اسم المشروع :-

*Crash Solver*

*الاسم الشخصي:-*

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*الثانويه الجديده*

*تاريخ التسليم:-*

*2018/6/16*

*الفهرس*

*\*مقدمه:-*

*شرح بسيط عن البرنامج.................... صفحه ( 2-1)*

*\*هدف البرنامج:-*

*\*لاي شرائح اشخاص خصص البرنامج:-*

*\*لاي نوع اجهزه خصص البرنامج:-*

*شرح يتضمن هذه المواضيع............صفحه (4-5)*

**مقدمة قصيرة :-**  
  
المشروع يهدف الى تحسين المهارات العقلية وتحسين التصرف تحت ضغط الوقت وكثرة المهام ومراقبة عدة اجزاء في اللعبة في آن واحد، حيث ان اللعبة تتدرج من حيث الصعوبة وسرعة اللعبة بشكل اوتوماتيكي مما يضيف طابع التحدي والتشويق داخل اللعبة.  
  
اللعبة مناسبة لمختلف الفئات العمرية فهي من نوع الالعاب البسيطة والتي تسبب الادمان النسبي وهدفها الظاهري هو التسلية بشكل عام.  
  
  
**شرح البرنامج وأهدافه :-**

اللعبة تتمحور حول منع الاصطدام بين السيارات القادمة من اتجاهات عدة وذلك بواسطة التلاعب في الاشارات الضوئية بالضغط عليها بالوقت المناسب.  
الهدف من البرنامج هو التسلية بشكل عام ولكن بالإضافة الي التسلية فهو يحسن المهارات الفكرية واتخاذ القرارات بالشكل المناسب وتحسين ردة الفعل تحت الضغط البسيط.

**الاجهزة التي تشغل البرنامج :-**

يمكن تشغيل البرنامج على كل الاجهزة التي تعمل بنظام ال اندرويد والتي تعمل بشاشة لمسية بشرط ان تكون الاجهزة تعمل بنظام اندرويد لوليبوب 5.0 وما فوق.

**شرح استخدام البرنامج :-**  
  
**البرنامج مكون من عدة صفحات :-**

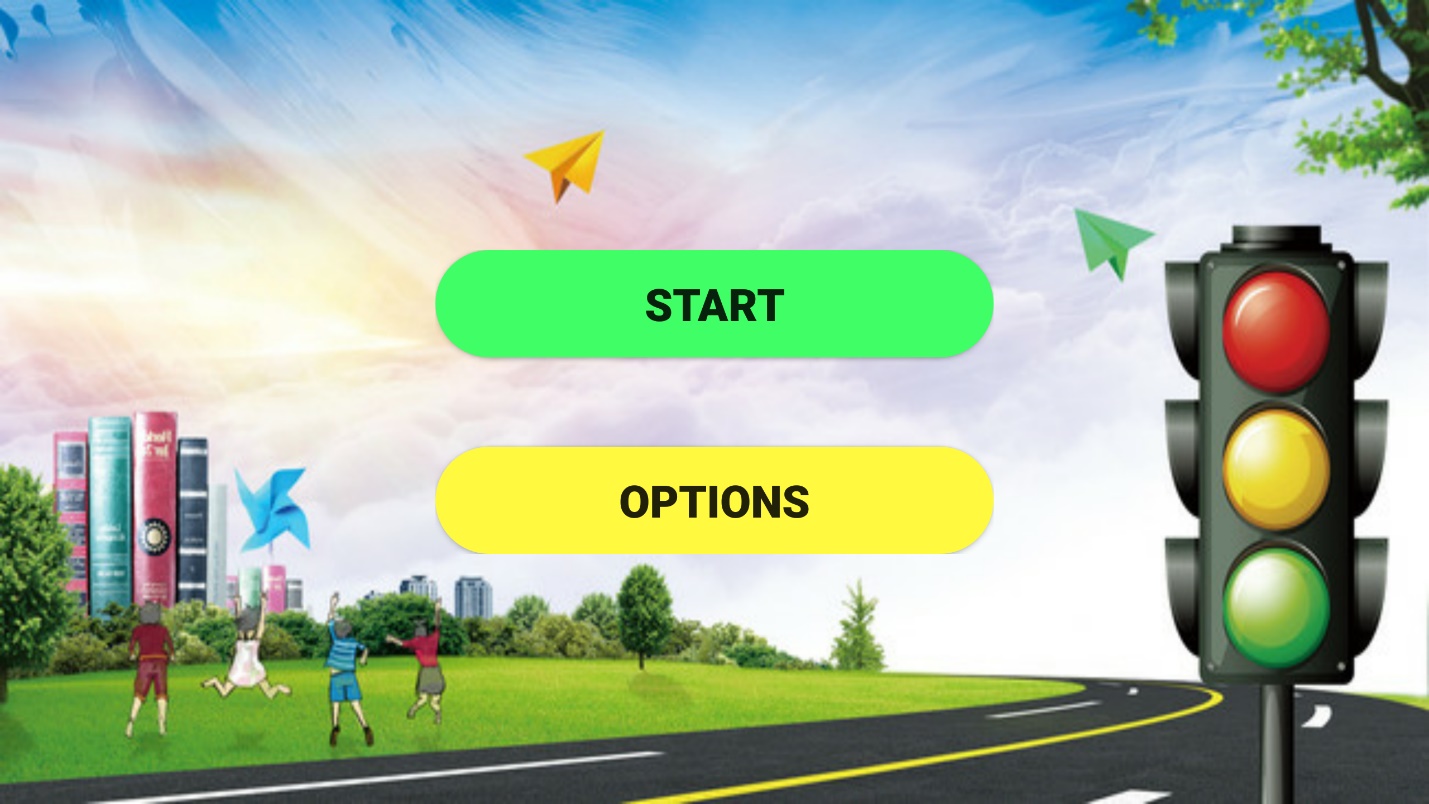
**الصفحة 1 (الرئيسية) :**الصفحة 1 هي الصفحة الرئيسية وصفحة البداية  
الصفحة تحتوي على زران وهما start او options فمن خلال الضغط على زر start تنتقل الي واجهة اللعبة الأساسية للعب ومن خلال زر options تنتقل لصفحة التحكم بالإعدادات.

