U18CO018

Shubham Shekhaliya

Sub: Software Tools

Lab: Assignment 7

Topic: Develop a Roulette Game for Android

Extending Assignment 6, here, we are adding certain rules to play Roulette game game which are explained below.

Input: Amount (in INR) and Choice

Amount: You are supposed to enter an amount, let’s say INR 500 and you will get the chance to spin the wheel 5 times, i.e., each trial will cost INR 100 and after each trial, INR 100 will be deducted from Amount.

Choice: You are supposed to give any one choice out of following four choices during each trial. If after each trial, the output of Roulette game is same as choice given by you for that trial, you will get reward (in INR) as mentioned below:

1. Choice 1: Any odd number between 0 to 36 Reward: INR 100

2. Choice 2: Any even number between 0 to 36 Reward: INR 100

3. Choice 3: Any Prime number between 0 to 36 Reward: INR 500

4. Choice 4: A fixed number between 0 to 36 Reward: INR 5000

Output: For each trial, your program should print following parameters as output: Trial\_number, Remaining\_amount, Reward\_earned, Trial\_left

And after completion of all trials, you are supposed to display

Amount\_invested, Total\_rewards\_earned and Net\_profit/Net\_loss earned.

Trial\_number indicates how many attempts/trial have been made till now.

Remaining\_amount is the Amount left after all trial made till now

Reward\_earned means the money you earned after rotation

Trial\_left indicates the number of attempt you have.

Amount\_invested denotes the initial amount you bet for.

Total\_rewards\_earned is the total money (in INR) you earned after completion of game/trials.

Net\_profit/Net\_loss indicates the profit/loss you got.

NOTE: You are not supposed to quit the game without completion.

MainActivity.java

package com.exmple.roulettegame;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.text.TextUtils;  
import android.view.View;  
import android.widget.Button;  
import android.widget.EditText;  
import android.widget.Toast;  
  
public class MainActivity extends AppCompatActivity {  
  
 private EditText amountEt;  
 private Button startBtn;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 amountEt = findViewById(R.id.*amountEt*);  
 startBtn = findViewById(R.id.*startBtn*);  
  
 startBtn.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View view) {  
 if( !TextUtils.*isEmpty*(amountEt.getText()) && TextUtils.*isDigitsOnly*(amountEt.getText()) ) {  
 int amount = Integer.*parseInt*(String.*valueOf*(amountEt.getText()));  
 Intent intent = new Intent(getBaseContext(),GameActivity.class);  
 intent.putExtra("amount", amount);  
 startActivity(intent);  
 } else {  
 Toast.*makeText*(MainActivity.this, "Enter valid amount", Toast.*LENGTH\_LONG*).show();  
 }  
 }  
 });  
  
 }  
}

activity\_main.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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <EditText  
 android:id="@+id/amountEt"  
 android:layout\_width="150dp"  
 android:gravity="center"  
 android:hint="Enter Amount"  
 android:inputType="number"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="300dp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <Button  
 android:id="@+id/startBtn"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Start Game"  
 android:layout\_marginTop="50dp"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/amountEt" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

GameActivity.java

package com.exmple.roulettegame;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.view.animation.Animation;  
import android.view.animation.DecelerateInterpolator;  
import android.view.animation.RotateAnimation;  
import android.widget.AdapterView;  
import android.widget.ArrayAdapter;  
import android.widget.Button;  
import android.widget.ImageView;  
import android.widget.NumberPicker;  
import android.widget.Spinner;  
import android.widget.TextView;  
import android.widget.Toast;  
  
import java.util.Arrays;  
import java.util.HashSet;  
import java.util.Random;  
  
public class GameActivity extends AppCompatActivity {  
  
 private static final String[] *SECTORS* = { "32 red", "15 black",  
 "19 red", "4 black", "21 red", "2 black", "25 red", "17 black", "34 red",  
 "6 black", "27 red","13 black", "36 red", "11 black", "30 red", "8 black",  
 "23 red", "10 black", "5 red", "24 black", "16 red", "33 black",  
 "1 red", "20 black", "14 red", "31 black", "9 red", "22 black",  
 "18 red", "29 black", "7 red", "28 black", "12 red", "35 black",  
 "3 red", "26 black", "zero"  
 };  
  
 private final String[] CHOICES = { "Odd No. Reward ₹ 100", "Even no. Reward ₹ 100"  
 , "Prime no. Reward ₹ 500", "Choose No. Reward ₹ 5000"  
 };  
  
 private static final int[] *NUMBERS* = {32, 15, 19, 4, 21, 2, 25, 17, 34,6,27,13,36,11,30,8,  
 23,10,5,24,16,33,1,20,14,31,9,22,18,29,7,28,12,35,3,26,0};  
  
