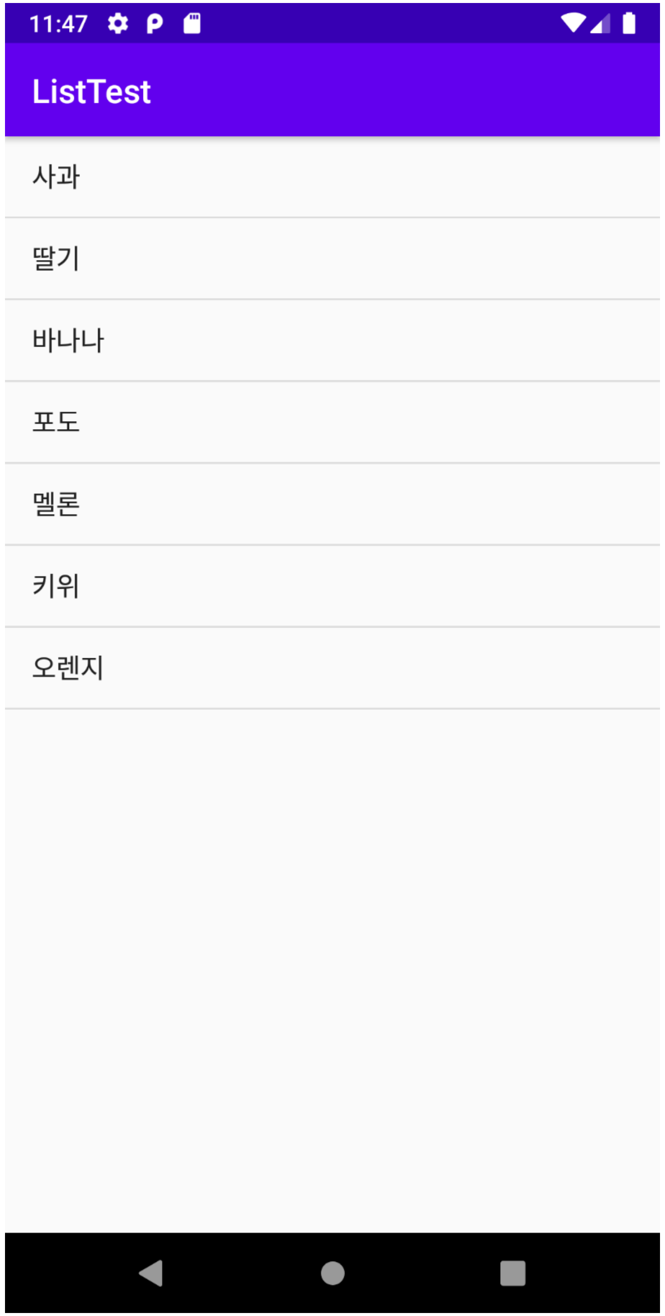
07

위젯과 프래그먼트

ListView



11:47

ListTest

사과

딸기

바나나

포도

멜론

키위

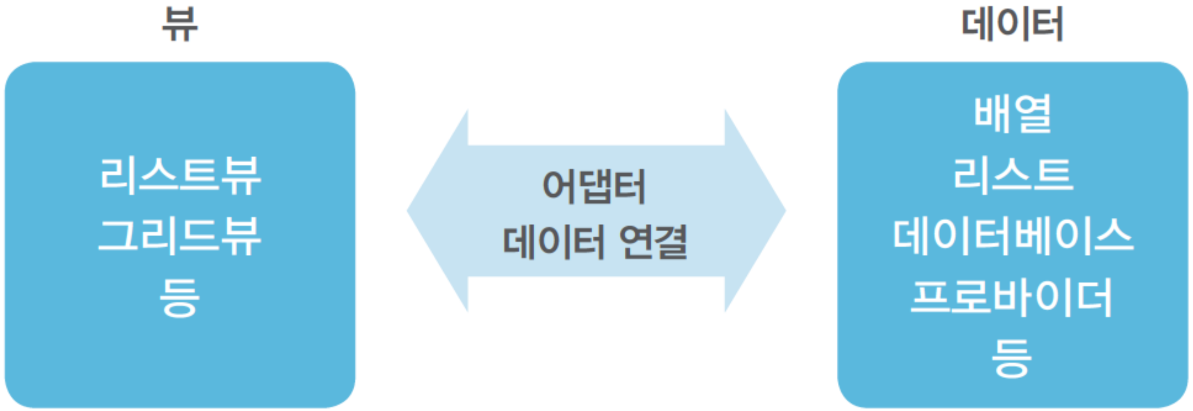
오렌지

어댑터뷰(AdapterView)

- 화면 크기보다 더 큰 자료를 표현하는 방법의 하나
- ScrollView : 적은 양이고 고정적인 데이터일 때 사용
- AdapterView : 같은 형태의 데이터가 반복되고 양이 많을 때 (예: 연락처)
  - AdapterView는 동일한 형태의 많은 양의 데이터를 표현하는 데 최적화된 추상 클래스

어댑터뷰(AdapterView)

- 화면 크기보다 더 큰 자료를 표현하는 방법의 하나
- ScrollView : 적은 양이고 고정적인 데이터일 때 사용
- AdapterView : 같은 형태의 데이터가 반복되고 양이 많을 때 (예: 연락처)
  - AdapterView는 동일한 형태의 많은 양의 데이터를 표현하는 데 최적화된 추상 클래스



뷰, 어댑터, 데이터의 관계

어댑터뷰 사용하기 3단계

1. 데이터를 준비한다
2. 데이터를 뷰에 연결해 줄 어댑터를 준비한다
3. 뷰에 어댑터를 붙인다

어댑터뷰(AdapterView)

1. 데이터 준비

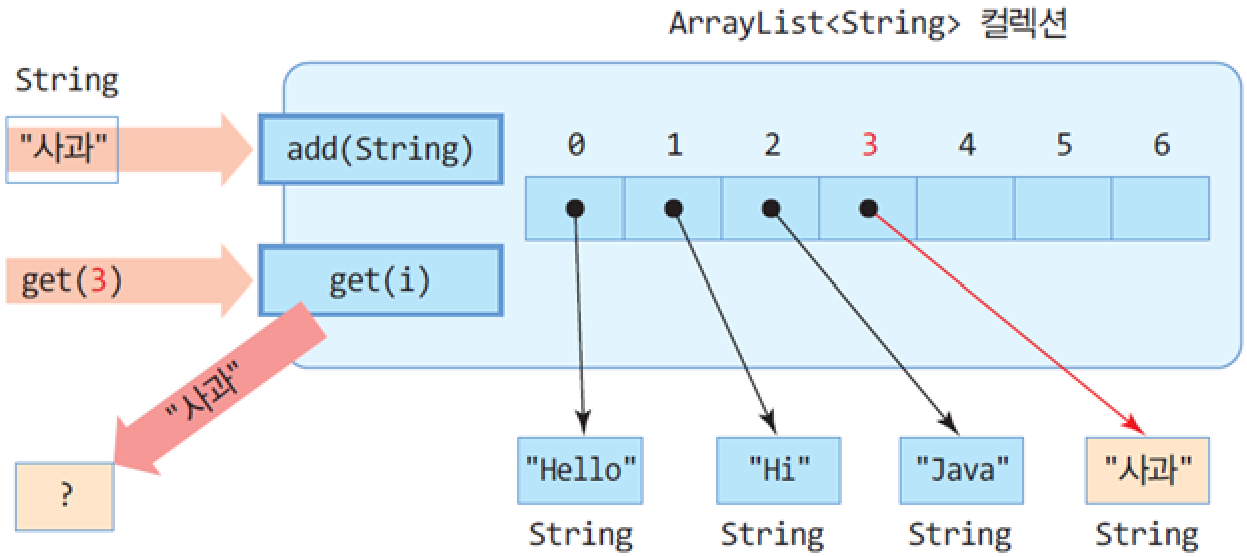
2. 어댑터 준비

3. 뷰에 어댑터 연결

ArrayList<E>

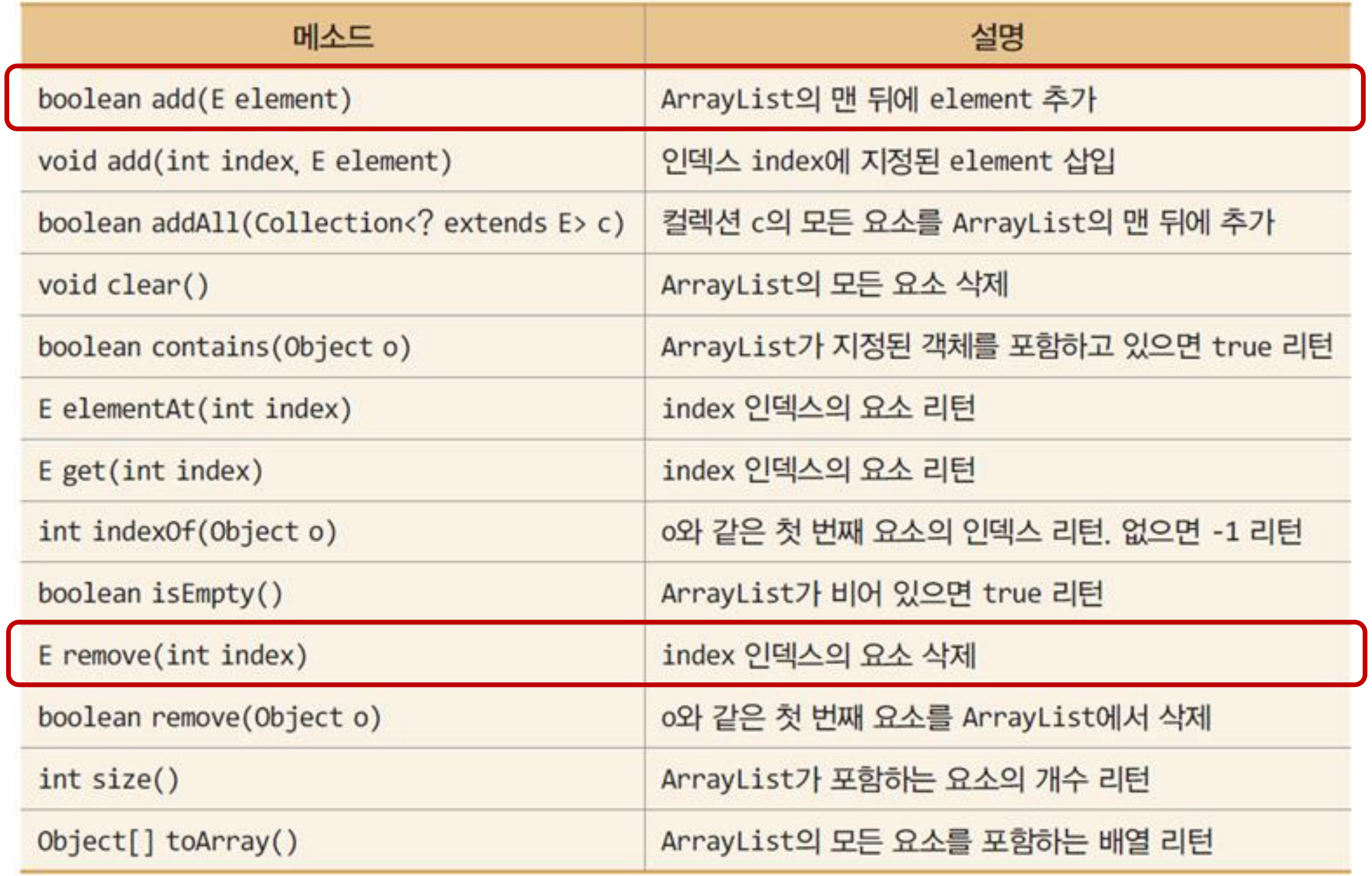
- ArrayList<E>
  - 가변 크기 배열을 구현한 클래스 : 배열의 길이 가변화로 길이제한 극복

```
ArrayList<String> = new ArrayList<String>();
```



ArrayList<E>

- ArrayList<E>
  - 가변 크기 배열을 구현한 클래스 : 배열의 길이 가변화로 길이제한 극복



메소드	설명
boolean add(E element)	ArrayList의 맨 뒤에 element 추가
void add(int index, E element)	인덱스 index에 지정된 element 삽입
boolean addAll(Collection<? extends E> c)	컬렉션 c의 모든 요소를 ArrayList의 맨 뒤에 추가
void clear()	ArrayList의 모든 요소 삭제
boolean contains(Object o)	ArrayList가 지정된 객체를 포함하고 있으면 true 리턴
E elementAt(int index)	index 인덱스의 요소 리턴
E get(int index)	index 인덱스의 요소 리턴
int indexOf(Object o)	o와 같은 첫 번째 요소의 인덱스 리턴. 없으면 -1 리턴
boolean isEmpty()	ArrayList가 비어 있으면 true 리턴
E remove(int index)	index 인덱스의 요소 삭제
boolean remove(Object o)	o와 같은 첫 번째 요소를 ArrayList에서 삭제
int size()	ArrayList가 포함하는 요소의 개수 리턴
Object[] toArray()	ArrayList의 모든 요소를 포함하는 배열 리턴

어댑터뷰(AdapterView)

데이터 준비

- 배열 또는 리스트 타입의 데이터를 준비한다

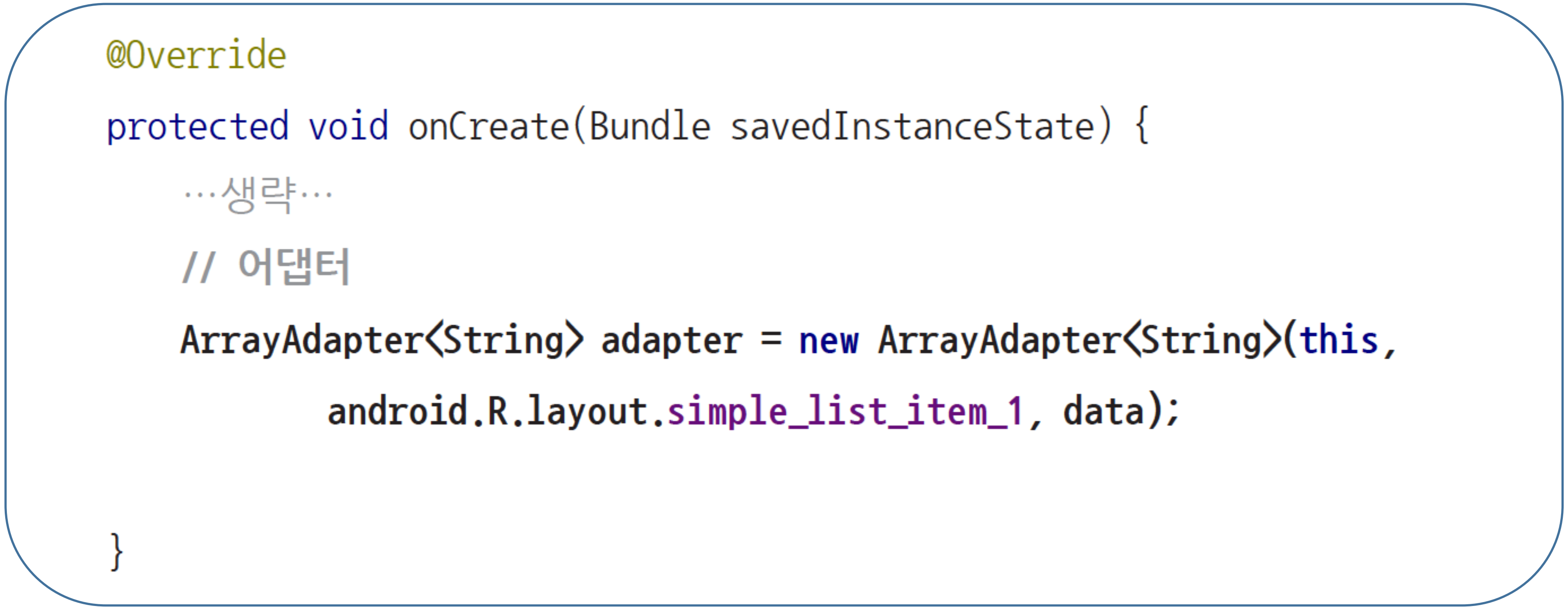
```
ArrayList<String> data = new ArrayList<>();
data.add("data1");
```

```
ArrayList<String> data = new ArrayList<>();
data.add("사과");
data.add("딸기");
data.add("바나나");
data.add("포도");
data.add("멜론");
data.add("키위");
data.add("오렌지");
```

어댑터뷰(AdapterView)

어뎁터 준비

- ArrayAdapter는 배열이나 리스트 데이터를 표현하는 안드로이드에서 제공되는 대표적인 어댑터



```
@Override
protected void onCreate(Bundle savedInstanceState) {
    …생략…
    // 어댑터
    ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
            android.R.layout.simple_list_item_1, data);

}
```

어댑터뷰(AdapterView)

어뎁터 준비

Layout ID	설명
simple_list_item_1	텍스트뷰 하나로 구성된 레이아웃
simple_list_item_2	텍스트뷰 두개로 구성된 레이아웃
simple_list_item_checked	오른쪽에 체크 표시가 됨
simple_list_item_single_choice	오른쪽에 라디오 버튼이 나옴
simple_list_item_multiple_choice	오른쪽에 체크버튼이 나옴

어댑터뷰(AdapterView)

뷰에 어뎁터 연결

- setAdapter()로 어댑터를 뷰와 연결하면 리스트가 표시 됨

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    …생략…
    // 뷰와 어댑터 연결
    ListView listView = (ListView) findViewById(R.id.list_view);
    listView.setAdapter(adapter);
}
```

어댑터뷰(AdapterView)

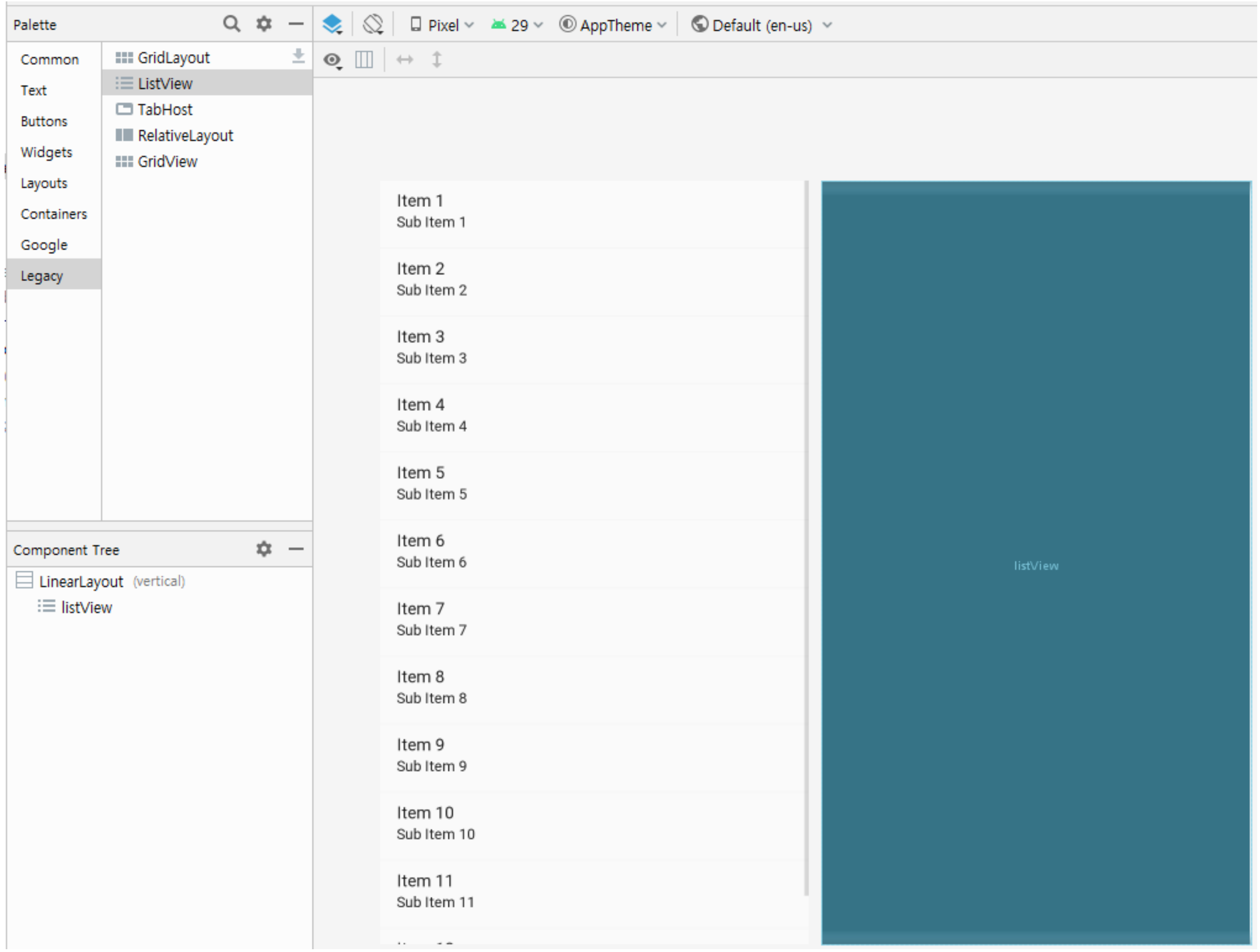
이벤트 추가

- 아이템 클릭리스너는 onItemClick() 콜백을 구현