**الصفحة 2 (الاعدادات) :**

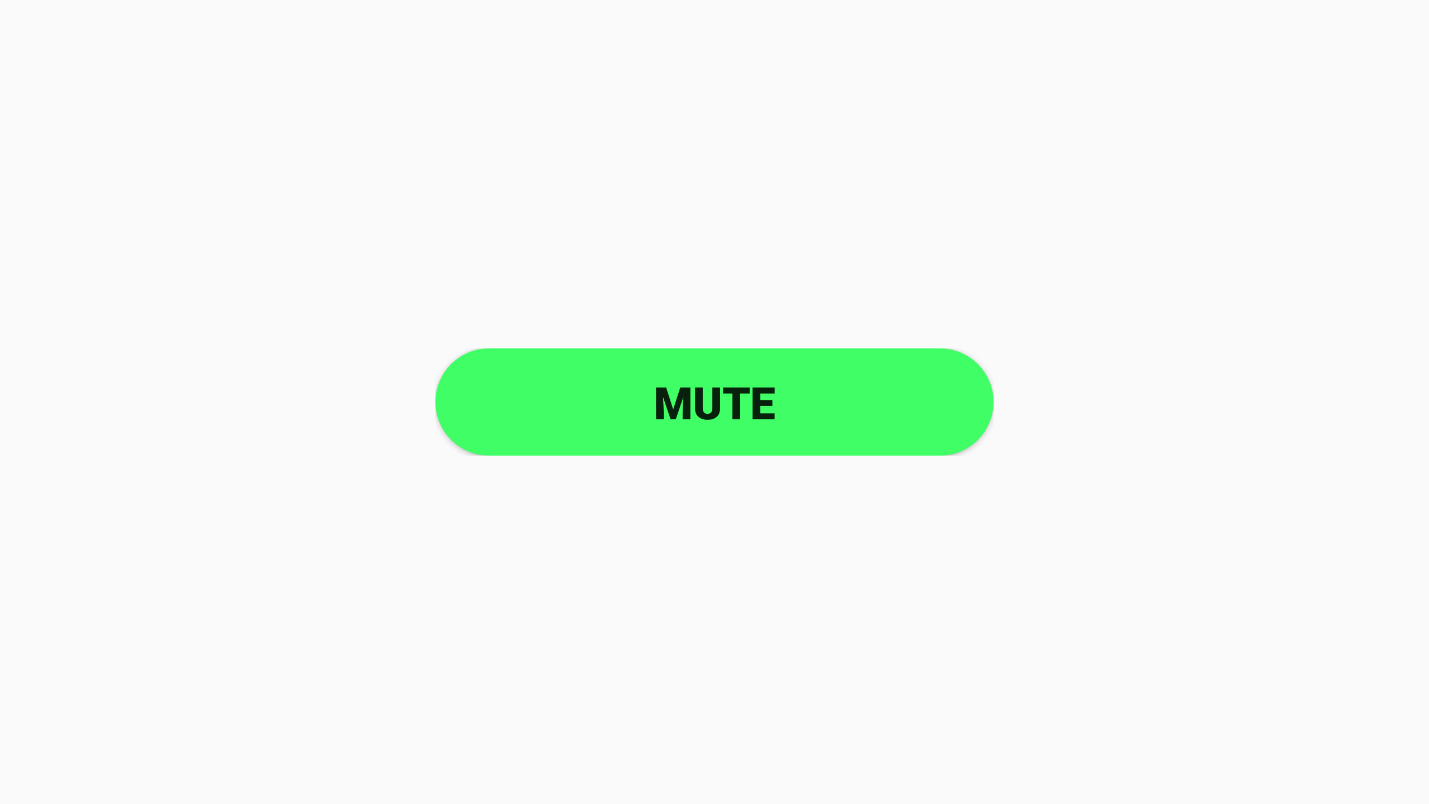
الصفحة 2 هي صفحة الاعدادات فمن خلال الصفحة 1 تنتقل للصفحة 2 بواسطة الزر optionsالصفحة 2 تمكن من التحكم باعدادات الصوت الخاصة باللعبة.

**الصفحة 3 (اللعبة) :**  
الصفحة 3 هي صفحة اللعبة فمن خلال الصفحة 1 تنتقل للصفحة 3 بواسطة الزر startللبدأ باللعبة والتي هي عبارة عن التحكم بإشارات المرور لمنع الاصطدام وكسب النقاط من خلال مرور اكبر عدد ممكن من السيارات.

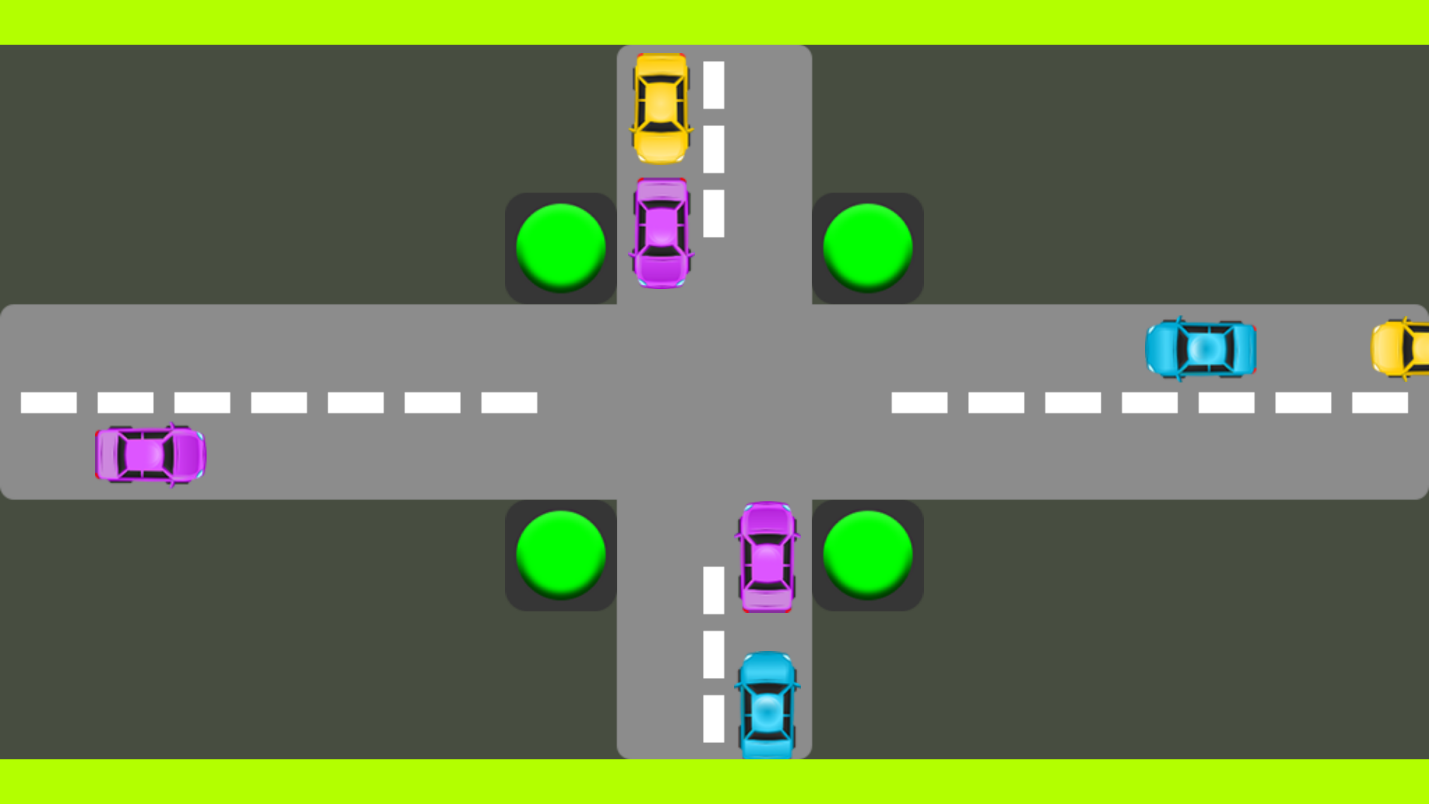
***الصفحة 1 (الرئيسية) :***

****

***الصفحة 2 (الاعدادات) :***

****

***الصفحة 3 (اللعبة) :***

****

**الاجهزة التي تم تفعيل البرنامج عليها :-**

\*htc 10  
\*samsung Galaxy s6  
\*pixel 2 xl  
  
الاجهزة كلها عملت بسلاسة وبشكل سليم

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"  
 android:background="#b3ff00"  
 tools:context="com.example.islam.androidapp.GameActivity"  
 android:orientation="vertical"**>  
  
  
 <**com.example.islam.androidapp.GameView  
  
 android:id="@+id/gameView"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:background="#474d40"** />  
  
</**RelativeLayout**>

Activity\_main 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="com.example.islam.androidapp.MainActivity"  
 android:background="@drawable/start\_page"  
 android:layout\_weight="100"** >  
  
<**LinearLayout  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_centerHorizontal="true"  
 android:layout\_centerVertical="true"  
 android:orientation="vertical"**>  
  
 <**Button  
 android:id="@+id/startBut"  
 android:layout\_width="250dp"  
 android:layout\_height="wrap\_content"  
 android:background="@drawable/rounded\_button"  
 android:text="Start"  
 android:textSize="20dp"  
 android:textStyle="bold"  
 android:onClick="play"** />  
  
 <**Button  
 android:id="@+id/optionBut"  
 android:layout\_width="250dp"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginTop="40dp"  
 android:text="Options"  
 android:background="@drawable/rounded\_button"  
 android:backgroundTint="@color/ylcolor"  
 android:textStyle="bold"  
 android:textSize="20dp"  
 android:onClick="options"** />  
  
</**LinearLayout**>  
</**RelativeLayout**>

Activity\_options 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="com.example.islam.androidapp.activity\_options"  
  
 android:layout\_weight="100"** >  
  
 <**LinearLayout  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_centerHorizontal="true"  
 android:layout\_centerVertical="true"  
 android:orientation="vertical"**>  
  
 <**Button  
 android:id="@+id/back"  
 android:layout\_width="250dp"  
 android:layout\_height="wrap\_content"  
 android:background="@drawable/rounded\_button"  
 android:text="Mute"  
 android:textSize="20dp"  
 android:textStyle="bold"  
 android:onClick="back"** />  
  
  
 </**LinearLayout**>  
</**RelativeLayout**>

MainActivity Class :

**package** com.example.islam.androidapp;  
  
**import** android.app.Activity;  
**import** android.content.Intent;  
**import** android.content.pm.ActivityInfo;  
**import** android.media.MediaPlayer;  
**import** android.support.v7.app.AppCompatActivity;  
**import** android.os.Bundle;  
**import** android.util.Log;  
**import** android.view.View;  
**import** android.view.Window;  
**import** android.view.WindowManager;  
**import** android.widget.Button;  
  
**public class** MainActivity **extends** Activity {  
 **private static final** String ***TAG*** = **"MainActiviy"**;  
 **private** Button **startBut**;  
 **private** Button **optionBut**;  
 MediaPlayer **mediaPlayer**;  
 **private boolean sound** = **false**;  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 setRequestedOrientation(ActivityInfo.***SCREEN\_ORIENTATION\_LANDSCAPE***);  
*// requestWindowFeature(Window.FEATURE\_NO\_TITLE);* getWindow().setFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***,  
 WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
  
 **startBut** = (Button)findViewById(R.id.***startBut***);  
 **optionBut** = (Button)findViewById(R.id.***optionBut***);  
 **mediaPlayer** = MediaPlayer.*create*(**this**,R.raw.***sound***);  
 Log.*d*(***TAG***,**"On Create"**);  
  
 }  
  
 @Override  
 **protected void** onStart() {  
 **super**.onStart();  
  
 **mediaPlayer**.start();  
 **mediaPlayer**.setLooping(**true**);  
  
 Log.*d*(***TAG***,**"On Start"**);  
 }  
  
 @Override  
 **protected void** onPause() {  
 **super**.onPause();  
 Log.*d*(***TAG***,**"On Pause"**);  
  
 }  
  
 @Override  
 **protected void** onStop() {  
 **super**.onStop();  
 **mediaPlayer**.stop();  
 Log.*d*(***TAG***,**"On Stop"**);  
  
 }  
  
 **public void** play(View v){  
 Intent i = **new** Intent(**this**,GameActivity.**class**);  
 startActivity(i);  
 }  
  
 **public void** options(View v){  
 Intent i = **new** Intent(**this**,activity\_options.**class**);  
 startActivity(i);  
 }  
}

Activity\_Options Class :

**package** com.example.islam.androidapp;  
  
**import** android.app.Activity;  
**import** android.content.Intent;  
**import** android.content.pm.ActivityInfo;  
**import** android.os.Bundle;  
**import** android.support.design.widget.FloatingActionButton;  
**import** android.support.design.widget.Snackbar;  
**import** android.support.v7.app.AppCompatActivity;  
**import** android.support.v7.widget.Toolbar;  
**import** android.view.View;  
**import** android.view.Window;  
**import** android.view.WindowManager;  
  
**public class** activity\_options **extends** Activity {  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
  
 **super**.onCreate(savedInstanceState);  
 requestWindowFeature(Window.***FEATURE\_NO\_TITLE***);  
 getWindow().setFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***,  
 WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
  
 setRequestedOrientation(ActivityInfo.***SCREEN\_ORIENTATION\_LANDSCAPE***);  
 setContentView(R.layout.***activity\_options***);  
 }  
 **public void** back(View v){  
 Intent i = **new** Intent(**this**,MainActivity.**class**);  
 startActivity(i);  
  
 }  
  
}

Car Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.graphics.RectF;  
  
**import** java.util.Random;  
  
**public abstract class** Car **implements** Runnable {  
 **protected float x**;  
 **protected float y**;  
 **protected float step**;  
 **protected** Bitmap **carBitmap**;  
 **protected** TrafficLight **trafficLight**;  
 **protected** CarList **carList**;  
 **protected** Car **next**;  
 **protected** Car **prev**;  
 **protected int carNumber**;  
 RectF **rectF**;  
 **protected boolean inJunction**;  
  
 **public static boolean** *running* = **true**;  
  
 **public** Car(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, CarList carList) {  
 Random rn = **new** Random();  
 **this**.**x** = x;  
 **this**.**y** = y;  
 **this**.**step** = rn.nextInt(8)+3;  
 **this**.**trafficLight** = trafficLight;  
 **this**.**carBitmap** = carBitmap;  
 **this**.**carList** = carList;  
 **this**.**next** = **null**;  
 **this**.**prev** = **null**;  
 **rectF** = **new** RectF(x,y,x+carBitmap.getWidth(),y+carBitmap.getHeight());  
 }  
 **public** Car(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, Car next, Car prev, CarList carList) {  
 Random rn = **new** Random();  
 **this**.**x** = x;  
 **this**.**y** = y;  
 **this**.**step** = rn.nextInt(8)+3;  
 **this**.**trafficLight** = trafficLight;  
 **this**.**carBitmap** = carBitmap;  
 **this**.**carList** = carList;  
 **this**.**next** = next;  
 **this**.**prev** = prev;  
 **rectF** = **new** RectF(x,y,x+carBitmap.getWidth(),y+carBitmap.getHeight());  
  
  
 }  
  
 **public float** getX() {  
 **return x**;  
 }  
  
 **public void** setX(**float** x) {  
 **this**.**x** = x;  
 }  
  
 **public float** getY() {  
 **return y**;  
 }  
  
 **public void** setY(**float** y) {  
 **this**.**y** = y;  
 }  
  
 **public float** getStep() {  
 **return step**;  
 }  
  
 **public void** setStep(**float** step) {  
 **this**.**step** = step;  
 }  
  
 **public** TrafficLight getTrafficLight() {  
 **return trafficLight**;  
 }  
  
 **public void** setTrafficLight(TrafficLight trafficLight) {  
 **this**.**trafficLight** = trafficLight;  
 }  
  
 **public** Car getNext() {  
 **return next**;  
 }  
  
 **public void** setNext(Car next) {  
 **this**.**next** = next;  
 }  
  
 **public void** setPrev(Car prev) {  
 **this**.**prev** = prev;  
 }  
  
 **public** Car getPrev() {  
 **return prev**;  
 }  
 **public** Bitmap getCarBitmap() {  
 **return carBitmap**;  
 }  
  
 **public void** setCarBitmap(Bitmap carBitmap) {  
 **this**.**carBitmap** = carBitmap;  
 }  
 **public void** go(){  
 *running* = **true**;  
 }  
 **public void** stop(){  
 *running* = **true**;  
 }  
 **public abstract void** draw(Canvas canvas);  
  
 **public abstract void** goFaster();  
  
 **public boolean** collideWithOtherCars(){  
 **return true**;  
 }  
 **public void** updateRectF(){  
 **rectF**.set(**x**,**y**,**x**+**carBitmap**.getWidth(),**y**+**carBitmap**.getHeight());  
 }  
}

CarBitmapFactory class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.BitmapFactory;  
  
**import** java.util.Random;  
  
**public final class** CarBitmapFactory {  
 **public static final int *NUM\_CARS*** = 5;  
 **public static** Bitmap getCar(**int** direction, Context context){  
  
 Random random = **new** Random();  
 **int** carNumber = random.nextInt(***NUM\_CARS***)+1;  
 **int** carSelection = carNumber+direction\*5;  
 *// 0=blue* String carName = **"smallcar"**+carSelection;  
 **int** resId = context.getResources().getIdentifier(carName,**"drawable"**,**"com.example.islam.androidapp"**);  
 Bitmap carBitmap = BitmapFactory.*decodeResource*(context.getResources(),resId);  
 **return** carBitmap;  
 }  
}

