*Android Development End-Sem Lab Exam:*

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* Create a Tic Tac Toe Game
* After playing 5 games
* Show the results of that 5 games in the next activity page

**Codes:**  
**Main activity.java:**  
package com.example.tictactoegame;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.TextView;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
public class MainActivity extends AppCompatActivity {  
  
 private Button[][] buttons = new Button[3][3];  
 private boolean player1Turn = true;  
 private int roundCount;  
 private int player1Points;  
 private int player2Points;  
 private int gamesPlayed = 0;  
 private final int maxGames = 5;  
  
 private TextView textViewPlayer1;  
 private TextView textViewPlayer2;  
 private Button buttonReset;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 textViewPlayer1 = findViewById(R.id.*text\_view\_p1*);  
 textViewPlayer2 = findViewById(R.id.*text\_view\_p2*);  
 buttonReset = findViewById(R.id.*button\_reset*);  
  
 // Initialize buttons  
 for (int i = 0; i < 3; i++) {  
 for (int j = 0; j < 3; j++) {  
 String buttonID = "button\_" + i + j;  
 int resID = getResources().getIdentifier(buttonID, "id", getPackageName());  
 buttons[i][j] = findViewById(resID);  
 buttons[i][j].setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 if (!((Button) v).getText().toString().equals("")) {  
 return;  
 }  
  
 if (player1Turn) {  
 ((Button) v).setText("X");  
 } else {  
 ((Button) v).setText("O");  
 }  
  
 roundCount++;  
  
 if (checkForWin()) {  
 if (player1Turn) {  
 player1Wins();  
 } else {  
 player2Wins();  
 }  
 } else if (roundCount == 9) {  
 draw();  
 } else {  
 player1Turn = !player1Turn;  
 }  
 }  
 });  
 }  
 }  
  
 // Reset button listener  
 buttonReset.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 resetGame();  
 }  
 });  
 }  
  
 private boolean checkForWin() {  
 String[][] field = new String[3][3];  
  
 for (int i = 0; i < 3; i++) {  
 for (int j = 0; j < 3; j++) {  
 field[i][j] = buttons[i][j].getText().toString();  
 }  
 }  
  
 for (int i = 0; i < 3; i++) {  
 if (field[i][0].equals(field[i][1]) && field[i][0].equals(field[i][2])  
 && !field[i][0].equals("")) {  
 return true;  
 }  
 }  
  
 for (int i = 0; i < 3; i++) {  
 if (field[0][i].equals(field[1][i]) && field[0][i].equals(field[2][i])  
 && !field[0][i].equals("")) {  
 return true;  
 }  
 }  
  
 if (field[0][0].equals(field[1][1]) && field[0][0].equals(field[2][2])  
 && !field[0][0].equals("")) {  
 return true;  
 }  
  
 if (field[0][2].equals(field[1][1]) && field[0][2].equals(field[2][0])  
 && !field[0][2].equals("")) {  
 return true;  
 }  
  
 return false;  
 }  
  
 private void player1Wins() {  
 player1Points++;  
 updatePointsText();  
 resetBoard();  
 gamesPlayed++;  
 checkGamesLimit();  
 }  
  
 private void player2Wins() {  
 player2Points++;  
 updatePointsText();  
 resetBoard();  
 gamesPlayed++;  
 checkGamesLimit();  
 }  
  
 private void draw() {  
 resetBoard();  
 gamesPlayed++;  
 checkGamesLimit();  
 }  
  
 private void updatePointsText() {  
 textViewPlayer1.setText("Player 1: " + player1Points);  
 textViewPlayer2.setText("Player 2: " + player2Points);  
 }  
  
 private void resetBoard() {  
 for (int i = 0; i < 3; i++) {  
 for (int j = 0; j < 3; j++) {  
 buttons[i][j].setText("");  
 }  
 }  
 roundCount = 0;  
 player1Turn = true;  
 }  
  
 private void resetGame() {  
 player1Points = 0;  
 player2Points = 0;  
 gamesPlayed = 0;  
 updatePointsText();  
 resetBoard();  
 }  
  
 private void checkGamesLimit() {  
 if (gamesPlayed >= maxGames) {  
 // When 5 games have been played, move to the next activity  
 Intent intent = new Intent(MainActivity.this, com.example.tictactoegame.ResultsActivity.class);  
 intent.putExtra("PLAYER\_1\_POINTS", player1Points);  
 intent.putExtra("PLAYER\_2\_POINTS", player2Points);  
 startActivity(intent);  
 }  
 }  
  
