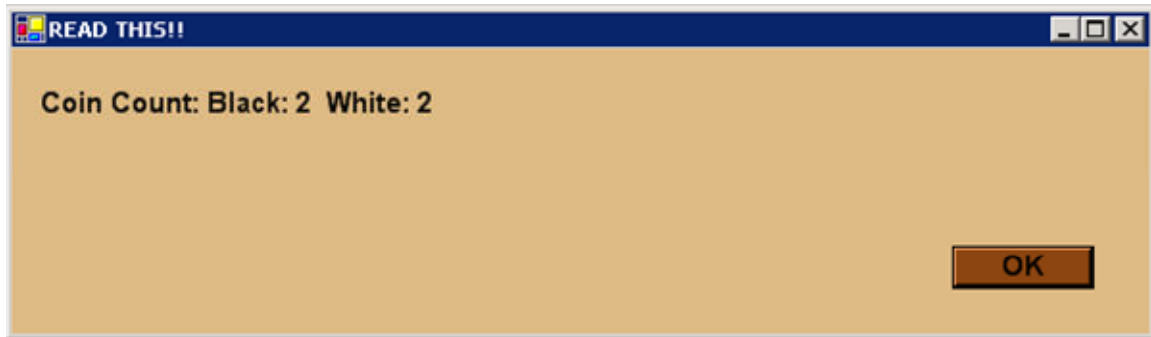
### 3. Start New Game

- Click on the “New Game” button under the “File” tab.
- This will start a new game with black to move first.
- The points will also be reset.

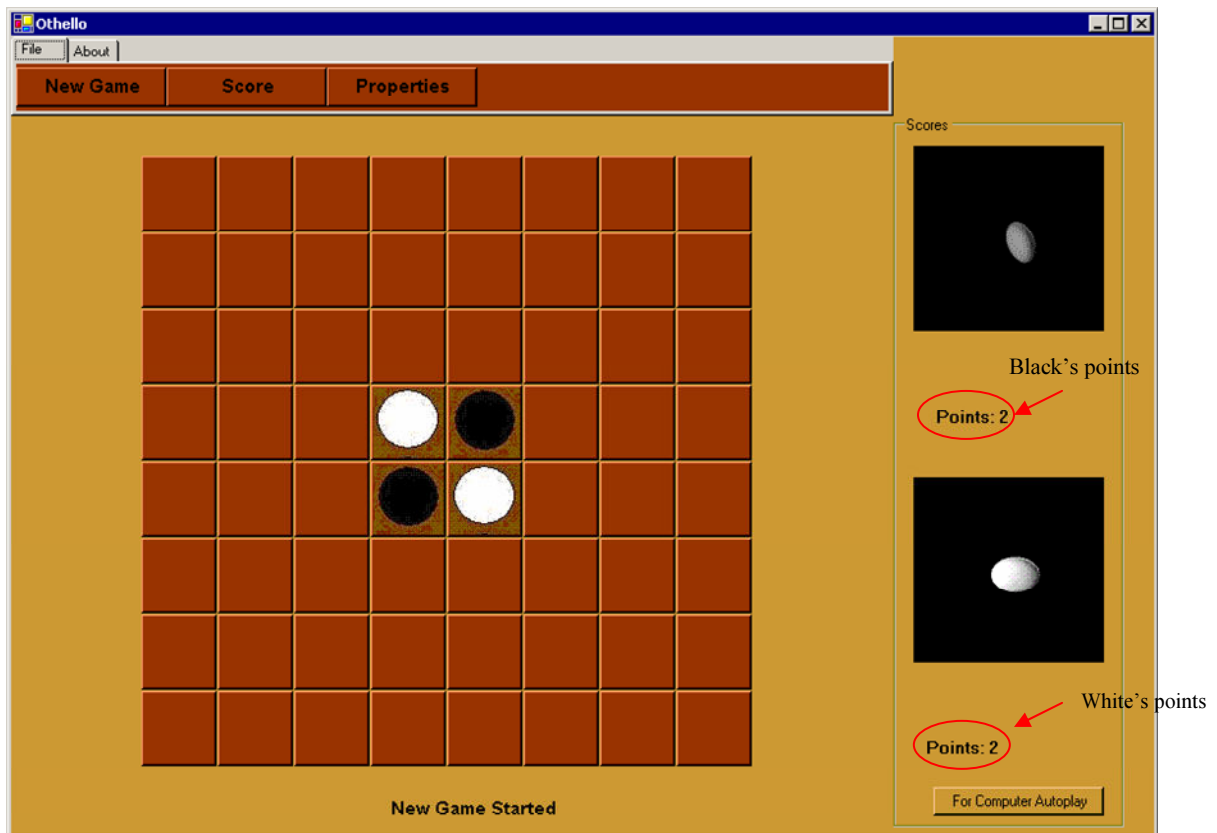


## 4. Score

- a. You can click on the “Score” button under the “File” tab and the following dialog box pops up showing the score of each player.