CarList Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
  
**public abstract class** CarList {  
 **public static final float *DISTANCE*** = 20;  
 **public static final int *MAX\_CARS*** = 10;  
 **public static final int *MIN\_GAP*** = 20;  
 **public static final int *MAX\_GAP*** = 60;  
 **protected int numOfCars**;  
 **protected** Car **head**;  
 **protected** Car **tail**;  
 **protected float Mingap**;  
 **protected** TrafficLight **trafficLight**;  
 **protected** Context **context**;  
 **protected float gap**;  
 **protected boolean movingToLast** = **false**;  
 Bitmap **carBitmap**;  
  
 **public** CarList(TrafficLight trafficLight , Context context,**int** direction){  
 **this**.**context** = context;  
 **carBitmap** = CarBitmapFactory.*getCar*(direction,context);  
 **this**.**trafficLight** = trafficLight;  
 }  
  
 **public synchronized void** draw(Canvas canvas){  
 Car p = **tail**;  
 **while** (p!=**null**){  
 p.draw(canvas);  
 p = p.getNext();  
 }  
 }  
  
 **public synchronized void** go(){  
 Car p = **tail**;  
 **while** (p!=**null**){  
 Thread t = **new** Thread(p);  
 t.start();  
 p = p.getNext();  
 }  
 }  
  
 **public synchronized** Car getTail() {  
 **return tail**;  
 }  
  
 **public void** removeFirst(){  
 **if**(**head** != **tail** ) {  
 **head** = **head**.getPrev();  
 **head**.setNext(**null**);  
 }  
 }  
 **public synchronized void** moveToLast(){  
 **movingToLast** = **true**;  
 Car p = **head**;  
 **head** = **head**.getPrev();  
 p.setNext(**tail**);  
 **tail**.setPrev(p);  
 **head**.setNext(**null**);  
 p.setPrev(**null**);  
 **tail** = **tail**.getPrev();  
 **movingToLast** = **false**;  
 notifyAll();  
 }  
  
 **public synchronized** String getStr() {  
 Car p = **head**;  
 String st = **""**;  
 **while** (p != **null**) {  
 st = st + p.getY() + **" -->"**;  
 p = p.getPrev();  
 }  
 **return** st;  
 }  
  
 **public synchronized void** waitIfMovingToLast() {  
 **if** (**movingToLast**) {  
 **try** {  
 wait();  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
 }  
 **public abstract void** addCar();  
  
}

DownToUpCars Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.util.Log;  
  
**public class** DownToUpCars **extends** CarList{  
 **public static final** String ***TAG*** = **"DownToUpCars"**;  
  
 **public** DownToUpCars(TrafficLight trafficLight , Context context){  
 **super**(trafficLight,context,0);  
 **tail** = **new** DUCar(550\*GameActivity.*sxFactor*,512\*GameActivity.*syFactor*,trafficLight,**carBitmap**,**this**);  
 **head** = **tail**;  
 }  
  
 **public void** addCar(){  
 **if**(**numOfCars** < ***MAX\_CARS***) {  
 **gap** =(**float**) (**head**.getCarBitmap().getHeight() + Math.*random*()\*(***MAX\_GAP***-***MIN\_GAP***)+***MIN\_GAP***);  
 Bitmap carBitmap = CarBitmapFactory.*getCar*(0,**context**);  
 DUCar duCar = **new** DUCar(550\*GameActivity.*sxFactor*, **tail**.getY()+**gap**, **trafficLight**,carBitmap,**this**);  
 duCar.setNext(**tail**);  
 **tail**.setPrev(duCar);  
 **tail** = **tail**.getPrev();  
 }  
 Log.*d*(***TAG***,getStr());  
 }  
  
  
}

DUCars Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.graphics.Paint;  
**import** android.util.Log;  
  
**import** java.util.Random;  
  
**public class** DUCar **extends** Car {  
  
 **public** DUCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, DownToUpCars downToUpCars) {  
 **super**(x-carBitmap.getWidth()/2,y,trafficLight,carBitmap,downToUpCars);  
 }  
  
 **public** DUCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, DUCar next, DUCar prev, DownToUpCars downToUpCars) {  
 **super**(x-carBitmap.getWidth()/2,y,trafficLight,carBitmap,next,prev,downToUpCars);  
  
 }  
  
 **public void** draw(Canvas canvas){  
 canvas.drawBitmap(**carBitmap**,**x**,**y**,**null**);  
 Paint p = **new** Paint();  
 p.setColor(0x88FF0000);  
*// canvas.drawRect(rectF,p);* }  
  
 **public synchronized void** goFaster(){  
 **if**(**step** < 15)  
 **step**++;  
 }  
  
 @Override  
 **public void** run() {  
 **while** (*running* ){  
 **if**(**inJunction** && GameView.*junction*.collideWith(**this**)) {  
 Log.*d*(**"Down Up Crash"**, **"CCCOOOOOLLLLIDDDD"**);  
 Car.*running* = **false**;  
 }  
  
 **y** = **y** - **step**;  
 **carList**.waitIfMovingToLast();  
 **if**(**next** !=**null** && **y** < **next**.**y** + **carBitmap**.getHeight() + DownToUpCars.***DISTANCE*** ) {  
 **y** = **y** + **step**;  
 **next**.goFaster();  
 }  
 **if**( !**inJunction** && **y** > 326\*GameActivity.*syFactor* && **y**< 326\*GameActivity.*syFactor*+20){  
 **if**( !**trafficLight**.getStatus() ) {  
 **y** = **y** + **step**;  
 **trafficLight**.waitToGreen();  
 }  
  
 GameView.*junction*.add(**this**);  
 **inJunction** = **true**;  
 }  
  
 **if**( **inJunction** && **y** + **carBitmap**.getHeight() < 186\*GameActivity.*syFactor* ) {  
 GameView.*junction*.remove(**this**);  
 **inJunction** = **false**;  
  
 }  
  
 **if**(**y** + **carBitmap**.getHeight() < 0 ){  
  
 **if**( **carList**.getTail().getY() > 512\*GameActivity.*syFactor* )  
 **y** = **carList**.getTail().getY() + **carBitmap**.getHeight() + DownToUpCars.***DISTANCE***;  
 **else  
 y** = 512\*GameActivity.*syFactor* + 5;  
 **step** = (**float**)(Math.*random*()\*10+3);  
  
 **carList**.moveToLast();  
  
  
 }  
 updateRectF();  
  
 **try** {  
 Thread.*sleep*(20);  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
  
 }  
  
}

GameActivity Class :

**package** com.example.islam.androidapp;  
  
**import** android.app.Activity;  
**import** android.content.Context;  
**import** android.content.pm.ActivityInfo;  
**import** android.graphics.Bitmap;  
**import** android.graphics.BitmapFactory;  
**import** android.os.Bundle;  
**import** android.support.design.widget.FloatingActionButton;  
**import** android.support.design.widget.Snackbar;  
**import** android.support.v7.app.AppCompatActivity;  
**import** android.support.v7.widget.Toolbar;  
**import** android.util.DisplayMetrics;  
**import** android.util.Log;  
**import** android.view.View;  
**import** android.view.Window;  
**import** android.view.WindowManager;  
**import** android.widget.LinearLayout;  
  
**public class** GameActivity **extends** Activity {  
 **public static int** *screenWidth*;  
 **public static int** *screenHeight*;  
  
 **public static int** *bgWidth*;  
 **public static int** *bgHeight*;  
  
 **public static float** *sx*;  
 **public static float** *sy*;  
  
 **public static float** *dx*;  
 **public static float** *dy*;  
  
 **public static int** *streetWidth*;  
 **public static int** *streetHeight*;  
  
 **public static float** *scaleFactor*;  
  
 **public static float** *sxFactor*;  
 **public static float** *syFactor*;  
  
 LinearLayout **display**;  
 LinearLayout **game**;  
  
 Bitmap **streetBitmap**;  
  
 GameView **gameView**;  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 requestWindowFeature(Window.***FEATURE\_NO\_TITLE***);  
 getWindow().setFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***,  
 WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
  
 setRequestedOrientation(ActivityInfo.***SCREEN\_ORIENTATION\_LANDSCAPE***);  
  