```
// 아이템 클릭 이벤트
listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
    @Override
    public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
        Toast.makeText(MainActivity.this, position + " 번째 아이템 선택",
                       Toast.LENGTH_SHORT).show();
    }
});
```

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:context=".MainActivity" >


    <ListView
        android:id="@+id/listView"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />
</LinearLayout>
```



MainActivity.java

방법 1

```java
public class MainActivity extends AppCompatActivity {

    ListView listView;

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

        ArrayList<String> data = new ArrayList<>();
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, data);
        listView.setAdapter(adapter);

        data.add("사과");
        data.add("딸기");
        data.add("바나나");
        data.add("포도");
        data.add("멜론");
        data.add("키위");
        data.add("오렌지");
        adapter.notifyDataSetChanged();
    }
}
```

MainActivity.java

방법 2

```java
public class MainActivity extends AppCompatActivity {

    ListView listView;

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

        String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        ArrayList<String> data = new ArrayList<>();
        for (int i=0; i< fruits.length; i++){
            data.add(fruits[i]);
        }

        ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, data);
        listView.setAdapter(adapter);
        adapter.notifyDataSetChanged();
    }
}
```

MainActivity.java

방법 3

```java
public class MainActivity extends AppCompatActivity {

    ListView listView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);
        String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};

        ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, fruits);
        listView.setAdapter(adapter);
    }
}
```

MainActivity.java

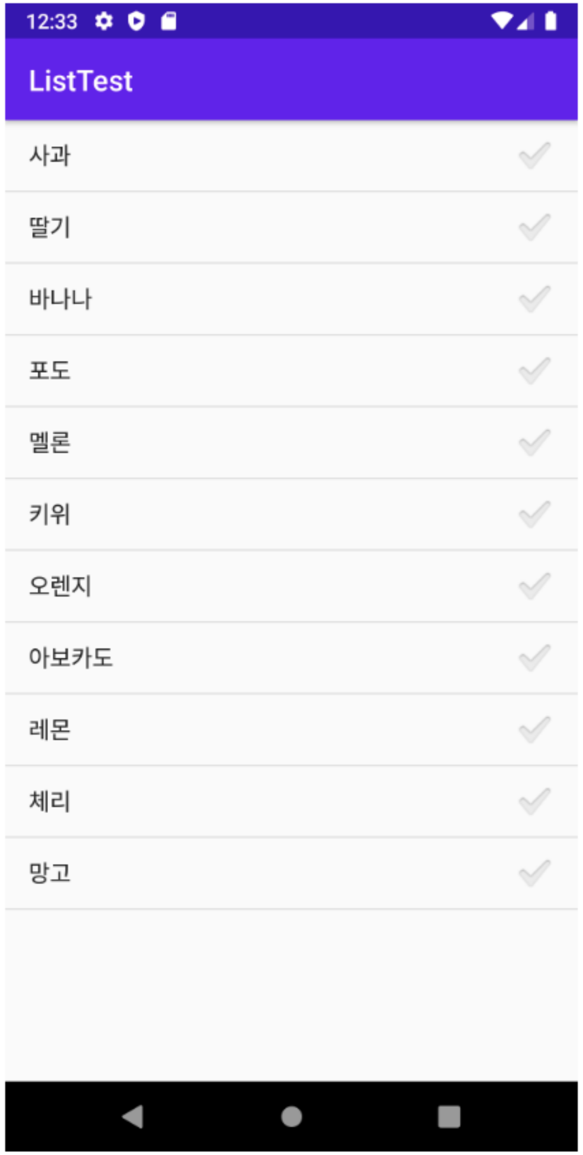
■ 방법 4 (ListActivity를 상속 받음)

```java
public class MainActivity extends ListActivity {

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

        String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this, android.R.layout.simple_list_item_1, fruits);
        setListAdapter(adapter);
    }

}
```

ListView Layout Option 선택

Layout ID	설명
simple_list_item_1	텍스트뷰 하나로 구성된 레이아웃
simple_list_item_2	텍스트뷰 두개로 구성된 레이아웃
simple_list_item_checked	오른쪽에 체크 표시가 됨
simple_list_item_single_choice	오른쪽에 라디오 버튼이 나옴
simple_list_item_multiple_choice	오른쪽에 체크버튼이 나옴

ListView Layout Option 선택

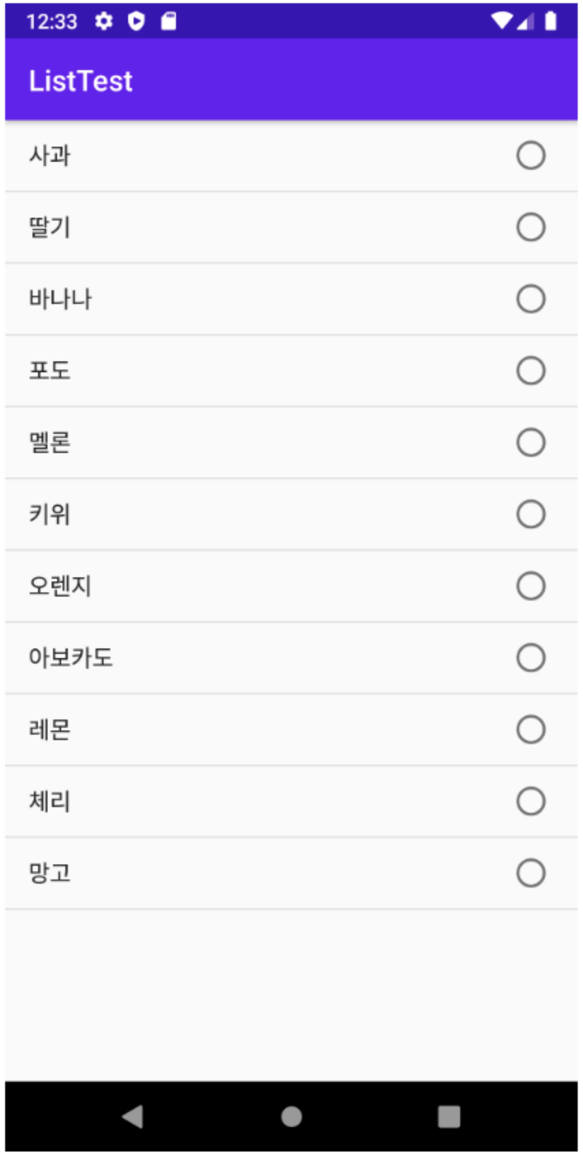


12:33

ListTest

사과 ✓
딸기 ✓
바나나 ✓
포도 ✓
멜론 ✓
키위 ✓
오렌지 ✓
아보카도 ✓
레몬 ✓
체리 ✓
망고 ✓

simple_list_item_checked

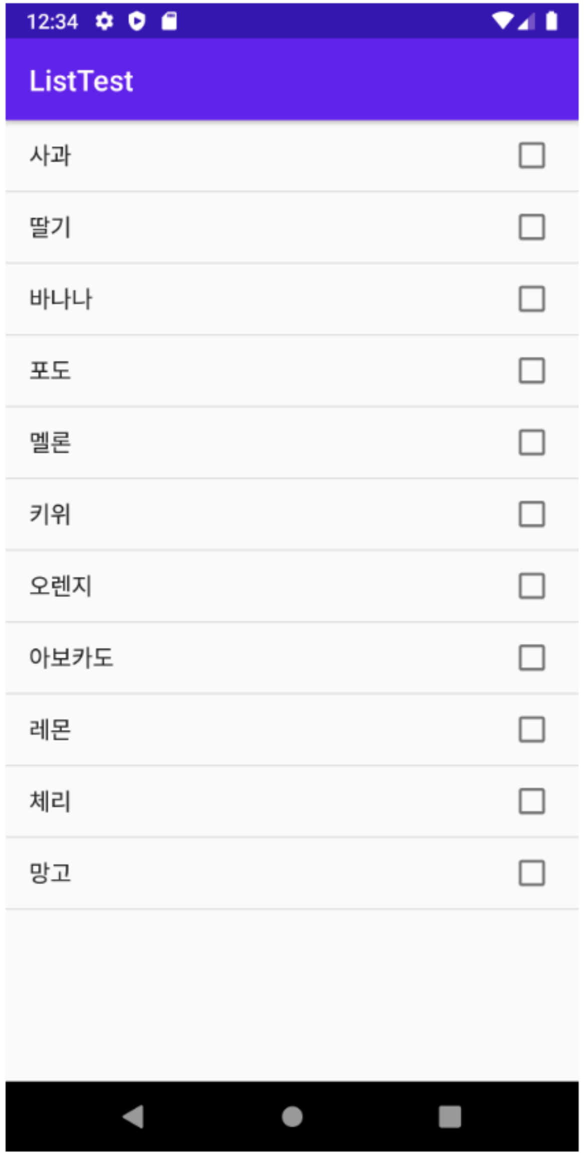


12:33

ListTest

사과 ○
딸기 ○
바나나 ○
포도 ○
멜론 ○
키위 ○
오렌지 ○
아보카도 ○
레몬 ○
체리 ○
망고 ○

simple_list_item_single_choice



12:34

ListTest

사과 □
딸기 □
바나나 □
포도 □
멜론 □
키위 □
오렌지 □
아보카도 □
레몬 □
체리 □
망고 □

simple_list_item_multiple_choice

ListView Layout Option 선택

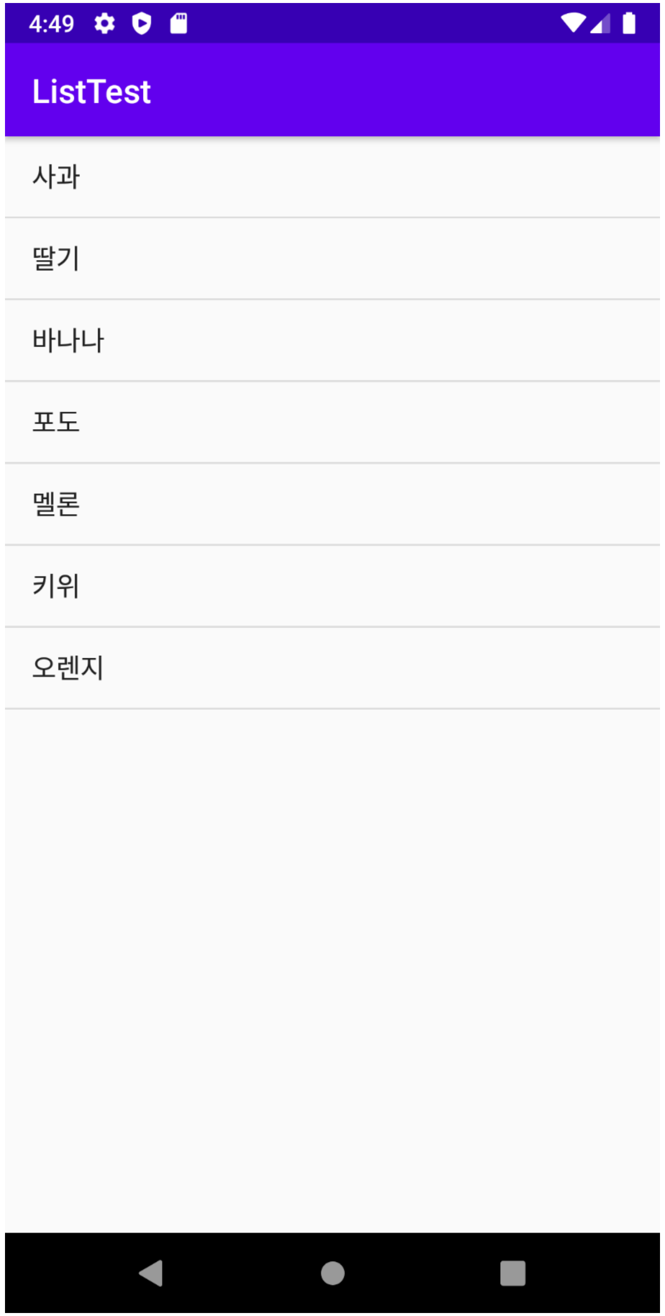
방법 3

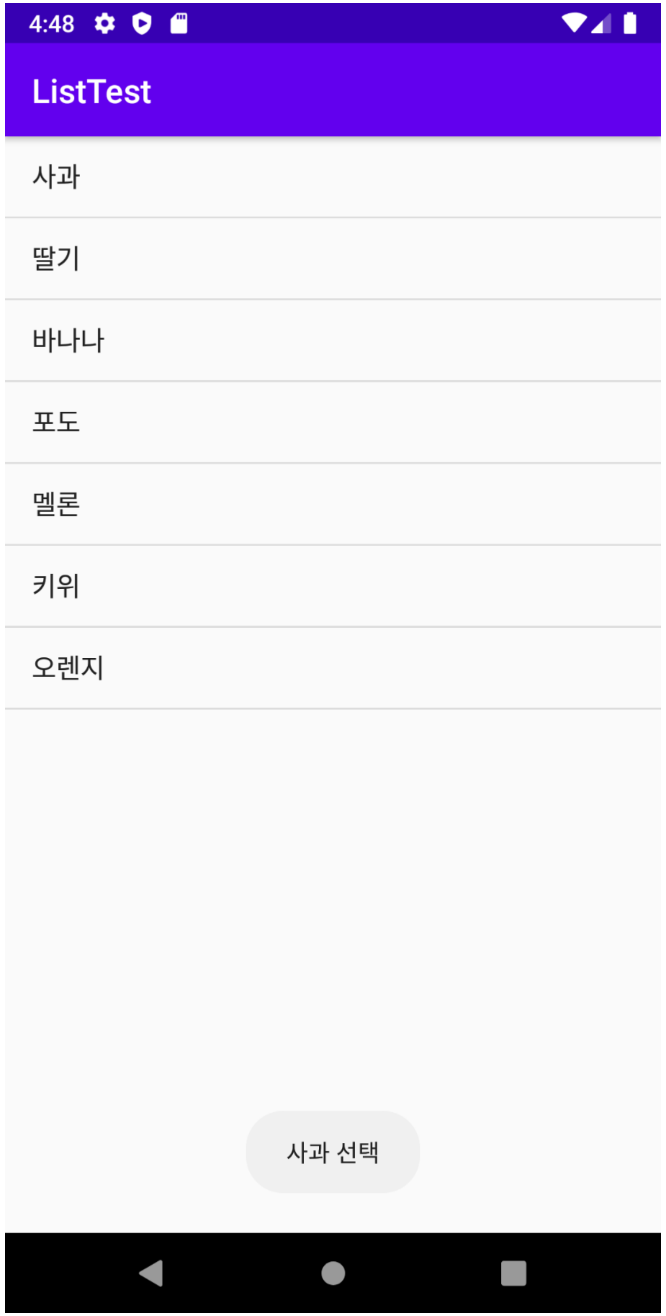
```
public class MainActivity extends AppCompatActivity {

    ListView listView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);
        String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};

        ArrayAdapter<String> adapter = new ArrayAdapter<>(this, android.R.layout.simple_list_item_1, fruits);
        listView.setAdapter(adapter);
    }
}
```

android.R.layout.

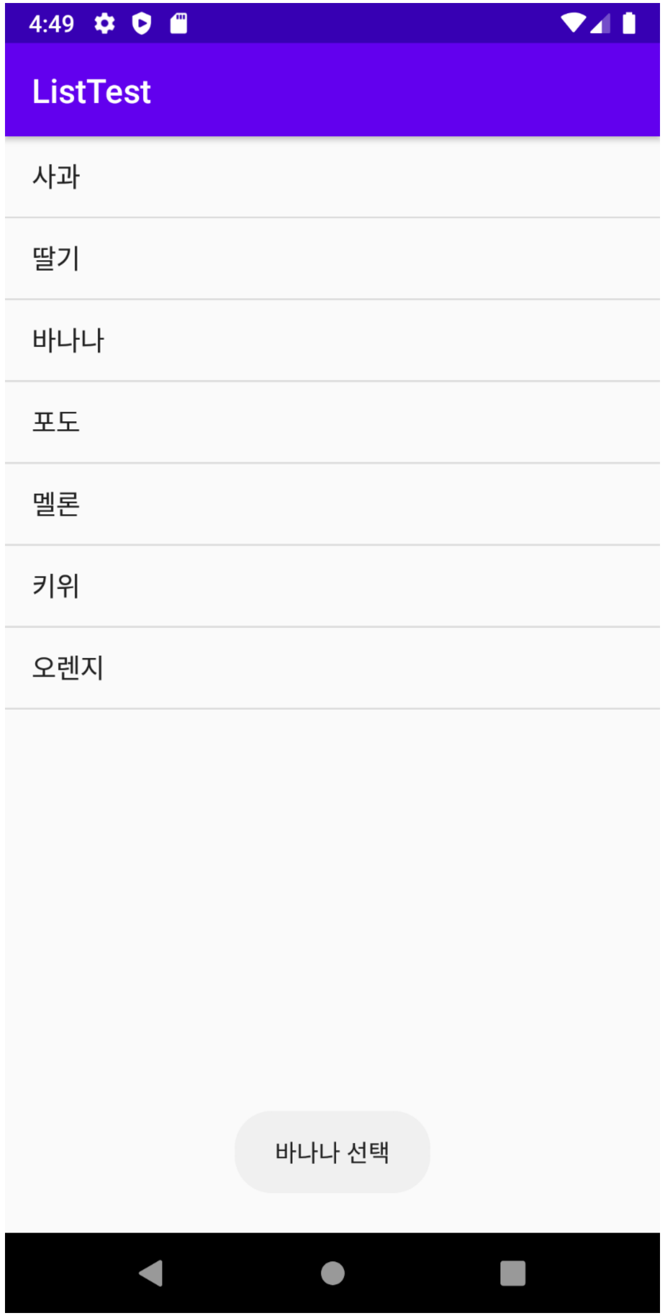
simple_list_item_1
simple_list_item_2
simple_list_item_checked
simple_list_item_single_choice
simple_list_item_multiple_choice

ListView 이벤트처리


4:49
ListTest
사과
딸기
바나나
포도
멜론
키위
오렌지


4:48
ListTest
사과
딸기
바나나
포도
멜론
키위
오렌지

사과 선택


4:49
ListTest
사과
딸기
바나나
포도
멜론
키위
오렌지

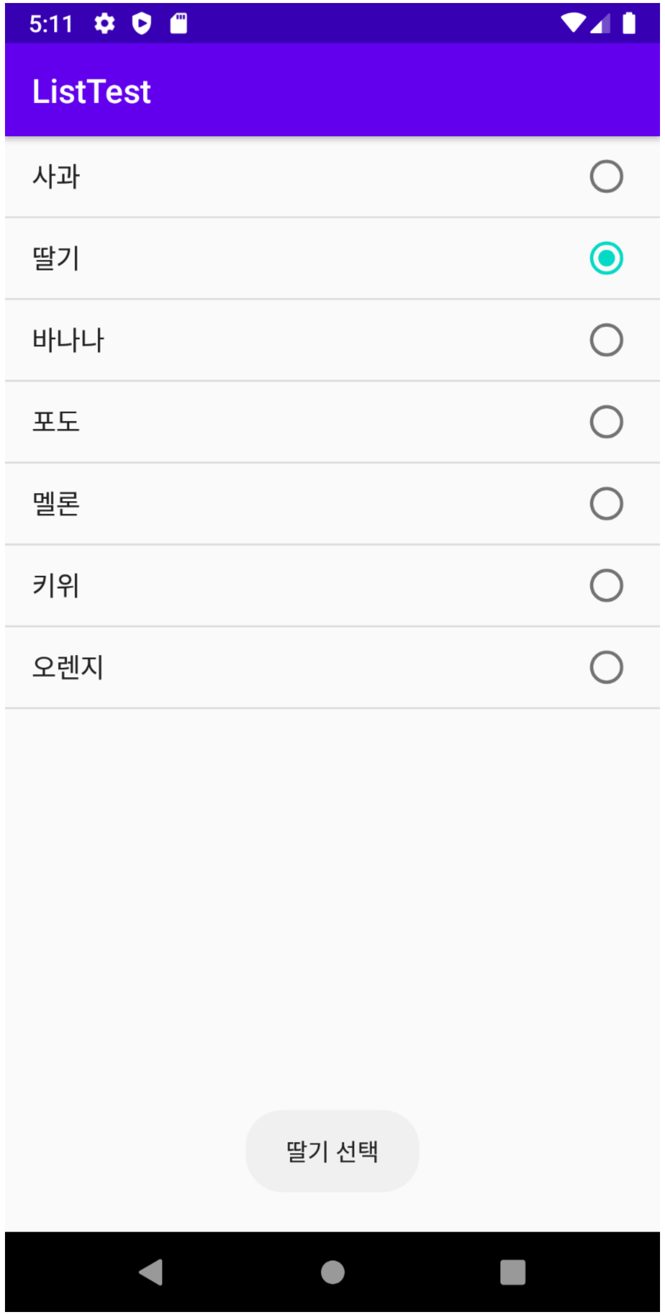
바나나 선택

MainActivity.java (ListView Event 처리)

```
public class MainActivity extends AppCompatActivity {

    ListView listView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);
        final String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        final ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
                                                        android.R.layout.simple_list_item_single_choice, fruits);
        listView.setAdapter(adapter);

        listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
                String item = fruits[position];
                Toast.makeText(getApplicationContext(), fruits[position] + " 선택", Toast.LENGTH_SHORT).show();

            }
        });
    }
}
```

