

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.tictactoe.game1">

    <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.tictactoe;

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.tictactoe.game1;  
  
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) {
            resetBoard();
        } else {
            endGame();
        }
    } else if (isBoardFull()) {
        roundsPlayed++;
        if (roundsPlayed < 5) {
            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.tictactoeegame1;

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().getIntentExtra("player1Score", 0);
        int player2Score =
getIntent().getIntentExtra("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
-->
    <corners android:radius="8dp" />
    <padding android:left="10dp" android:right="10dp"
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
        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
        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 -->
```

```
<color name="primary_color">#2E2E2E</color> <!-- Dark Gray -->
<color name="secondary_color">#3498DB</color> <!-- Blue -->
<color name="accent_color">#FFFFFF</color> <!-- White -->
</resources>
```

Output:



