



오디오

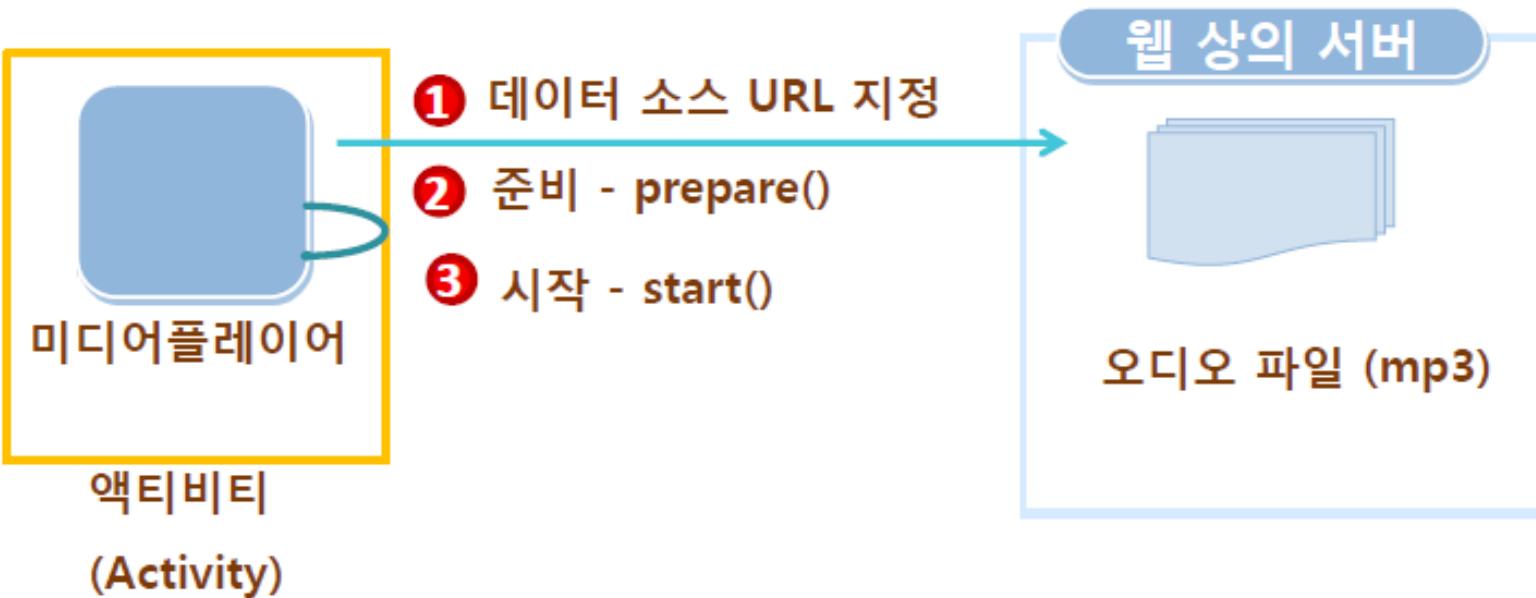
○ 오디오 재생을 위해 **MediaPlayer** 클래스 사용

◎ **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



미디어플레이어를 이용한 음악파일 재생 과정

프로젝트 생성

○ 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



```
activity_main.xml x
```

```
<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>
```



```
>MainActivity.java x
1 package com.example.administrator.audioplayer01;
2
3 import ...
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 }
```

```
c MainActivity.java x
22
23 @Override
24     public void onClick(View v) {
25         playAudio();
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

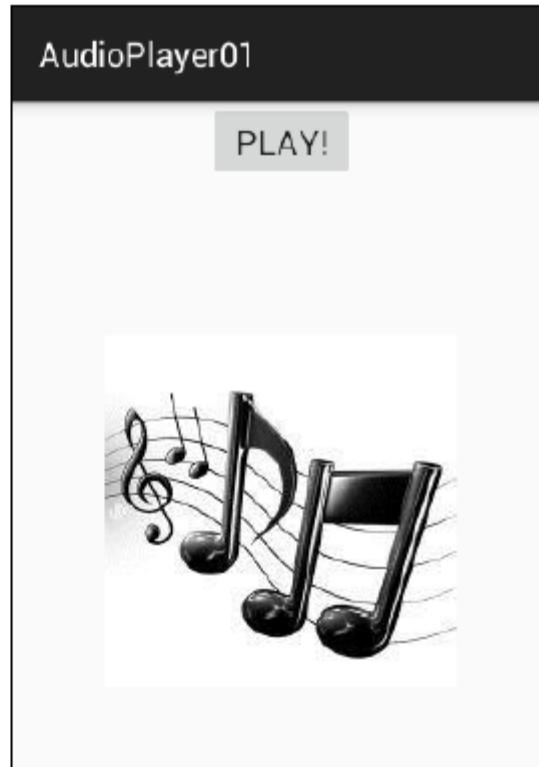
<?xml version="1.0" encoding="utf-8"?
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.administrator.audioplayer01">

    <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>
```