  
 DisplayMetrics metrics = **new** DisplayMetrics();  
 getWindowManager().getDefaultDisplay().getMetrics(metrics);  
 *screenWidth* = metrics.**widthPixels**;  
 *screenHeight* = metrics.**heightPixels**;  
  
 **streetBitmap** = BitmapFactory.*decodeResource*(getResources(),R.drawable.***street***);  
 *bgWidth* = **streetBitmap**.getWidth();  
 *bgHeight* = **streetBitmap**.getHeight();  
  
 *sx* = *screenWidth* / (**float**)*bgWidth*;  
 *sy* = *screenHeight* / (**float**)*bgHeight*;  
  
 *sxFactor* = *bgWidth* / 1024;  
 *syFactor* = *bgHeight* / 512;  
  
 *scaleFactor* = *sx* < *sy* ? *sx* : *sy* ;  
 *streetWidth* = (**int**)(*bgWidth*\**scaleFactor*);  
 *streetHeight* = (**int**)(*bgHeight*\**scaleFactor*);  
  
  
 setContentView(R.layout.***activity\_game***);  
  
 **gameView** = (GameView)findViewById(R.id.***gameView***);  
 **gameView**.getLayoutParams().**width** = *streetWidth*;  
 **gameView**.getLayoutParams().**height** = *streetHeight*;  
  
 *dx* = (*screenWidth*-*streetWidth*)/2;  
 **gameView**.setX(*dx*);  
 *dy*=(*screenHeight* - *streetHeight*)/2;  
 **gameView**.setY(*dy*);  
 Log.*d*(**"RRRRRRRRR"**,**"Repeat"**);  
  
 }  
  
}

GameView Class :

**package** com.example.islam.androidapp;  
  
**import** android.annotation.SuppressLint;  
**import** android.content.Context;  
**import** android.content.Intent;  
**import** android.graphics.Bitmap;  
**import** android.graphics.BitmapFactory;  
**import** android.graphics.Canvas;  
**import** android.graphics.Paint;  
**import** android.support.annotation.Nullable;  
**import** android.util.AttributeSet;  
**import** android.util.DisplayMetrics;  
**import** android.util.Log;  
**import** android.view.Display;  
**import** android.view.MotionEvent;  
**import** android.view.View;  
**import** android.view.WindowManager;  
**import** android.widget.ImageView;  
  
**import** java.util.ArrayList;  
**import** java.util.List;  
  
*/\*\*  
 \* Created by islam on 2/5/2018.  
 \*/***public class** GameView **extends** View {  
 **float scaleFactor**;  
 RightToLeftCars **rightToLeftCars**;  
 LeftToRightCars **leftToRightCars**;  
 DownToUpCars **downToUpCars**;  
 UpToDownCars **upToDownCars**;  
 **private** Level **level**;  
 **private** TrafficLight[] **trafficLights**;  
 **public boolean gameOver** = **false**;  
 **public boolean finish** = **false**;  
 **public static** Junction *junction*;  
  
 **public** GameView(Context context) {  
 **super**(context);  
 init(context);  
 }  
  
 **public** GameView(Context context, @Nullable AttributeSet attrs) {  
 **super**(context, attrs);  
 init(context);  
 }  
  
 **public** GameView(Context context, @Nullable AttributeSet attrs, **int** defStyleAttr) {  
 **super**(context, attrs, defStyleAttr);  
 init(context);  
 }  
  
 **public** GameView(Context context, @Nullable AttributeSet attrs, **int** defStyleAttr, **int** defStyleRes) {  
 **super**(context, attrs, defStyleAttr, defStyleRes);  
 init(context);  
  
 }  
  
 **public void** init(Context context){  
 DisplayMetrics metrics = **new** DisplayMetrics();  
 WindowManager wm = (WindowManager) context.getSystemService(Context.***WINDOW\_SERVICE***);  
 Display display = wm.getDefaultDisplay();  
 display.getMetrics(metrics);  
 **level** = **new** Level(context);  
 **trafficLights** = **level**.getTrafficLights();  
  
  
 *junction* = **new** Junction(**this**);  
 **float** sx = GameActivity.*streetWidth*/(**float**)**level**.getWidth();  
 **float** sy = GameActivity.*streetHeight*/(**float**)**level**.getHeight();  
 **scaleFactor** = sx < sy ? sx : sy;  
  
 Log.*d*(**"Game View"** , **"OOOOOOOOOOOO"**);  
  
 }  
  
  
 @Override  
 **protected void** onFinishInflate() {  
 **super**.onFinishInflate();  
 Log.*d*(**"View "**,**"Finish Flate"**);  
 }  
  
 @SuppressLint(**"ResourceAsColor"**)  
 **public void** draw(Canvas canvas){  
 **super**.draw(canvas);  
 **int** state = canvas.save();  
  
  
 canvas.scale(**scaleFactor**,**scaleFactor**);  
  
 **level**.draw(canvas);  
 **if**( **gameOver** && !**finish** ){  
 Log.*d*(**"sddsfdsfdsfdsf"**,**"Game Over"**);  
 Paint p = **new** Paint();  
 p.setTextSize(100);  
 p.setTextAlign(Paint.Align.***CENTER***);  
 canvas.drawText(**"Crash"**,512\*GameActivity.*sxFactor*,256\*GameActivity.*syFactor*,p);  
 **finish** = **true**;  
 }  
 canvas.restoreToCount(state);  
 **if**(!**gameOver**)  
 invalidate();  
  
  
  
  
  
 }  
  
 **public void** gameOver() {  
 **this**.**gameOver** = **true**;  
 }  
  
 @Override  
 **public boolean** onTouchEvent(MotionEvent event) {  
 **float** x = event.getX();  
 **float** y = event.getY();  
 **if**( **finish** ){  
 Intent i = **new** Intent(getContext(),MainActivity.**class**);  
 getContext().startActivity(i);  
 }  
 **if**(event.getAction() == MotionEvent.***ACTION\_UP***){  
 **for** ( TrafficLight trafficLight :**trafficLights**) {  
 **if**( trafficLight.contains(x,y)) {  
 Log.*d*(**"Inside "** ,x + **" "** + y);  
 trafficLight.changeStatus();  
 **break**;  
 }  
 }  
 }  
 Log.*d*(**"View .. "**,x + **" "**+ y);  
 **return true**;  
 }  
}

Junction Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.RectF;  
**import** android.util.Log;  
  
**import** java.util.ArrayList;  
**import** java.util.Iterator;  
**import** java.util.List;  
  
**public class** Junction {  
 **private** List<Car> **list**;  
 GameView **gameView**;  
 **public** Junction(GameView gameView){  
 **list** = **new** ArrayList<Car>();  
 **this**.**gameView** = gameView;  
 }  
  
 **public synchronized void** add(Car car){  
 **list**.add(car);  
 }  
  
 **public synchronized void** remove(Car car){  
 Iterator<Car> iterator = **list**.iterator();  
  
 **while** (iterator.hasNext()){  
 Car c = iterator.next();  
 **if**(c == car ){  
 iterator.remove();  
 **return**;  
 }  
 }  
  
 }  
  
 **public synchronized boolean** collideWith(Car car){  
 **for** (Car c : **list**) {  
 **if**( c != car && RectF.*intersects*(car.**rectF**,c.**rectF**)) {  
 **gameView**.gameOver();  
 **return true**;  
 }  
  
 }  
 **return false**;  
 }  
  
  
}

LeftToRightCars Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.util.Log;  
  
**public class** LeftToRightCars **extends** CarList{  
 **public static final** String ***TAG*** = **"LeftToRightCars"**;  
  
  
 **public** LeftToRightCars(TrafficLight trafficLight ,Context context){  
 **super**(trafficLight,context,3);  
 **tail** = **new** LRCar(0-**carBitmap**.getWidth(),GameActivity.*syFactor*\*294,trafficLight,**carBitmap**,**this**);  
 **head** = **tail**;  
 }  
  
