Android Development Lab End Semester Lab Exam

Experiment 11:

Create a Tic Tac Toe game. After playing 5 rounds, show the results of the games in the next activity page.

Code:

AndroidManifest.xml

```
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.tictactoegame1">
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic launcher"
        android:label="@string/app name"
        android:roundIcon="@mipmap/ic launcher round"
        android:supportsRtl="true"
android: theme="@style/Theme.AppCompat.DayNight.DarkActionBar">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action
android:name="android.intent.action.MAIN" />
                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity
            android:name=".GameActivity"
            android:exported="false" />
        <activity
            android:name=".ResultsActivity"
            android:exported="false" />
    </application>
```

```
</manifest>
```

MainActivity.java

```
package com.example.tictactoegame1;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    private EditText player1EditText;
    private EditText player2EditText;
    private Button playButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity main);
        player1EditText = findViewById(R.id.player1Name);
        player2EditText = findViewById(R.id.player2Name);
        playButton = findViewById(R.id.startButton);
        playButton.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String player1 =
player1EditText.getText().toString();
                String player2 =
player2EditText.getText().toString();
                Intent intent = new Intent(MainActivity.this,
GameActivity.class);
                intent.putExtra("player1", player1.isEmpty() ?
"Player 1" : player1);
                intent.putExtra("player2", player2.isEmpty() ?
"Player 2" : player2);
                startActivity(intent);
```

```
}
        });
    }
}
GameActivity.java
package com.example.tictactoegame1;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.GridLayout;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class GameActivity extends AppCompatActivity {
    private GridLayout gameGrid;
    private TextView score;
    private Button endGameButton;
   private String[][] board;
    private String currentPlayer;
    private int player1Score;
   private int player2Score;
   private int roundsPlayed;
    private String player1;
    private String player2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity game);
        gameGrid = findViewById(R.id.gameGrid);
        score = findViewById(R.id.score);
        endGameButton = findViewById(R.id.endGameButton);
        player1 = getIntent().getStringExtra("player1");
        player2 = getIntent().getStringExtra("player2");
        board = new String[3][3];
        currentPlayer = player1;
```

```
player1Score = 0;
        player2Score = 0;
        roundsPlayed = 0;
        initializeBoard();
        endGameButton.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(GameActivity.this,
ResultsActivity.class);
                intent.putExtra("player1Score", player1Score);
                intent.putExtra("player2Score", player2Score);
                startActivity(intent);
                finish();
        });
    }
    private void initializeBoard() {
        gameGrid.removeAllViews(); // Clear previous buttons
        for (int row = 0; row < 3; row++) {
            for (int col = 0; col < 3; col++) {
                Button button = new Button(this);
                button.setLayoutParams (new
GridLayout.LayoutParams());
                button.setText("");
                final int finalRow = row;
                final int finalCol = col;
                button.setOnClickListener(new
View.OnClickListener() {
                    @Override
                    public void onClick(View v) {
                        if (board[finalRow][finalCol] == null)
{
                            board[finalRow][finalCol] =
currentPlayer;
button.setText(currentPlayer.equals(player1) ? "X" : "O");
                            if (checkWin()) {
                                 if
(currentPlayer.equals(player1)) {
                                     player1Score++;
```

```
} else {
                                      player2Score++;
                                  roundsPlayed++;
                                  if (roundsPlayed < 5) {</pre>
                                      resetBoard();
                                  } else {
                                      endGame();
                              } else if (isBoardFull()) {
                                  roundsPlayed++;
                                  if (roundsPlayed < 5) {</pre>
                                      resetBoard();
                                  } else {
                                      endGame();
                             currentPlayer =
currentPlayer.equals(player1) ? player2 : player1;
                             updateScore();
                         }
                     }
                 });
                 gameGrid.addView(button);
            }
        }
    }
    private boolean checkWin() {
        // Check rows
        for (int i = 0; i < 3; i++) {
            if (board[i][0] != null &&
board[i][0].equals(board[i][1]) &&
board[i][0].equals(board[i][2])) {
                 return true;
             }
        }
        // Check columns
        for (int i = 0; i < 3; i++) {
            if (board[0][i] != null &&
board[0][i].equals(board[1][i]) &&
board[0][i].equals(board[2][i])) {
                 return true;
```

```
}
        }
        // Check diagonals
        if (board[0][0] != null &&
board[0][0].equals(board[1][1]) &&
board[0][0].equals(board[2][2])) {
            return true;
        }
        if (board[0][2] != null &&
board[0][2].equals(board[1][1]) &&
board[0][2].equals(board[2][0])) {
            return true;
        }
        return false;
    }
    private boolean isBoardFull() {
        for (int row = 0; row < 3; row++) {
            for (int col = 0; col < 3; col++) {
                if (board[row][col] == null) {
                    return false;
                }
            }
        return true;
    }
    private void resetBoard() {
        board = new String[3][3];
        initializeBoard();
    }
    private void endGame() {
        Intent intent = new Intent(GameActivity.this,
ResultsActivity.class);
        intent.putExtra("player1Score", player1Score);
        intent.putExtra("player2Score", player2Score);
        startActivity(intent);
        finish();
    }
    private void updateScore() {
```

```
score.setText("Score: " + player1Score + " - " +
player2Score);
    }
ResultsActivity.java
package com.example.tictactoegame1;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class ResultsActivity extends AppCompatActivity {
    private TextView results;
    private Button playAgainButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity results);
        results = findViewById(R.id.results);
        playAgainButton = findViewById(R.id.playAgainButton);
        int player1Score =
getIntent().getIntExtra("player1Score", 0);
        int player2Score =
getIntent().getIntExtra("player2Score", 0);
        results.setText("Player 1: " + player1Score +
"\nPlayer 2: " + player2Score);
        playAgainButton.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View v) {
                finish();
        });
    }
}
```