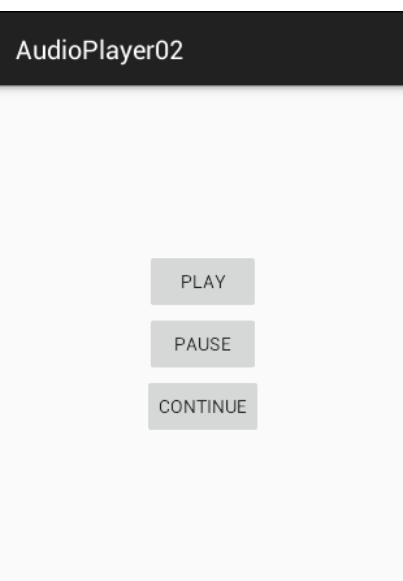
오디오 파일을 인터넷 연결 위해서 퍼미션 설정



프로젝트 생성

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



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: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>
```



>MainActivity.java ×

```
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 }
```

MainActivity.java

```
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()

```
c 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 }
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 }
```

- 시작
- 정지시점 시작

- 오디오 소스 세팅
- 준비
- 시작

```
c MainActivity.java x
00     mediaPlayer.prepare();
01
02     mediaPlayer.start();
03
04 }
05
06
07
08
09 protected void onDestroy(){
10     super.onDestroy();
11     killMediaPlayer();
12 }
13
14
15 private void killMediaPlayer(){
16     if(mediaPlayer != null){
17         try{
18             mediaPlayer.release();
19         }catch (Exception e){
20             e.printStackTrace();
21         }
22     }
23 }
24
25 }
```

