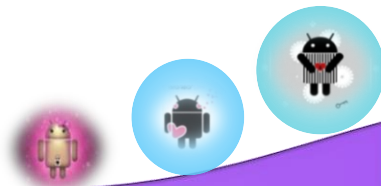




오디오



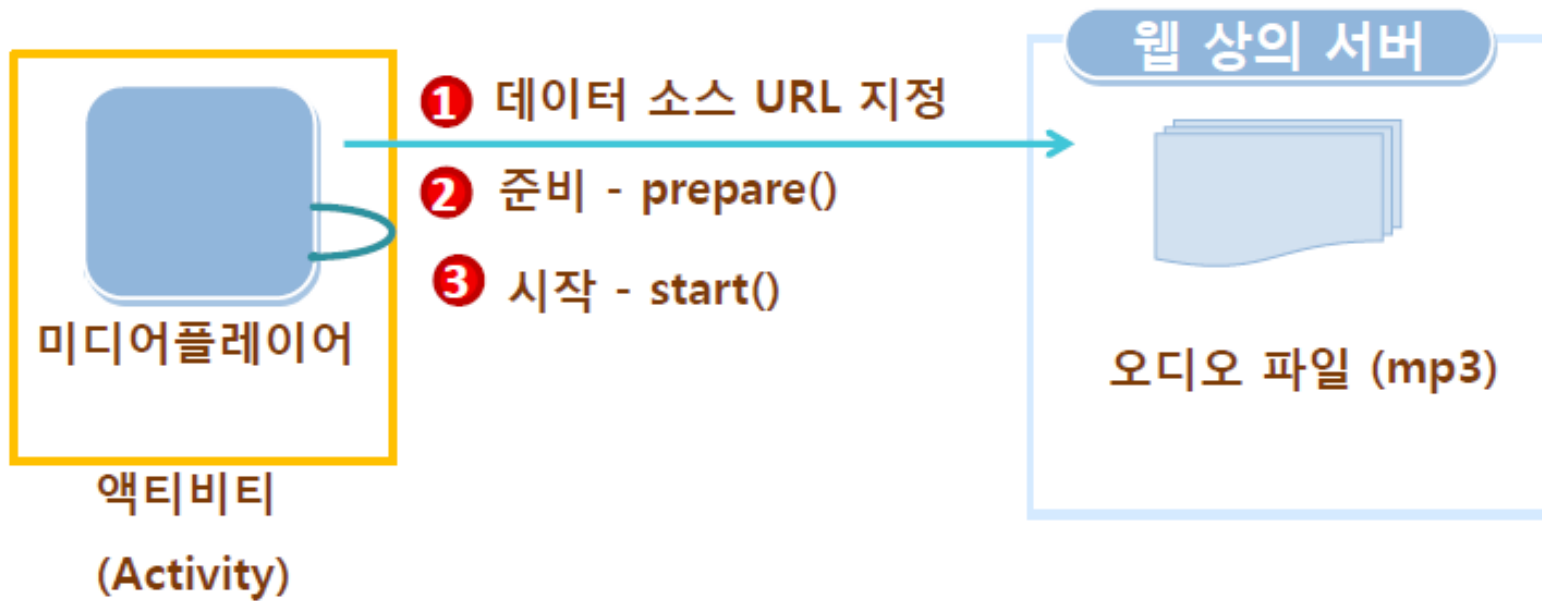


- 오디오 재생을 위해 **MediaPlayer** 클래스 사용
 - ◎ **MediaPlayer**의 데이터 소스 지정 방법
 - 웹 상의 위치 지정
 - 미디어가 있는 웹 상의 위치를 **URL**로 지정
 - 단말 **SD**카드에 넣은 후 위치 지정
 - 단말에 넣어 둔 **SD**카드에 파일을 넣은 후 그 위치를 지정



음악파일 재생 과정

3



미디어플레이어를 이용한 음악파일 재생 과정



○ 프로젝트 정보

- ◎ Application Name: AudioPlayer01
- ◎ Minimum SDK : API 18
- ◎ Add an activity to Mobile: Blank Activity
- ◎ Activity Name: MainActivity
- ◎ Layout Name: activity_main
- ◎ Title: MainActivity
- ◎ Menu Resource Name: menu_main



화면설계

5



activity_main.xml ×

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="Play!"
        android:textSize="20dp" />

</LinearLayout>
```

AudioPlayer01

PLAY!



```
MainActivity.java x
1 package com.example.administrator.audioplayer01;
2
3 import ...
4
5
6
7
8
9
10
11 public class MainActivity extends AppCompatActivity {
12     public static final String AUDIO_URL =
13         "http://sites.google.com/site/ubiaccessmobile/sample_audio.amr";
14
15     @Override
16     protected void onCreate(Bundle savedInstanceState) {
17         super.onCreate(savedInstanceState);
18         setContentView(R.layout.activity_main);
19
20         Button btn = (Button) findViewById(R.id.btn);
21         btn.setOnClickListener(new View.OnClickListener() {
22             @Override
23             public void onClick(View v) {
24                 playAudio();
25             }
26         });
27     }
28 }
```

MainActivity.java x

```
22  @Override
23  public void onClick(View v) {
24      playAudio();
25  }
26  });
27  }
28
29  private void playAudio() {
30      MediaPlayer player = new MediaPlayer();
31      try {
32          player.setDataSource(AUDIO_URL);
33          player.prepare();
34          player.start();
35      } catch (IOException e) {
36          e.printStackTrace();
37      }
38  }
39  }
40
```

```

AndroidManifest.xml x
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.administrator.audioplayer01">

    <uses-permission android:name="android.permission.INTERNET" />

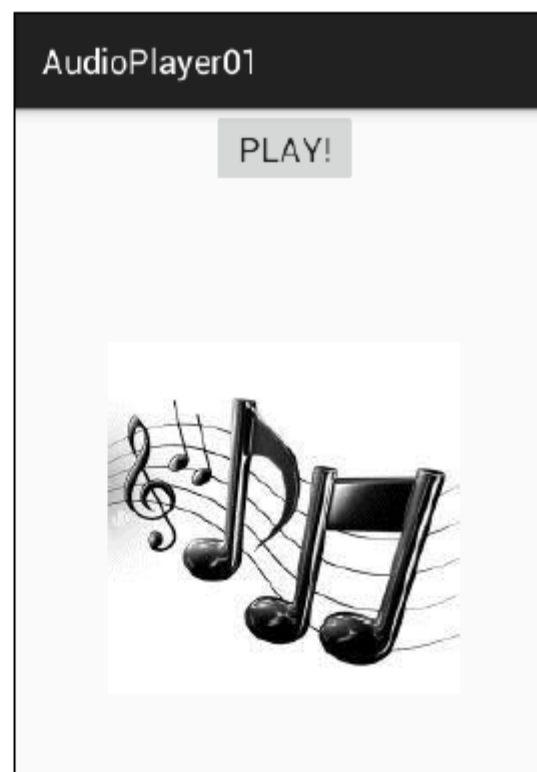
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="AudioPlayer01"
        android:theme="@style/AppTheme">
        <activity
            android:name=".MainActivity"
            android:label="AudioPlayer01">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>

```

오디오 파일을 인터넷 연결 위해서 퍼미션 설정





프로젝트 정보

- ⦿ Application Name: AudioPlayer02
- ⦿ Minimum SDK : API 18
- ⦿ Add an activity to Mobile: Blank Activity
- ⦿ Activity Name: MainActivity
- ⦿ Layout Name: activity_main
- ⦿ Title: MainActivity
- ⦿ Menu Resource Name: menu_main

AudioPlayer02

PLAY

PAUSE

CONTINUE



```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btn01"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Play" />

    <Button
        android:id="@+id/btn02"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Pause" />

    <Button
        android:id="@+id/btn03"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Continue" />

</LinearLayout>
```



```
1 package com.example.administrator.audioplayer02;
2
3 import android.media.MediaPlayer;
4 import android.os.Bundle;
5 import android.support.v7.app.AppCompatActivity;
6 import android.view.View;
7 import android.widget.Button;
8 import android.widget.Toast;
9
10 public class MainActivity extends AppCompatActivity {
11     public static final String AUDIO_URL =
12         "http://sites.google.com/site/ubiaccessmobile/sample_audio.amr";
13     private MediaPlayer mediaPlayer;
14     private int playbackPosition = 0;
15
16     @Override
17     protected void onCreate(Bundle savedInstanceState) {
18         super.onCreate(savedInstanceState);
19         setContentView(R.layout.activity_main);
20
21         Button startBtn = (Button) findViewById(R.id.btn01);
22         Button pauseBtn = (Button) findViewById(R.id.btn02);
23         Button restartBtn = (Button) findViewById(R.id.btn03);
24     }
25 }
```

MainActivity.java x