MainActivity.java (ListView Event 처리 – ListActivity 상속)

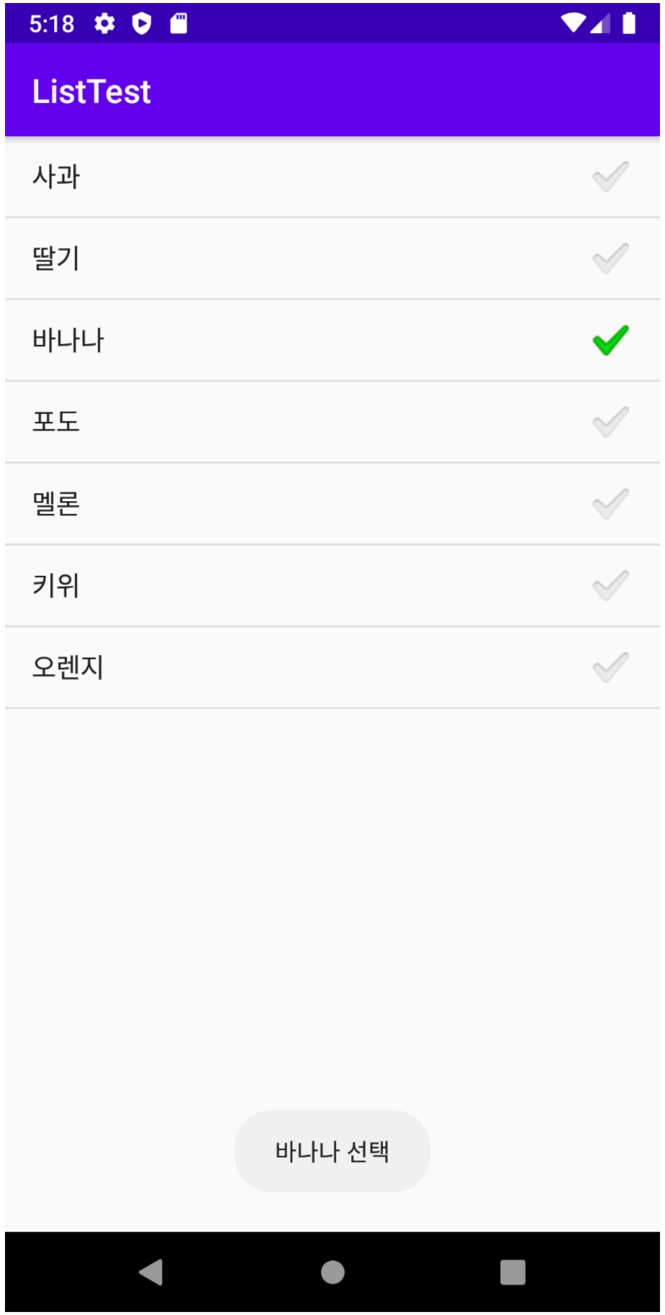
```
public class MainActivity extends ListActivity {

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

        String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지", "아보카도", "레몬", "체리", "망고"};
        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
                android.R.layout.simple_list_item_1, fruits);
        setListAdapter(adapter);
    }

    @Override
    protected void onListItemClick(ListView l, View v, int position, long id) {
        String item = (String) getListAdapter().getItem(position);
        Toast.makeText(this, item + " 선택", Toast.LENGTH_SHORT).show();
    }
}
```



5:11

ListTest

- 사과 ○
- 딸기 ●
- 바나나 ○
- 포도 ○
- 멜론 ○
- 키위 ○
- 오렌지 ○



5:18

ListTest

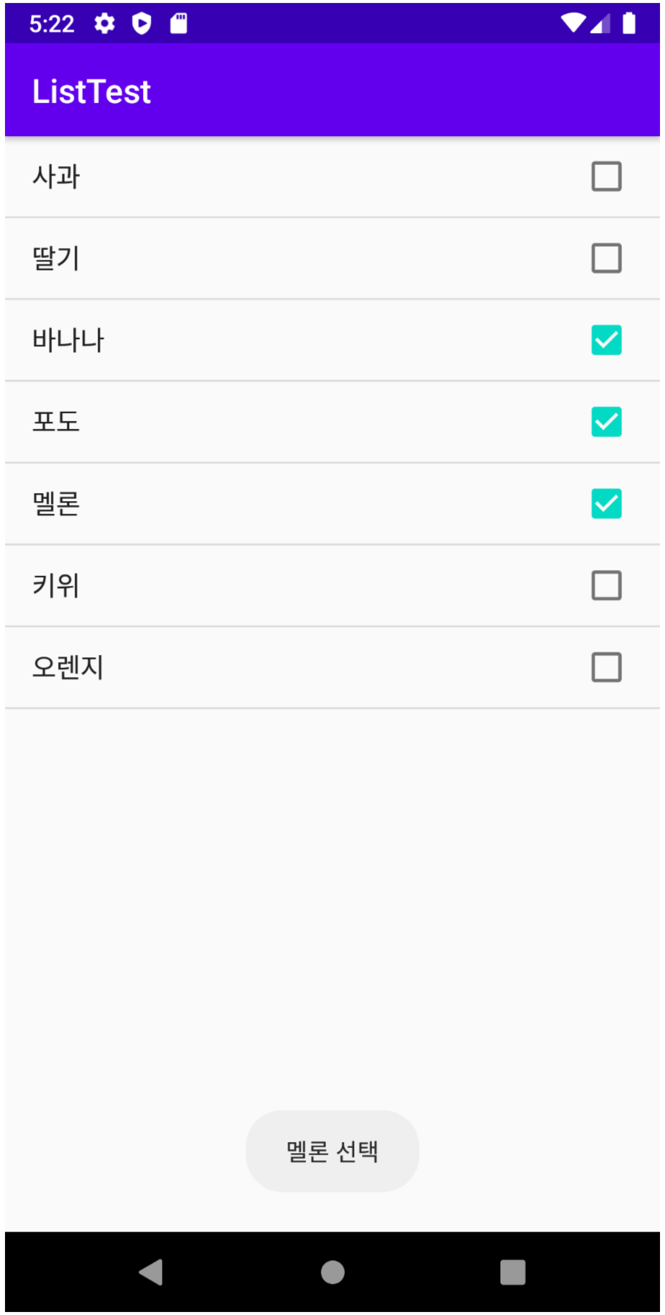
- 사과
- 딸기
- 바나나 ✓
- 포도
- 멜론
- 키위
- 오렌지

MainActivity.java (ListView Event 처리)

```
public class MainActivity extends AppCompatActivity {

    ListView listView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);

        final String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        final ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
                                                        android.R.layout.simple_list_item_single_choice, fruits);
        listView.setChoiceMode(ListView.CHOICE_MODE_SINGLE);
        listView.setAdapter(adapter);

        listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
                String item = fruits[position];
                Toast.makeText(getApplicationContext(), item + " 선택", Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

MainActivity.java (ListView Event 처리)

```java
public class MainActivity extends AppCompatActivity {

    ListView listView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);

        final String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        final ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
                                                         android.R.layout.simple_list_item_checked, fruits);
        listView.setChoiceMode(ListView.CHOICE_MODE_SINGLE);
        listView.setAdapter(adapter);

        listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
                String item = fruits[position];
                Toast.makeText(getApplicationContext(), item + " 선택", Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```



사과 ☐

딸기 ☐

바나나 ☑

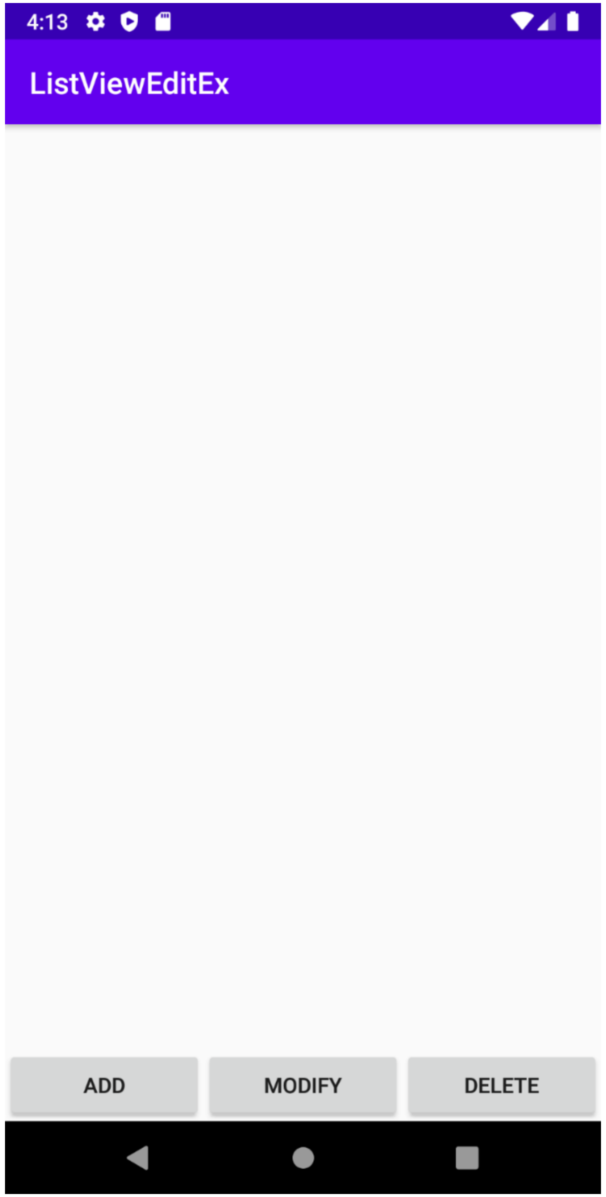
포도 ☑

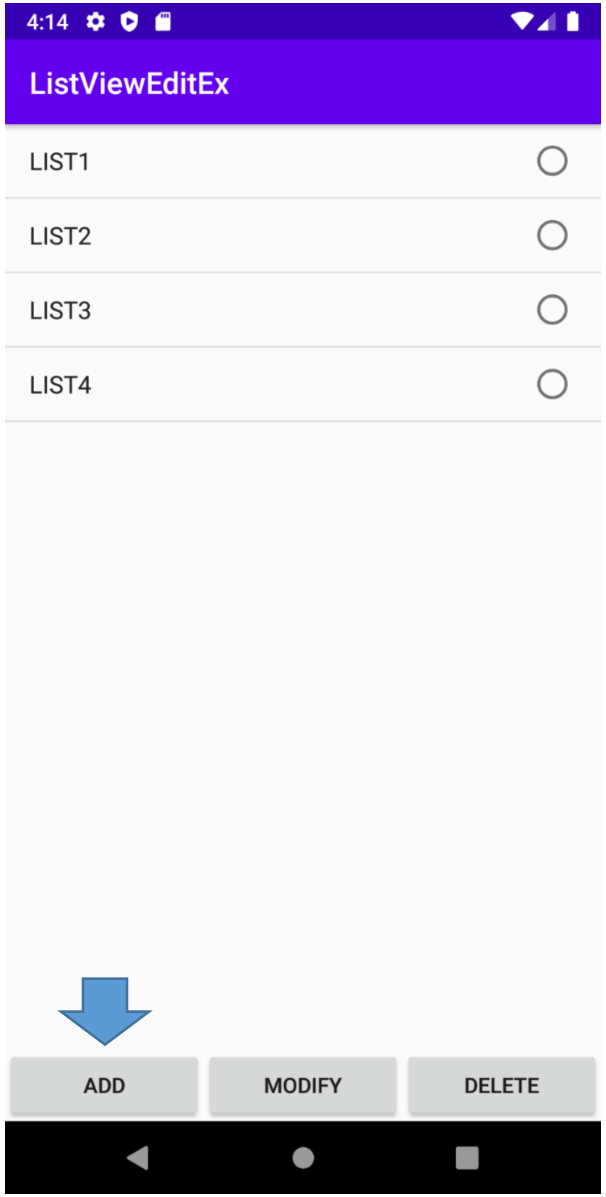
멜론 ☑

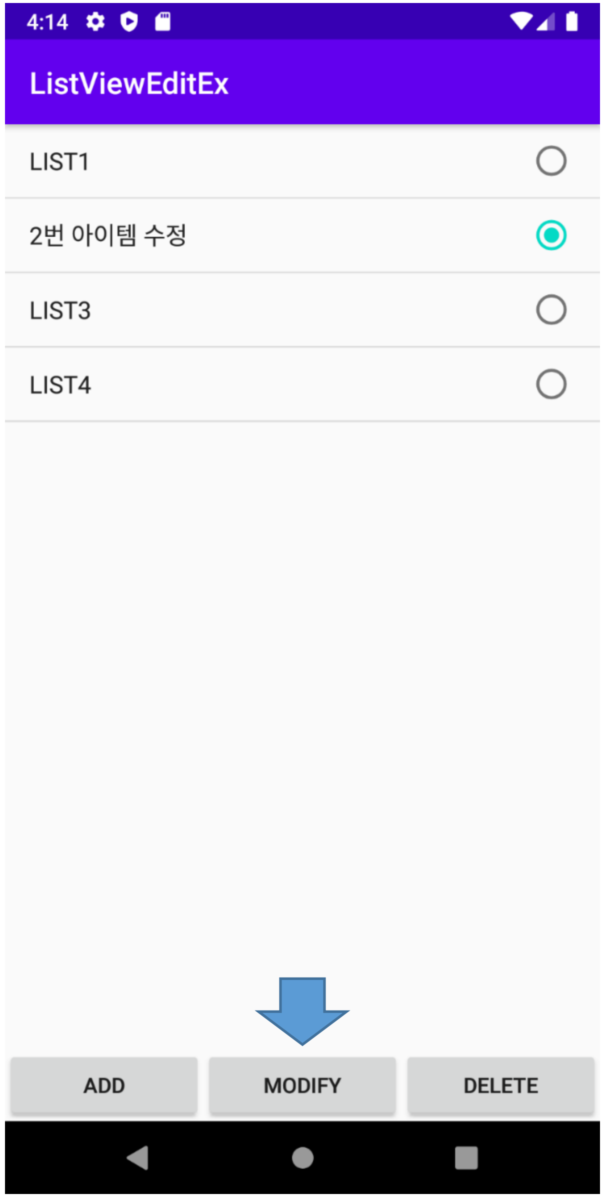
키위 ☐

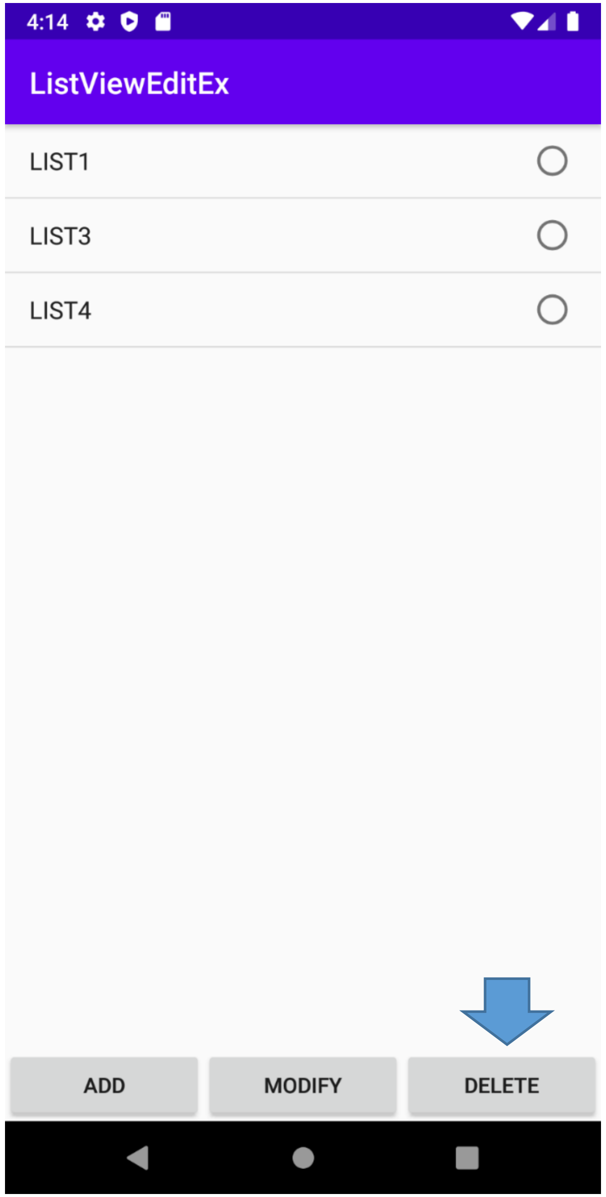
오렌지 ☐

```
public class MainActivity extends AppCompatActivity {

    ListView listView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        listView = findViewById(R.id.listView);

        final String[] fruits = {"사과","딸기","바나나","포도","멜론","키위","오렌지"};
        final ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
                                                android.R.layout.simple_list_item_multiple_choice, fruits);
        listView.setChoiceMode(ListView.CHOICE_MODE_MULTIPLE);
        listView.setAdapter(adapter);

        listView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {

                String item = fruits[position];
                Toast.makeText(getApplicationContext(), fruits[position] + " 선택", Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```


4:13
ListViewEditEx
ADD
MODIFY
DELETE


4:14
ListViewEditEx
LIST1 ○
LIST2 ○
LIST3 ○
LIST4 ○
ADD
MODIFY
DELETE


4:14
ListViewEditEx
LIST1 ○
2번 아이템 수정 ●
LIST3 ○
LIST4 ○
ADD
MODIFY
DELETE


4:14
ListViewEditEx
LIST1 ○
LIST3 ○
LIST4 ○
ADD
MODIFY
DELETE

activity_main.xml

```xml
<?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=".MainActivity">

    <ListView
        android:id="@+id/listview"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:choiceMode="singleChoice"
        android:layout_marginBottom="10dp"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <Button
            android:id="@+id/btn_add"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Add" />

        <Button
            android:id="@+id/btn_modify"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Modify" />

        <Button
            android:id="@+id/btn_delete"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Delete" />

    </LinearLayout>
</LinearLayout>
```

MainActivity.java

```
public class MainActivity extends AppCompatActivity {

    ListView listview;
    ArrayList<String> items;

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

        items = new ArrayList<String>() ;
        final ArrayAdapter adapter = new ArrayAdapter(this, android.R.layout.simple_list_item_single_choice, items) ;
        listview = findViewById(R.id.listview);
        listview.setAdapter(adapter) ;

    }
}
```

MainActivity.java

```java
public class MainActivity extends AppCompatActivity {

    ListView listview;
    ArrayList<String> items;
    Button btn_add;

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

        items = new ArrayList<String>() ;
        final ArrayAdapter adapter = new ArrayAdapter(this, android.R.layout.simple_list_item_single_choice, items);
        listview = findViewById(R.id.listview);
        listview.setAdapter(adapter) ;

        btn_add = findViewById(R.id.btn_add) ;
        btn_add.setOnClickListener(new Button.OnClickListener() {
            public void onClick(View v) {
                int count = adapter.getCount();
                // 아이템 추가.
                items.add("LIST" + Integer.toString(count + 1));
                // listview 갱신
               adapter.notifyDataSetChanged();
            }
        }) ;
    }
}
```

MainActivity.java

```
public class MainActivity extends AppCompatActivity {

    Button btn_modify;

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

        // modify button에 대한 이벤트 처리.
        btn_modify = findViewById(R.id.btn_modify) ;
        btn_modify.setOnClickListener(new Button.OnClickListener() {
            public void onClick(View v) {
                int checked ;
                int count = adapter.getCount() ;
                if (count > 0) {
                    // 현재 선택된 아이템의 position 획득.
                    checked = listview.getCheckedItemPosition();
                    if (checked > -1 && checked < count) {
                        // 아이템 수정
                        items.set(checked, Integer.toString(checked+1) + "번 아이템 수정") ;
                        // listview 갱신
                        adapter.notifyDataSetChanged();
                    }
                }
            }
        });
    }
}
```

MainActivity.java

```java
public class MainActivity extends AppCompatActivity {

    Button btn_delete

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

        // delete button에 대한 이벤트 처리.
        Button btn_delete = (Button)findViewById(R.id.btn_delete) ;
        btn_delete.setOnClickListener(new Button.OnClickListener() {
            public void onClick(View v) {
                int count, checked ;
                count = adapter.getCount() ;

                if (count > 0) {
                    // 현재 선택된 아이템의 position 획득.
                    checked = listview.getCheckedItemPosition();

                    if (checked > -1 && checked < count) {
                        // 아이템 삭제
                        items.remove(checked) ;
                        // listview 선택 초기화.
                        listview.clearChoices();
                        // listview 갱신.
                        adapter.notifyDataSetChanged();
                    }
                }
            }
        }) ;
    }
}
```

MainActivity.java

