Introduction to Java Programming

Lab 2 - March 26, 2019

Instructor: Maxwell Young

Becoming a competent programmer requires a lot of practice. The following questions will provide practice with the contents of class: if/else statements, while and for loops, and input from the user.

In this lab, you will construct a rudimentary interactive tic-tac-toe game. Create a new project called TicTacToe. You will write all of your code within the main( ) function.

---

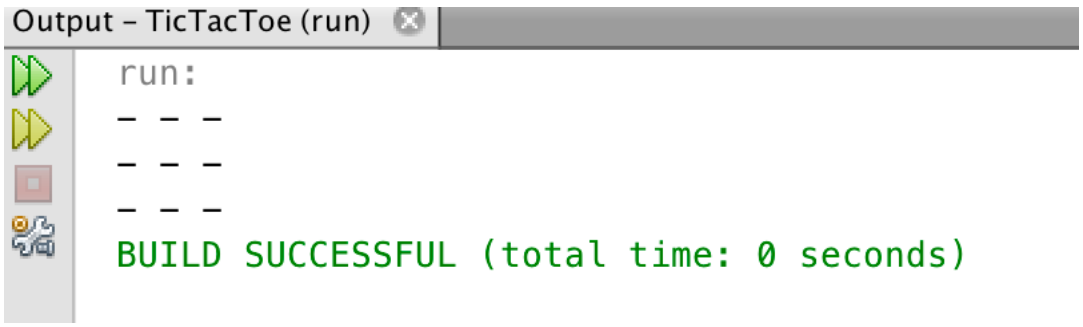
(1) **[Topics: arrays and loops]** Write code to execute the following tasks:

(i) Create 3 arrays, each of size 3. Make each array store String objects.

Each array will represent a single row of your tic-tac-toe board, so you should name them sensibly (something like row1, row2, row3).

(ii) Initialize all elements of all arrays to "-" (that is, a single dash).

(iii) Use a for loop to write out the each row of your tic-tac-toe board. The output should look like:



(2) [Topics: taking user input] Your code now needs to ask for input from both players in sequence, and update the board to reflect these moves.

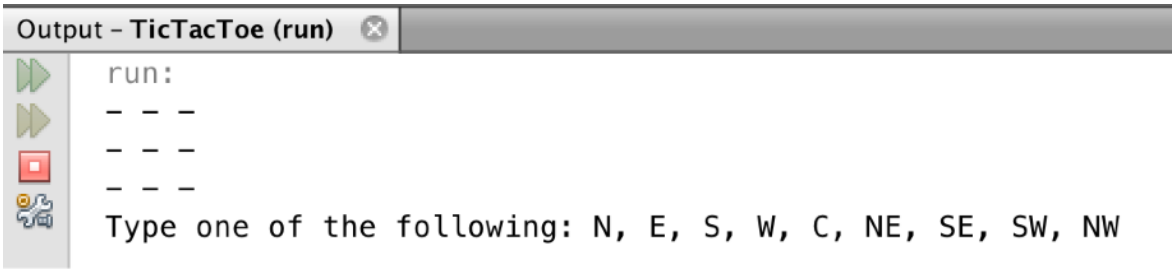
You will use the scanner class to do this. See:

https://docs.oracle.com/javase/7/docs/api/java/util/Scanner.html

(i) Import the scanner class by placing the following line above the `public class TicTacToe` line:

import java.util.Scanner;

(ii) You can learn about this class in the documentation, but we will use the following code to obtain input from the user:




```
Scanner myScanner = new Scanner(System.in);
String move = myScanner.next();
System.out.println("You typed:" + move);
```

(iii) Write out a menu for users that puts the following to the screen:

where N=north, E = east, SW = southwest, etc. These refer to 9 positions on the tic-tac-toe board.

(iv) Use the scanner object to accept the user's choice. Assume they entered a valid choice; we are not checking for errors.

(3) [Topics: if/else statements]

(i) Update the board by filling in the changing the value of the appropriate array (row1, row2, or row3) and inserting the string "X" or "O".

You will need to use if/else statements to determine which square the player wishes to mark.

To compare two strings, you can use the `equals` function. Find the documentation for the String class, and make use of this function.

---

(4) [Topics: loops] Now we pull the above pieces together. The structure of your code should be:

```
for(int i=0; i<9; i++){
     // Print board
     // Ask user for input
     // Update board
}
```

(i) You have all the pieces in the comments, now put them all in a for-loop.

---

(5) [Topics: if/else statements] We can improve our game:

(i) We have no way of determining which player is making the move. Modify your code slightly to specify Player1 or Player2:

(ii) We have no way for determining when a player wins; we should fix this.

(iii) Once a player wins, we should stop the game. Implement this functionality.

(iv) If neither player wins --- it is a draw --- then we should declare this too. Implement this functionality.