 @Override  
 protected void onSaveInstanceState(Bundle outState) {  
 super.onSaveInstanceState(outState);  
 outState.putInt("roundCount", roundCount);  
 outState.putInt("player1Points", player1Points);  
 outState.putInt("player2Points", player2Points);  
 outState.putBoolean("player1Turn", player1Turn);  
 }  
  
 @Override  
 protected void onRestoreInstanceState(Bundle savedInstanceState) {  
 super.onRestoreInstanceState(savedInstanceState);  
 roundCount = savedInstanceState.getInt("roundCount");  
 player1Points = savedInstanceState.getInt("player1Points");  
 player2Points = savedInstanceState.getInt("player2Points");  
 player1Turn = savedInstanceState.getBoolean("player1Turn");  
 updatePointsText();  
 }  
}

**ResultsActivity.java**

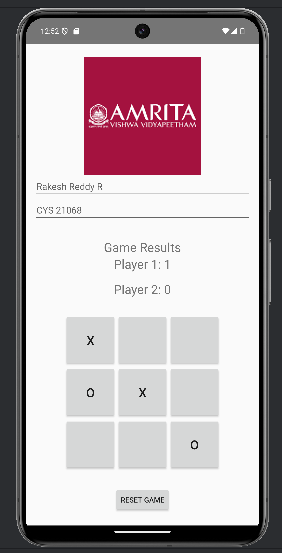
package com.example.tictactoegame;  
  
import androidx.appcompat.app.AppCompatActivity;  
import android.os.Bundle;  
import android.widget.TextView;  
  
public class ResultsActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_result*);  
  
 TextView resultTextView = findViewById(R.id.*text\_view\_results*);  
  
 int player1Points = getIntent().getIntExtra("player1Points", 0);  
 int player2Points = getIntent().getIntExtra("player2Points", 0);  
  
 resultTextView.setText("Player 1 Points: " + player1Points + "\nPlayer 2 Points: " + player2Points);  
 }  
}

Androidmanifest.xml:  
<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools">  
  
 <application>  
 <activity android:name=".ResultsActivity" />  
 <activity android:name=".MainActivity"  
 android:theme="@style/Theme.AppCompat.Light.NoActionBar"  
 android:exported="true">  
 <intent-filter>  
 <action android:name="android.intent.action.MAIN" />  
 <category android:name="android.intent.category.LAUNCHER" />  
 </intent-filter>  
 </activity>  
  
 </application>  
  
</manifest>

**Activityresult.xml:**  
  
<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
  
 <LinearLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:gravity="center"  
 android:orientation="vertical">  
  
 <TextView  
 android:id="@+id/resultText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Results"  
 android:textSize="24sp"  
 android:layout\_marginTop="32dp"  
 android:layout\_gravity="center"  
 android:textColor="#000000"/>  
  
 <TextView  
 android:id="@+id/text\_view\_results"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Results"  
 android:textSize="24sp"/>  
 </LinearLayout>  
</androidx.constraintlayout.widget.ConstraintLayout>

**activitymain.xml:**  
<?xml version="1.0" encoding="utf-8"?>  
<androidx.constraintlayout.widget.ConstraintLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:id="@+id/main"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:gravity="center"  
 android:padding="16dp">  
  
  
 <TextView  
 android:id="@+id/resultText"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Game Results"  
 android:textSize="24sp"  
 android:layout\_marginTop="32dp"  
 android:layout\_gravity="center"/>  
  
 <!-- Player 1 Score -->  
 <TextView  
 android:id="@+id/text\_view\_p1"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Player 1: 0"  
 android:textSize="24sp"  
 android:layout\_marginBottom="16dp" />  
  
 <!-- Player 2 Score -->  
 <TextView  
 android:id="@+id/text\_view\_p2"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Player 2: 0"  
 android:textSize="24sp"  
 android:layout\_marginBottom="32dp" />  
  
 <!-- Tic Tac Toe Grid -->  
 <GridLayout  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:rowCount="3"  
 android:columnCount="3"  
 android:layout\_marginBottom="32dp">  
  
 <!-- Buttons for Tic Tac Toe Grid -->  
 <Button  
 android:id="@+id/button\_00"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_01"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_02"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_10"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_11"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_12"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_20"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_21"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
  
 <Button  
 android:id="@+id/button\_22"  
 android:layout\_width="100dp"  
 android:layout\_height="100dp"  
 android:textSize="24sp" />  
 </GridLayout>  
  
 <!-- Reset Button -->  
 <Button  
 android:id="@+id/button\_reset"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Reset Game" />  
 </LinearLayout>  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**Output Screenshots:**

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