 private static HashSet<Integer> *PRIMES* = new HashSet<Integer>(Arrays.*asList*(2,3,5,7,11,13,17,19,23,29,31));;  
  
 private static final Random *RANDOM* = new Random();  
 private int degree = 0, degreeOld = 0;  
 private static final float *HALF\_SECTOR* = (360.0f/37.0f)/2.0f;  
  
 private Button spinBtn;  
 private TextView resultTv;  
 private ImageView wheel;  
  
 private TextView trialNumberTv, remainingAmountTv, trialLeftTv, rewardEarnedTv;  
  
 private NumberPicker numberPicker;  
 private Spinner spinner;  
  
 private int amount = 0, type = 1, choose = -1;  
 private int totalTrial = 0, trialLeft = 0;  
 private int rewardEarned = 0, remainingAmount = 0;  
 private int trialNumber = 0;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_game*);  
  
 amount = getIntent().getIntExtra("amount", 0);  
*// Toast.makeText(GameActivity.this, "" + amount, Toast.LENGTH\_LONG).show();* trialLeft = totalTrial = amount / 100;  
 remainingAmount = amount;  
  
  
 numberPicker = findViewById(R.id.*numberPicker*);  
 numberPicker.setMinValue(0);  
 numberPicker.setMaxValue(36);  
  
 spinner = findViewById(R.id.*spinner*);  
  
 ArrayAdapter<String> aa = new ArrayAdapter<String>(this,android.R.layout.*simple\_spinner\_item*,CHOICES);  
 aa.setDropDownViewResource(android.R.layout.*simple\_spinner\_dropdown\_item*);  
 spinner.setAdapter(aa);  
  
 spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {  
 @Override  
 public void onItemSelected(AdapterView<?> adapterView, View view, int position, long l) {  
 switch (position) {  
 case 0:  
 makePickerInvisible();  
 type = 1;  
 choose = -1;  
 break;  
 case 1:  
 makePickerInvisible();  
 type = 2;  
 choose = -1;  
 break;  
 case 2:  
 makePickerInvisible();  
 type = 3;  
 choose = -1;  
 break;  
 default:  
 makePickerVisible();  
 type = 4;  
 choose = numberPicker.getValue();  
 break;  
 }  
 }  
  
 @Override  
 public void onNothingSelected(AdapterView<?> adapterView) {  
  
 }  
 });  
  
  
 spinBtn = findViewById(R.id.*spinBtn*);  
 resultTv = findViewById(R.id.*resultTv*);  
 wheel = findViewById(R.id.*wheel*);  
  
 trialNumberTv = findViewById(R.id.*trialNumber*);  
 remainingAmountTv = findViewById(R.id.*remainingAmount*);  
 trialLeftTv = findViewById(R.id.*trialLeft*);  
 rewardEarnedTv = findViewById(R.id.*rewardEarned*);  
  
 trialNumberTv.setText("Trial Number : " + trialNumber);  
 remainingAmountTv.setText("Remaining Amount : " + remainingAmount);  
 trialLeftTv.setText("Trial Left : " + trialLeft);  
 rewardEarnedTv.setText("Reward Earned : " + rewardEarned);  
  
 if(trialLeft == 0) {  
 spinBtn.setText("See Summary");  
 }  
  
 spinBtn.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View view) {  
 if(trialLeft == 0) {  
 Toast.*makeText*(GameActivity.this, "All trial are finished", Toast.*LENGTH\_LONG*).show();  
 Intent intent = new Intent(GameActivity.this, SummaryActivity.class);  
 intent.putExtra("amount", amount);  
 intent.putExtra("reward", rewardEarned);  
 startActivity(intent);  
 } else {  
 if(type == 4) {  
 choose = numberPicker.getValue();  
 }  
 spin(view);  
 }  
 }  
 });  
 }  
  
 public void spin(View v) {  
 degreeOld = degree % 360;  
 degree = *RANDOM*.nextInt(360) + 720;  
  
 RotateAnimation rotateAnim = new RotateAnimation(degreeOld, degree,  
 RotateAnimation.*RELATIVE\_TO\_SELF*, 0.5f, RotateAnimation.*RELATIVE\_TO\_SELF*, 0.5f);  
 rotateAnim.setDuration(3600);  
 rotateAnim.setFillAfter(true);  
 rotateAnim.setInterpolator(new DecelerateInterpolator());  
 rotateAnim.setAnimationListener(new Animation.AnimationListener() {  
 @Override  
 public void onAnimationStart(Animation animation) {  
 resultTv.setText("");  
 trialNumberTv.setText("");  
 remainingAmountTv.setText("");  
 trialLeftTv.setText("");  
 rewardEarnedTv.setText("");  
  
 spinner.setVisibility(View.*GONE*);  
 numberPicker.setVisibility(View.*GONE*);  
 }  
  