- 액티비티가 호출될 때 호출

- 미디어 플레이어에 세팅되어 있는 오디오 해제

AndroidManifest.xml

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

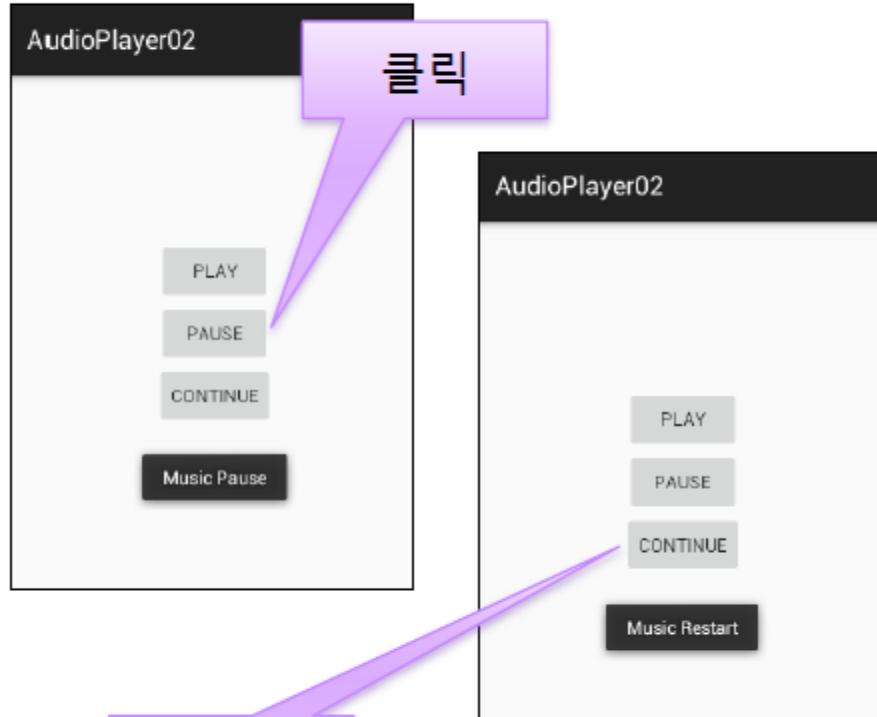
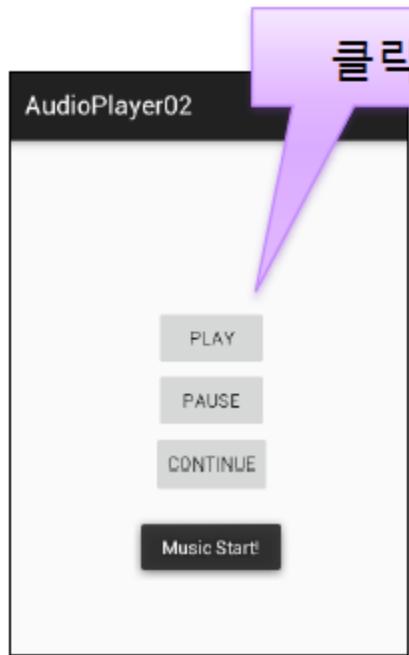
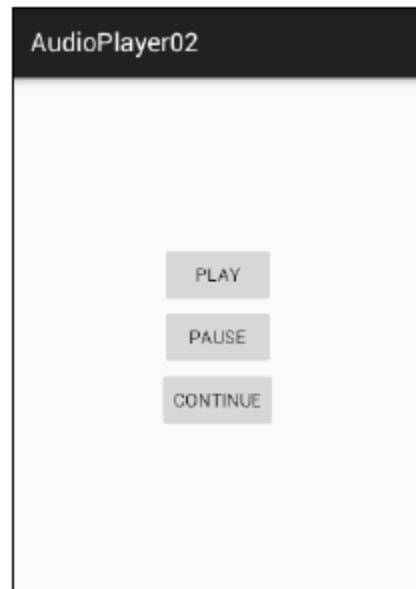
    <uses-permission android:name="android.permission.INTERNET" />