edittext_background.xml

```
<shape
xmlns:android="http://schemas.android.com/apk/res/android">
    <solid android:color="@color/secondary color" /> <!-- Blue</pre>
-->
    <corners android:radius="8dp" />
    <padding android:left="10dp" android:right="10dp"</pre>
android:top="5dp" android:bottom="5dp"/>
</shape>
activity main.xml
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout width="match parent"
    android:layout height="match parent"
    android:background="@color/primary color"
    android:padding="16dp">
    <ImageView</pre>
        android:id="@+id/logoImageView"
        android:layout width="150dp"
        android:layout height="150dp"
        android:layout centerHorizontal="true"
        android:layout marginTop="150dp"
        android:src="@drawable/tictactoe" />
    <TextView
        android:id="@+id/titleTextView"
        android:layout width="wrap content"
        android: layout height="wrap content"
        android:layout below="@id/logoImageView"
        android:layout centerHorizontal="true"
        android:layout marginTop="20dp"
        android:text="TicTacToe"
        android:textColor="@color/accent color"
        android:textSize="30sp"
        android:textStyle="bold" />
    <LinearLayout
        android:layout width="match parent"
        android:layout height="wrap content"
        android:layout below="@id/titleTextView"
        android:layout marginTop="40dp"
```

```
android:orientation="horizontal"
        android:gravity="center">
        <EditText
            android:id="@+id/player1Name"
            android:layout width="0dp"
            android:layout height="wrap content"
            android:layout weight="1"
            android:hint="Player 1"
            android:textColor="@color/accent color"
            android:background="@drawable/edittext background"
            android:layout marginEnd="10dp" />
        <EditText
            android:id="@+id/player2Name"
            android:layout width="0dp"
            android:layout height="wrap content"
            android:layout weight="1"
            android:hint="Player 2"
            android:textColor="@color/accent color"
            android:background="@drawable/edittext background"
/>
    </LinearLayout>
    <Button
        android:id="@+id/startButton"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:layout centerHorizontal="true"
        android:layout marginTop="500dp"
        android:text="Start Game"
        android:backgroundTint="@color/secondary color"
        android:textColor="@color/accent color" />
    <ImageView</pre>
        android:id="@+id/topRightImageView"
        android:layout width="100dp"
        android:layout height="25dp"
        android:layout alignParentRight="true"
        android:layout marginTop="10dp"
        android:layout marginEnd="0dp"
        android:src="@drawable/amrita" />
    <TextView
```

```
android:id="@+id/nameTextView"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:layout alignParentRight="true"
        android:layout marginTop="30dp"
        android:text="Vishnu Vignesh"
        android:textColor="@color/accent color" />
    <TextView
        android:id="@+id/studentIdTextView"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:layout alignParentRight="true"
        android:layout marginTop="45dp"
        android:text="CH.EN.U4CYS21093"
        android:textColor="@color/accent color" />
</RelativeLayout>
activity game.xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout width="match parent"
    android:layout height="match parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="16dp"
    android:background="@android:color/darker gray">
    <TextView
        android:id="@+id/score"
        android:layout width="wrap content"
        android: layout height="wrap content"
        android:text="Score: 0 - 0"
        android:textSize="24sp"
        android:textColor="@android:color/white"/>
    <GridLayout
        android:id="@+id/gameGrid"
        android:layout width="match parent"
        android:layout height="0dp"
        android:layout weight="1"
        android:rowCount="3"
        android:columnCount="3"
```

```
android:layout gravity="center"
        android:padding="8dp">
    </GridLayout>
    <Button
        android:id="@+id/endGameButton"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:text="End Game"
        android:layout marginTop="20dp"
        android:backgroundTint="@android:color/holo blue dark"
        android:textColor="@android:color/white" />
</LinearLayout>
activity results.xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout width="match parent"
    android:layout height="match parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="16dp"
    android:background="@android:color/darker gray">
    <TextView
        android:id="@+id/results"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:textSize="24sp"
        android:textColor="@android:color/white"/>
    <Button
        android:id="@+id/playAgainButton"
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:text="Play Again"
        android:layout marginTop="20dp"
        android:backgroundTint="@android:color/holo blue dark"
        android:textColor="@android:color/white"/>
</LinearLayout>
colors.xml
<resources>
    <!-- Primary Colors -->
```

Output:







