[2CEIT5PE5: MOBILE APPLICATION DEVELOPMENT]

Practical: 7

AIM: What is BroadcastReceiver? Difference between service and BroadcastReceiver. Create an Alarm application by using service & BroadcastReceiver.

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What is Broadcast Receiver?

In Android, broadcasts are the system-wide events that occur due to changes in system state, like LOW_BATTERY, incoming or outgoing calls, network connectivity change, device reboot, etc. These are some of the system events that require us to perform some action. Android's system sends broadcasts when various system events occur.

Broadcast Receiver	Service
Broadcast intents are usually delivered to all Broadcast Receivers registered for that intent.	Services are only sent to one matching Service instance.
Broadcast Receiver is used when you want to fire some stuff or code during some event.	Service is used when you want to do something in background, any long running process can be done using Service in Background.
Broadcast receivers are limited by maximum amount of time.	Service are run in background long period of time.
Usually system will send some info which can be received by your app.	If you want to do something in background. this will be running always in background even if the application closed.

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">

    <com.google.android.material.appbar.AppBarLayout
        android:id="@+id/appbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintTop_toTopOf="parent">

        <androidx.appcompat.widget.Toolbar
            android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Alarm Application"
                android:textSize="18dp"
                android:textStyle="bold"/>

        </androidx.appcompat.widget.Toolbar>
```

```
</com.google.android.material.appbar.AppBarLayout>

<androidx.core.widget.NestedScrollView
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    app:layout_constraintTop_toBottomOf="@id/appbar"
    app:layout_constraintStart_toStartOf="parent"
    android:layout_marginTop="60dp"
    app:layout_behavior="@string/appbar_scrolling_view_behavior"
    >
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">

            <com.google.android.material.card.MaterialCardView
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginStart="20dp"
                android:layout_marginTop="30dp"
                android:layout_marginEnd="20dp"
                app:cardCornerRadius="15dp"
                app:cardElevation="10dp"
                android:layout_marginBottom="40dp">

                <LinearLayout
                    android:layout_width="match_parent"
                    android:layout_height="match_parent"
                    android:orientation="vertical">

                    <ImageView
                        android:layout_width="match_parent"
                        android:layout_height="200dp"
                        android:src="@drawable/alarm"
                        android:scaleType="fitXY"/>

                    <LinearLayout
                        android:layout_width="match_parent"
                        android:layout_height="wrap_content"
                        android:backgroundTint="#EAEFEA"
                        android:orientation="vertical"
                        android:padding="20dp">
                        <TextView
                            android:layout_width="wrap_content"
                            android:layout_height="wrap_content"
                            android:text="Create Alarm Time"
                            android:textStyle="bold"
                            android:textSize="15dp"/>

                        <TextView
                            android:layout_width="wrap_content"
                            android:layout_height="wrap_content"
                            android:layout_marginTop="10dp"
                            android:layout_marginStart="10dp"
                            android:text=
                            "By pressing buttons, Alarm can be created and cancelled."/>

                        <TextView
                            android:layout_width="wrap_content"
                            android:layout_height="wrap_content"
                            android:layout_marginStart="10dp"
                            android:text=
                            "Check Current time by looking below real digital clock."
                            android:layout_marginTop="10dp"/>

                        <TextClock
                            android:id="@+id/show_time_tv"
                            android:layout_width="wrap_content"
                            android:layout_height="wrap_content"
                            android:layout_gravity="center"
                            android:text="Show Time Here"
                            android:textStyle="bold"
                            android:layout_marginTop="10dp"
                            android:textSize="15dp"/>

                        <com.google.android.material.button.MaterialButton
                            android:id="@+id/btn_set_alarm"
                            android:layout_width="wrap_content"
                            android:layout_height="wrap_content"
                            app:cornerRadius="25dp"
                            android:layout_marginTop="10dp"
                            app:icon="@drawable/ic_baseline_add_alarm_24"
                            android:text="Create Alarm"
                            android:textStyle="bold"
                            android:textAllCaps="false"/>

                    </LinearLayout>

                </LinearLayout>

            </com.google.android.material.card.MaterialCardView>

            <com.google.android.material.card.MaterialCardView
                android:id="@+id/cancel_alarm_card_view"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginStart="20dp"
                android:layout_marginEnd="20dp"
                app:cardCornerRadius="15dp"
                app:cardElevation="10dp">

                <LinearLayout
                    android:layout_width="match_parent"
                    android:layout_height="match_parent"
                    android:orientation="vertical">

                    <ImageView
                        android:layout_width="match_parent"
                        android:layout_height="200dp"
                        android:scaleType="fitXY"
                        android:src="@drawable/alarm" />
```

```
                        <LinearLayout
                            android:layout_width="match_parent"
                            android:layout_height="wrap_content"
                            android:backgroundTint="#EAEFEA"
                            android:orientation="vertical"
                            android:padding="20dp">

                            <TextView
                                android:layout_width="wrap_content"
                                android:layout_height="wrap_content"
                                android:text="Set Alarm Time"
                                android:textStyle="bold"
                                android:textSize="15dp"/>

                            <TextView
                                android:id="@+id/set_alarm_time"
                                android:layout_width="wrap_content"
                                android:layout_height="wrap_content"
                                android:layout_marginTop="10dp"
                                android:text="Time"
                                android:textStyle="bold"
                                android:textSize="15dp"/>




                            <com.google.android.material.button.MaterialButton
                                android:id="@+id/btn_cancel_alarm"
                                android:layout_width="wrap_content"
                                android:layout_height="wrap_content"
                                app:cornerRadius="25dp"
                                android:layout_marginTop="20dp"
                                app:icon="@drawable/ic_baseline_alarm_off_24"
                                android:text="Cancel Alarm"
                                android:textStyle="bold"
                                android:textAllCaps="false"/>

                        </LinearLayout>

                    </LinearLayout>

                </com.google.android.material.card.MaterialCardView>
            </LinearLayout>

        </androidx.core.widget.NestedScrollView>

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

MainActivity.kt

```
package com.example.madpractical7_21012022013

import android.app.AlarmManager
import android.app.PendingIntent
import android.app.TimePickerDialog
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.view.View
import android.widget.TextClock
import android.widget.TextView
import com.google.android.material.button.MaterialButton
import com.google.android.material.card.MaterialCardView
import java.util.*

class MainActivity : AppCompatActivity() {
    var mili:Long=0

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val CancleAlarmCardView = findViewById<MaterialCardView>
        (R.id.cancel_alarm_card_view)
        val BtnCreateAlarm = findViewById<MaterialButton>(R.id.btn_set_alarm)
        val SetAlarmTime = findViewById<TextView>(R.id.set_alarm_time)
        val BtnCancelAlarm = findViewById<MaterialButton>(R.id.btn_cancel_alarm)
        val clockTC = findViewById<TextClock>(R.id.show_time_tv)

        clockTC.format12Hour = "hh:mm:ss a"

        CancleAlarmCardView.visibility=View.GONE

        BtnCreateAlarm.setOnClickListener {
            var cal:Calendar = Calendar.getInstance()
            var hour = cal.get(Calendar.HOUR_OF_DAY)
            var min = cal.get(Calendar.MINUTE)
            val tpd = TimePickerDialog(this,TimePickerDialog.OnTimeSetListener(function = {
            view, h, m ->
                mili=getMillis(h,m)
                setAlarm(getMillis(h,m),"Start")
                CancleAlarmCardView.visibility=View.VISIBLE
                SetAlarmTime.text=h.toString()+":"+m.toString()
            }),hour,min,false)
            tpd.show()
        }

        BtnCancelAlarm.setOnClickListener{
            setAlarm(mili,"Stop")
            CancleAlarmCardView.visibility=View.GONE
        }
    }
    fun setAlarm(millisTime: Long, str: String)
    {
        val intent = Intent(this, AlarmBroadcastReceiver::class.java)
        intent.putExtra("Service1", str)
        val pendingIntent =
        PendingIntent.getBroadcast(applicationContext, 234324243, intent, 0)
        val alarmManager = getSystemService(ALARM_SERVICE) as AlarmManager
        if(str == "Start") {
            alarmManager.setExact(
                AlarmManager.RTC_WAKEUP,
                millisTime,
                pendingIntent
            )
        }else if(str == "Stop")
        {
            alarmManager.cancel(pendingIntent)
            sendBroadcast(intent)
        }
    }

    fun getMillis(hour:Int,min:Int):Long
    {
        val setcalendar = Calendar.getInstance()
        setcalendar[Calendar.HOUR_OF_DAY] = hour
        setcalendar[Calendar.MINUTE] = min
        setcalendar[Calendar.SECOND] = 0
        return setcalendar.timeInMillis
    }
}
```

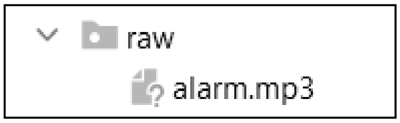
AlarmBroadcastReceiver.kt

```
package com.example.madpractical7_21012022013

import android.content.BroadcastReceiver
import android.content.Context
import android.content.Intent

class AlarmBroadcastReceiver : BroadcastReceiver() {

    override fun onReceive(context: Context, intent: Intent) {
        val str1 = intent.getStringExtra("Service1")
        if(str1 == "Start" || str1 == "Stop")
        {
            val intentService = Intent(context, AlarmService::class.java)
            intentService.putExtra("Service1", intent.getStringExtra("Service1"))
            if(str1 == "Start")
            {
                context.startService(intentService)
            }
            else if(str1=="Stop") {
                context.stopService(intentService)
            }
        }
    }
}
```

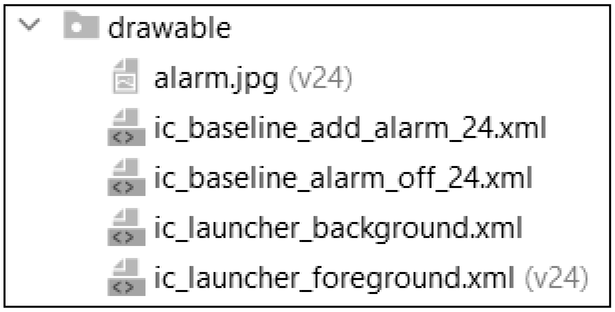
AlarmService.kt

```
package com.example.madpractical7_21012022013

import android.app.Service
import android.content.Intent
import android.media.MediaPlayer
import android.os.IBinder

class AlarmService : Service() {
    var mp: MediaPlayer? = null
    override fun onBind(intent: Intent): IBinder {
        TODO("Return the communication channel to the service.")
    }
    override fun onStartCommand(intent: Intent?, flags: Int, startId: Int): Int {
        if(intent != null) {
            mp = MediaPlayer.create(this, R.raw.alarm);
            mp?.start()
        }
        return START_STICKY
    }
    override fun onDestroy() {
        mp?.stop()
        super.onDestroy()
    }
}
```

Resource:



```
raw
    alarm.mp3
```

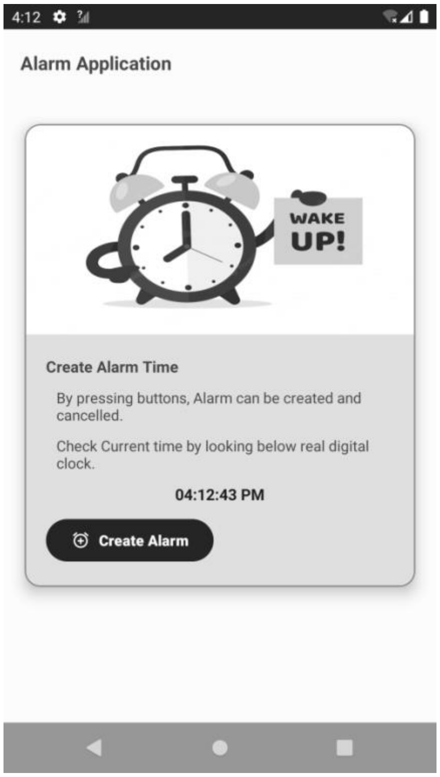


```
drawable
    alarm.jpg (v24)
    ic_baseline_add_alarm_24.xml
    ic_baseline_alarm_off_24.xml
    ic_launcher_background.xml
    ic_launcher_foreground.xml (v24)
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.example.madpractical7_21012022013">
    <uses-permission android:name="android.permission.SCHEDULE_EXACT_ALARM"/>
    <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.MADPractical7_21012022013"
        tools:targetApi="31">
        <service
            android:name=".AlarmService"
            android:enabled="true"
            android:exported="true"/>

        <receiver
            android:name=".AlarmBroadcastReceiver"
            android:directBootAware="true"
            android:enabled="true"
            android:exported="true" >
            <intent-filter>
                <action android:name="android.intent.action.BOOT_COMPLETED"/>
                <action android:name="android.intent.action.LOCKED_BOOT_COMPLETED"/>
            </intent-filter>
        </receiver>

        <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>
    </application>
</manifest>
```