    <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" />

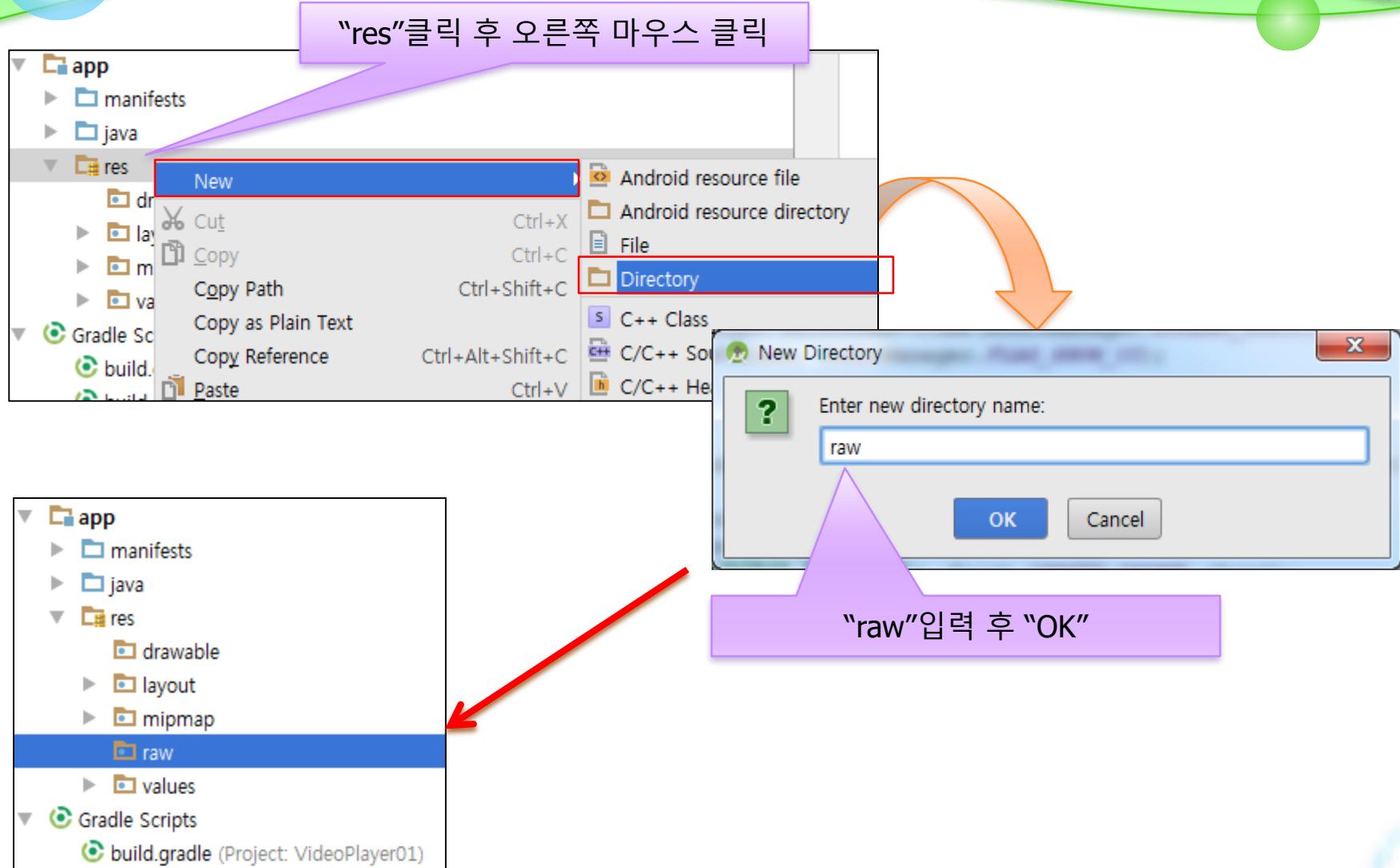
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

• 인터넷 퍼미션



로컬 음악 재생



The screenshot shows the Android Studio interface. On the left, the Project Structure view displays the app directory with its subfolders: manifests, java, and res. The res folder contains drawable, layout (with activity_main.xml), mipmap, raw (containing kalimba.mp3), and value. A purple callout box points to the raw folder with the text "음악파일 복사 (kalimba.mp3)". On the right, the code editor shows MainActivity.java:

```
package com.example.admin.audiotest;

import ...

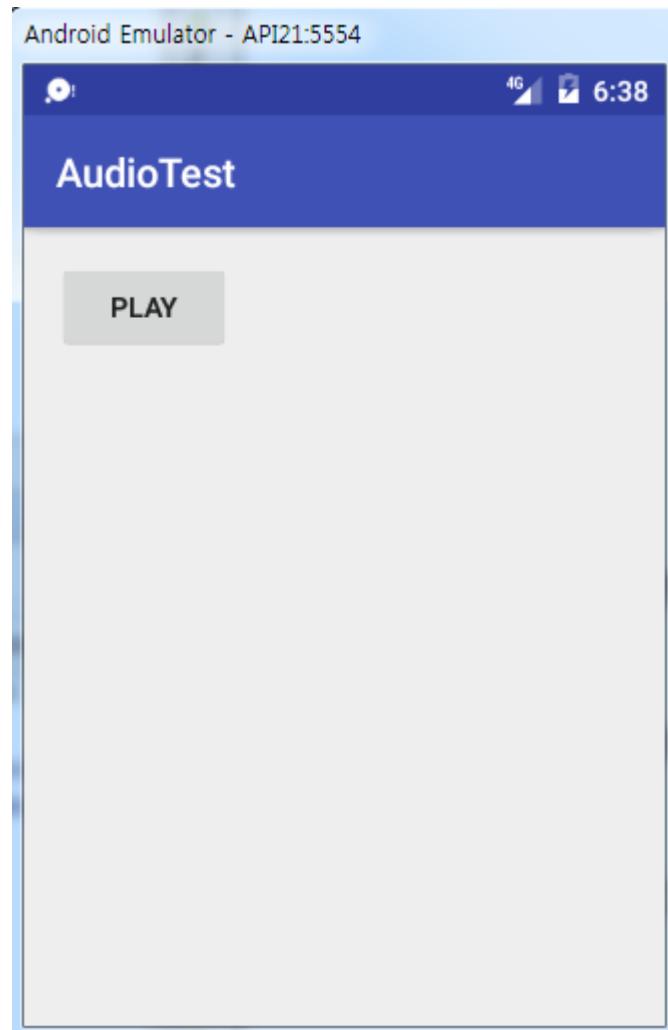
public class MainActivity extends AppCompatActivity {

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

        Button btn = (Button) findViewById(R.id.btn);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                playAudio();
            }
        });
    }

    private void playAudio() {
        MediaPlayer player;

        player = MediaPlayer.create(MainActivity.this, R.raw.kalimba);
        player.start();
    }
}
```