```
24  
25 startBtn.setOnClickListener(new View.OnClickListener() {  
26     @Override  
27     public void onClick(View v) {  
28         try {  
29             playAudio(AUDIO_URL);  
30         } catch (Exception e) {  
31             e.printStackTrace();  
32         }  
33         Toast.makeText(getApplicationContext(), "Music Start!", Toast.LENGTH_SHORT).show();  
34     }  
35 });
```

```
36  
37 pauseBtn.setOnClickListener(new View.OnClickListener() {  
38     @Override  
39     public void onClick(View v) {  
40         if (mediaPlayer != null) {  
41             playbackPosition = mediaPlayer.getCurrentPosition();  
42             mediaPlayer.pause();  
43             Toast.makeText(getApplicationContext(), "Music Pause", Toast.LENGTH_SHORT).show();  
44         }  
45     }  
46 });
```

- 정지시점 기억
- Pause()

MainActivity.java x

```
46     });
47     restartBtn.setOnClickListener(new View.OnClickListener() {
48         @Override
49         public void onClick(View v) {
50             if (mediaPlayer != null && !mediaPlayer.isPlaying()) {
51                 mediaPlayer.start();
52                 mediaPlayer.seekTo(playbackPosition);
53                 Toast.makeText(getApplicationContext(),
54                     "Music Restart", Toast.LENGTH_SHORT).show();
55             }
56         }
57     });
58 }
```

- 시작
- 정지시점 시작

```
59
60 private void playAudio(String url) throws Exception{
61     killMediaPlayer();
62
63     mediaPlayer = new MediaPlayer();
64     mediaPlayer.setDataSource(url);
65     mediaPlayer.prepare();
66     mediaPlayer.start();
67 }
68
```

- 오디오 소스 세팅
- 준비
- 시작