Output:



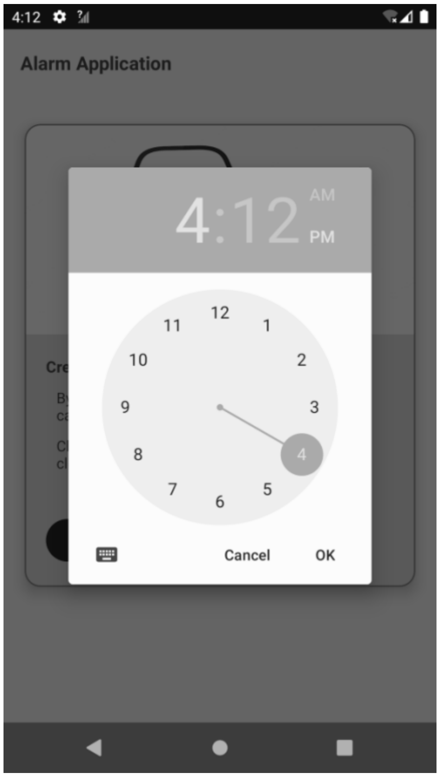
Alarm Application

Create Alarm Time

By pressing buttons, Alarm can be created and cancelled.

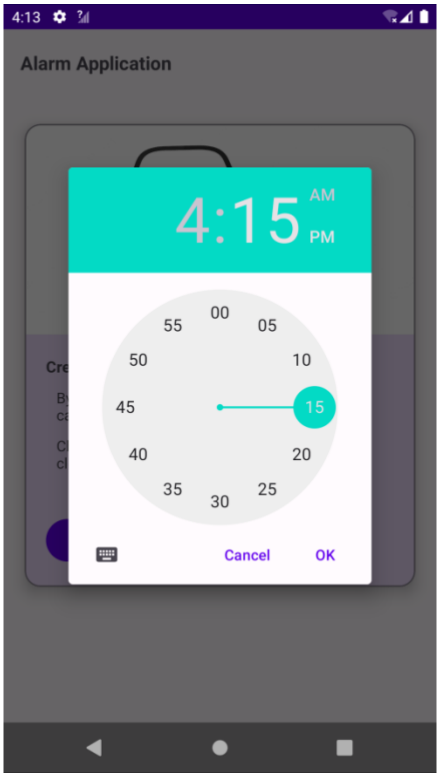
Check Current time by looking below real digital clock.

04:12:43 PM



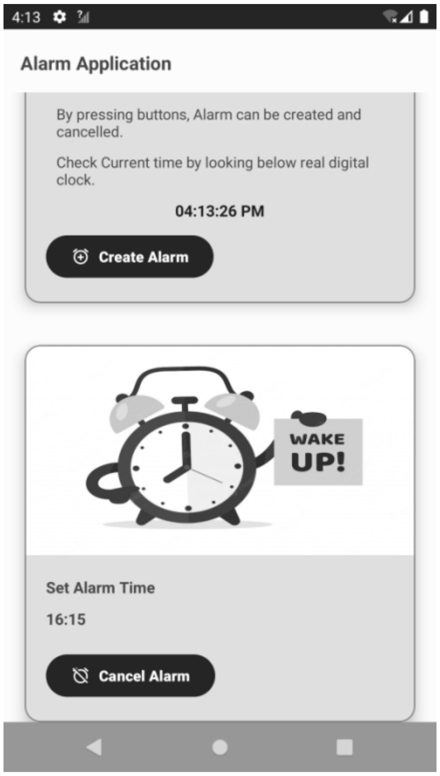
Alarm Application

4:12 PM



Alarm Application

4:15 PM



Alarm Application

By pressing buttons, Alarm can be created and cancelled.

Check Current time by looking below real digital clock.

04:13:26 PM

Set Alarm Time

16:15