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 생성

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

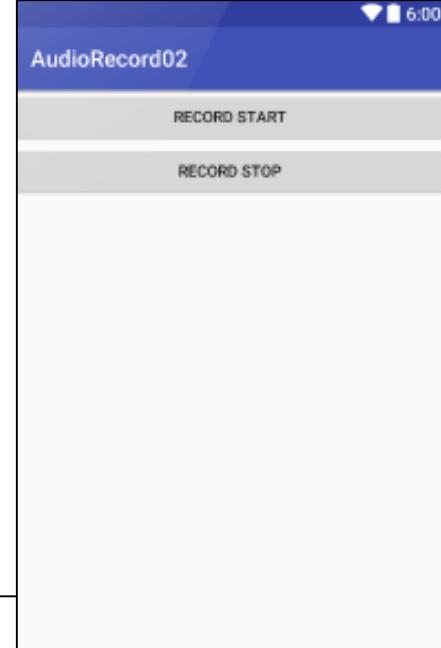


```
activity_main.xml x
```

```
<?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>
```



c 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 }
```

MainActivity.java

```

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

```

저장경로

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

```
AndroidManifest.xml x

<?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>
```

퍼미션

오디오 녹음/재생



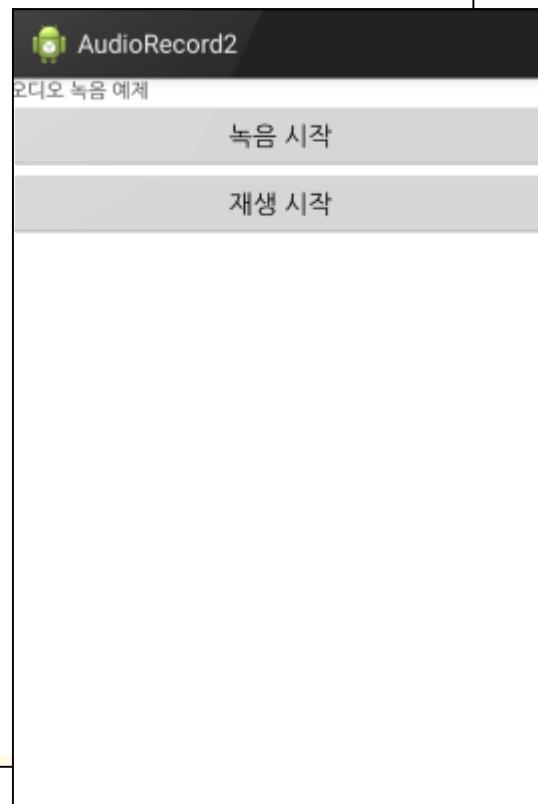
프로젝트 정보

- ◎ 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 *

```
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;
```

recorder, player
객체생성

AudioRecord2Activity.java ×

```
22  
23     @Override  
24     public void onCreate(Bundle icicle) {  
25         super.onCreate(icicle);  
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

AudioRecord2Activity.java x

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

```
78
79
80 ⬆️
81     @Override
82     public void onPause() {
83         super.onPause();
84         if (recorder != null) {
85             recorder.release();
86             recorder = null;
87         }
88         if (player != null) {
89             player.release();
90             player = null;
91         }
92     }
93
94
```

```
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
```