```
MainActivity.java x
65 mediaPlayer.prepare();
66 mediaPlayer.start();
67 }
68
69 protected void onDestroy(){
70     super.onDestroy();
71     killMediaPlayer();
72 }
73
74 private void killMediaPlayer(){
75     if(mediaPlayer != null){
76         try{
77             mediaPlayer.release();
78         } catch (Exception e){
79             e.printStackTrace();
80         }
81     }
82 }
83 }
84
```

• 액티비티가 호출
될 때 호출

• 미디어 플레이어에 세팅
되어 있는 오디오 해제

AndroidManifest.xml x

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.administrator.audioplayer02">

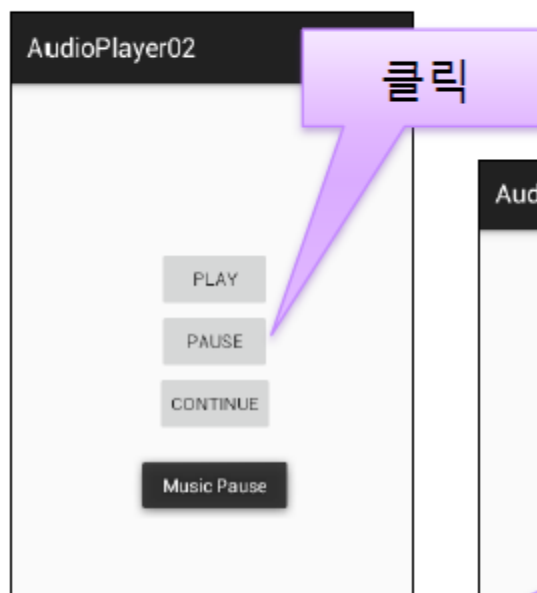
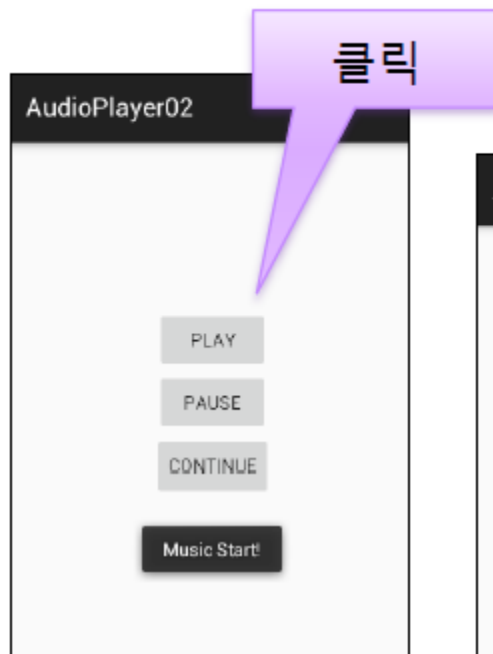