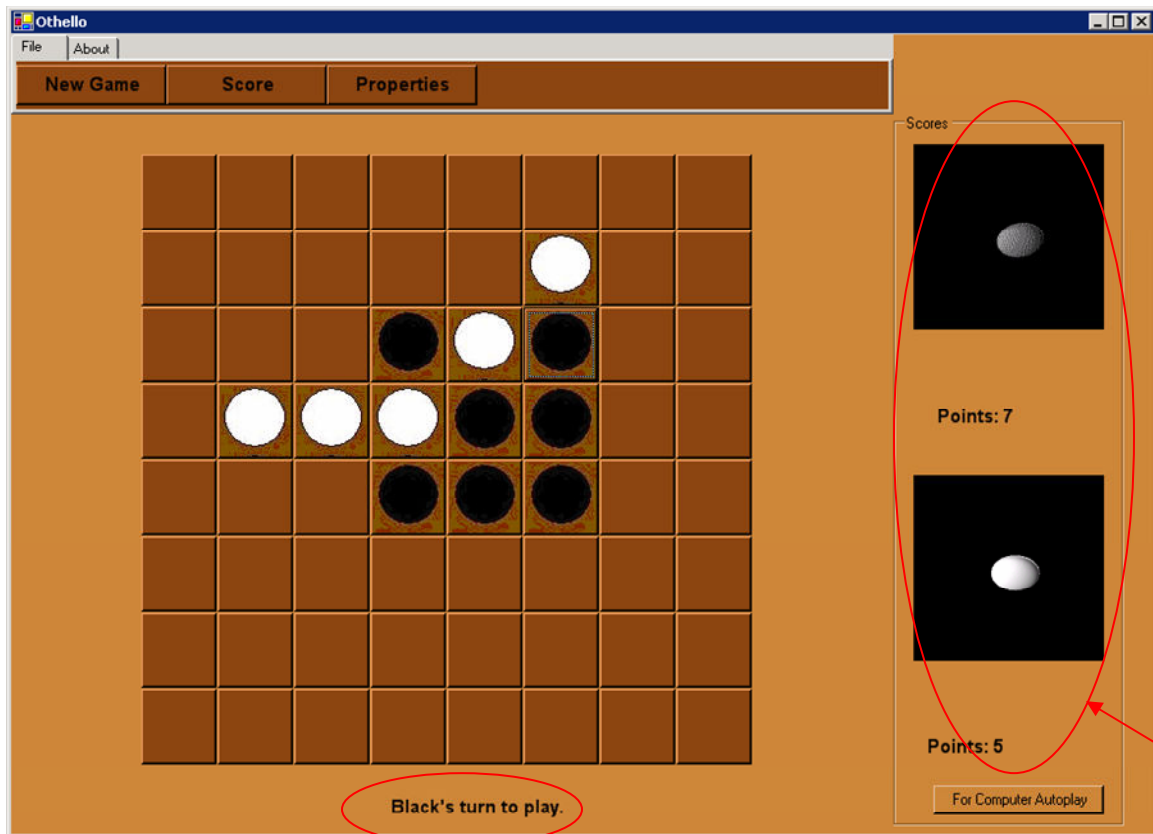


- b. You can also look at the score to the right side of your screen



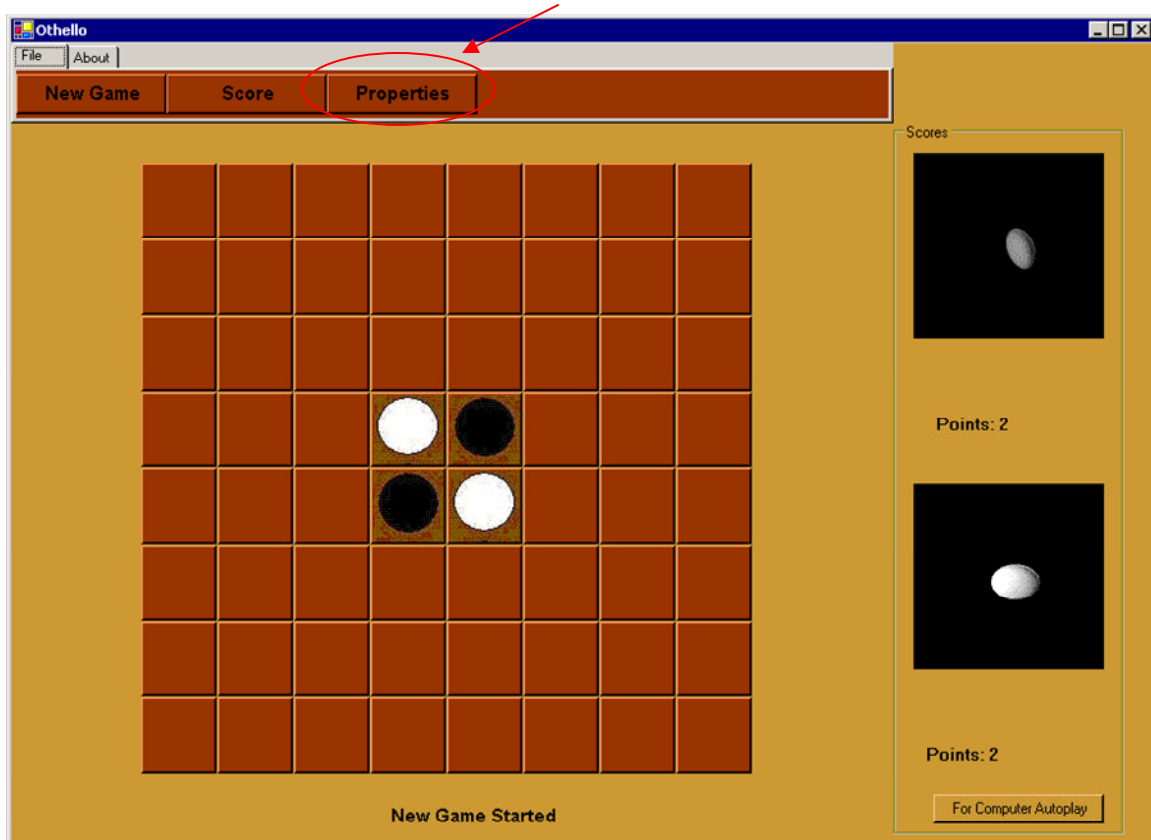
## 5. Turn to Play

- a. It is indicated on the bottom of the board as whose turn it is to play, black's turn or white's turn (default) or if the player/user specifies a name in the options, that name gets displayed.
- b. Player's turn is also shown by the rotating coin on the right side of the board. If white coin is rotating it is white's turn, else if black coin is rotating then it is black's turn.



## 6. Change Options

- a. The user can change the heuristics that are being used by the computer to play against the user or against itself. This can be done by clicking on the “Properties” button under the “File” tab



- b. The following options dialog box will show up.
- c. To change the depth that the computer is searching you can enter the depth in the Depth textbox of the Player 2

Options

Player 1: Human/Computer Depth: Enter Depth

Search Strategy: ☐ Minimax ☐ Depth MiniMax ☐ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics: ☐ Static Board Weight Heuristic ☒ Component-wise Heuristic

Capture Corner: 30 Player Mobility: 5 Coin Stability: 15 Flankable Coins: 25

Player 2: ComputerTwo Depth: Enter Depth

Search Strategy: ☐ Minimax ☐ Depth MiniMax ☐ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics: ☐ Static Board Weight Heuristic ☒ Component-wise Heuristic

Capture Corner: 30 Player Mobility: 5 Coin Stability: 15 Flankable Coins: 25