```
public class MainActivity extends AppCompatActivity {

    ListView listview;
    ArrayList<String> items;

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

        // 빈 데이터 리스트 생성.
        items = new ArrayList<String>() ;
        // ArrayAdapter 생성. 아이템 View를 선택(single choice)가능하도록 만듦.
        final ArrayAdapter adapter = new ArrayAdapter(this, android.R.layout.simple_list_item_single_choice, items) ;

        // listview 생성 및 adapter 지정.
        listview = findViewById(R.id.listview);
        listview.setAdapter(adapter) ;

        Button btn_add = (Button)findViewById(R.id.btn_add) ;
        btn_add.setOnClickListener(new Button.OnClickListener() {
            public void onClick(View v) {
                int count = adapter.getCount();
                // 아이템 추가.
                items.add("LIST" + Integer.toString(count + 1));
                // listview 갱신
        adapter.notifyDataSetChanged();
            }
        }) ;
```

MainActivity.java

```
// modify button에 대한 이벤트 처리.
Button btn_modify = (Button)findViewById(R.id.btn_modify) ;
btn_modify.setOnClickListener(new Button.OnClickListener() {
    public void onClick(View v) {
        int checked ;
        int count = adapter.getCount() ;

        if (count > 0) {
            // 현재 선택된 아이템의 position 획득.
            checked = listview.getCheckedItemPosition();
            if (checked > -1 && checked < count) {
                // 아이템 수정
    items.set(checked, Integer.toString(checked+1) + "번 아이템 수정") ;

                // listview 갱신
    adapter.notifyDataSetChanged();
            }
        }
    }
});
```

MainActivity.java

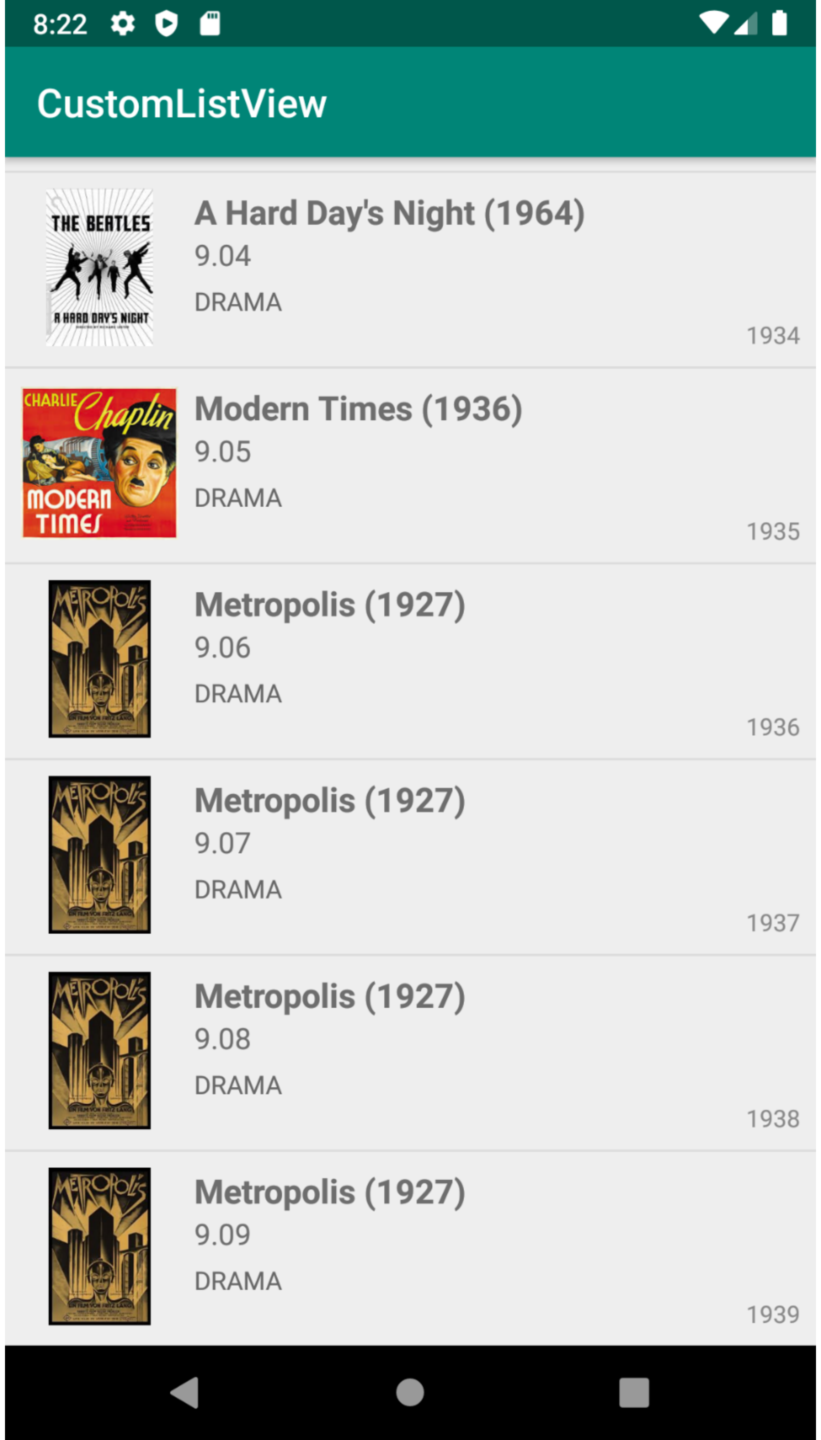
```
    // delete button에 대한 이벤트 처리.
    Button btn_delete = (Button)findViewById(R.id.btn_delete) ;
    btn_delete.setOnClickListener(new Button.OnClickListener() {
      public void onClick(View v) {
        int count, checked ;
        count = adapter.getCount() ;

        if (count > 0) {
          // 현재 선택된 아이템의 position 획득.
          checked = listview.getCheckedItemPosition();

          if (checked > -1 && checked < count) {
            // 아이템 삭제
      items.remove(checked) ;

            // listview 선택 초기화.
            listview.clearChoices();

            // listview 갱신.
            adapter.notifyDataSetChanged();
          }
        }
      }
    }) ;
  }
}
```

10.4. 나만의 어댑터 만들기 : BaseAdapter

좀 더 복잡한 데이터와 레이아웃을 표현하고자 한다면 나만의 어댑터를 작성해야 한다

1. 모델 클래스 생성
2. 커스텀 어댑터 생성

CustomListView



8:22

CustomListView

A Hard Day's Night (1964)
9.04
DRAMA
1934

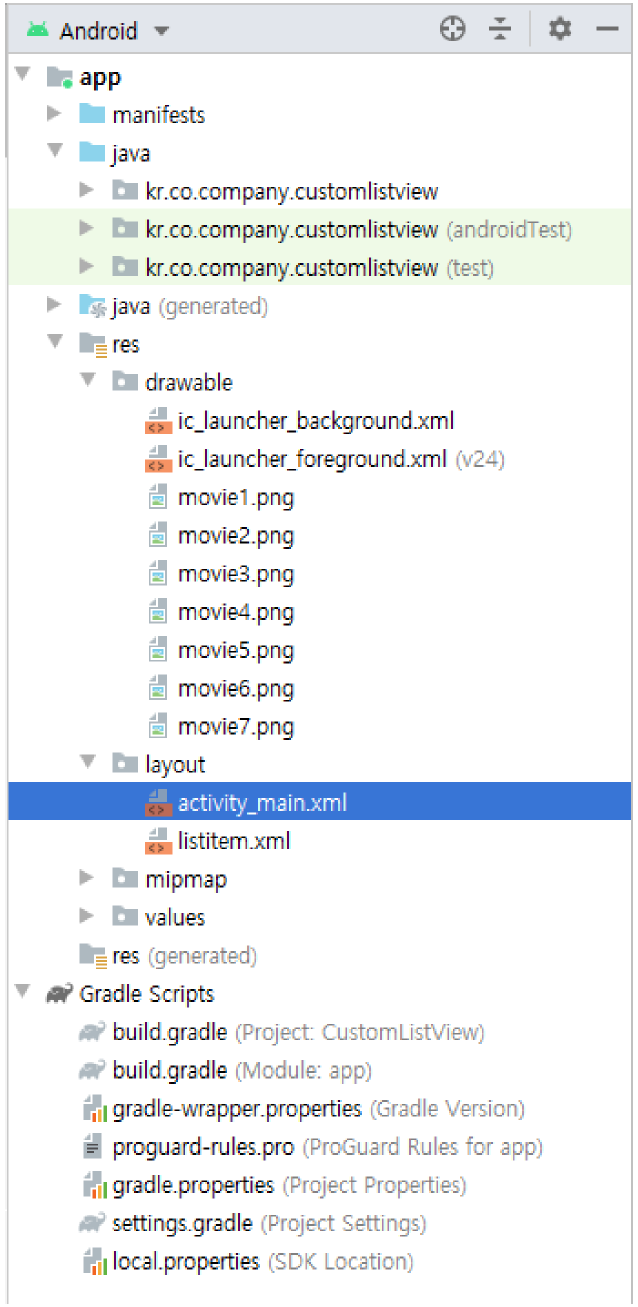
Modern Times (1936)
9.05
DRAMA
1935

Metropolis (1927)
9.06
DRAMA
1936

Metropolis (1927)
9.07
DRAMA
1937

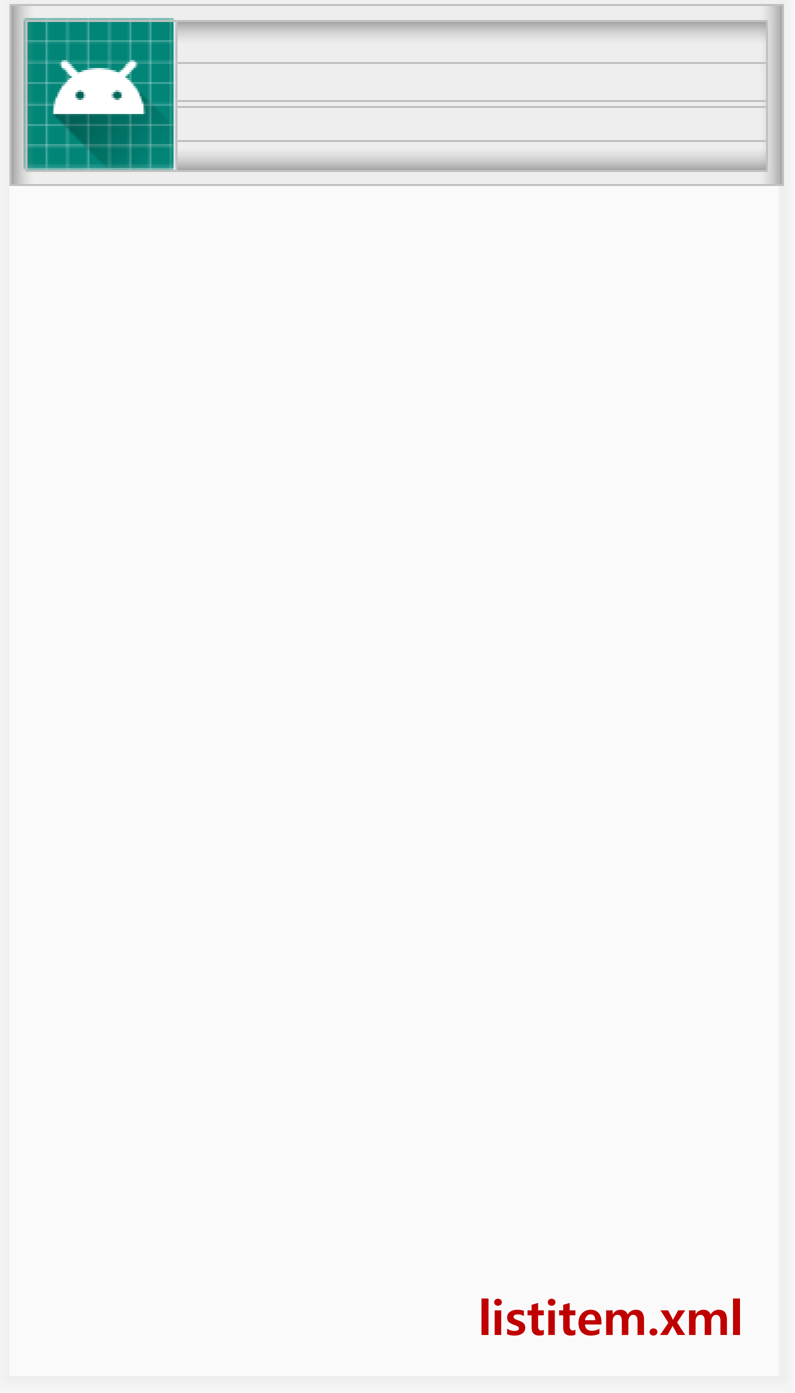
Metropolis (1927)
9.08
DRAMA
1938

Metropolis (1927)
9.09
DRAMA
1939



```
Android
app
  manifests
  java
    kr.co.company.customlistview
    kr.co.company.customlistview (androidTest)
    kr.co.company.customlistview (test)
  java (generated)
  res
    drawable
      ic_launcher_background.xml
      ic_launcher_foreground.xml (v24)
      movie1.png
      movie2.png
      movie3.png
      movie4.png
      movie5.png
      movie6.png
      movie7.png
    layout
      activity_main.xml
      listitem.xml
    mipmap
    values
  res (generated)
Gradle Scripts
  build.gradle (Project: CustomListView)
  build.gradle (Module: app)
  gradle-wrapper.properties (Gradle Version)
  proguard-rules.pro (ProGuard Rules for app)
  gradle.properties (Project Properties)
  settings.gradle (Project Settings)
  local.properties (SDK Location)
```

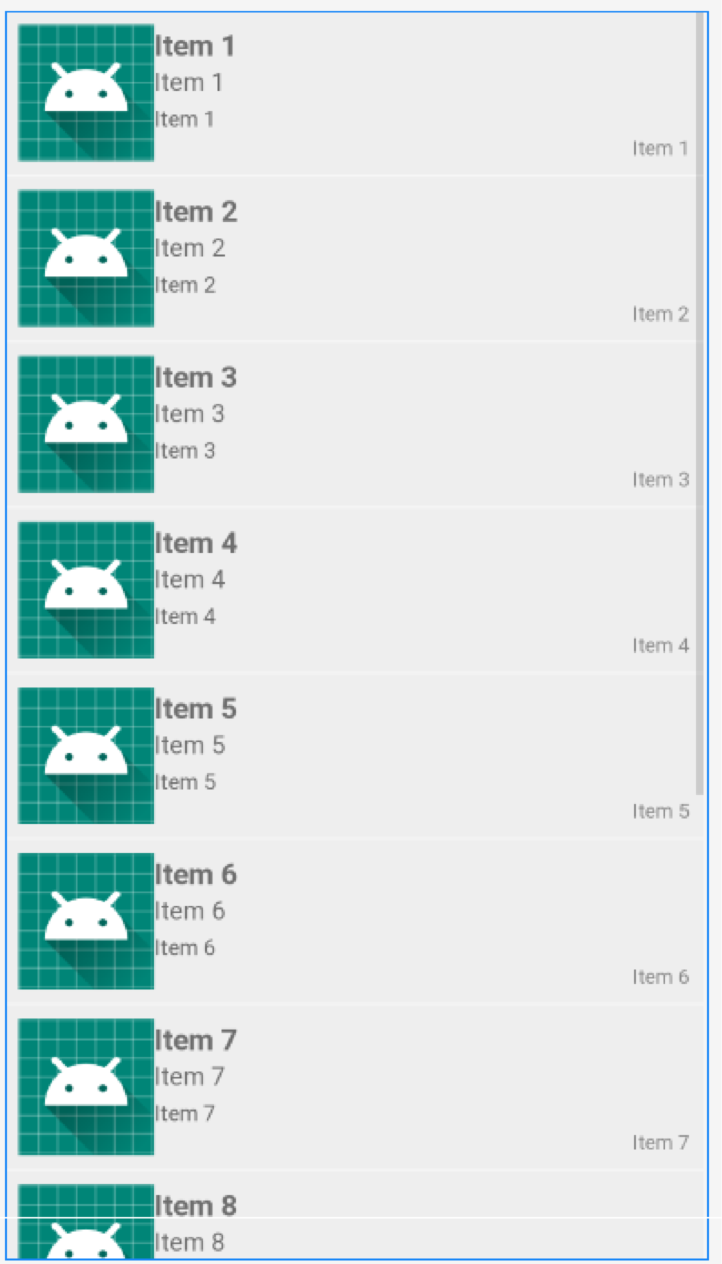
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="#eeeeee"
    android:padding="8dp" >
    <ImageView
        android:id="@+id/movie_image"
        android:layout_width="80dp"
        android:layout_height="80dp"
        android:src="@mipmap/ic_launcher"/>

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

        <TextView
            android:id="@+id/movie_title"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="17dp"
            android:textStyle="bold" />

        <TextView
            android:id="@+id/movie_rating"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textSize="15dp" />

        <TextView
            android:id="@+id/movie_genre"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="3dp"
            android:textColor="#666666"
            android:textSize="13dp" />

        <TextView
            android:id="@+id/movie_releaseYear"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:textColor="#888888"
            android:gravity="right"
            android:textSize="12dp" />
    </LinearLayout>

</LinearLayout>
```



listitem.xml

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"
    tools:context=".MainActivity" >
    <ListView
        android:id="@+id/list_movie"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        tools:listitem="@layout/listitem" >
    </ListView>
</LinearLayout>
```



Item 1
Item 1
Item 1
Item 1

Item 2
Item 2
Item 2
Item 2

Item 3
Item 3
Item 3
Item 3

Item 4
Item 4
Item 4
Item 4

Item 5
Item 5
Item 5
Item 5

Item 6
Item 6
Item 6
Item 6

Item 7
Item 7
Item 7
Item 7

Item 8
Item 8

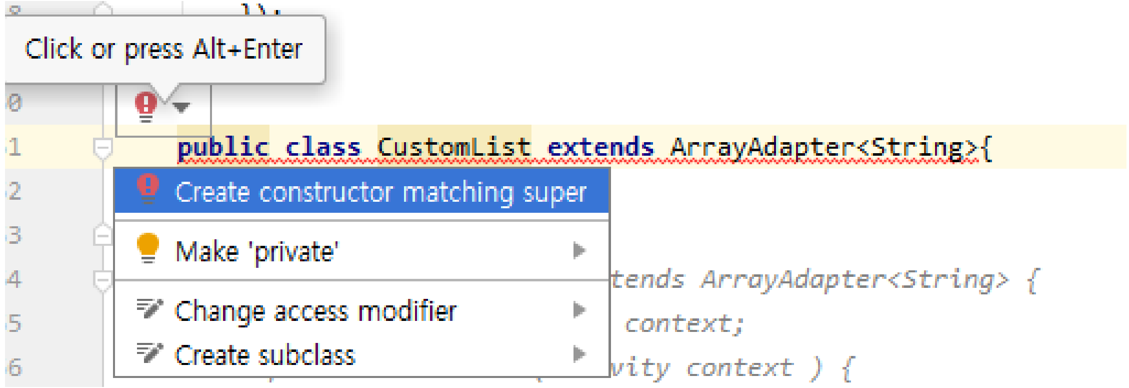
MainActivity.java

```java
public class MainActivity extends  AppCompatActivity {
    ListView list_movie;
    String[] titles = {
            "The Wizard of Oz (1939)",
            "Citizen Kane (1941)",
            "All About Eve (1950)",
            "The Third Man (1949)",
            "A Hard Day's Night (1964)",
            "Modern Times (1936)",
            "Metropolis (1927)",
            "Metropolis (1927)",
            "Metropolis (1927)",
            "Metropolis (1927)"
    } ;
    Integer[] images = {
            R.drawable.movie1,
            R.drawable.movie2,
            R.drawable.movie3,
            R.drawable.movie4,
            R.drawable.movie5,
            R.drawable.movie6,
            R.drawable.movie7,
            R.drawable.movie7,
            R.drawable.movie7,
            R.drawable.movie7
    };
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
```

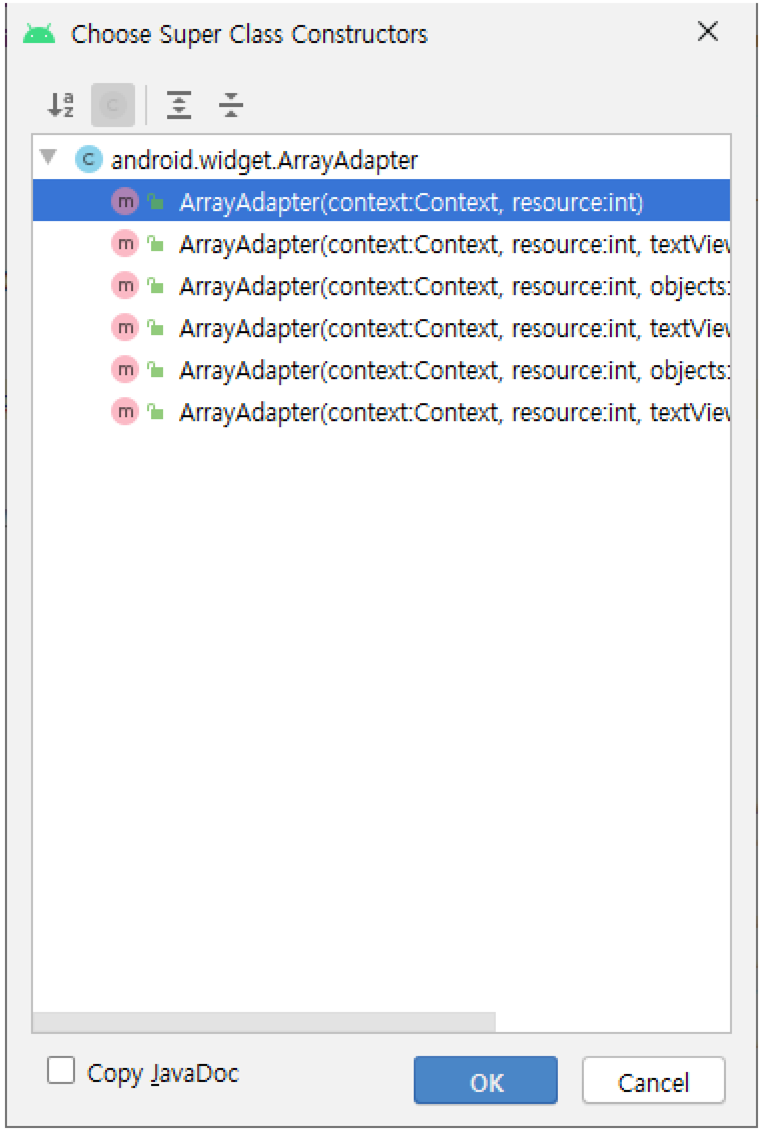
MainActivity.java