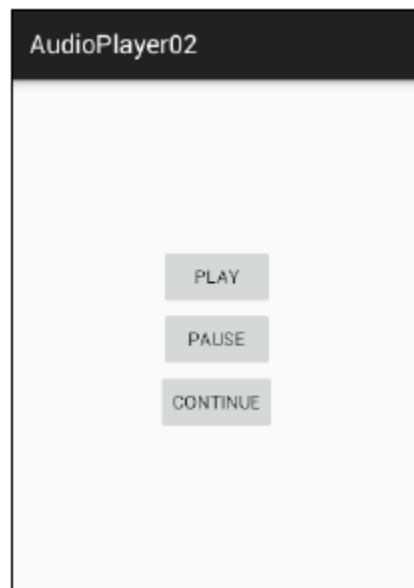
    <uses-permission android:name="android.permission.INTERNET" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="AudioPlayer02"
        android:theme="@style/AppTheme">
        <activity
            android:name=".MainActivity"
            android:label="AudioPlayer02">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

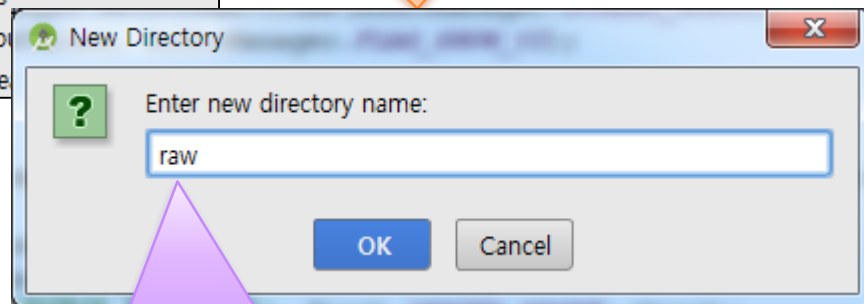
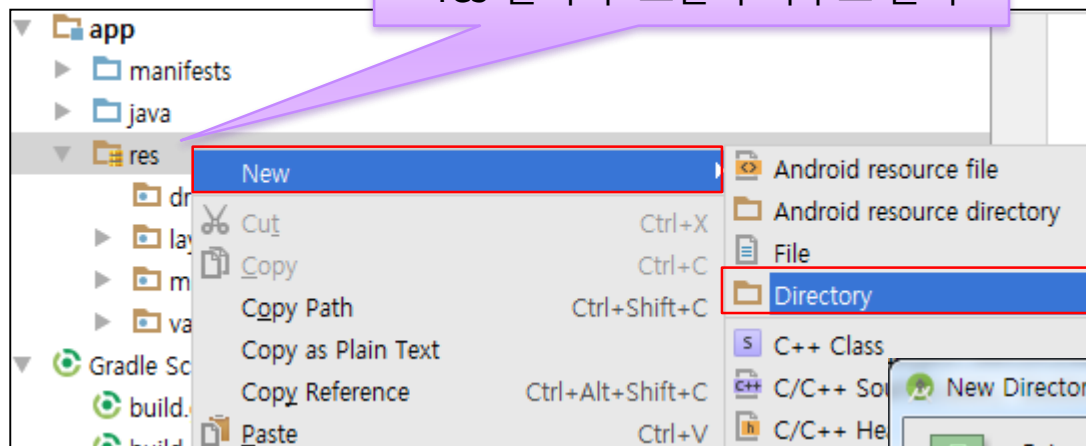
• 인터넷 퍼미션



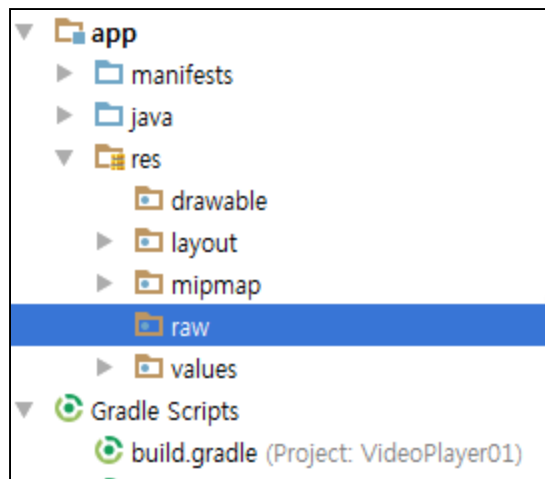
로컬 음악 재생

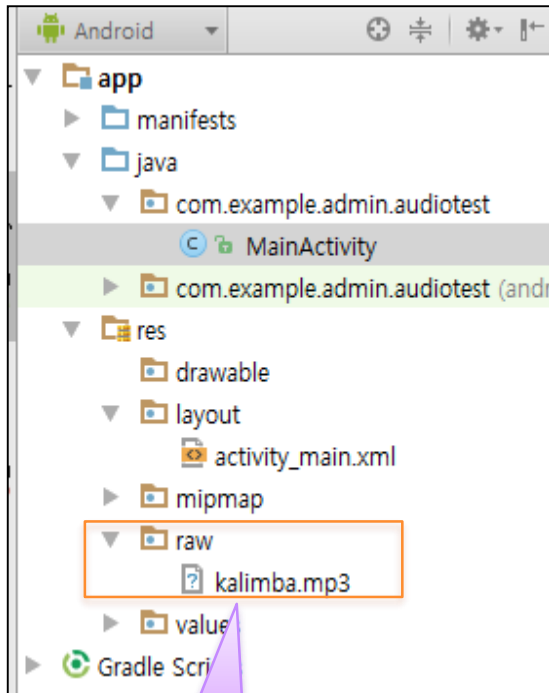
18

"res"클릭 후 오른쪽 마우스 클릭

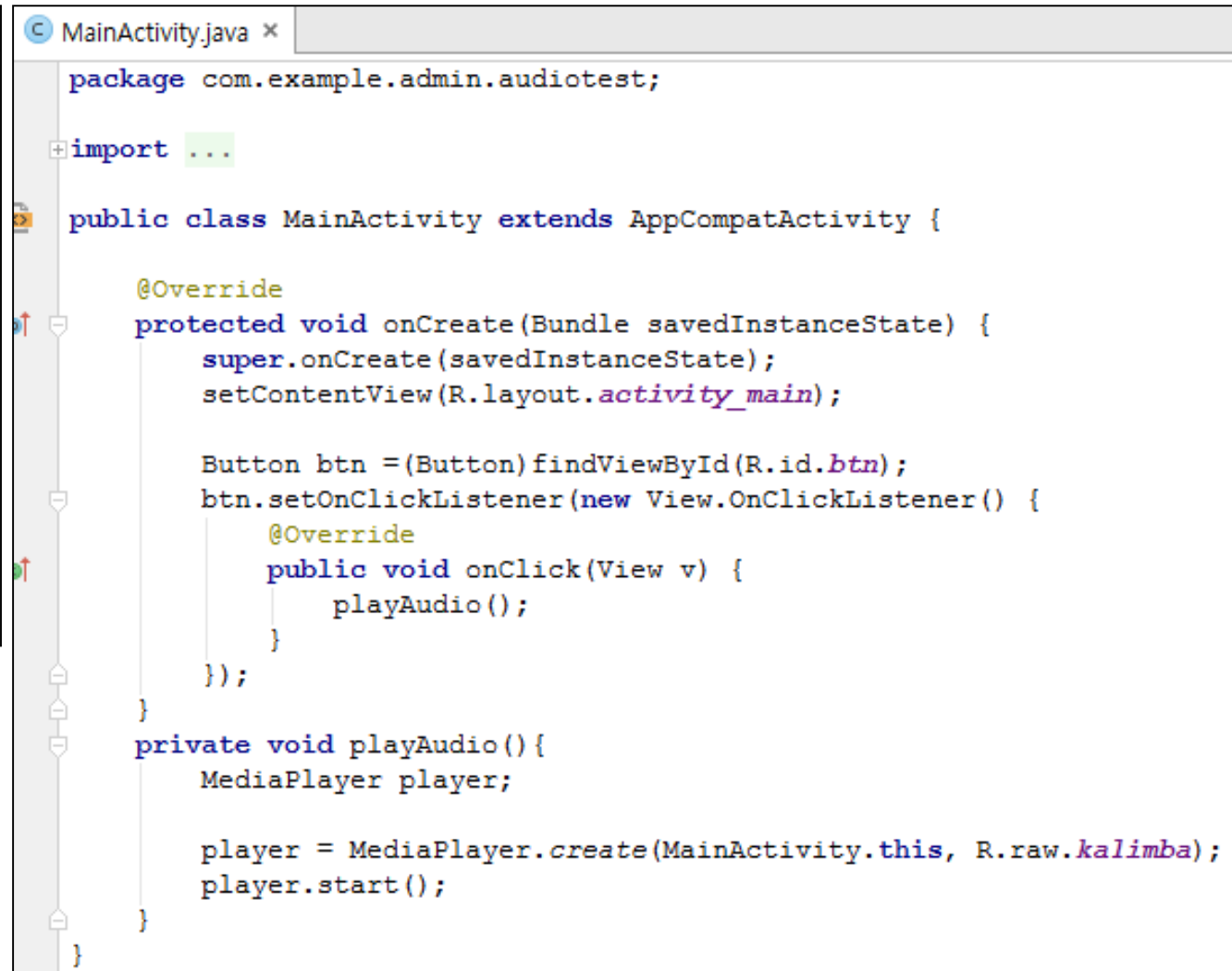


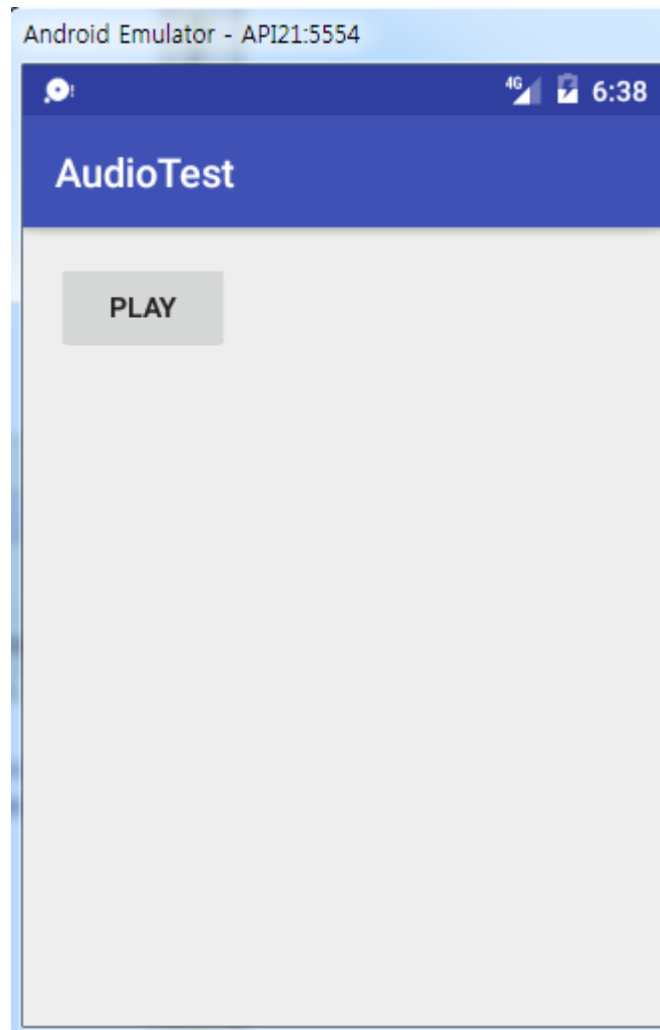