 @Override  
 public void onAnimationEnd(Animation animation) {  
 int i = getSector(360 - (degree % 360));  
 resultTv.setText(*SECTORS*[i]);  
 trialNumber++;  
 trialLeft--;  
 remainingAmount-=100;  
  
 int tempReward = 0;  
  
 if(type == 1) {  
 if(isOdd(i)) {  
 rewardEarned += 100;  
 tempReward = 100;  
 }  
 } else if (type == 2) {  
 if(isEven(i)) {  
 rewardEarned += 100;  
 tempReward = 100;  
 }  
 } else if (type == 3) {  
 if(isPrime(i)) {  
 rewardEarned += 500;  
 tempReward = 500;  
 }  
 } else {  
 if(isSame(i)) {  
 rewardEarned += 5000;  
 tempReward = 5000;  
 }  
 }  
  
  
 trialNumberTv.setText("Trial Number : " + trialNumber);  
 remainingAmountTv.setText("Remaining Amount : " + remainingAmount);  
 trialLeftTv.setText("Trial Left : " + trialLeft);  
 rewardEarnedTv.setText("Reward Earned : " + tempReward);  
  
 if(trialLeft == 0) {  
 spinBtn.setText("See Summary");  
 }  
  
  
 spinner.setVisibility(View.*VISIBLE*);  
 if(type == 4)  
 numberPicker.setVisibility(View.*VISIBLE*);  
 }  
  
 @Override  
 public void onAnimationRepeat(Animation animation) {  
  
 }  
 });  
 wheel.startAnimation(rotateAnim);  
 }  
  
 private int getSector(int degrees) {  
 int i = 0;  
 String text = null;  
  
 do {  
 float start = *HALF\_SECTOR* \* (i \* 2 + 1);  
 float end = *HALF\_SECTOR* \* (i \* 2 + 3);  
  
 if (degrees >= start && degrees < end) {  
 text = *SECTORS*[i];  
*// Toast.makeText(GameActivity.this,SECTORS[i],Toast.LENGTH\_LONG).show();* break;  
 }  
  
 i++;  
 } while (text == null && i < *SECTORS*.length);  
  
 if(i>=36 || text==null) {  
 i = 36;  
 }  
  
 return i;  
 }  
  
 private boolean isEven(int i) {  
 return *NUMBERS*[i] %2 == 0;  
 }  
  
 private boolean isOdd(int i) {  
 return *NUMBERS*[i]%2 == 1;  
 }  
  
 private boolean isPrime(int i) {  
 return *PRIMES*.contains(*NUMBERS*[i]);  
 }  
  
 private boolean isSame(int i) {  
 return choose == *NUMBERS*[i];  
 }  
  
 @Override  
 public void onBackPressed() {  
*// super.onBackPressed();* }  
  
 public void makePickerInvisible() {  
 numberPicker.setVisibility(View.*GONE*);  
 }  
  
 public void makePickerVisible() {  
 numberPicker.setVisibility(View.*VISIBLE*);  
 }  
}

activity\_game.xml

*<?*xml version="1.0" encoding="utf-8"*?>*<RelativeLayout 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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".GameActivity">  
  
 <TextView  
 android:id="@+id/resultTv"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentTop="true"  
 android:layout\_marginTop="15dp"  
 android:textSize="20sp"  
 android:textColor="#FF0000"  
 android:layout\_centerHorizontal="true"  
 android:text="Result"/>  
  
 <TextView  
 android:id="@+id/trialNumber"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignTop="@id/resultTv"  
 android:layout\_marginTop="40dp"  
 android:layout\_below="@id/resultTv"  
 android:textSize="20sp"  
 android:textColor="#FF0000"  
 android:layout\_centerHorizontal="true"  
 android:text="trial number"/>  
  
 <TextView  
 android:id="@+id/remainingAmount"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignTop="@id/trialNumber"  
 android:layout\_marginTop="25dp"  
 android:layout\_below="@id/trialNumber"  
 android:textSize="20sp"  
 android:textColor="#FF0000"  
 android:layout\_centerHorizontal="true"  
 android:text="Remaining Amount"/>  
  
 <TextView  
 android:id="@+id/rewardEarned"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignTop="@id/remainingAmount"  
 android:layout\_marginTop="25dp"  
 android:layout\_below="@id/remainingAmount"  
 android:textSize="20sp"  
 android:textColor="#FF0000"  
 android:layout\_centerHorizontal="true"  
 android:text="Reward Earned"/>  
  