```
public class MainActivity extends  AppCompatActivity {
    ListView list_movie;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        CustomList adapter = new CustomList(MainActivity.this);
        list_movie=(ListView)findViewById(R.id.list_movie);
        list_movie.setAdapter(adapter);
        list_movie.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
                Toast.makeText(getApplicationContext(), titles[+position], Toast.LENGTH_SHORT).show();
            }
        });

        list_movie.setAdapter(adapter);

    }
}
```

```
public class CustomList extends ArrayAdapter<String>{}
```



```
public class CustomList extends ArrayAdapter<String>{
```



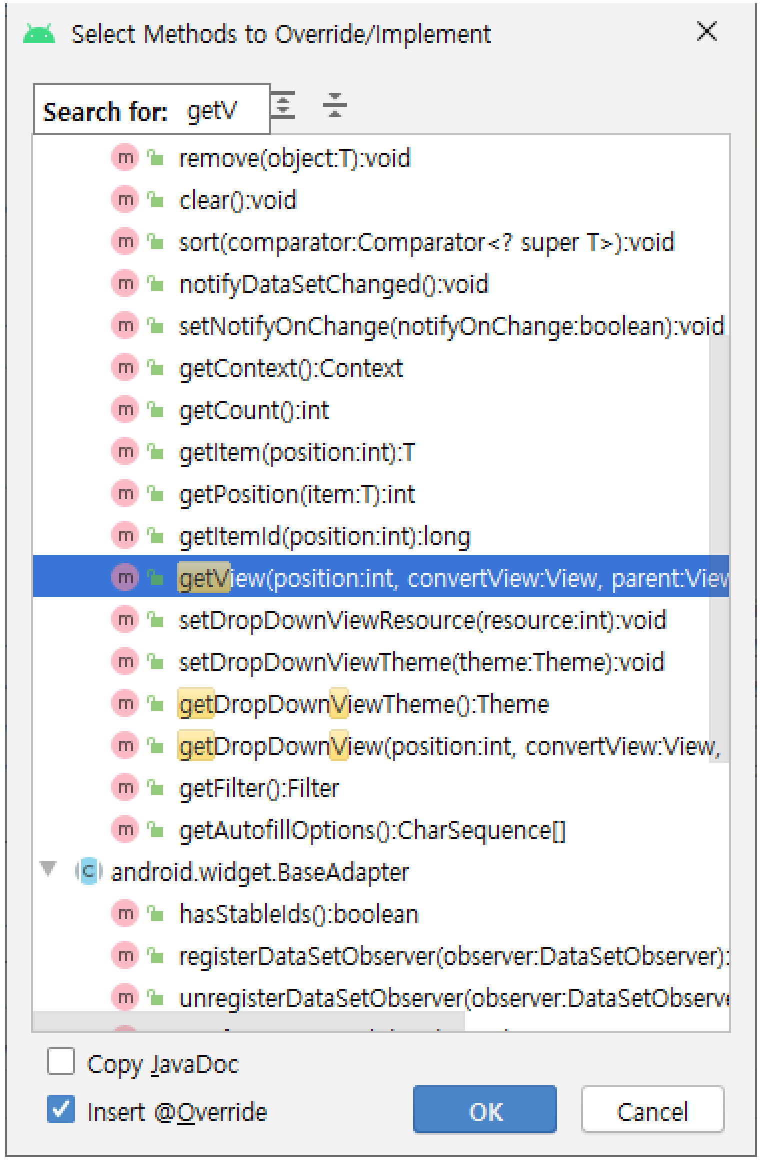
Choose Super Class Constructors
android.widget.ArrayAdapter
ArrayAdapter(context:Context, resource:int)
ArrayAdapter(context:Context, resource:int, textViev
ArrayAdapter(context:Context, resource:int, objects:
ArrayAdapter(context:Context, resource:int, textViev
ArrayAdapter(context:Context, resource:int, objects:
ArrayAdapter(context:Context, resource:int, textViev
□ Copy JavaDoc
OK
Cancel

```
public class CustomList extends ArrayAdapter<String>{

    public CustomList(@NonNull Context context, int resource) {
        super(context, resource);
    }
}
```

```
private final Activity context;
public CustomList(@NonNull Activity context) {
    super(context, R.layout.listitem, titles);
    this.context = context;
}
```

```
public class CustomList extends ArrayAdapter<String>{

    @NonNull
    @Override
    public View getView(int position, @Nullable View convertView, @NonNull ViewGroup parent) {
        return super.getView(position, convertView, parent);
    }
}
```

```
public View getView(int position, @Nullable View convertView, @NonNull ViewGroup parent) {
    LayoutInflater inflater = context.getLayoutInflater();
    View movieView = inflater.inflate(R.layout.listitem, null, true);
    ImageView imageView = (ImageView) rowView.findViewById(R.id.movie_image);
    TextView title = (TextView) rowView.findViewById(R.id.movie_title);
    TextView rating = (TextView) rowView.findViewById(R.id.movie_rating);
    TextView genre = (TextView) rowView.findViewById(R.id.movie_genre);
    TextView year = (TextView) rowView.findViewById(R.id.movie_releaseYear);

    title.setText(titles[position]);
    imageView.setImageResource(images[position]);
    rating.setText("9.0"+position);
    genre.setText("DRAMA");
    year.setText(1930+position+"");
    return movieView;
}
```



Select Methods to Override/Implement

Search for: getV

- remove(object:T):void
- clear():void
- sort(comparator:Comparator<? super T>):void
- notifyDataSetChanged():void
- setNotifyOnChange(notifyOnChange:boolean):void
- getContext():Context
- getCount():int
- getItem(position:int):T
- getPosition(item:T):int
- getItemId(position:int):long
- getView(position:int, convertView:View, parent:View
- setDropDownViewResource(resource:int):void
- setDropDownViewTheme(theme:Theme):void
- getDropDownViewTheme():Theme
- getDropDownView(position:int, convertView:View,
- getFilter():Filter
- getAutofillOptions():CharSequence[]

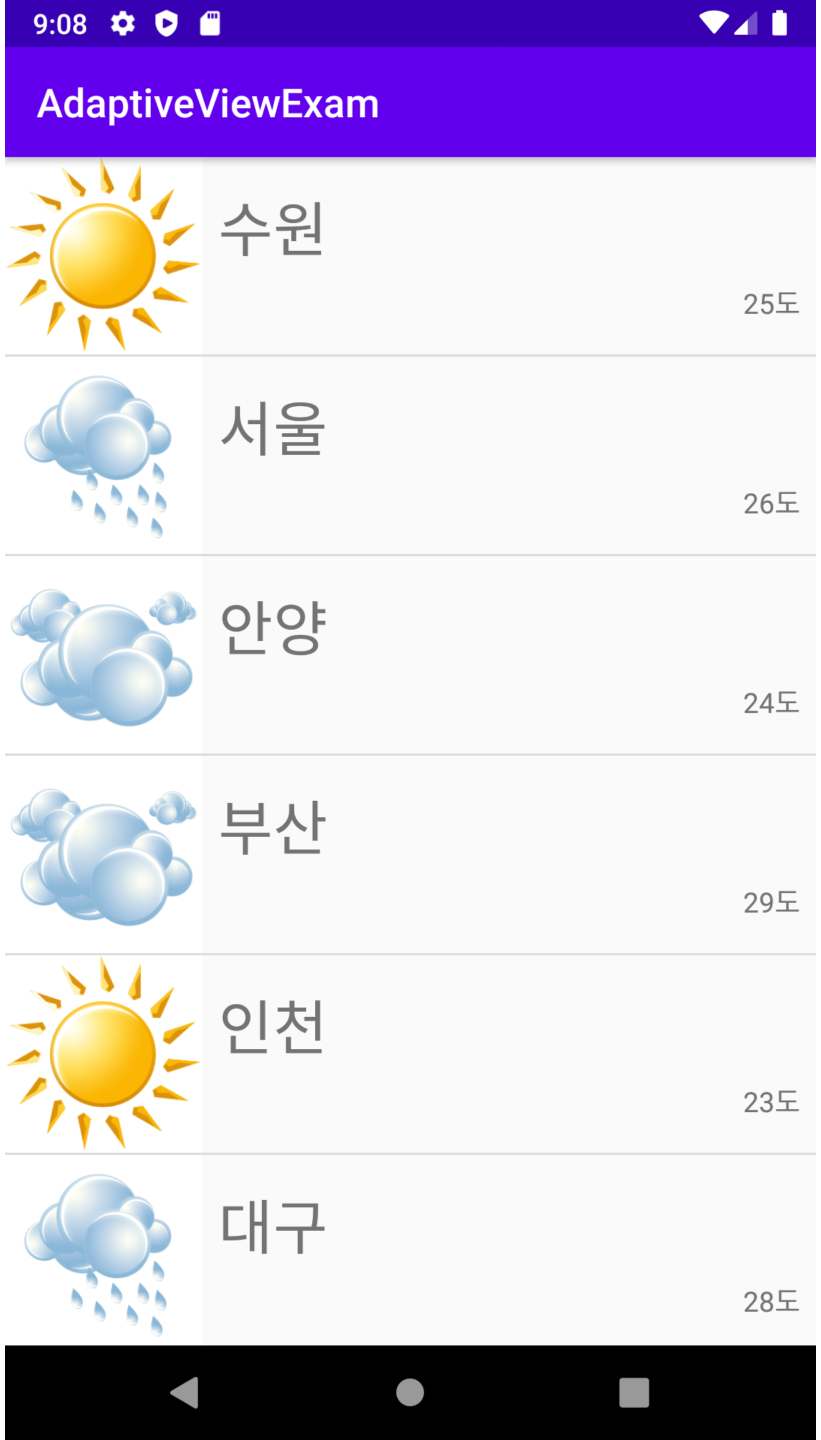
android.widget.BaseAdapter

- hasStableIds():boolean
- registerDataSetObserver(observer:DataSetObserver):
- unregisterDataSetObserver(observer:DataSetObserve

☐ Copy JavaDoc

☑ Insert @Override

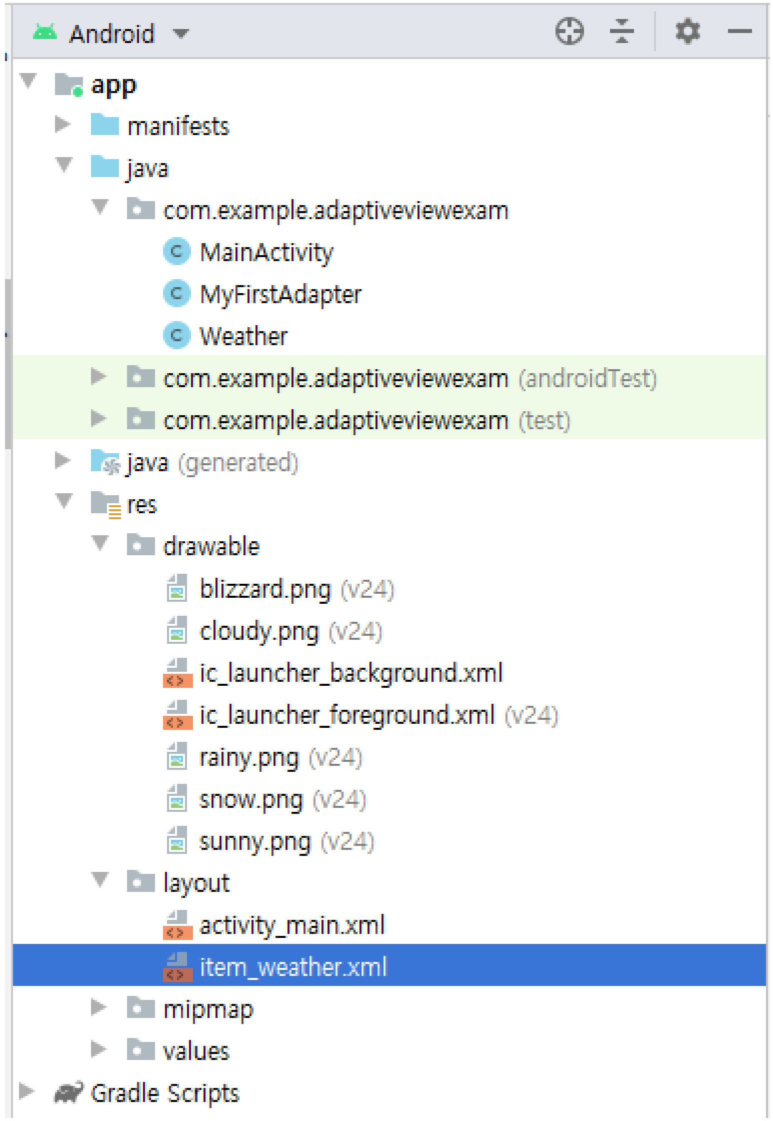
```java
public class CustomList extends ArrayAdapter<String> {
    private final Activity context;
    public CustomList(Activity context ) {
        super(context, R.layout.listitem, titles);
        this.context = context;
    }
    @Override
    public View getView(int position, View view, ViewGroup parent) {
        LayoutInflater inflater = context.getLayoutInflater();
        View rowView= inflater.inflate(R.layout.listitem, null, true);
        ImageView imageView = (ImageView) rowView.findViewById(R.id.movie_image);
        TextView title = (TextView) rowView.findViewById(R.id.movie_title);
        TextView rating = (TextView) rowView.findViewById(R.id.movie_rating);
        TextView genre = (TextView) rowView.findViewById(R.id.movie_genre);
        TextView year = (TextView) rowView.findViewById(R.id.movie_releaseYear);

        title.setText(titles[position]);
        imageView.setImageResource(images[position]);
        rating.setText("9.0"+position);
        genre.setText("DRAMA");
        year.setText(1930+position+"");
        return rowView;
    }
}
```



9:08

AdaptiveViewExam

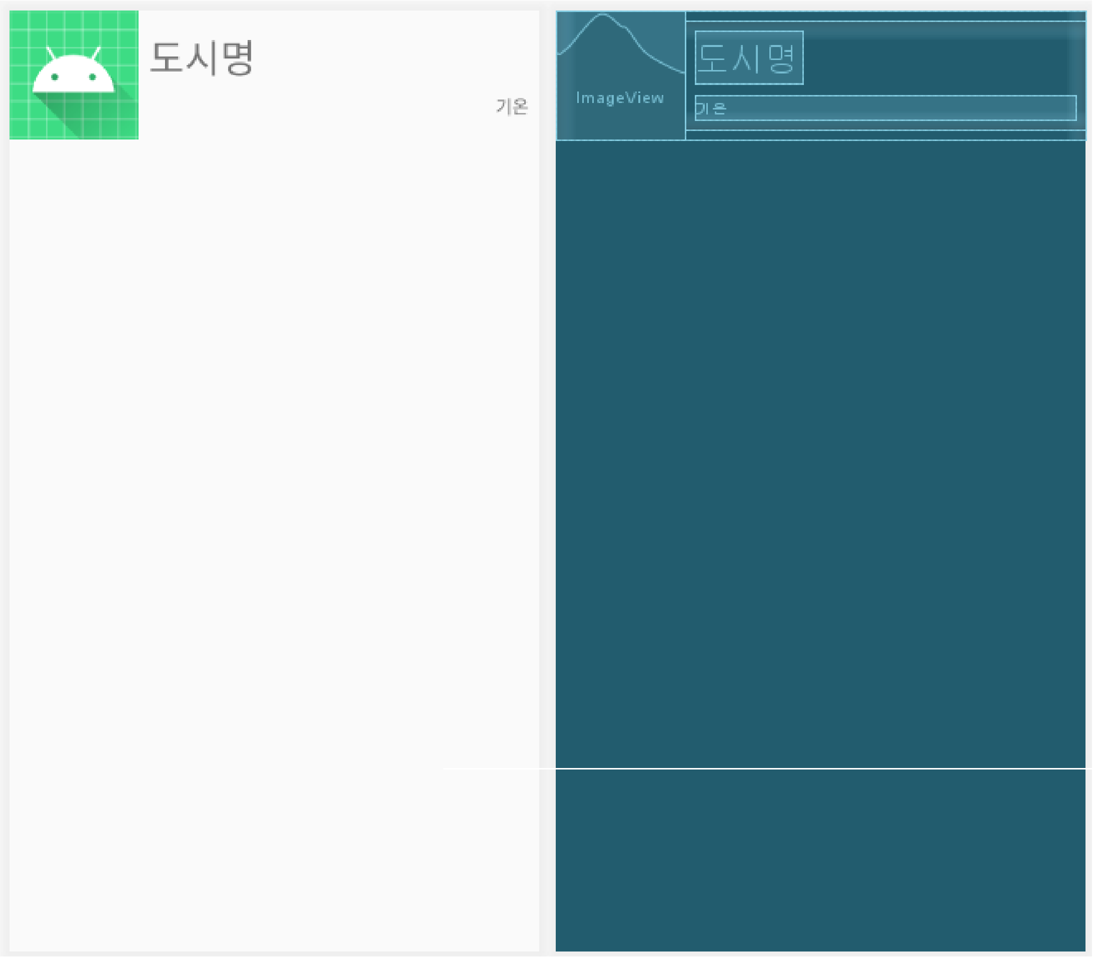
수원	25도
서울	26도
안양	24도
부산	29도
인천	23도
대구	28도



```
app
  manifests
  java
    com.example.adaptiveviewexam
      MainActivity
      MyFirstAdapter
      Weather
    com.example.adaptiveviewexam (androidTest)
    com.example.adaptiveviewexam (test)
  java (generated)
  res
    drawable
      blizzard.png (v24)
      cloudy.png (v24)
      ic_launcher_background.xml
      ic_launcher_foreground.xml (v24)
      rainy.png (v24)
      snow.png (v24)
      sunny.png (v24)
    layout
      activity_main.xml
      item_weather.xml
    mipmap
    values
Gradle Scripts
```

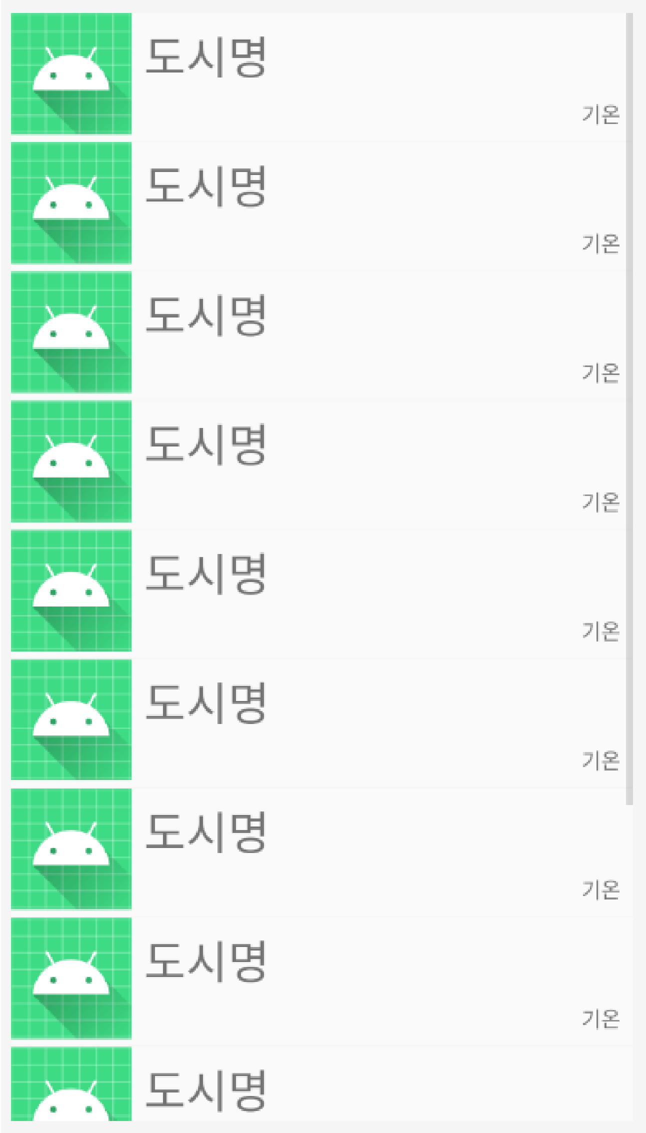
item_weather.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content">

    <ImageView
        android:id="@+id/weather_image"
        android:layout_width="80dp"
        android:layout_height="80dp"
        android:src="@mipmap/ic_launcher" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:orientation="vertical"
        android:padding="8dp">

        <TextView
            android:id="@+id/city_text"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="도시명"
            android:textSize="30dp" />

        <TextView
            android:id="@+id/temp_text"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="8dp"
            android:gravity="end"
            android:text="기온" />

    </LinearLayout>
</LinearLayout>
```



activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:context=".MainActivity">

