U18CO009

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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


```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
<?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

```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;
```

```java
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);
```

```java
        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);
```

```java
        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);
            }
```

```java
        @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;
```

```java
        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.java

```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"/>
```

```xml
<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"
```

```xml
            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

```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();
```

```java
        }

        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
<?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"
```

```xml
            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>
```
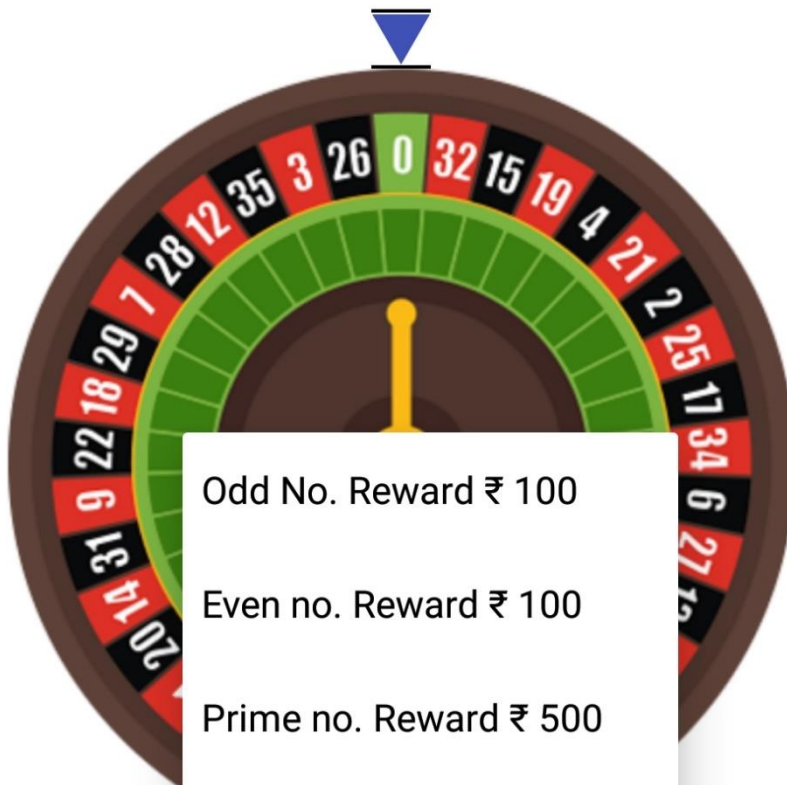
Outputs Screen Shots are below

500

START GAME

Result

Trial Number : 0
Remaining Amount : 500
Reward Earned : 0
Trial Left : 5

Odd No. Reward ₹ 100

Even no. Reward ₹ 100

Prime no. Reward ₹ 500

Choose No. Reward ₹ 5000

Odd No. Rewar..

SPIN

34 red

Trial Number : 1
Remaining Amount : 400
Reward Earned : 0
Trial Left : 4

Odd No. Rewar..

SPIN

30 red

Trial Number : 2
Remaining Amount : 300
Reward Earned : 0
Trial Left : 3

Prime no. Rewa.. ▾

SPIN

21 red

Trial Number : 3
Remaining Amount : 200
Reward Earned : 0
Trial Left : 2

Prime no. Rewa.. ▾

SPIN

21 red

Trial Number : 3
Remaining Amount : 200
Reward Earned : 0
Trial Left : 2

16

Choose No. Re..   17

SPIN

18

SPIN

34 red

Trial Number : 5
Remaining Amount : 0
Reward Earned : 0
Trial Left : 0

16

Choose No. Re.. ▼   17

SEE SUMMARY

18

Total amount invested is 500

Total reward amount is 0

Total Loss 500

Better Luck Next time