Apply

- d. You can also change the search strategies among:
- Minimax
  - Depth MiniMax
  - AlphaBeta
  - Depth AlphaBeta
  - Iterative Deepening

Though non-depth limited searches will practically take infeasible amounts of time before the computer executes its move, the user is just given that option in case he/she wants to check this feature out.

The screenshot shows a software window titled "Options" with a tan background. It contains settings for two players. For Player 1, the "Player" dropdown is set to "Human/Computer" and the "Depth" field is "Enter Depth". The "Search Strategy" section has five radio buttons: "Minimax", "Depth Minimax", "AlphaBeta", "Depth AlphaBeta", and "Iterative Deepening". The "Heuristics" section for Player 1 has "Static Board Weight Heuristic" selected, with four sliders below it: "Capture Corner" (30), "Player Mobility" (5), "Coin Stability" (15), and "Flankable Coins" (25). For Player 2, the "Player" dropdown is set to "ComputerTwo" and the "Depth" field is "Enter Depth". The "Search Strategy" section for Player 2 has the same five radio buttons, with "Minimax" selected. A red circle is drawn around this entire "Search Strategy" section for Player 2, and a red arrow points from the right side of the window towards the "Iterative Deepening" radio button. The "Heuristics" section for Player 2 is identical to Player 1's, with "Component-wise Heuristic" selected and the same four sliders. An "Apply" button is located at the bottom right of the window.