 **public void** addCar(){  
 **if**(**numOfCars** < ***MAX\_CARS***) {  
 **gap** =(**float**) (**head**.getCarBitmap().getWidth() + Math.*random*()\*(***MAX\_GAP***-***MIN\_GAP***)+***MIN\_GAP***);  
 Bitmap carBitmap = CarBitmapFactory.*getCar*(3,**context**);  
 LRCar LRCar = **new** LRCar(**tail**.getX() - carBitmap.getWidth() - **gap**, GameActivity.*syFactor*\*294, **trafficLight**,carBitmap,**this**);  
 LRCar.setNext(**tail**);  
 **tail**.setPrev(LRCar);  
 **tail** = **tail**.getPrev();  
 }  
 Log.*d*(**"Cars"** , getStr());  
 }  
  
}

Level Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.BitmapFactory;  
**import** android.graphics.Canvas;  
**import** android.graphics.Color;  
**import** android.graphics.Paint;  
**import** android.graphics.Rect;  
**import** android.util.Log;  
  
*/\*\*  
 \* Created by islam on 5/20/2018.  
 \*/***public class** Level {  
 **private** Bitmap **bg**;  
 **private** TrafficLight[] **trafficLights**;  
 **private** CarList[] **cars**;  
  
 **public** Level(Context context){  
 **int** x;  
 **int** y;  
 **bg** = BitmapFactory.*decodeResource*(context.getResources(),R.drawable.***street***);  
 **float** sx = GameActivity.*bgWidth* / 1024;  
 **float** sy = GameActivity.*bgHeight* / 512;  
 Log.*d*(**"SX SY"**,**"Sx = "**+sx + **" Sy = "**+sy);  
 TrafficLight trafficLightLt;  
 TrafficLight trafficLightRt;  
 TrafficLight trafficLightLb;  
 TrafficLight trafficLightRb;  
  
 Rect rectLt = **new** Rect(0,0,sx(442),sy(186));  
 trafficLightLt = **new** TrafficLight(context,rectLt);  
 trafficLightLt.setX(442\*sx-trafficLightLt.getWidht());  
 trafficLightLt.setY(186\*sy-trafficLightLt.getHeight());  
  
 Rect rectLb = **new** Rect(0,sy(326),sx(442),sy(512));  
 trafficLightLb = **new** TrafficLight(context,rectLb);  
 trafficLightLb.setX(442\*sx-trafficLightLb.getWidht());  
 trafficLightLb.setY(326\*sy);  
  
 Rect rectRt = **new** Rect(sx(582),0,sx(1024),sy(186));  
 trafficLightRt = **new** TrafficLight(context,rectRt);  
 trafficLightRt.setX(582\*sx);  
 trafficLightRt.setY(186\*sy-trafficLightRt.getHeight());  
  
 Rect rectRb = **new** Rect(sx(582),sy(326),sx(1024),sy(512));  
 trafficLightRb = **new** TrafficLight(context,rectRb);  
 trafficLightRb.setX(582\*sx);  
 trafficLightRb.setY(326\*sy);  
  
 **trafficLights** = **new** TrafficLight[]{trafficLightLt,trafficLightLb,trafficLightRt,trafficLightRb};  
  
 **cars** = **new** CarList[4];  
 **cars**[2] = **new** RightToLeftCars(**trafficLights**[2],context);  
 **cars**[2].addCar();  
 *// rightToLeftCars.addCar();* **cars**[1] = **new** LeftToRightCars(**trafficLights**[1],context);  
 **cars**[1].addCar();  
 **cars**[3] = **new** DownToUpCars(**trafficLights**[3],context);  
 **cars**[3].addCar();  
  
 **cars**[0] = **new** UpToDownCars(**trafficLights**[0],context);  
 **cars**[0].addCar();  
  
 go();  
 }  
  
 **public void** draw(Canvas canvas){  
 canvas.drawBitmap(**bg**,0,0,**null**);  
 Paint p = **new** Paint();  
 p.setColor(Color.***GRAY***);  
 **for** (TrafficLight trafficLight : **trafficLights**) {  
 trafficLight.draw(canvas);  
 *// canvas.drawRect(trafficLight.getRect(),p);* }  
 **for** (CarList carList : **cars** ) {  
 carList.draw(canvas);  
 }  
 }  
  
 **public int** getWidth(){  
 **return bg**.getWidth();  
 }  
  
 **public int** getHeight(){  
 **return bg**.getHeight();  
 }  
  
 **public** TrafficLight[] getTrafficLights() {  
 **return trafficLights**;  
 }  
  
 **private int** sx(**float** x){  
 **float** sx = GameActivity.*bgWidth* / 1024;  
 **return** (**int**)(x\*sx\*GameActivity.*scaleFactor*);  
 }  
 **private int** sy(**float** y){  
 **float** sy = GameActivity.*bgHeight* / 512;  
 **return** (**int**)(y\*sy\*GameActivity.*scaleFactor*);  
 }  
  
 **private void** go(){  
 Car.*running* = **true**;  
 **for** (CarList carList : **cars** ) {  
 carList.go();  
 }  
 }  
  
}

LRCar Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.graphics.Paint;  
  
**import** java.util.Random;  
  
**public class** LRCar **extends** Car{  
  
  
 **public** LRCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, LeftToRightCars leftToRightCars) {  
 **super**(x,y-carBitmap.getHeight()/2,trafficLight,carBitmap,leftToRightCars);  
 }  
  
 **public** LRCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, LRCar next, LRCar prev, LeftToRightCars leftToRightCars) {  
 **super**(x,y-carBitmap.getHeight()/2,trafficLight,carBitmap,next,prev,leftToRightCars);  
  
 }  
  
 **public void** draw(Canvas canvas){  
 canvas.drawBitmap(**carBitmap**,**x**,**y**,**null**);  
 Paint p = **new** Paint();  
 p.setColor(0x88FF0000);  
 *//canvas.drawRect(rectF,p);* }  
  
 **public synchronized void** goFaster(){  
 **if**(**step** < 15)  
 **step**++;  
  
 }  
  
 **public void** run() {  
 **while** (*running* ){  
 **x** = **x** + **step**;  
 **carList**.waitIfMovingToLast();  
 **if**(**next** !=**null** && **x** + **carBitmap**.getWidth() + RightToLeftCars.***DISTANCE*** > **next**.**x** ) {  
 **x** = **x** - **step**;  
 **next**.goFaster();  
 }  
 **if**( !**inJunction** && **x** + **carBitmap**.getWidth() < 442\*GameActivity.*sxFactor* && **x**+**carBitmap**.getWidth()> 442\*GameActivity.*sxFactor*-20){  
 **if**( !**trafficLight**.getStatus() ) {  
 **x** = **x** - **step**;  
 **trafficLight**.waitToGreen();  
 }  
 GameView.*junction*.add(**this**);  
 **inJunction** = **true**;  
 }  
  
 **if**( **inJunction** && **x** + **carBitmap**.getWidth() > 582\*GameActivity.*syFactor* ) {  
 GameView.*junction*.remove(**this**);  
 **inJunction** = **false**;  
  
 }  
 **if**(**x** > 1024\*GameActivity.*sxFactor* ){  
  
 **if**( **carList**.getTail().getX() + **carBitmap**.getWidth() < 0 )  
 **x** = **carList**.getTail().getX() - **carBitmap**.getWidth() - RightToLeftCars.***DISTANCE***;  
 **else  
 x** = -5-**carBitmap**.getWidth();  
 **step** = (**float**)(Math.*random*()\*10+3);  
  
 **carList**.moveToLast();  
  
  
 }  
 updateRectF();  
 **try** {  
 Thread.*sleep*(20);  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
  
 }  
  
}

MainActivity Class :

**package** com.example.islam.androidapp;  
  
**import** android.app.Activity;  
**import** android.content.Intent;  
**import** android.content.pm.ActivityInfo;  
**import** android.media.MediaPlayer;  
**import** android.support.v7.app.AppCompatActivity;  
**import** android.os.Bundle;  
**import** android.util.Log;  
**import** android.view.View;  
**import** android.view.Window;  
**import** android.view.WindowManager;  
**import** android.widget.Button;  
  
**public class** MainActivity **extends** Activity {  
 **private static final** String ***TAG*** = **"MainActiviy"**;  
 **private** Button **startBut**;  
 **private** Button **optionBut**;  
 MediaPlayer **mediaPlayer**;  
 **private boolean sound** = **false**;  
  