 <TextView  
 android:id="@+id/trialLeft"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignTop="@id/rewardEarned"  
 android:layout\_marginTop="25dp"  
 android:layout\_below="@id/rewardEarned"  
 android:textSize="20sp"  
 android:textColor="#FF0000"  
 android:layout\_centerHorizontal="true"  
 android:text="Trial Left"/>  
  
 <ImageView  
 android:id="@+id/triangle"  
 android:layout\_width="25dp"  
 android:layout\_height="25dp"  
 android:layout\_centerHorizontal="true"  
 android:layout\_above="@id/wheel"  
 android:layout\_marginBottom="-10dp"  
 app:srcCompat="@drawable/triangle"  
 android:background="@color/black"/>  
  
 <ImageView  
 android:id="@+id/wheel"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_above="@+id/spinBtn"  
 android:layout\_centerHorizontal="true"  
 android:layout\_marginLeft="20dp"  
 android:layout\_marginRight="20dp"  
 android:layout\_marginBottom="57dp"  
 android:adjustViewBounds="true"  
 android:scaleType="centerInside"  
 app:srcCompat="@drawable/wheel" />  
  
 <Button  
 android:id="@+id/spinBtn"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentBottom="true"  
 android:layout\_centerHorizontal="true"  
 android:text="SPIN"  
 android:layout\_marginBottom="10dp" />  
  
 <Spinner  
 android:id="@+id/spinner"  
 android:layout\_width="0dp"  
 android:layout\_height="50dp"  
 android:layout\_above="@+id/spinBtn"  
 android:layout\_alignParentStart="true"  
 android:layout\_alignParentEnd="true"  
 android:layout\_marginStart="104dp"  
 android:layout\_marginEnd="104dp"  
 android:layout\_marginBottom="4dp"  
 android:textAlignment="center"/>  
  
 <NumberPicker  
 android:id="@+id/numberPicker"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentStart="true"  
 android:layout\_alignParentEnd="true"  
 android:layout\_alignParentBottom="true"  
 android:layout\_marginStart="328dp"  
 android:spinnerMode="dropdown"  
 android:layout\_marginEnd="19dp"  
 android:layout\_marginBottom="-2dp" />  
  
</RelativeLayout>

SummaryActivity.java

package com.exmple.roulettegame;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.TextView;  
import android.widget.Toast;  
  
public class SummaryActivity extends AppCompatActivity {  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_summary*);  
  
 TextView amountTv = findViewById(R.id.*summaryAmount*);  
 TextView rewardTv = findViewById(R.id.*summaryReward*);  
 TextView gainTv = findViewById(R.id.*summaryGain*);  
  
 Button playAgainBtn = findViewById(R.id.*playAgain*);  
  
 int amount = getIntent().getIntExtra("amount", 0);  
 int reward = getIntent().getIntExtra("reward", 0);  
  
 int gain = reward - (amount/100) \*100;  
  
 amountTv.setText("Total amount invested is " + amount);  
 rewardTv.setText("Total reward amount is " + reward);  
  
 if(gain < 0) {  
 *// loss* gain \*= -1;  
 gainTv.setText("Total Loss " + gain);  
 Toast.*makeText*(SummaryActivity.this, "Better Luck Next time", Toast.*LENGTH\_LONG*).show();  
 } else {  
 *// win* gainTv.setText("Total Profit " + gain);  
 Toast.*makeText*(SummaryActivity.this, "Congratulation", Toast.*LENGTH\_LONG*).show();  
 }  
  
 playAgainBtn.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View view) {  
 Intent intent = new Intent(SummaryActivity.this, MainActivity.class);  
 startActivity(intent);  
 }  
 });  
 }  
  
 @Override  
 public void onBackPressed() {  
*// super.onBackPressed();* }  
}

activity\_summary.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:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".SummaryActivity">  
  
 <TextView  
 android:id="@+id/summaryAmount"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="200dp"  
 android:textStyle="bold"  
 android:textSize="20sp"  
 android:text="TextView"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <TextView  
 android:id="@+id/summaryReward"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="50dp"  
 android:textStyle="bold"  
 android:textSize="20sp"  
 android:text="TextView"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/summaryAmount" />  
  
 <TextView  
 android:id="@+id/summaryGain"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="50dp"  
 android:textStyle="bold"  
 android:textSize="20sp"  
 android:text="TextView"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/summaryReward" />  
  
 <Button  
 android:id="@+id/playAgain"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginBottom="100dp"  
 android:text="Play Again"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintStart\_toStartOf="parent" />  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**Outputs Screen Shots are below**

     