- e. Heuristics that can be used by the system can also be changed. If the user wants to select Static Board Weighing, the user would not be able to give individual weights to each of the heuristics. However, if the user selects component-wise heuristics then the user can give individual weights.

Options

Player 1: Human/Computer Depth: Enter Depth

Search Strategy

☐ Minimax ☐ Depth Minimax ☐ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics

☐ Static Board Weight Heuristic

☒ Component-wise Heuristic

Capture Corner: 30 Player Mobility: 5 Coin Stability: 15 Flankable Coins: 25

Player 2: ComputerTwo Depth: Enter Depth

Search Strategy

☐ Minimax ☐ Depth Minimax ☒ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics

☐ Static Board Weight Heuristic

☒ Component-wise Heuristic

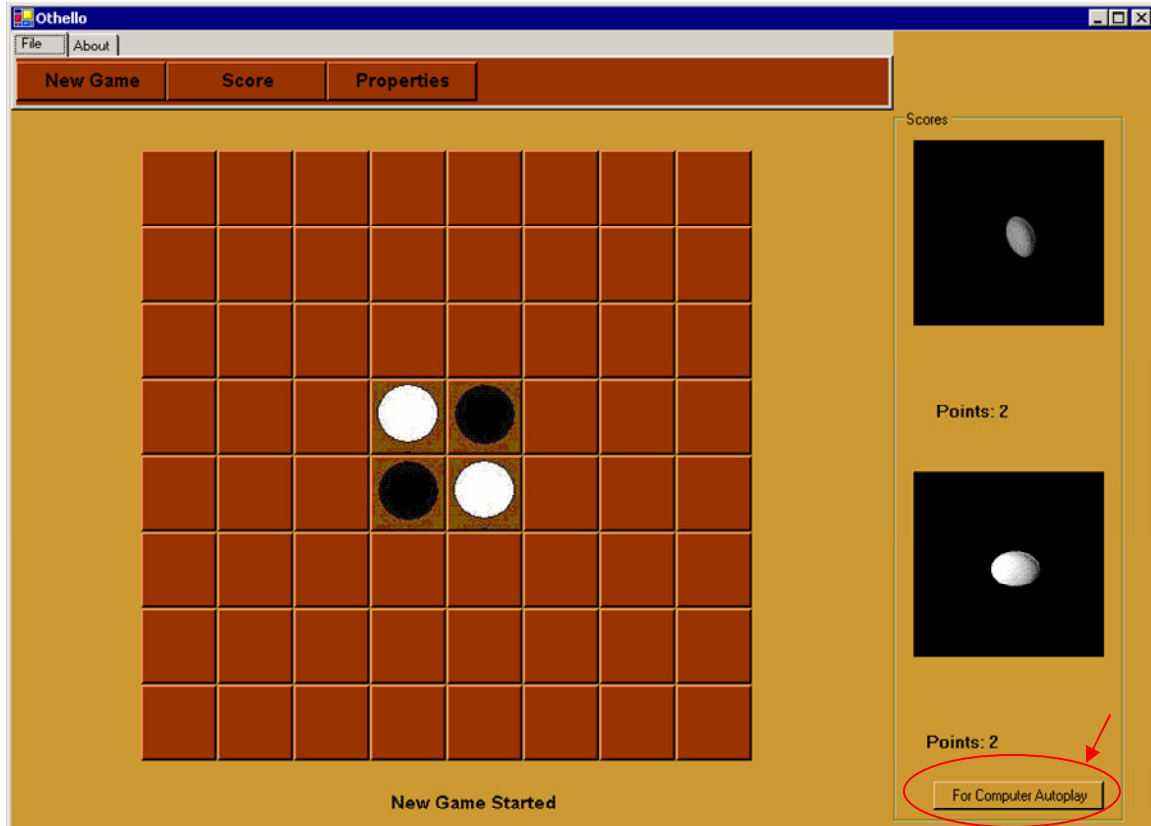
Capture Corner: 30 Player Mobility: 5 Coin Stability: 15 Flankable Coins: 25

Apply

Hit *new game* and then change *properties* for the entered properties to take effect. **DO NOT** change *properties* and then hit *new game*, this will start a game with default properties set.