 @Override  
 **protected void** onCreate(Bundle savedInstanceState) {  
 **super**.onCreate(savedInstanceState);  
 setContentView(R.layout.***activity\_main***);  
 setRequestedOrientation(ActivityInfo.***SCREEN\_ORIENTATION\_LANDSCAPE***);  
*// requestWindowFeature(Window.FEATURE\_NO\_TITLE);* getWindow().setFlags(WindowManager.LayoutParams.***FLAG\_FULLSCREEN***,  
 WindowManager.LayoutParams.***FLAG\_FULLSCREEN***);  
  
 **startBut** = (Button)findViewById(R.id.***startBut***);  
 **optionBut** = (Button)findViewById(R.id.***optionBut***);  
 **mediaPlayer** = MediaPlayer.*create*(**this**,R.raw.***sound***);  
 Log.*d*(***TAG***,**"On Create"**);  
  
 }  
  
 @Override  
 **protected void** onStart() {  
 **super**.onStart();  
  
 **mediaPlayer**.start();  
 **mediaPlayer**.setLooping(**true**);  
  
 Log.*d*(***TAG***,**"On Start"**);  
 }  
  
 @Override  
 **protected void** onPause() {  
 **super**.onPause();  
 Log.*d*(***TAG***,**"On Pause"**);  
  
 }  
  
 @Override  
 **protected void** onStop() {  
 **super**.onStop();  
 **mediaPlayer**.stop();  
 Log.*d*(***TAG***,**"On Stop"**);  
  
 }  
  
 **public void** play(View v){  
 Intent i = **new** Intent(**this**,GameActivity.**class**);  
 startActivity(i);  
 }  
  
 **public void** options(View v){  
 Intent i = **new** Intent(**this**,activity\_options.**class**);  
 startActivity(i);  
 }  
}

RightToLeftCars Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
  
**public class** RightToLeftCars **extends** CarList{  
  
 **public static final** String ***TAG*** = **"RightToLeftCars"**;  
  
  
 **public** RightToLeftCars(TrafficLight trafficLight ,Context context){  
 **super**(trafficLight,context,1);  
 **tail** = **new** RLCar(1024\*GameActivity.*sxFactor*,GameActivity.*syFactor*\*218,trafficLight,**carBitmap**,**this**);  
 **head** = **tail**;  
 }  
  
 **public void** addCar(){  
 **if**(**numOfCars** < ***MAX\_CARS***) {  
 **gap** =(**float**) (**head**.getCarBitmap().getWidth() + Math.*random*()\*(***MAX\_GAP***-***MIN\_GAP***)+***MIN\_GAP***);  
 Bitmap carBitmap = CarBitmapFactory.*getCar*(1,**context**);  
 RLCar RLCar = **new** RLCar(**tail**.getX() + **gap**, GameActivity.*syFactor*\*218, **trafficLight**,carBitmap,**this**);  
 RLCar.setNext(**tail**);  
 **tail**.setPrev(RLCar);  
 **tail** = **tail**.getPrev();  
 }  
 }  
}

RLCar Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.graphics.Paint;  
  
**import** java.util.Random;  
  
**public class** RLCar **extends** Car {  
  
 **public** RLCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, RightToLeftCars rightToLeftCars) {  
 **super**(x,y-carBitmap.getHeight()/2,trafficLight,carBitmap,rightToLeftCars);  
  
 }  
  
 **public** RLCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, RLCar next, RLCar prev, RightToLeftCars rightToLeftCars) {  
 **super**(x,y-carBitmap.getHeight()/2,trafficLight,carBitmap,next,prev,rightToLeftCars);  
 }  
  
  
 **public void** draw(Canvas canvas){  
 canvas.drawBitmap(**carBitmap**,**x**,**y**,**null**);  
 Paint p = **new** Paint();  
 p.setColor(0x8800FF00);  
 *//canvas.drawRect(rectF,p);* }  
  
 **public synchronized void** goFaster(){  
 **if**(**step** < 15)  
 **step**++;  
  
 }  
  
 @Override  
 **public void** run() {  
 **while** (*running* ){  
  
 **x** = **x** - **step**;  
 **carList**.waitIfMovingToLast();  
 **if**(**next** !=**null** && **x** < **next**.**x** + **carBitmap**.getWidth() + CarList.***DISTANCE*** ) {  
 **x** = **x** + **step**;  
 **next**.goFaster();  
 }  
 **if**( !**inJunction** && **x** > 582\*GameActivity.*sxFactor* && **x**< 582\*GameActivity.*sxFactor*+20){  
 **if**( !**trafficLight**.getStatus() ) {  
 **x** = **x** + **step**;  
 **trafficLight**.waitToGreen();  
 }  
 GameView.*junction*.add(**this**);  
 **inJunction** = **true**;  
 }  
 **if**( **inJunction** && **x** + **carBitmap**.getWidth() < 442\*GameActivity.*sxFactor* ) {  
 GameView.*junction*.remove(**this**);  
 **inJunction** = **false**;  
 }  
 **if**(**x** + **carBitmap**.getWidth() < 0 ){  
  
 **if**( **carList**.getTail().getX() > 1024\*GameActivity.*sxFactor* )  
 **x** = **carList**.getTail().getX() + **carBitmap**.getWidth() + CarList.***DISTANCE***;  
 **else  
 x** = 1024\*GameActivity.*sxFactor* + 5;  
 **step** = (**float**)(Math.*random*()\*10+3);  
  
 **carList**.moveToLast();  
  
  
 }  
 updateRectF();  
 **try** {  
 Thread.*sleep*(20);  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
  
 }  
}

TrafficLight Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.BitmapFactory;  
**import** android.graphics.Canvas;  
**import** android.graphics.Color;  
**import** android.graphics.Paint;  
**import** android.graphics.Rect;  
**import** android.widget.Button;  
  
*/\*\*  
 \* Created by islam on 2/13/2018.  
 \*/***public class** TrafficLight {  
  
 **private boolean status**;  
 **private float x** ;  
 **private float y**;  
 **private** Bitmap **currentColor** = **null**;  
 **private** Bitmap **red** = **null**;  
 **private** Bitmap **green** = **null**;  
 **private** Button **button**;  
 **private** Rect **rect**;  
 **private boolean isCarWaiting**;  
  
  
  
  
 **public** TrafficLight(Context context,Rect rect){  
 **red** = BitmapFactory.*decodeResource*(context.getResources(),R.drawable.***red\_light***);  
 **green** = BitmapFactory.*decodeResource*(context.getResources(),R.drawable.***green\_light***);  
 **currentColor** = **green**;  
 **this**.**rect** = rect;  
 **status** = **true**;  
 **isCarWaiting** = **false**;  
 }  
  
  
  
  
 **public void** draw(Canvas canvas){  
 Paint p = **new** Paint();  
 canvas.drawBitmap(**currentColor**,**x**,**y**,p);  
 p.setColor(Color.***RED***);  
 *// canvas.drawRect(rect,p);* }  
  
 **public synchronized void** changeStatus(){  
 **if**(**status**)  
 **currentColor** = **red**;  
 **else  
 currentColor** = **green**;  
 **if**( !**status** && **isCarWaiting** ) {  
 **isCarWaiting** = **false**;  
 notify();  
 }  
  
 **status** = !**status**;  
  
 }  
  
 **public void** setY(**float** y) {  
 **this**.**y** = y;  
 }  
 **public void** setX(**float** x) {  
 **this**.**x** = x;  
 }  
  
 **public float** getX() {  
 **return x**;  
 }  
  
 **public float** getY() {  
 **return y**;  
 }  
  
 **public int** getWidht(){  
 **return red**.getWidth();  
 }  
 **public int** getHeight(){  
 **return red**.getHeight();  
 }  
  
 **public boolean** contains(**float** x,**float** y){  
 **return rect**.contains((**int**)x, (**int**)y);  
 }  
  
 **public** Rect getRect(){  
 **return rect**;  
 }  
  
 **public boolean** getStatus(){  
 **return status**;  
 }  
  
 **public synchronized void** waitToGreen(){  
 **try** {  
 **isCarWaiting** = **true**;  
 wait();  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
}