"raw"입력 후 "OK"





음악파일 복사
(kalimba.mp3)





오디오 녹음



○ 오디오 녹음을 위한 과정

◎ 미디어리코더 객체 생성

- 오디오 녹음을 위해 미디어리코더 객체를 **new** 연산자를 이용하여 만듦

◎ 오디오 입력 및 출력 형식 설정

- 오디오 정보를 입력 받을 데이터 소스와 함께 출력 형식을 설정함

◎ 오디오 인코더와 파일 지정

- 오디오 파일을 만들 때 필요한 인코더(**Encoder**)와 함께 파일 이름을 지정함

◎ 녹음 시작

- 녹음을 시작하면 오디오 파일이 만들어지고 인코딩된 바이트 스트림이 저장됨

◎ 매니페스트에 권한 설정

- 애플리케이션에서 녹음을 하려면 **RECORD_AUDIO** 권한이 있어야 하므로 매니페스트에 추가





프로젝트 정보

- ⦿ Application Name: AudioRecorder01
- ⦿ Minimum SDK : API 18
- ⦿ Add an activity to Mobile: Blank Activity
- ⦿ Activity Name: MainActivity
- ⦿ Layout Name: activity_main
- ⦿ Title: MainActivity
- ⦿ Menu Resource Name: menu_main



