

SYSC 2004 Object-Oriented Software Development

Lab 10

Lab 10:

Background Reading

- *Objects First with Java*, Chapters 11-13.

Objective

The objective of this lab is to gain further experience with inheritance, polymorphism and a very basic GUI.

Getting Started

1. Download file `tictactoe.zip` from cuLearn. Save the file to the desktop.
2. Right-click on the `tictactoe.zip` folder and select **Extract All...** to extract all the files into a folder called `tictactoe`.
3. Launch BlueJ.

Part 1 - Completing the TicTacToe Class

The `TicTacToe` class is nearly complete, except that the bodies of the `print()` and `toString()` methods are missing.

1. Complete the `print()` method. It will just output the current `TicTacToe` object. (Hint: This method is just one line long. All the "work" is in `toString()`.)
2. So that the `print()` method works properly, you must now complete the `toString()` method. It should return a textual representation of the current state of the tic-tac-toe game. This textual representation will include the vertical and horizontal lines we usually draw when playing this game on paper (i.e. you should use characters that will approximate these lines, such as `|` and `-`). Note that the board field is a 3x3 array of "X"s, "O"s, and blanks. The indices of each square are as follows:

```
[0][0] | [0][1] | [0][2]
-----
[1][0] | [1][1] | [1][2]
-----
[2][0] | [2][1] | [2][2]
```

Note that you do **not** enter the "[" or "]" when playing the game, just in writing the Java code.

The board representation will include the winning player (or indicate a tie) if the game is over. The winner field is EMPTY if there is no winner (yet), and otherwise contains PLAYER_X, PLAYER_O, or TIE (see the constants defined at the top of the class).

Here are some examples of what `toString()` should return:

- Start of the game:

```
  |  |
-----
  |  |
-----
  |  |
```

- Part way through the game:

```
 O |  | X
-----
  | X |
-----
  |  |
```

- End of the game:

```
 O |  | X
-----
 X | X | X
-----
 O | O |
X wins
```

- Get Part 1 checked by a TA.

Part 2 - Completing the TicTacToeFrame Class

- Now you are to complete subclass `TicTacToeFrame` which uses a very simple GUI to display the tic tac toe board (but still gets input from the terminal window). The GUI consists of a `JTextArea` in a `JScrollPane` in a `JFrame`. All you need to do is write the constructor (which sets up the GUI), and then override `print()` so that it writes to the `JTextArea` instead of to the terminal window.
- Get Part 2 checked by a TA.

Part 3 - Javadoc Comments

- Double-check that all your Javadoc comments are complete.
 - Get Part 3 checked by a TA.
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