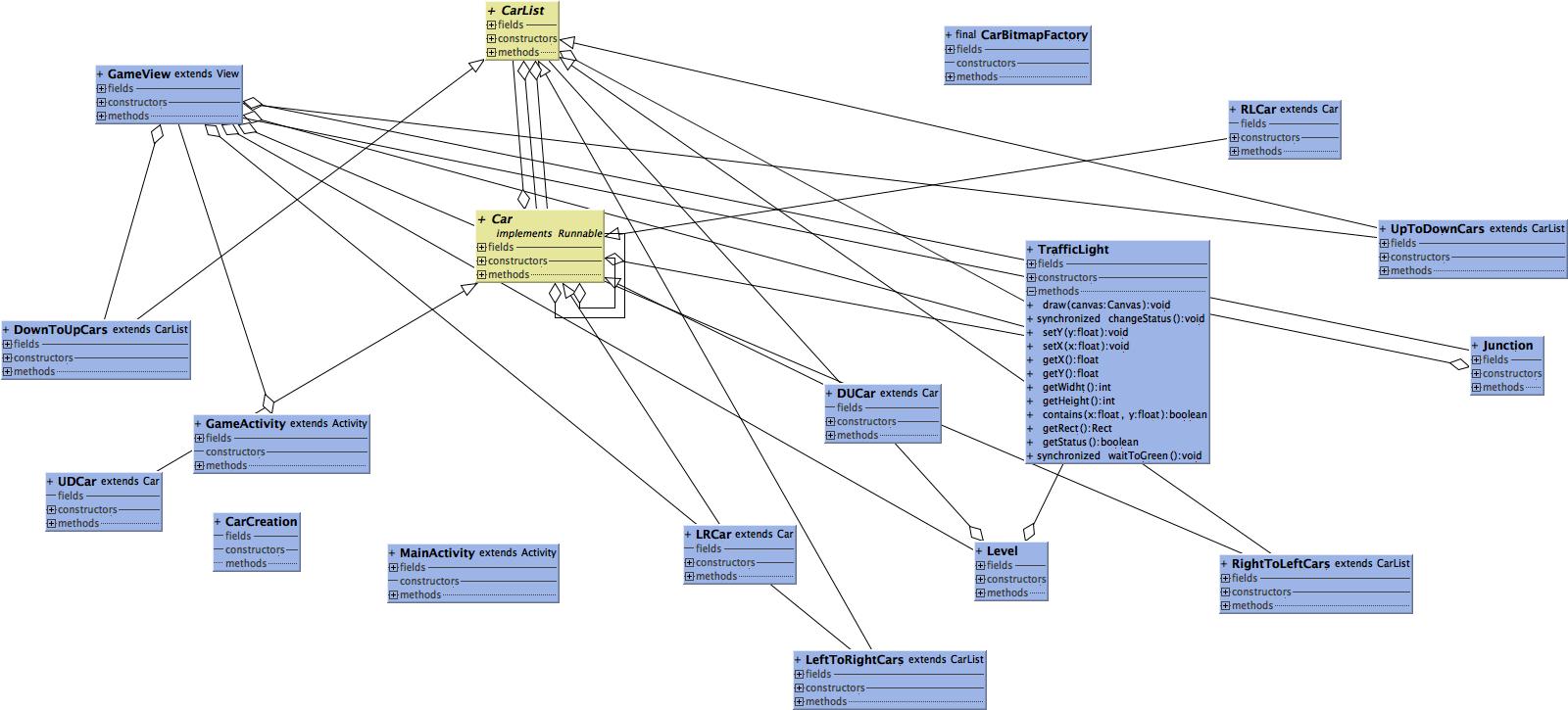
UDCar Class :

**package** com.example.islam.androidapp;  
  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.graphics.Paint;  
**import** android.util.Log;  
  
**import** java.util.Random;  
  
**public class** UDCar **extends** Car{  
  
 **public** UDCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, UpToDownCars upToDownCars) {  
 **super**(x-carBitmap.getWidth()/2,y,trafficLight,carBitmap,upToDownCars);  
 }  
  
 **public** UDCar(**float** x, **float** y, TrafficLight trafficLight, Bitmap carBitmap, UDCar next, UDCar prev, UpToDownCars upToDownCars) {  
 **super**(x-carBitmap.getWidth()/2,y,trafficLight,carBitmap,next,prev,upToDownCars);  
  
 }  
  
 **public void** draw(Canvas canvas){  
 canvas.drawBitmap(**carBitmap**,**x**,**y**,**null**);  
 Paint p = **new** Paint();  
 p.setColor(0x880000FF);  
 *// canvas.drawRect(rectF,p);* }  
  
 **public synchronized void** goFaster(){  
 **if**(**step** < 15)  
 **step**++;  
  
 }  
  
 @Override  
 **public void** run() {  
 **while** (*running* ){  
 **if**(**inJunction** && GameView.*junction*.collideWith(**this**)) {  
 Log.*d*(**"UP Down Crash"**, **"CCCOOOOOLLLLIDDDD"**);  
 Car.*running* = **false**;  
 }  
  
 **y** = **y** + **step**;  
 **carList**.waitIfMovingToLast();  
 **if**(**next** !=**null** && **y** + **carBitmap**.getHeight() + UpToDownCars.***DISTANCE*** > **next**.**y** ) {  
 **y** = **y** - **step**;  
 **next**.goFaster();  
 }  
 **if**( !**inJunction** && **y** + **carBitmap**.getHeight() > 186\*GameActivity.*syFactor* && **y**+**carBitmap**.getHeight() < 186\*GameActivity.*syFactor*+20){  
 **if**( !**trafficLight**.getStatus() ) {  
 **y** = **y** - **step**;  
 **trafficLight**.waitToGreen();  
 }  
 GameView.*junction*.add(**this**);  
 **inJunction** = **true**;  
 }  
 **if**( **inJunction** && **y** + **carBitmap**.getHeight() > 326\*GameActivity.*syFactor* ) {  
 GameView.*junction*.remove(**this**);  
 **inJunction** = **false**;  
  
 }  
 **if**(**y** > 512\*GameActivity.*syFactor* ){  
  
 **if**( **carList**.getTail().getY() < 0 )  
 **y** = **carList**.getTail().getY() - **carBitmap**.getHeight() - DownToUpCars.***DISTANCE***;  
 **else  
 y** = -**carBitmap**.getHeight() - 5;  
 **step** = (**float**)(Math.*random*()\*10+3);  
  
 **carList**.moveToLast();  
  
  
 }  
 updateRectF();  
 **try** {  
 Thread.*sleep*(20);  
 } **catch** (InterruptedException e) {  
 e.printStackTrace();  
 }  
 }  
  
 }  
  
}

UpToDownCars Class :

**package** com.example.islam.androidapp;  
  
**import** android.content.Context;  
**import** android.graphics.Bitmap;  
**import** android.graphics.Canvas;  
**import** android.util.Log;  
  
**public class** UpToDownCars **extends** CarList{  
  
 **public static final** String ***TAG*** = **"UpToDoenCars"**;  
  
  
 **public** UpToDownCars(TrafficLight trafficLight ,Context context){  
 **super**(trafficLight,context,2);  
 **tail** = **new** UDCar(474\*GameActivity.*sxFactor*,-**carBitmap**.getHeight(),trafficLight,**carBitmap**,**this**);  
 **head** = **tail**;  
 }  
  
 **public void** addCar(){  
 **if**(**numOfCars** < ***MAX\_CARS***) {  
 **gap** =(**float**) (**head**.getCarBitmap().getHeight() + Math.*random*()\*(***MAX\_GAP***-***MIN\_GAP***)+***MIN\_GAP***);  
 Bitmap carBitmap = CarBitmapFactory.*getCar*(2,**context**);  
 UDCar udCar = **new** UDCar(474\*GameActivity.*sxFactor*, **tail**.getY()-**gap**, **trafficLight**,carBitmap,**this**);  
 udCar.setNext(**tail**);  
 **tail**.setPrev(udCar);  
 **tail** = **tail**.getPrev();  
 }  
 }  
  
}

**UML Diagram**

****