```
activity_main.xml x
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context="com.example.admin.audiorecord02.MainActivity">

    <Button
        android:id="@+id/record"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Record START">

    </Button>

    <Button
        android:id="@+id/play"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Record STOP">

    </Button>
</LinearLayout>
```



MainActivity.java x

```
1 package com.example.admin.audiorecord02;
2
3 import android.media.MediaPlayer;
4 import android.media.MediaRecorder;
5 import android.os.Bundle;
6 import android.os.Environment;
7 import android.support.v7.app.AppCompatActivity;
8 import android.view.View;
9 import android.widget.Button;
10 import android.widget.Toast;
11
12 import java.io.IOException;
13
14 public class MainActivity extends AppCompatActivity {
15
16     private static String RECORD_FILE;
17     MediaPlayer player;
18     MediaRecorder recorder;
19
20     @Override
21     protected void onCreate(Bundle savedInstanceState) {
22         super.onCreate(savedInstanceState);
23         setContentView(R.layout.activity_main);
24     }
25 }
```


C MainActivity.java x

저장경로

```
24 Button recordStartBtn = (Button) findViewById(R.id.record);
25 Button recordStopBtn = (Button) findViewById(R.id.play);
26 RECORD_FILE = Environment.getExternalStorageDirectory().getPath();
27 RECORD_FILE = RECORD_FILE + "/Download/recored.mp4";
28 Toast.makeText(getApplicationContext(), RECORD_FILE, Toast.LENGTH_SHORT).show();
29 recordStartBtn.setOnClickListener(new View.OnClickListener() {
30     @Override
31     public void onClick(View v) {
32         if (recorder != null) {
33             recorder.stop();
34             recorder.release();
35             recorder = null;
36         }
37         recorder = new MediaRecorder();
38         recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
39         recorder.setOutputFormat(MediaRecorder.OutputFormat.MPEG_4);
40         recorder.setAudioEncoder(MediaRecorder.AudioEncoder.DEFAULT);
41         recorder.setOutputFile(RECORD_FILE);
42         Toast.makeText(getApplicationContext(),
43             "Recorder Start!", Toast.LENGTH_SHORT).show();
44         try {
45             recorder.prepare();
46             recorder.start();
47         } catch (IOException e) {
48             e.printStackTrace();
49         }
50     }
51 });
52
```

환경설정

C MainActivity.java x

```
52     });
53     recordStopBtn.setOnClickListener(new View.OnClickListener() {
54         @Override
55         public void onClick(View v) {
56             if (recorder == null) return;
57             recorder.stop();
58             recorder.release();
59             recorder = null;
60             Toast.makeText(getApplicationContext(),
61                 "Recorder Stop", Toast.LENGTH_SHORT).show();
62         }
63     });
64 }
65
66 @Override
67 public void onPause() {
68
69     if (recorder != null) {
70         recorder.release();
71         recorder = null;
72     }
73
74     if (player != null) {
75         player.release();
76         player = null;
77     }
78     super.onPause();
79 }
80 }
```

레코더 반납

액티비티 실행전
에 초기화



```
<?xml version="1.0" encoding="utf-8" ?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.admin.audiorecord02">

    <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
    <uses-permission android:name="android.permission.RECORD_AUDIO" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="AudioRecord02"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