    <ListView
        android:id="@+id/list_view"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:listitem="@layout/item_weather" />
</LinearLayout>
```

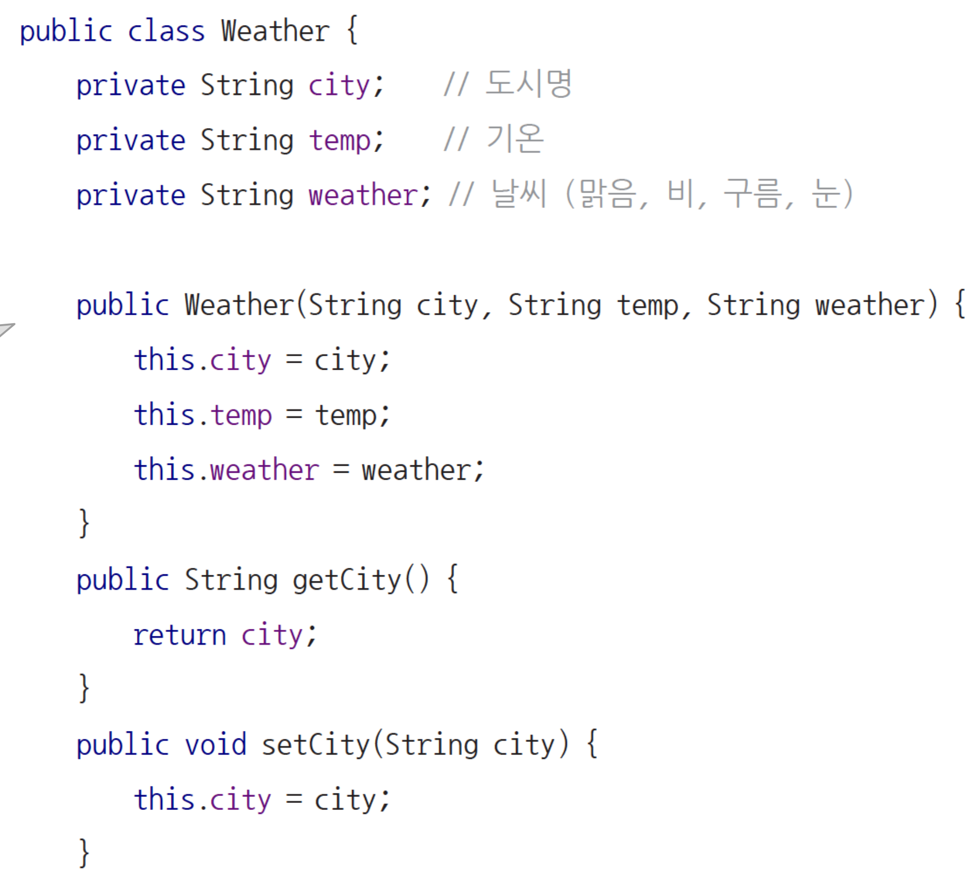


Weather class 생성

모델 클래스 생성

모델 클래스 작성 순서

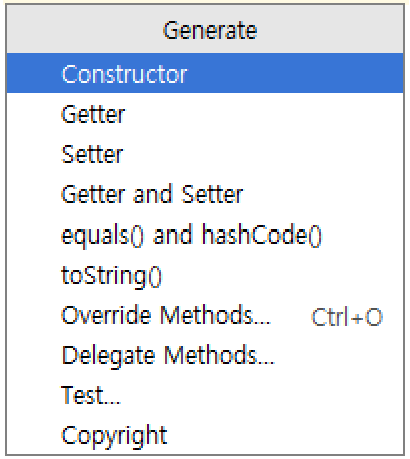
1. 클래스를 새로 생성한다
2. 필요한 멤버 변수를 선언한다
3. 필요하면 생성자를 만든다
4. 멤버 변수들은 게터/세터를 만든다
5. 필요시 toString()을 재정의한다
6. 필요시 equals(), hashcode()를 재정의한다

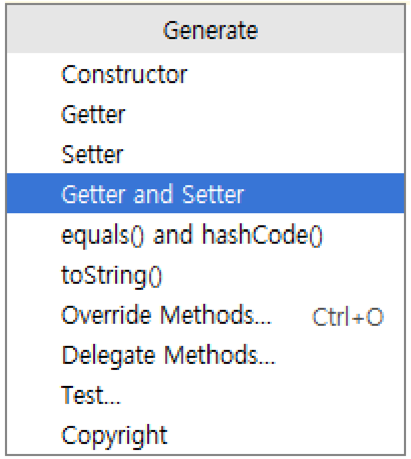


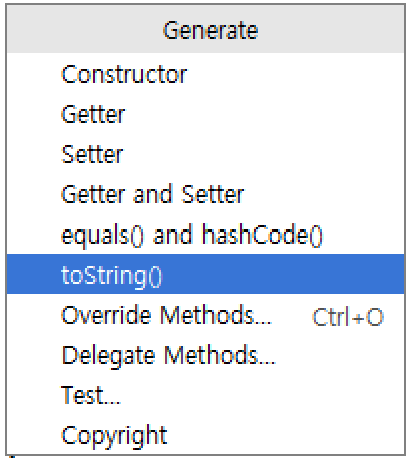
```
public class Weather {
    private String city;    // 도시명
    private String temp;    // 기온
    private String weather; // 날씨 (맑음, 비, 구름, 눈)

    public Weather(String city, String temp, String weather) {
        this.city = city;
        this.temp = temp;
        this.weather = weather;
    }
    public String getCity() {
        return city;
    }
    public void setCity(String city) {
        this.city = city;
    }
```

Weather.java

```
public class Weather {
    private String city;
    private String temp;
    private String weather;
}
```

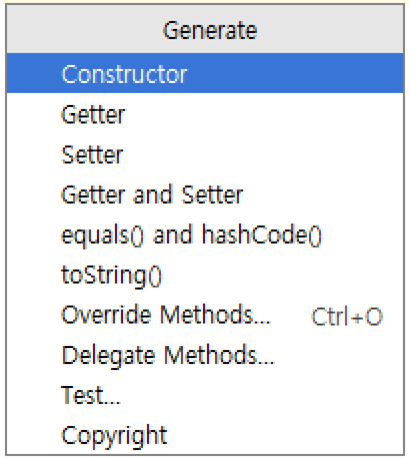


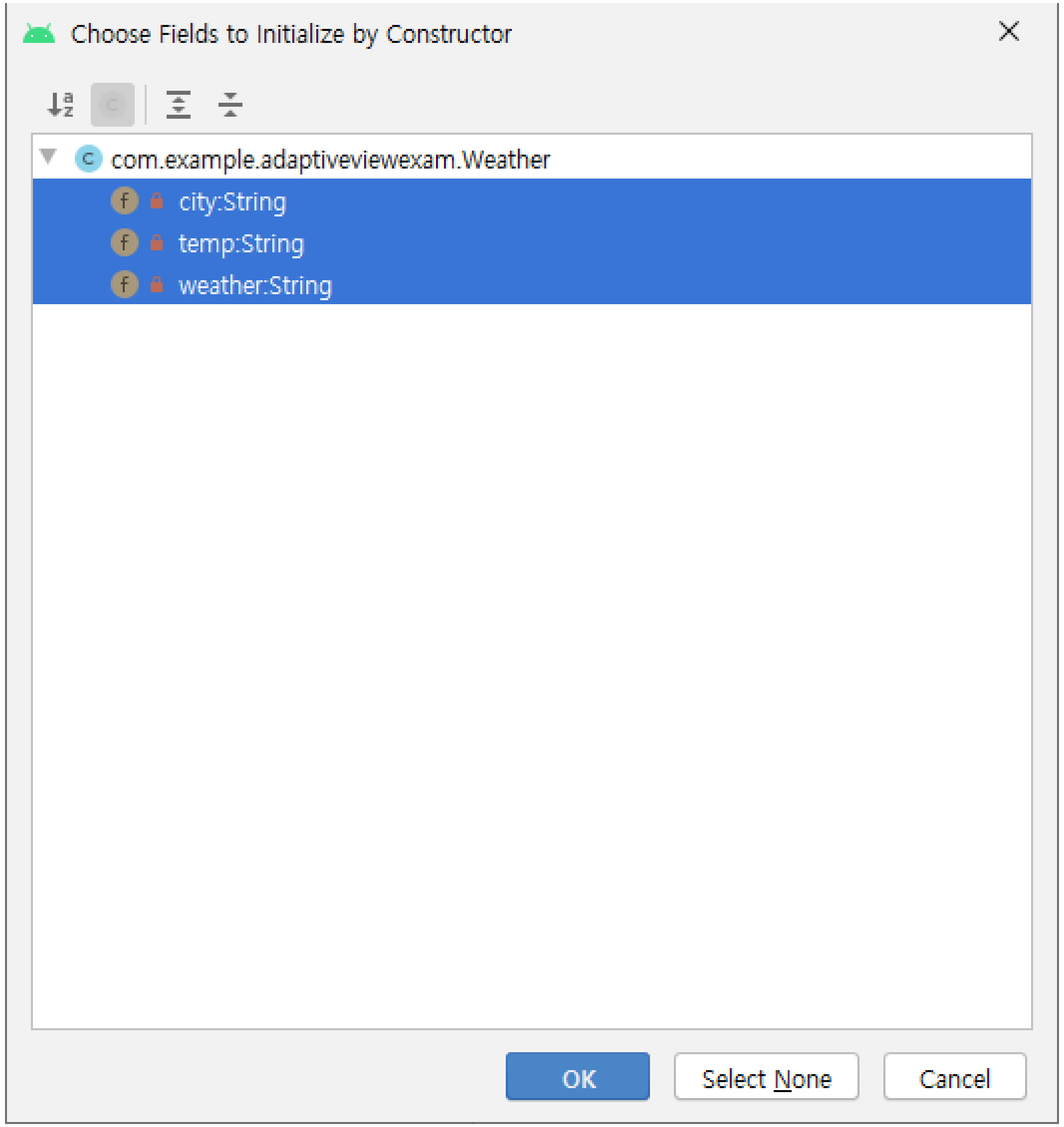




Weather.java

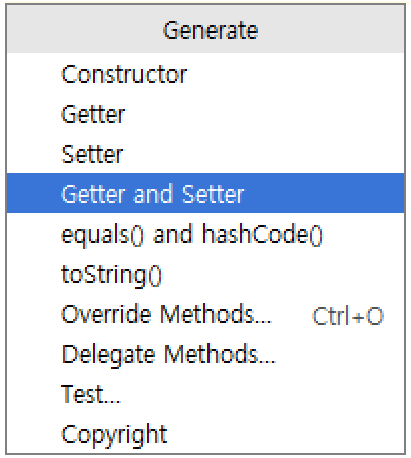
```
public Weather(String city, String temp, String weather) {
    this.city = city;
    this.temp = temp;
    this.weather = weather;
}
```

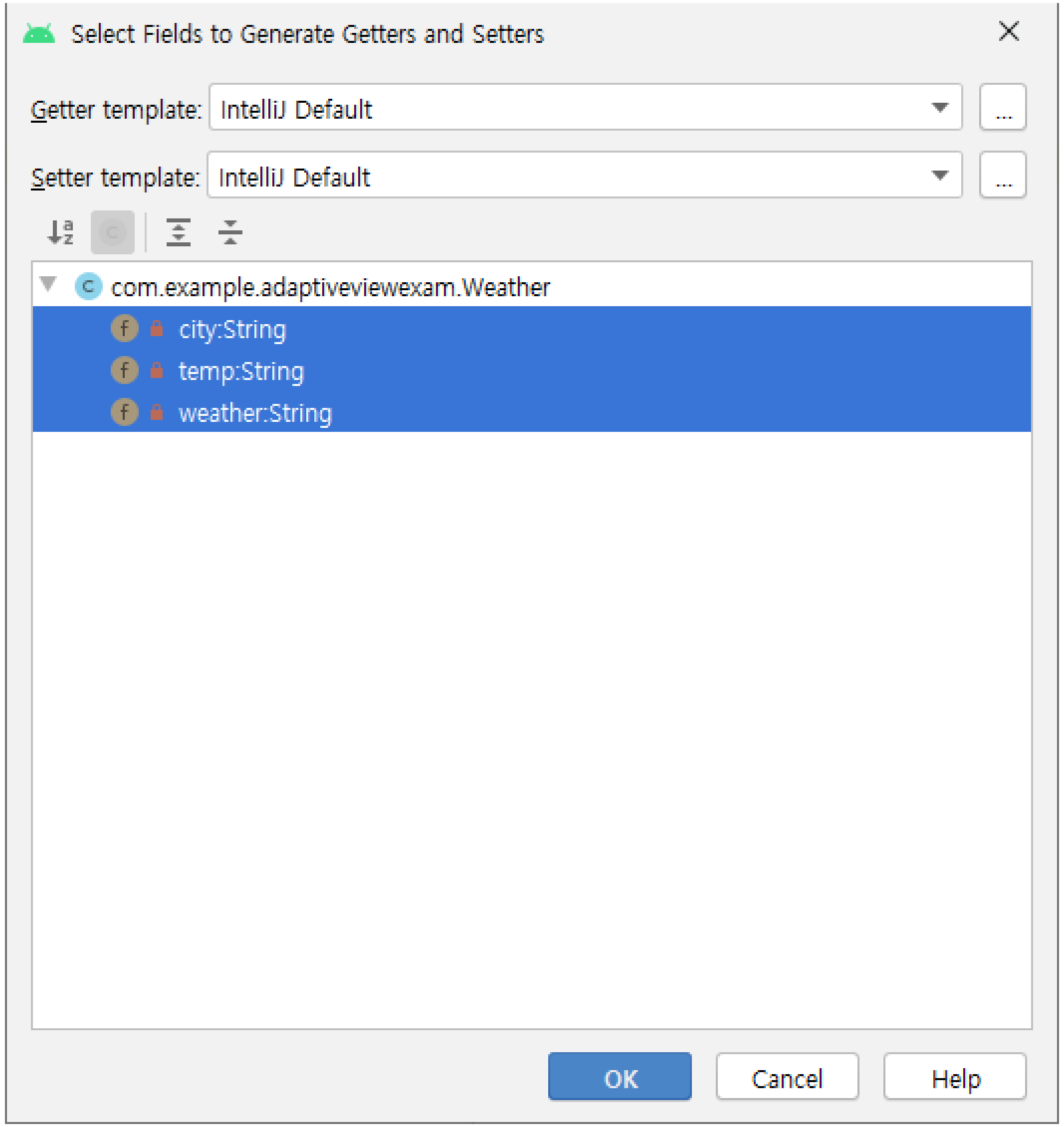



Choose Fields to Initialize by Constructor
com.example.adaptiveviewexam.Weather
city:String
temp:String
weather:String
OK
Select None
Cancel

Weather.java

```
public String getCity() {
    return city;
}

public void setCity(String city) {
    this.city = city;
}

public String getTemp() {
    return temp;
}

public void setTemp(String temp) {
    this.temp = temp;
}

public String getWeather() {
    return weather;
}

public void setWeather(String weather) {
    this.weather = weather;
}
```




Select Fields to Generate Getters and Setters

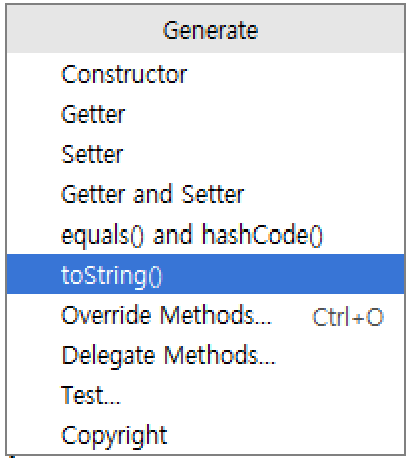
Getter template: IntelliJ Default

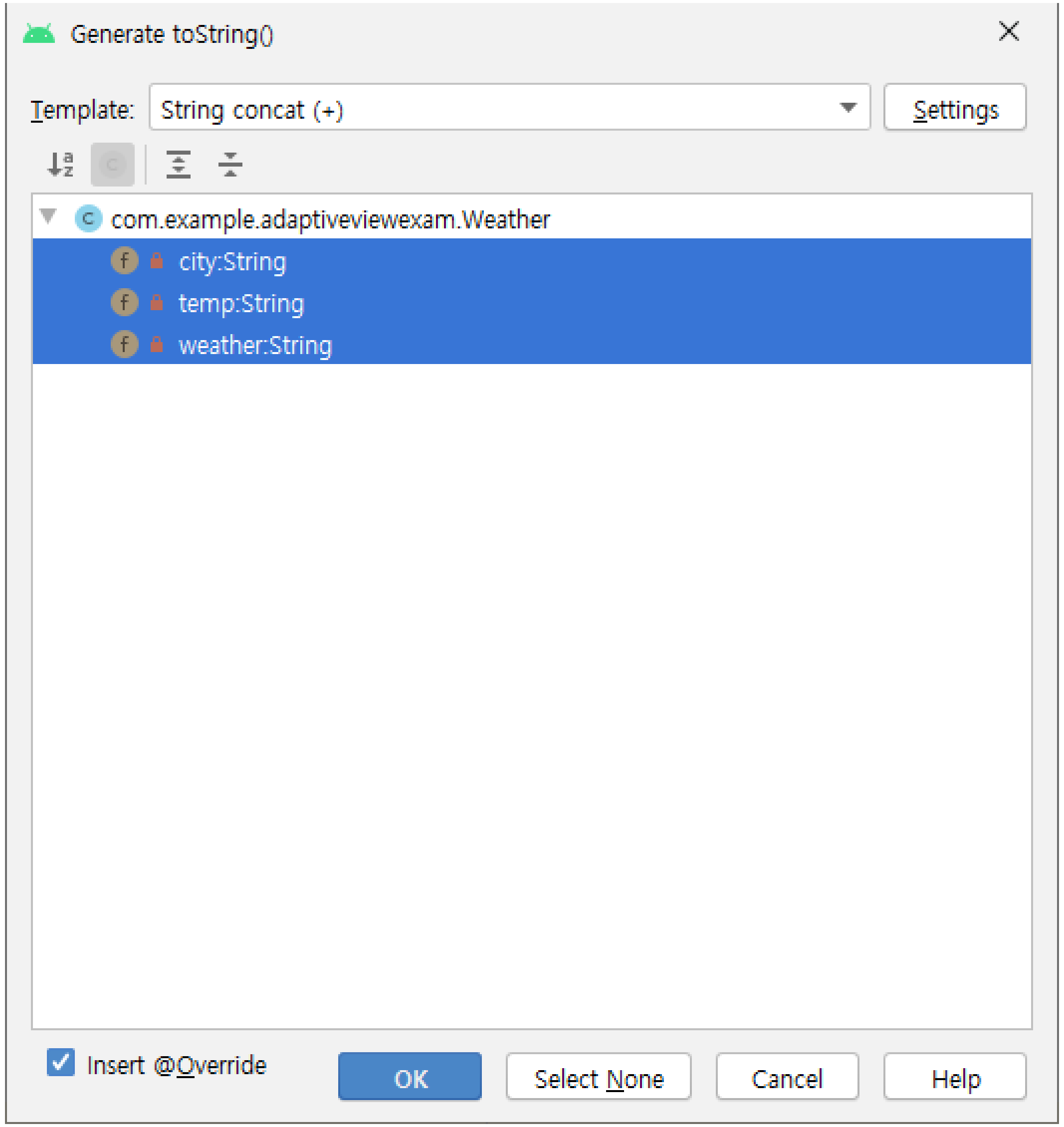
Setter template: IntelliJ Default

com.example.adaptiveviewexam.Weather
- city:String
- temp:String
- weather:String

Weather.java

