Ex. No. 10 Alarm Clock - Android Application

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Develop an Alarm Clock Android Application.

1. Use permission for WAKE_LOCK.
2. Have a TimePicker component followed by a ToggleButton to select time and Alarm On / Off.
3. Use the AlarmManager to set the alarm and send notification on alarm trigger.
4. Perform 3 different notifications
    a. Show a message to user in the activity UI
    b. Play the alarm ringtone
    c. Send an Android notification message

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=".MainActivity">

   <TimePicker
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:id="@+id/time"
       />

   <ToggleButton
       android:id="@+id/set"
       android:layout_width="150dp"
       android:layout_height="50dp"
       android:layout_below="@+id/time"
       android:layout_marginLeft="130dp"
       />

</RelativeLayout>
```

display.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"
   android:layout_width="match_parent"
   android:layout_height="match_parent">
```

```
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Close App to turn off alarm!"
        android:padding="50dp"
        android:textSize="20dp"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.alarm;

import androidx.appcompat.app.AppCompatActivity;

import android.app.AlarmManager;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Intent;
import android.os.Build;
import android.os.Bundle;
import android.text.format.Time;
import android.view.View;
import android.widget.Button;
import android.widget.TimePicker;
import android.widget.Toast;
import android.widget.ToggleButton;

import com.example.alarm.databinding.ActivityMainBinding;

import java.util.Calendar;

public class MainActivity extends AppCompatActivity {

    private ActivityMainBinding binding;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        binding = ActivityMainBinding.inflate(getLayoutInflater());
        setContentView(binding.getRoot());
```

```
        createNotificationChannel();

        ToggleButton b1 = findViewById(R.id.set);
        TimePicker t1 = findViewById(R.id.time);
        t1.setIs24HourView(true);


        b1.setOnCheckedChangeListener((buttonView, isChecked) -> {
            if (isChecked) {
                setAlarm();
            } else {
                cancelAlarm();
            }
        });
    }

    private void createNotificationChannel() {
        if(Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            CharSequence name = "alarm";
            String desc = "Channel for alarm";
            int importance = NotificationManager.IMPORTANCE_HIGH;
            NotificationChannel channel = new NotificationChannel("alarm", name,
importance);
            channel.setDescription(desc);

            NotificationManager notifs =
getSystemService(NotificationManager.class);
            notifs.createNotificationChannel(channel);
        }
    }

    public void  setAlarm() {

        TimePicker timePicker = findViewById(R.id.time);
        AlarmManager alarm = (AlarmManager) getSystemService(ALARM_SERVICE);

        Intent intent = new Intent(this, AlarmReceiver.class);
        PendingIntent pendingIntent =
PendingIntent.getBroadcast(this.getApplicationContext(), 234, intent,
PendingIntent.FLAG_IMMUTABLE);

        int hour = timePicker.getHour();
        int minute = timePicker.getMinute();
        Calendar calendar = Calendar.getInstance();
        calendar.set(Calendar.HOUR_OF_DAY, hour);
        calendar.set(Calendar.MINUTE, minute);
        calendar.set(Calendar.SECOND, 0);

        long triggerTime = calendar.getTimeInMillis();
```

```
        int timeInSec = 1;

        alarm.set(AlarmManager.RTC_WAKEUP, triggerTime, pendingIntent);
        Toast.makeText(this, "Alarm set for " + hour + ":" + minute,
Toast.LENGTH_SHORT).show();
    }

    public void cancelAlarm() {
        AlarmManager alarm = (AlarmManager) getSystemService(ALARM_SERVICE);

        Intent intent = new Intent(this, AlarmReceiver.class);
        PendingIntent pendingIntent =
PendingIntent.getBroadcast(this.getApplicationContext(), 234, intent,
PendingIntent.FLAG_IMMUTABLE);

        if(alarm != null) {
            alarm.cancel(pendingIntent);
        }

        Toast.makeText(this, "Alarm unset!", Toast.LENGTH_SHORT).show();
    }

}
```

AlarmReceiver.java

```
package com.example.alarm;

import static androidx.core.content.ContextCompat.startActivity;

import android.app.AlarmManager;
import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.media.Ringtone;
import android.media.RingtoneManager;
import android.net.Uri;
import android.os.Build;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;
```

```
public class AlarmReceiver extends BroadcastReceiver {

   static Uri alarmrt1 =
RingtoneManager.getDefaultUri(RingtoneManager.TYPE_ALARM);

   @Override
   public void onReceive(Context context, Intent intent) {
       Toast.makeText(context, "INSIDE WOHOOO", Toast.LENGTH_LONG).show();

       Intent i = new Intent(context, In.class);
       intent.setFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
       PendingIntent p = PendingIntent.getActivity(context, 0, i,
PendingIntent.FLAG_IMMUTABLE);

       NotificationCompat.Builder builder = new
NotificationCompat.Builder(context, "alarm")
               .setSmallIcon(R.drawable.ic_launcher_foreground)
               .setContentTitle("Your Alarm is going off!!!")
               .setContentInfo("You set this alarm!")
               .setAutoCancel(true)
               .setDefaults(NotificationCompat.DEFAULT_ALL)
               .setPriority(NotificationCompat.PRIORITY_HIGH)
               .setContentIntent(p);

       NotificationManagerCompat notifications =
NotificationManagerCompat.from(context);
       if (ActivityCompat.checkSelfPermission(context,
android.Manifest.permission.POST_NOTIFICATIONS) !=
PackageManager.PERMISSION_GRANTED) {
           return;
       }
       else {
           notifications.notify(123, builder.build());
       }

       Ringtone ringtone =
RingtoneManager.getRingtone(context.getApplicationContext(), alarmrt1);
       //Toast.makeText(context, ringtone.toString(),
Toast.LENGTH_SHORT).show();
       intent.putExtra("RINGTONE_URI", alarmrt1);
       ringtone.play();
   }

   public static Uri getInstant() {
       return alarmrt1;

   }
```

```
}
```

In.java

```
package com.example.alarm;

import android.content.Intent;
import android.media.Ringtone;
import android.media.RingtoneManager;
import android.net.Uri;
import android.os.Bundle;
import android.widget.Toast;
//ce3c069
import androidx.appcompat.app.AppCompatActivity;

public class In extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
       super.onCreate(savedInstanceState);
       setContentView(R.layout.display);

       Intent intent = getIntent();

       Uri ringtoneUri = intent.getParcelableExtra("RINGTONE_URI");
       Ringtone ringtone = RingtoneManager.getRingtone(In.this, ringtoneUri);

       //Toast.makeText(In.this, ringtone.toString(),
Toast.LENGTH_SHORT).show();

       if (ringtone.isPlaying()) {
           //Toast.makeText(In.this, "yes", Toast.LENGTH_SHORT).show();
           ringtone.stop();
       }
       else {
           //Toast.makeText(In.this, "no", Toast.LENGTH_SHORT).show();
       }
   }
}
```

AndroidManifest.java

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools">

   <uses-permission android:name="android.permission.POST_NOTIFICATIONS" />
   <uses-permission android:name="android.permission.WAKE_LOCK" />
   <uses-permission android:name="android.permission.VIBRATE" />

   <application
```

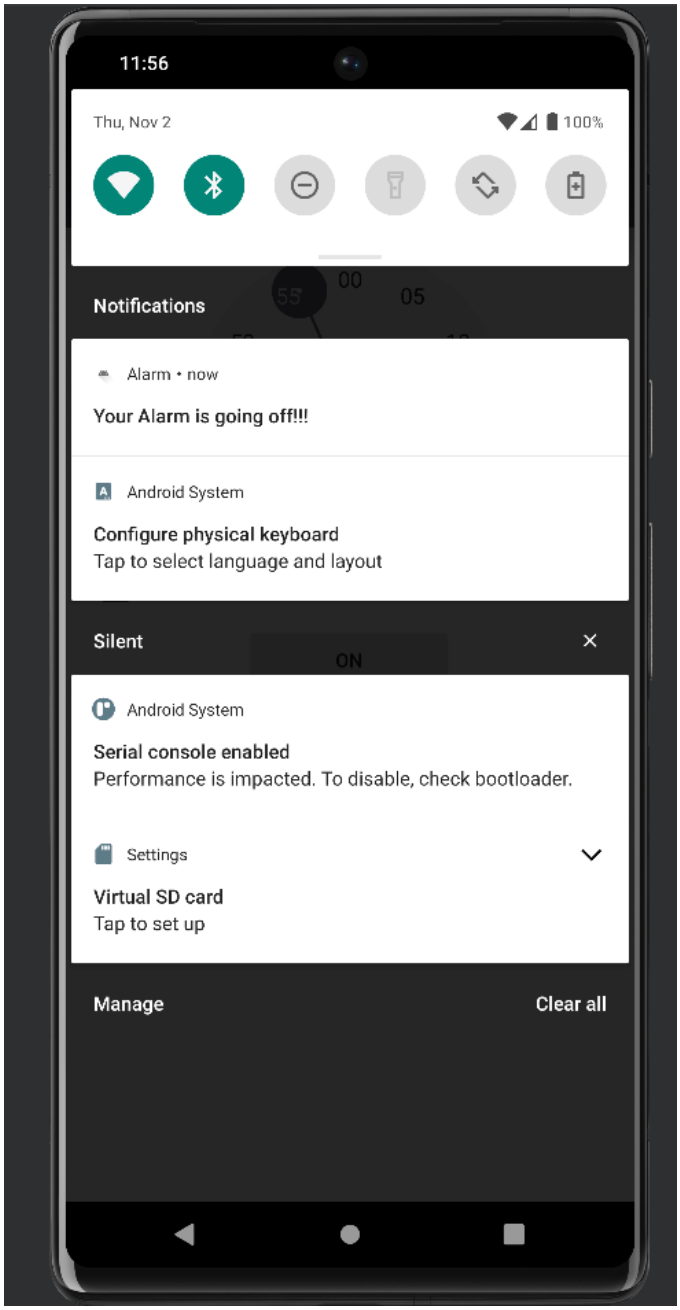
```
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Alarm"
        tools:targetApi="31">
        <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=".In"
            android:exported="false"
            />
        <receiver android:name=".AlarmReceiver"
            />
    </application>

</manifest>
```


11:55
23:56
55
00
05
10
15
20
25
30
35
40
45
50
ON
Alarm set for 23:56
11:55
23:56
55
00
05
10
15
20
25
30
35
40
45
50
OFF
Alarm unset!


Alarm
Your Alarm is going off!!!
00
05
10
15
20
25
30
35
40
45
50
55
ON
You alarm is going off with this ringtone!
android.media.Ringtone@20699c0



Best Practices

1. Keep the index form clean and uncluttered.
2. Use default ringtone as it is known by everyone.
3. Ensure the form works on various mobile devices.

Learning Outcomes

1. Learnt how to use UI Elements for Android App development.
2. Learnt how to use Phone shared storage.