오디오 녹음/재생

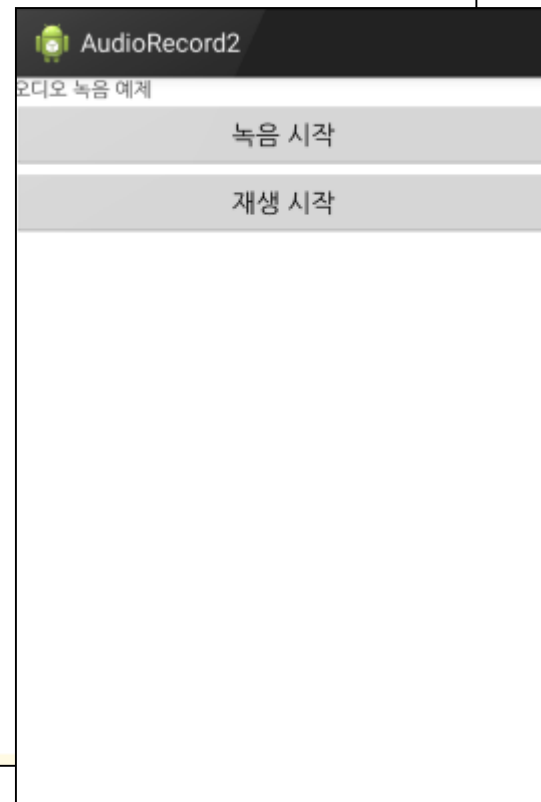


프로젝트 정보

- ◉ Application Name: AudioRecorder02
- ◉ Minimum SDK : API 18
- ◉ Add an activity to Mobile: Blank Activity
- ◉ Activity Name: MainActivity
- ◉ Layout Name: activity_main
- ◉ Title: MainActivity
- ◉ Menu Resource Name: menu_main



```
main.xml x
1  <?xml version="1.0" encoding="utf-8"?>
2  <LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
3      android:layout_width="match_parent"
4      android:layout_height="match_parent"
5      android:orientation="vertical">
6
7      <TextView
8          android:layout_width="match_parent"
9          android:layout_height="wrap_content"
10         android:text="오디오 녹음 예제" />
11
12     <Button
13         android:id="@+id/record"
14         android:layout_width="match_parent"
15         android:layout_height="wrap_content"
16         android:text="녹음 시작">
17     </Button>
18
19     <Button
20         android:id="@+id/play"
21         android:layout_width="match_parent"
22         android:layout_height="wrap_content"
23         android:text="재생 시작">
24     </Button>
25 </LinearLayout>
```



```
C AudioRecord2Activity.java x
1  package kr.co.company.audiorecord2;
2
3  import android.app.Activity;
4  import android.media.MediaPlayer;
5  import android.media.MediaRecorder;
6  import android.os.Bundle;
7  import android.os.Environment;
8  import android.util.Log;
9  import android.view.View;
10 import android.widget.Button;
11
12 import java.io.IOException;
13
14
15 public class AudioRecord2Activity extends Activity {
16     private static final String LOG_TAG = "AudioRecorderTest";
17     private static String filename = null;
18
19     Button play, record;
20     private MediaRecorder recorder = null;
21     private MediaPlayer player = null;
22 }
```




recorder, player
객체생성

```
22
23  @Override
24  public void onCreate(Bundle savedInstanceState) {
25      super.onCreate(savedInstanceState);
26      setContentView(R.layout.main);
27      filename = Environment.getExternalStorageDirectory().getAbsolutePath();
28      filename += "/Download/test.3gp";
29      play = (Button) findViewById(R.id.play);
30      record = (Button) findViewById(R.id.record);
31
32      play.setOnClickListener(new Button.OnClickListener() {
33          public void onClick(View v) {
34              if (player == null) {
35                  player = new MediaPlayer();
36                  try {
37                      player.setDataSource(filename);
38                      player.prepare();
39                      player.start();
40                  } catch (IOException e) {
41                      Log.e(LOG_TAG, "prepare() failed");
42                  }
43                  play.setText("재생 중지");
44              } else {
45                  player.release();
46                  player = null;
47                  play.setText("재생 시작");
48              }
49          }
50      });
51  }
```

저장위치

```
51
52
53  record.setOnClickListener(new Button.OnClickListener() {
54      public void onClick(View v) {
55          if (recorder == null) {
56              recorder = new MediaRecorder();
57              recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
58              recorder.setOutputFormat(MediaRecorder.OutputFormat.THREE_GPP);
59              recorder.setOutputFile(filename);
60              recorder.setAudioEncoder(MediaRecorder.AudioEncoder.AMR_NB);
61
62              try {
63                  recorder.prepare();
64              } catch (IOException e) {
65                  Log.e(LOG_TAG, "prepare() failed");
66              }
67
68              recorder.start();
69              record.setText("녹음 중지");
70          } else {
71              recorder.stop();
72              recorder.release();
73              recorder = null;
74              record.setText("녹음 시작");
75          }
76      }
77  });
78 }
```



```
78
79
80  
81
82
83
84
85
86
87
88
89
90
91 
92 }
93
94
```

```
@Override
public void onPause() {
    super.onPause();
    if (recorder != null) {
        recorder.release();
        recorder = null;
    }

    if (player != null) {
        player.release();
        player = null;
    }
}
```

```
AndroidManifest.xml x
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3      package="kr.co.company.audiorecord2"
4      android:versionCode="1"
5      android:versionName="1.0" >
6      <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
7      <uses-permission android:name="android.permission.RECORD_AUDIO"/>
8
9      <uses-sdk
10         android:minSdkVersion="8"
11         android:targetSdkVersion="18" />
12
13     <application
14         android:allowBackup="true"
15         android:icon="@drawable/ic_launcher"
16         android:label="AudioRecord2"
17         android:theme="@style/AppTheme" >
18         <activity
19             android:name="kr.co.company.audiorecord2.AudioRecord2Activity"
20             android:label="AudioRecord2" >
21             <intent-filter>
22                 <action android:name="android.intent.action.MAIN" />
23
24                 <category android:name="android.intent.category.LAUNCHER" />
25             </intent-filter>
26         </activity>
27     </application>
28 </manifest>
29
```