## 7. Computer vs Computer Play

- a. You can click on the button “For Computer Autoplay” to start the computer playing against itself. However, if you haven’t changed the options, then the computer plays against itself with the same set of search strategies and heuristic function values.



- b. To change the search strategies and heuristics used by one of the computer players you can change the Player 1 option to “ComputerOne” from the drop down menu. This should enable all the different settings that can be set for the computer player.
- c. As discussed in the options sections you can change the various values for depth, search strategies and heuristics.

Options

Player 1 **Human/Computer** Depth

Search Strategy

☐ Minimax ☐ Depth Minimax ☐ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics

☐ Static Board Weight Heuristic

☒ Component-wise Heuristic

Capture Corner  Player Mobility  Coin Stability  Flankable Coins

Player 2 **ComputerTwo** Depth

Search Strategy

☐ Minimax ☐ Depth Minimax ☐ AlphaBeta ☐ Depth AlphaBeta ☐ Iterative Deepening

Heuristics

☐ Static Board Weight Heuristic

☒ Component-wise Heuristic

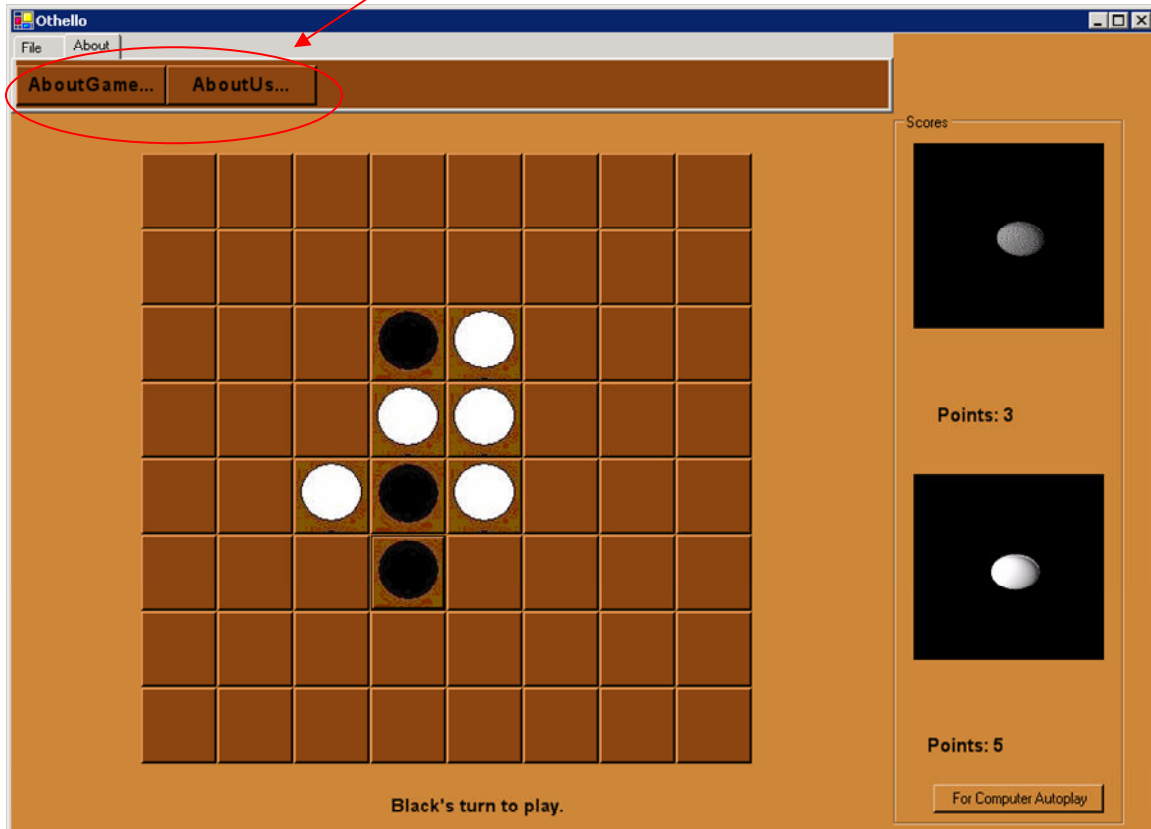
Capture Corner  Player Mobility  Coin Stability  Flankable Coins

**Apply**

## 8. About

### 8.1 Version Information

- a. To get the version information, click on the “About” tab and then on the “About Game” button.



- b. The following dialog box will be displayed



## **8.2 Developer Information**

- a. Similarly if you click on “About Us” button under “About” tab, the developer information for this product will be displayed.
- b. The following dialog box shows up