```
@Override
public String toString() {
    return "Weather{" +
            "city='" + city + '\'' +
            ", temp='" + temp + '\'' +
            ", weather='" + weather + '\'' +
            '}';
}
```





Template: String concat (+)

com.example.adaptiveviewexam.Weather
- city:String
- temp:String
- weather:String

☑ Insert @Override

MyFirstAdapter.java

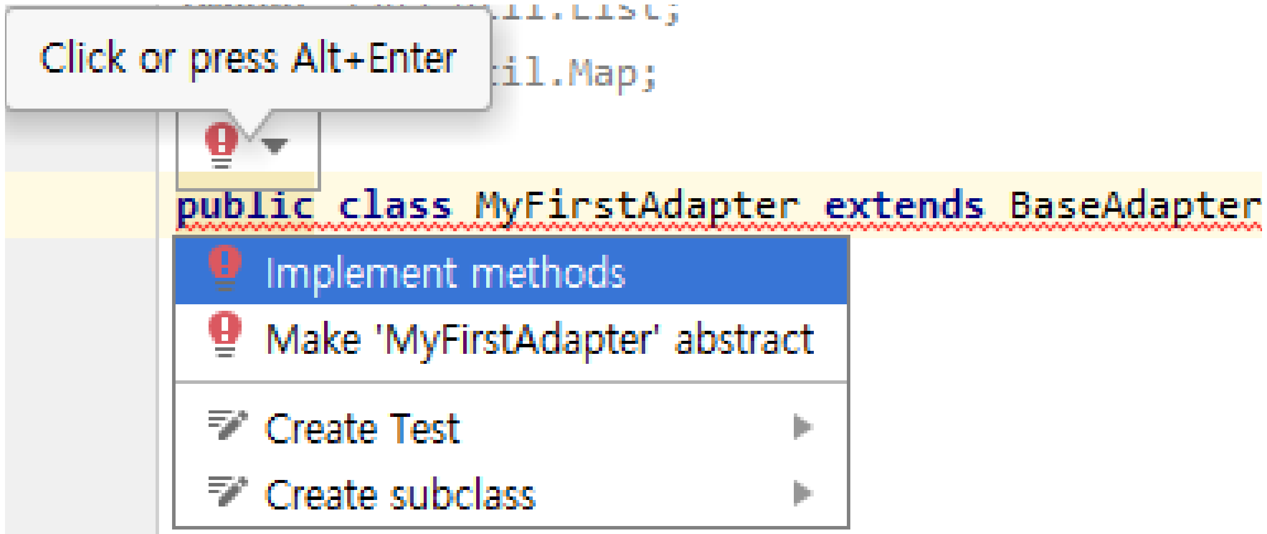
```
public class MyFirstAdapter extends BaseAdapter {}
```

커스텀 어댑터 작성 순서

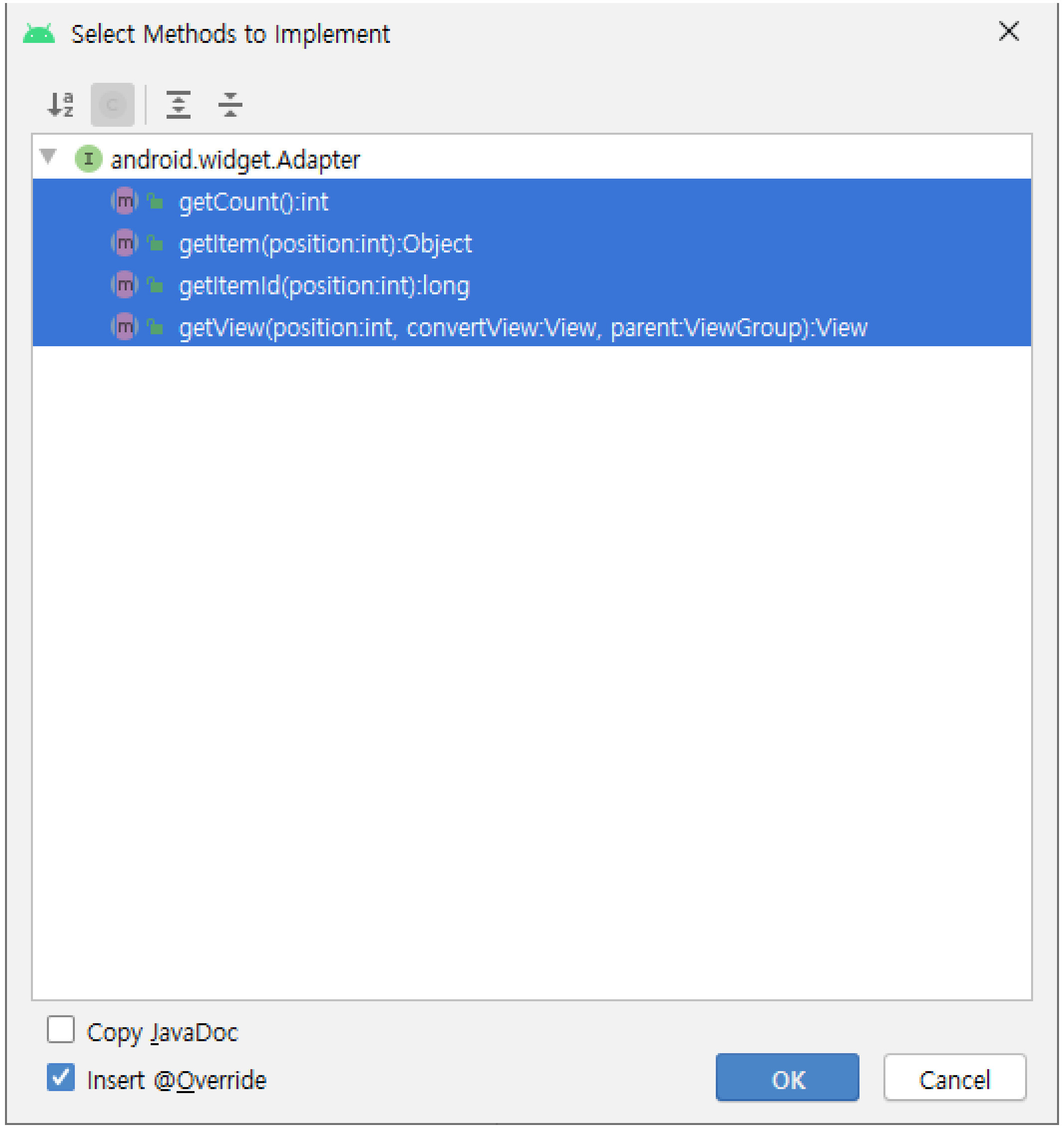
1. BaseAdapter를 상속 받는 클래스 생성
2. 네 가지 오버라이드 메서드를 구현한다
3. 필요시 생성자 또는 public 메서드 등을 추가하여 데이터를 받을 수 있도록 한다

MyFirstAdapter.java

```
public class MyFirstAdapter extends BaseAdapter {}
```



```
il.List;
il.Map;

public class MyFirstAdapter extends BaseAdapter
```



Select Methods to Implement
android.widget.Adapter
getCount():int
getItem(position:int):Object
getItemId(position:int):long
getView(position:int, convertView:View, parent:ViewGroup):View
OK
Cancel

□ Copy JavaDoc

☑ Insert @Override

MyFirstAdapter.java

```java
public class MyFirstAdapter extends BaseAdapter {
    @Override
    public int getCount() {
        return 0;
    }

    @Override
    public Object getItem(int position) {
        return null;
    }

    @Override
    public long getItemId(int position) {
        return 0;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        return null;
    }
}
```

MyFirstAdapter.java

```java
public class MyFirstAdapter extends BaseAdapter {

    private List<Weather> mData;

    @Override
    public int getCount() {
        return mData.size();
    }

    @Override
    public Object getItem(int position) {
        return mData.get(position);
    }

    @Override
    public long getItemId(int position) {
        return position;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        return null;
    }
}
```

MyFirstAdapter.java

```java
public class MyFirstAdapter extends BaseAdapter {

    private List<Weather> mData;

   @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        //작성한 레이아웃을 들고 와야 함
        convertView = LayoutInflater.from(parent.getContext())
                      .inflate(R.layout.item_weather, parent, false);

        ImageView weather_image = convertView.findViewById(R.id.weather_image);
        TextView city_text = convertView.findViewById(R.id.city_text);
        TextView temp_text = convertView.findViewById(R.id.temp_text);

        Weather weather = mData.get(position);
        city_text.setText(weather.getCity());
        temp_text.setText(weather.getTemp());

        return convertView;
    }
}
```

MyFirstAdapter.java

```java
public class MyFirstAdapter extends BaseAdapter {

    private List<Weather> mData;
    private Map<String, Integer> mWeatherImageMap;

    public MyFirstAdapter(List<Weather> mData) {
        this.mData = mData;
        mWeatherImageMap = new HashMap<>();
        mWeatherImageMap.put("맑음", R.drawable.sunny);
        mWeatherImageMap.put("폭설", R.drawable.blizzard);
        mWeatherImageMap.put("구름", R.drawable.cloudy);
        mWeatherImageMap.put("비", R.drawable.rainy);
        mWeatherImageMap.put("눈", R.drawable.snow);
    }


    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        ...
        weather_image.setImageResource(mWeatherImageMap.get(weather.getWeather()));
        ...
        return convertView;
    }
}
```

MyFirstAdapter.java

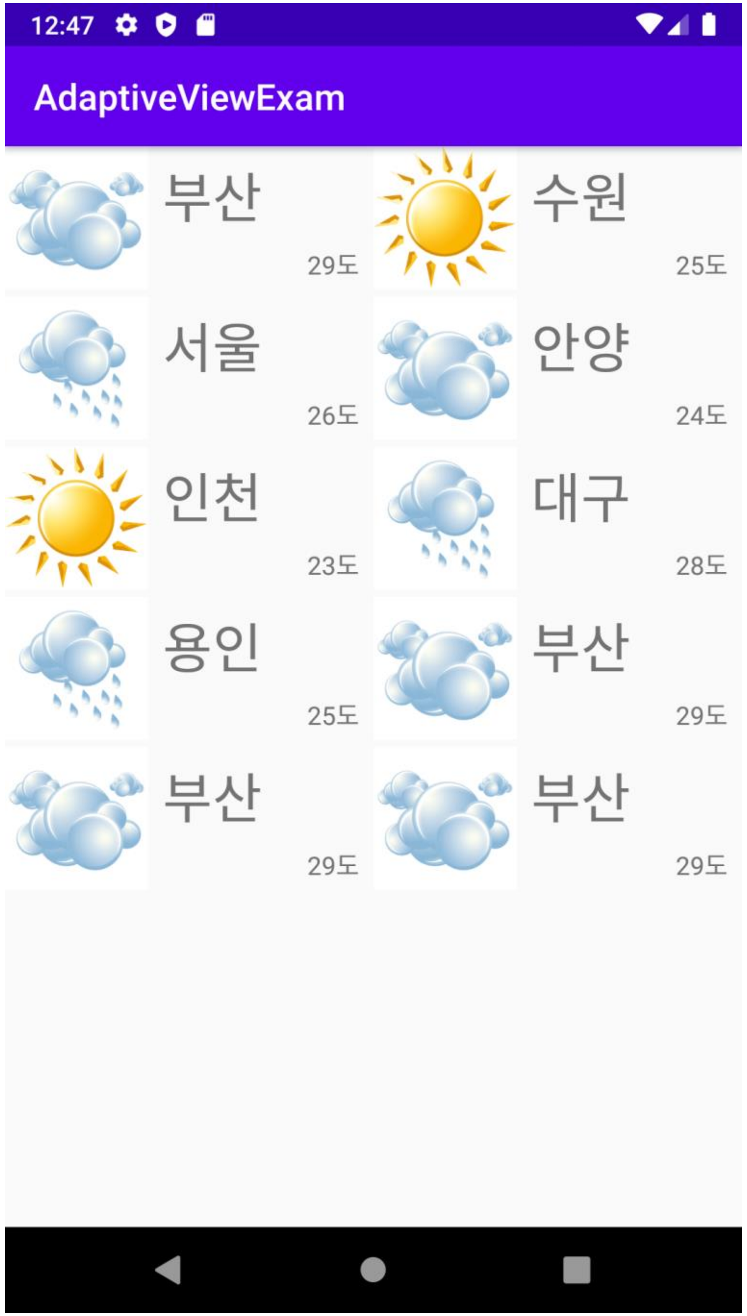
```java
@Override
public View getView(int position, View convertView, ViewGroup parent) {
    ViewHolder holder;

    if (convertView == null) {
        holder = new ViewHolder();
        convertView = LayoutInflater.from(parent.getContext())
                .inflate(R.layout.item_weather, parent, false);

        // 날씨, 도시, 기온 View
        ImageView weather_image = (ImageView) convertView.findViewById(R.id.weather_image);
        TextView city_text = (TextView) convertView.findViewById(R.id.city_text);
        TextView temp_text = (TextView) convertView.findViewById(R.id.temp_text);

        holder.weather_image = weather_image;
        holder.city_text = city_text;
        holder.temp_text = temp_text;

        convertView.setTag(holder);
    } else {
        holder = (ViewHolder) convertView.getTag();
    }


    // 현재 position 의 날씨 데이터
    Weather weather = mData.get(position);

    // 데이터 설정 => 홀더에 저장
    holder.city_text.setText(weather.getCity());
    holder.temp_text.setText(weather.getTemp());
    holder.weather_image.setImageResource(mWeatherImageMap.get(weather.getWeather()));

    return convertView;
}

static class ViewHolder {
    ImageView weather_image;
    TextView city_text;
    TextView temp_text;
}
```

MainActivity.java

```java
public class MainActivity extends AppCompatActivity {

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


        ArrayList<Weather> data = new ArrayList<>();
        data.add(new Weather("수원", "25도", "맑음"));
        data.add(new Weather("서울", "26도", "비"));
        data.add(new Weather("안양", "24도", "구름"));
        data.add(new Weather("부산", "29도", "구름"));
        data.add(new Weather("인천", "23도", "맑음"));
        data.add(new Weather("대구", "28도", "비"));
        data.add(new Weather("용인", "25도", "비"));


        MyFirstAdapter adapter = new MyFirstAdapter(data);

        // 뷰
        ListView listView = (ListView) findViewById(R.id.list_view);
        listView.setAdapter(adapter);
    }
}
```

```java
public class MyFirstAdapter extends BaseAdapter {

    private List<Weather> mData;
    private Map<String, Integer> mWeatherImageMap;

    public MyFirstAdapter(List<Weather> mData) {
        this.mData = mData;
        mWeatherImageMap = new HashMap<>();
        mWeatherImageMap.put("맑음", R.drawable.sunny);
        mWeatherImageMap.put("폭설", R.drawable.blizzard);
        mWeatherImageMap.put("구름", R.drawable.cloudy);
        mWeatherImageMap.put("비", R.drawable.rainy);
        mWeatherImageMap.put("눈", R.drawable.snow);
    }

    @Override
    public int getCount() {
        return mData.size();
    }

    @Override
    public Object getItem(int position) {
        return mData.get(position);
    }

    @Override
    public long getItemId(int position) {
        return position;
    }

}
```

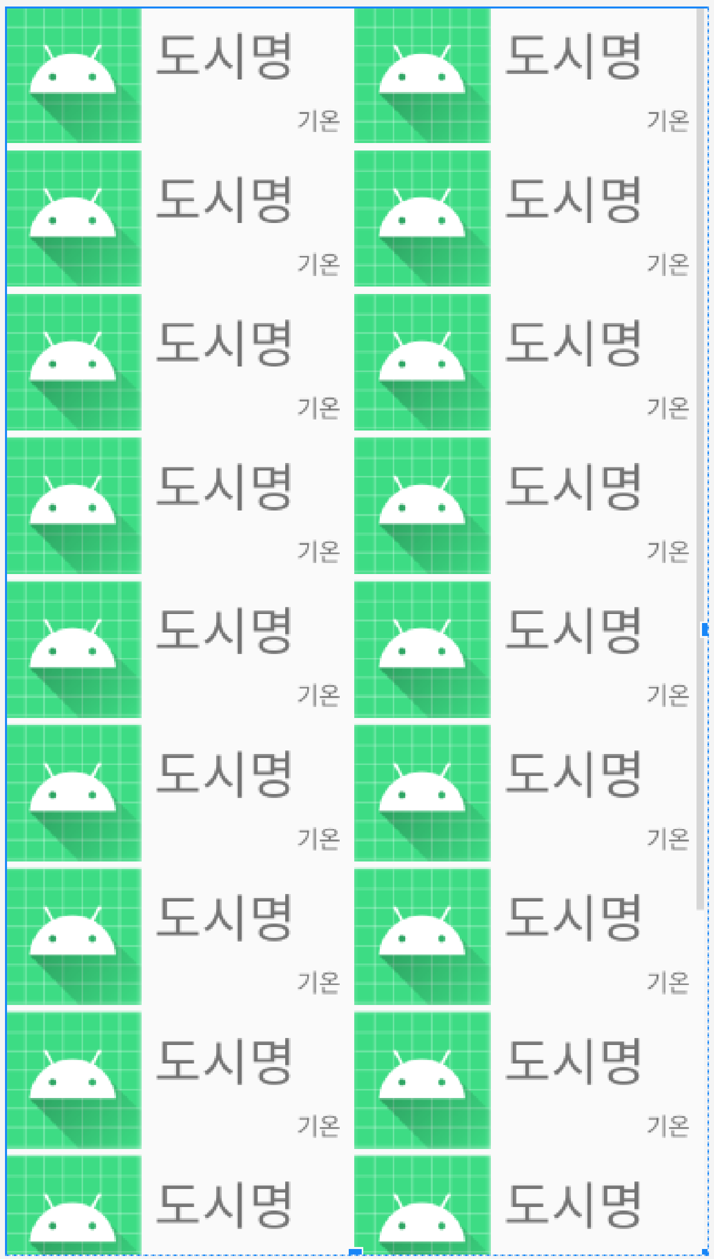
```
    @Override
    public View getView(int position, View convertView, ViewGroup parent) {
        ViewHolder holder;

        if (convertView == null) {
            holder = new ViewHolder();
            convertView = LayoutInflater.from(parent.getContext())
                    .inflate(R.layout.item_weather, parent, false);

            // 날씨, 도시, 기온 View
            ImageView weather_image = (ImageView) convertView.findViewById(R.id.weather_image);
            TextView city_text = (TextView) convertView.findViewById(R.id.city_text);
            TextView temp_text = (TextView) convertView.findViewById(R.id.temp_text);

            holder.weather_image = weather_image;
            holder.city_text = city_text;
            holder.temp_text = temp_text;

            convertView.setTag(holder);
        } else {
            holder = (ViewHolder) convertView.getTag();
        }

        // 현재 position 의 날씨 데이터
        Weather weather = mData.get(position);

        // 데이터 설정 => 홀더에 저장
        holder.city_text.setText(weather.getCity());
        holder.temp_text.setText(weather.getTemp());
        holder.weather_image.setImageResource(mWeatherImageMap.get(weather.getWeather()));

        return convertView;
    }

    static class ViewHolder {
        ImageView weather_image;
        TextView city_text;
        TextView temp_text;
    }
}
```



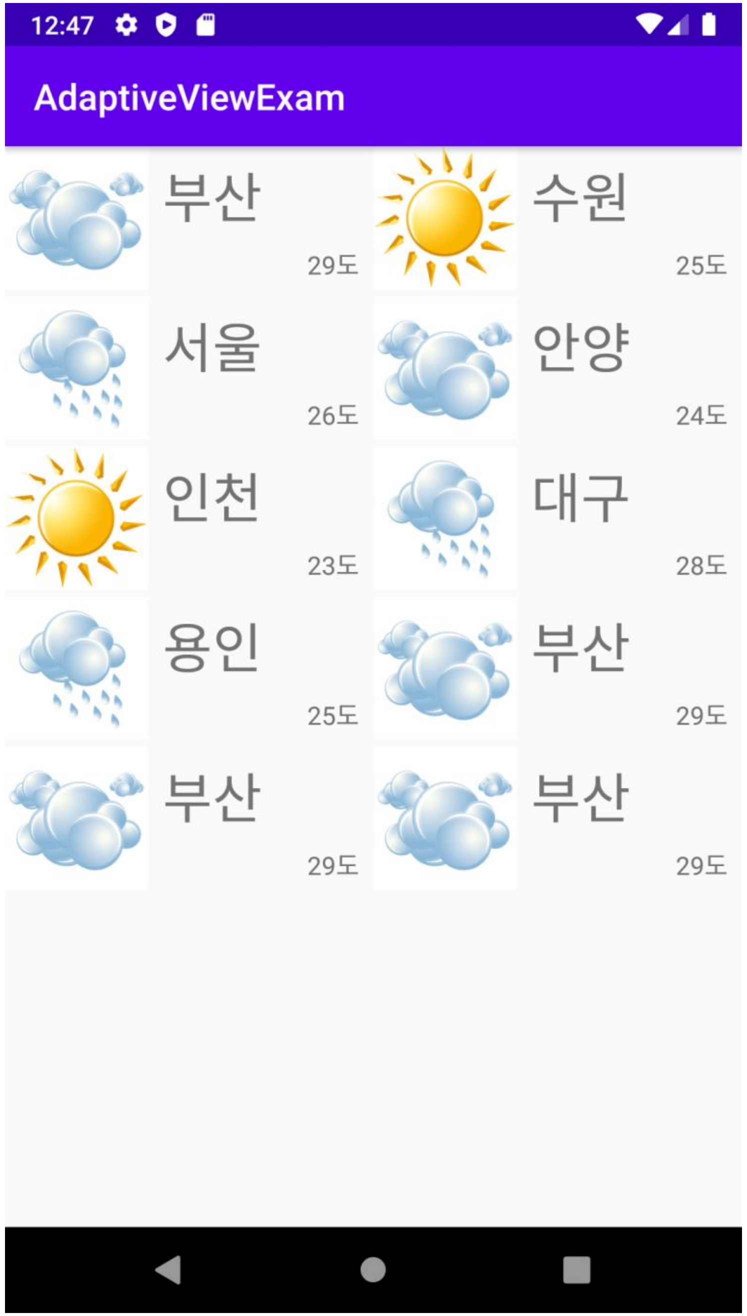
부산 29도
수원 25도
서울 26도
안양 24도
인천 23도
대구 28도
용인 25도
부산 29도
부산 29도
부산 29도

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:context=".MainActivity">

    <GridView
        android:id="@+id/list_view"
        android:numColumns="2"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:listitem="@layout/item_weather" />
</LinearLayout>
```



