CS478: Software Development for Mobile Platforms

Project #3

Due time: 9:00 pm on 11/14/2016

Total points: 100

Instructor: Ugo Buy

TAs: Pranjal Desai and Venkat Sathyanarayanan

For this project you will design and code one new Android app implementing a simple game of tic-tac-toe. The game will be played by two asynchronous Java worker threads playing against each other. The UI thread will be responsible for creating and starting these two worker threads. Each thread will take turns taking the following actions:

1. Figuring out the next move
2. Communicating the move to the UI thread, which will then update the device's display
3. Waiting for the opponent to complete their move

In addition, to starting the worker threads, the UI thread will display a button allowing the device user to start the game. Pressing this button while a game is in progress will void the current game and start a new game from scratch. The UI thread is further responsible for the following actions:

1. Displaying the current tic-tac-toe board that shows the moves of the worker threads thus far.
2. Receiving notifications of moves by the worker threads.
3. Updating the display after each move.
4. Informing each worker thread of its opponent's move. This will also signal the thread that it should make the next move.
5. Checking on the status of the game, by determining whether one player has won, the game has ended in a tie, or the game needs to continue.
6. Displaying an appropriate message to indicate the outcome of each game.
7. Signaling the two worker threads that the game is over; the two threads should stop their execution as a result of this action.

You must implement the communication among the Java threads with handlers. Each thread T must have a handler associated with it. Other threads will communicate with T either by posting runnables or by sending messages on T's handler queue. Also, you should ensure that the game is played at a sensible speed. If the worker threads produce moves too fast, it is your responsibility to design the worker threads in such a way each move is delayed by about 1 second with respect to the previous move.

You must work alone on this project. For this project use a Nexus 5 device running the usual Android platform (API 23—Marshmallow). You are not required to provide backward compatibility with previous Android versions. Submit one Studio project as a zip archive using the submission link in the assignment's page on Blackboard. No late submissions will be accepted.