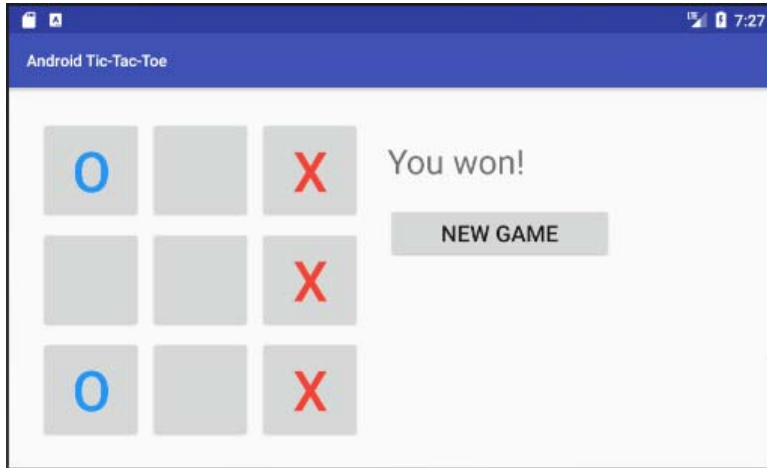


Tic-Tac-Toe: Save State

Android App Development

10 points

Modify your Tic-Tac-Toe app so the app handles screen rotations.



Your app should have a time delay when the computer makes a move as implemented below:

```
// Set to true when game is started
private boolean mHumanTurn;

public void onPlayButtonClick(View view) {
    if (!mHumanTurn) return;

    Button button = (Button) view;

    // Determine which button was clicked
    int buttonNum = 0;
    for (int i = 0; i < mGameButtons.length; i++) {
        if (button == mGameButtons[i])
            buttonNum = i;
    }

    if (!mGame.isGameOver() && mGame.setPlayerMove(buttonNum)) {
        button.setText("X");
        button.setTextColor(ContextCompat.getColor(this, R.color.colorX));

        if (!isGameOver()) {
            makeComputerMove();
        }
    }
}

private void makeComputerMove() {
    mHumanTurn = false;
    setGameStatus("Computer's turn");

    // Make move in 1 second
    new CountDownTimer(1000, 1000) {
```

```

        public void onTick(long millisUntilFinished) {
        }

        public void onFinish() {
            getComputerMove();
            if (!isGameOver()) {
                mHumanTurn = true;
                setStatus("Your turn");
            }
        }
    }.start();
}

```

Make the following modifications:

1. Create a landscape layout file that aligns the status label to the right of the game board and the new game button directly under it.
2. Add methods to the TicTacToeGame class to save and restore the board state.
3. Save the board state when a configuration change (like changing the device orientation) occurs, and restore the board state when the activity is started again. Make the UI game board show the restored board state.
4. Also save whose turn it is during a configuration change. When the activity is re-started, use the `isGameOver()` method to update the game status label, or if the game is not over, tell the player it's her turn or let the computer make its move.

Extra Credit

2 bonus points for adding some sound effects to the game. Use the SoundPool to play a short sound when the player wins or loses. You can find all kinds of sound files from <https://freesound.org/> <https://developer.android.com/reference/android/media/SoundPool.html>

Turn In

Verify that your game works correctly when the phone is rotated. You may want to make the computer delay 3 seconds before making a move so that you can make a move and change the phone's orientation before the computer makes its move.

Clean your project (Build → Clean Project from the menu), then zip up your project. Then rebuild the APK file (Build → Build APK from the menu) for your project.

Submit the zip file the `app\build\outputs\apk\app-debug.apk` file to Easel. **Note:** The `app-debug.apk` file should be more than 1 MB. If it's smaller, then it's a partial APK meant for Instant Run. You must turn in the full APK file.