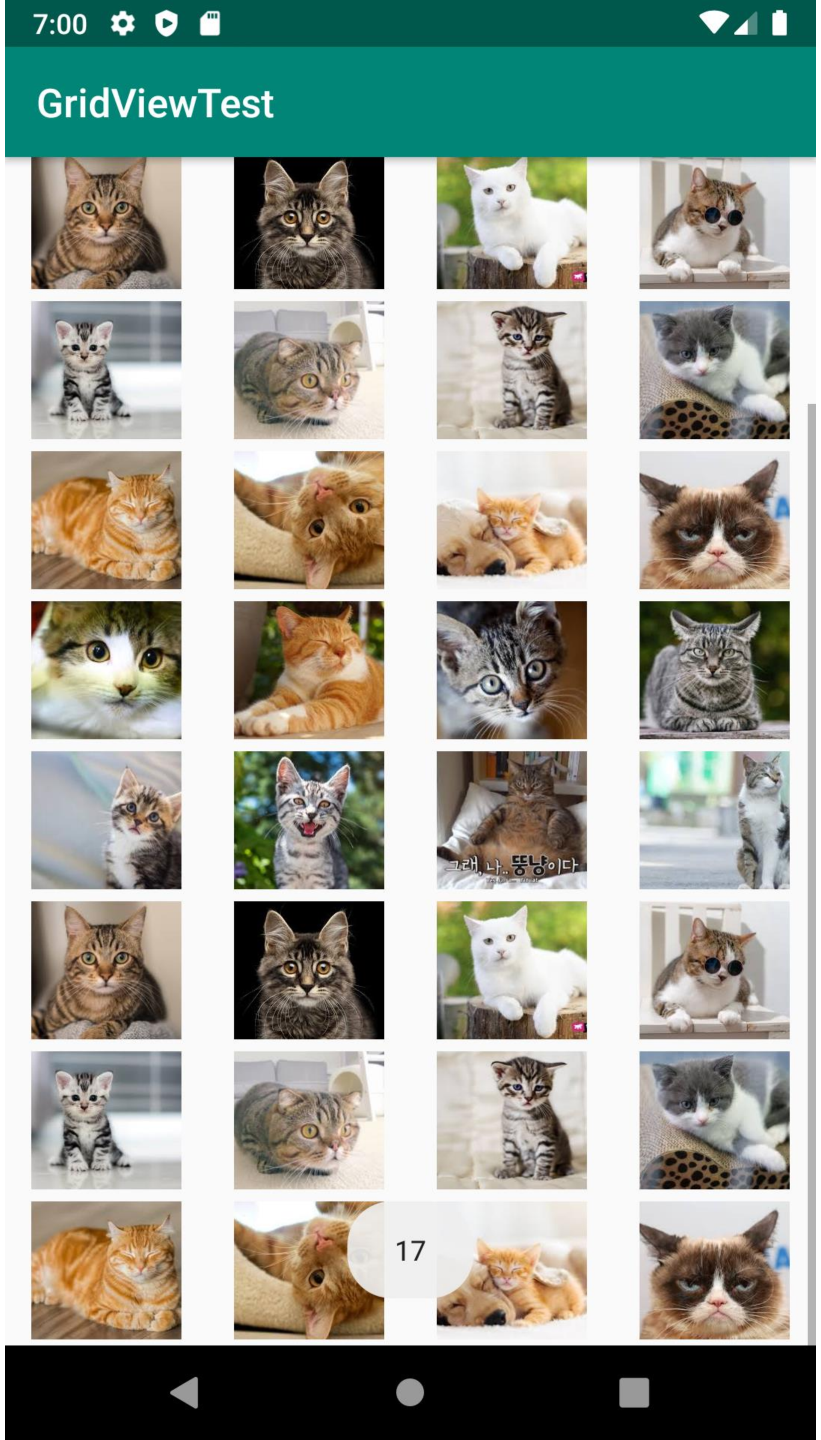
```
public class MainActivity extends AppCompatActivity {

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


        ArrayList<Weather> data = new ArrayList<>();
        data.add(new Weather("부산", "29도", "구름"));
        data.add(new Weather("수원", "25도", "맑음"));
        data.add(new Weather("서울", "26도", "비"));
        data.add(new Weather("안양", "24도", "구름"));
        data.add(new Weather("인천", "23도", "맑음"));
        data.add(new Weather("대구", "28도", "비"));
        data.add(new Weather("용인", "25도", "비"));
        data.add(new Weather("부산", "29도", "구름"));
        data.add(new Weather("부산", "29도", "구름"));
        data.add(new Weather("부산", "29도", "구름"));


        MyFirstAdapter adapter = new MyFirstAdapter(data);

        // 뷰
        GridView listView = (GridView) findViewById(R.id.list_view);
        listView.setAdapter(adapter);
    }
}
```

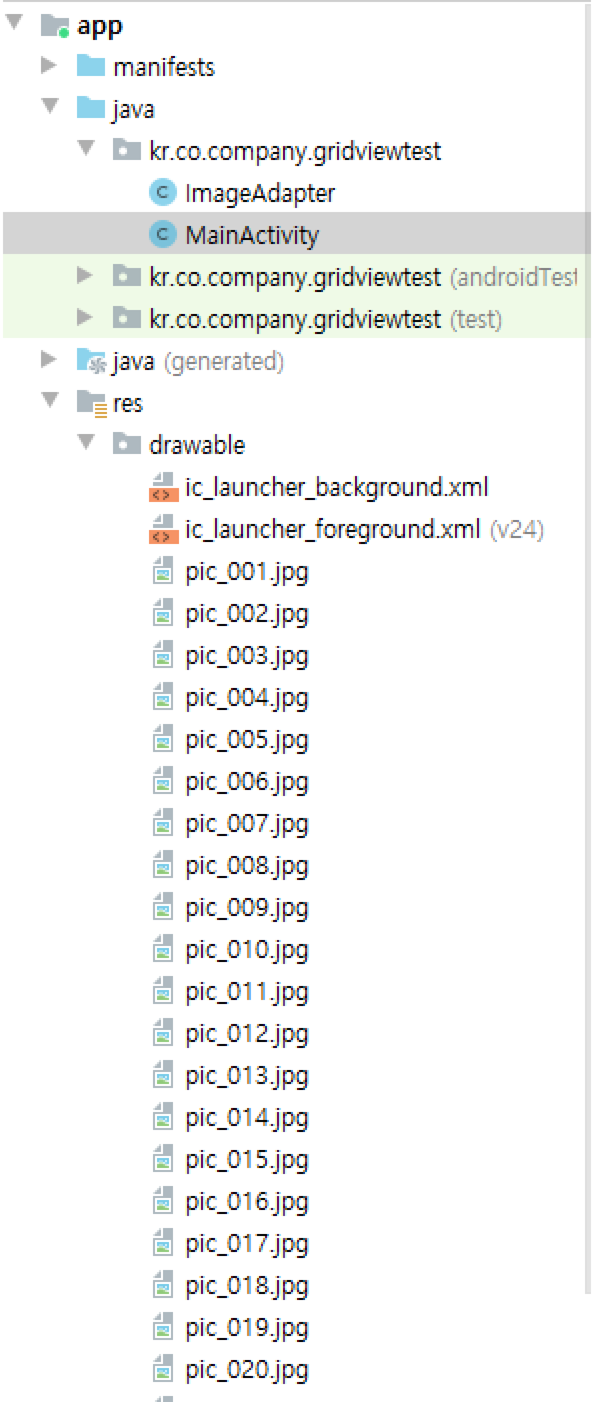


12:47

AdaptiveViewExam

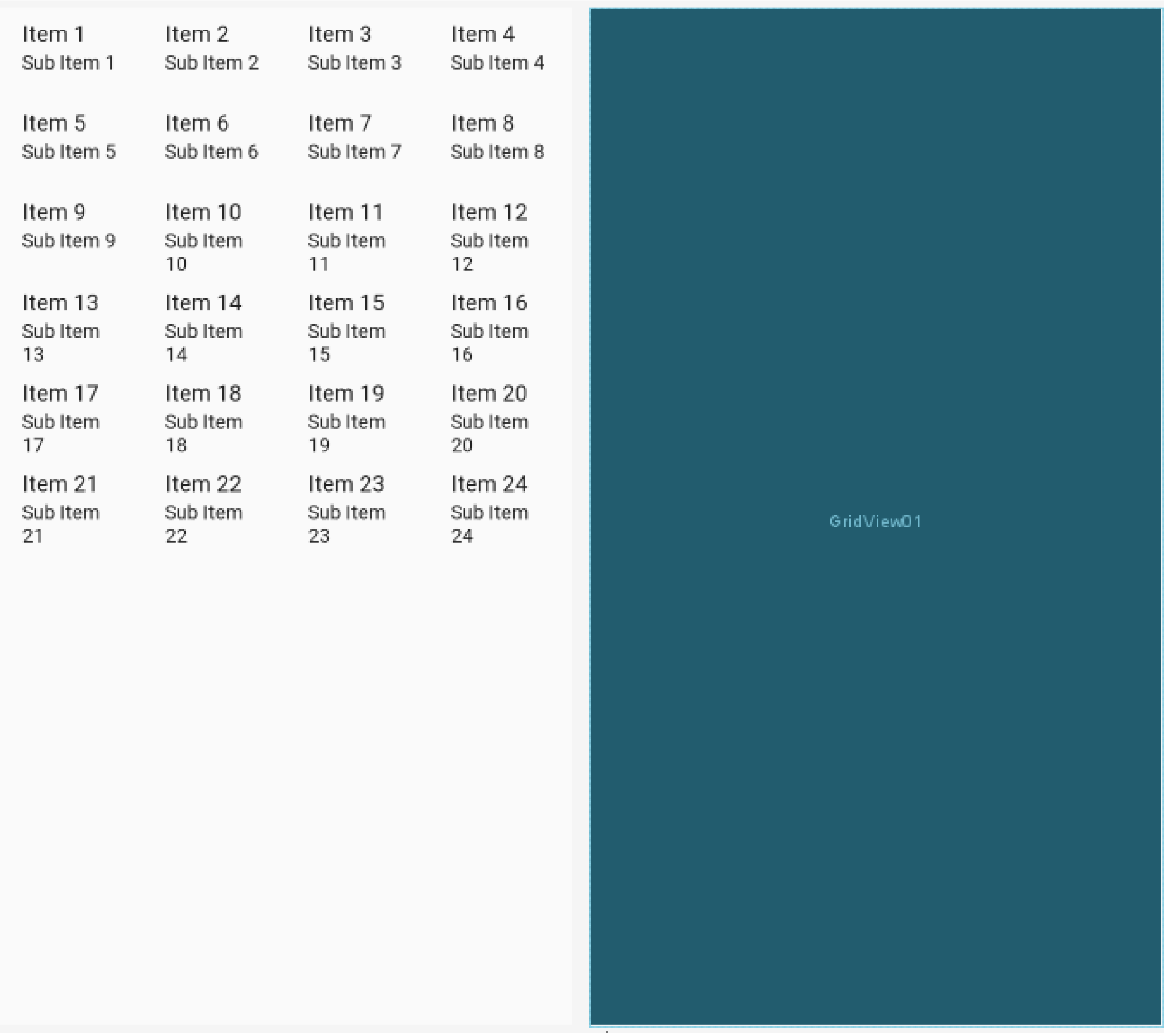
부산 29도	수원 25도
서울 26도	안양 24도
인천 23도	대구 28도
용인 25도	부산 29도
부산 29도	부산 29도


7:00
GridViewTest
그래, 나.. 뚱냥이다
17

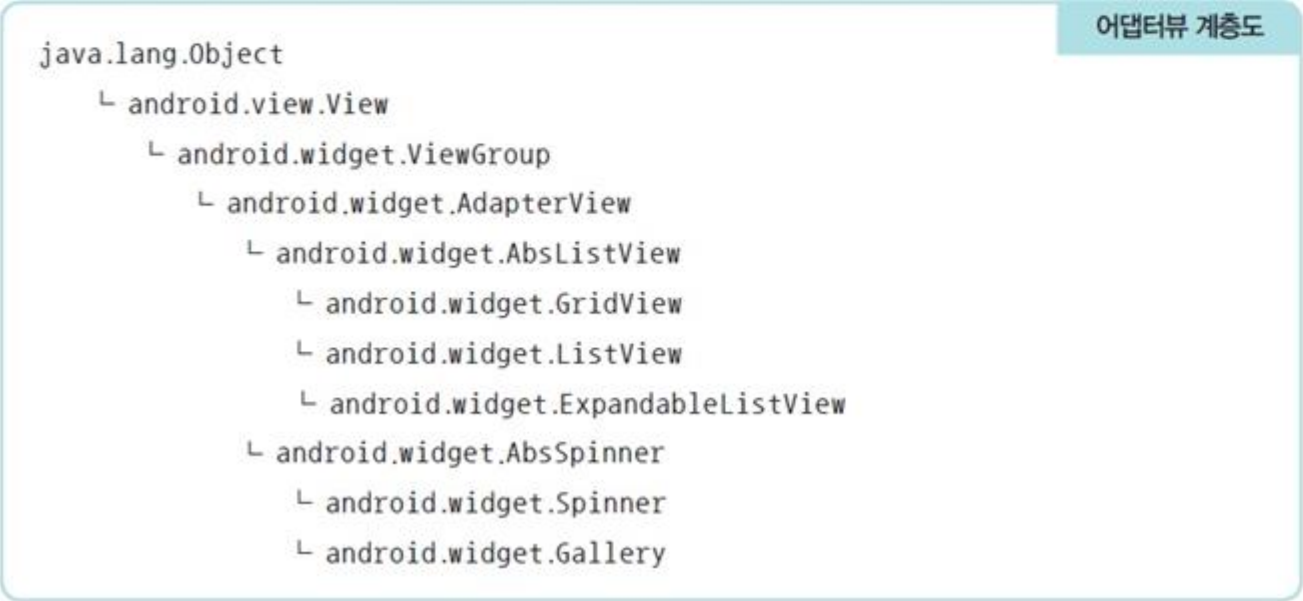


```
app
  manifests
  java
    kr.co.company.gridviewtest
      ImageAdapter
      MainActivity
    kr.co.company.gridviewtest (androidTest
    kr.co.company.gridviewtest (test)
  java (generated)
  res
    drawable
      ic_launcher_background.xml
      ic_launcher_foreground.xml (v24)
      pic_001.jpg
      pic_002.jpg
      pic_003.jpg
      pic_004.jpg
      pic_005.jpg
      pic_006.jpg
      pic_007.jpg
      pic_008.jpg
      pic_009.jpg
      pic_010.jpg
      pic_011.jpg
      pic_012.jpg
      pic_013.jpg
      pic_014.jpg
      pic_015.jpg
      pic_016.jpg
      pic_017.jpg
      pic_018.jpg
      pic_019.jpg
      pic_020.jpg
```

```
<?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_height="match_parent"
    android:layout_width="match_parent"
    android:orientation="vertical">

    <GridView
        android:id="@+id/GridView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:numColumns="4"
        android:gravity="center"
        />
</LinearLayout>
```



Item 1 Sub Item 1	Item 2 Sub Item 2	Item 3 Sub Item 3	Item 4 Sub Item 4
Item 5 Sub Item 5	Item 6 Sub Item 6	Item 7 Sub Item 7	Item 8 Sub Item 8
Item 9 Sub Item 9	Item 10 Sub Item 10	Item 11 Sub Item 11	Item 12 Sub Item 12
Item 13 Sub Item 13	Item 14 Sub Item 14	Item 15 Sub Item 15	Item 16 Sub Item 16
Item 17 Sub Item 17	Item 18 Sub Item 18	Item 19 Sub Item 19	Item 20 Sub Item 20
Item 21 Sub Item 21	Item 22 Sub Item 22	Item 23 Sub Item 23	Item 24 Sub Item 24



어댑터뷰 계층도

```
java.lang.Object
    └ android.view.View
        └ android.widget.ViewGroup
            └ android.widget.AdapterView
                └ android.widget.AbsListView
                    └ android.widget.GridView
                    └ android.widget.ListView
                    └ android.widget.ExpandableListView
                └ android.widget.AbsSpinner
                    └ android.widget.Spinner
                    └ android.widget.Gallery
```

MainActivity.java

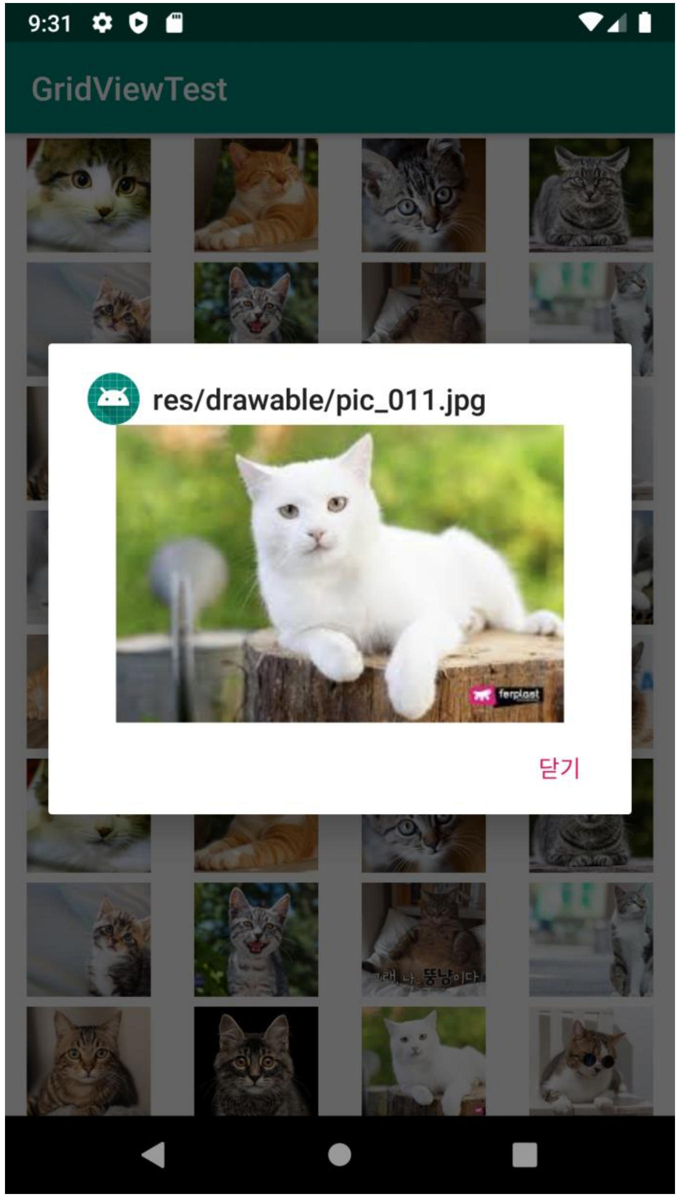
```java
public class MainActivity extends AppCompatActivity {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        GridView gridview = (GridView) findViewById(R.id.GridView);

        ImageAdapter adapter = new ImageAdapter(this);
        gridview.setAdapter(adapter);

        gridview.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> adapterView, View view, int position, long l) {
                Toast.makeText(MainActivity.this, "" + position, Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

ImageAdapter.java

```
public class ImageAdapter extends BaseAdapter {
    private Context mContext;
    // references to our images
    private Integer[] thumbImages = {
            R.drawable.pic_001, R.drawable.pic_002,
            R.drawable.pic_003, R.drawable.pic_004,
            R.drawable.pic_005, R.drawable.pic_006,
            R.drawable.pic_007, R.drawable.pic_008,
            R.drawable.pic_009, R.drawable.pic_010,
            R.drawable.pic_011, R.drawable.pic_012,
            R.drawable.pic_013, R.drawable.pic_014,
            R.drawable.pic_015, R.drawable.pic_016,
            R.drawable.pic_017, R.drawable.pic_018,
            R.drawable.pic_019, R.drawable.pic_020,
            R.drawable.pic_001, R.drawable.pic_002,
            R.drawable.pic_003, R.drawable.pic_004,
            R.drawable.pic_005, R.drawable.pic_006,
            R.drawable.pic_007, R.drawable.pic_008,
            R.drawable.pic_009, R.drawable.pic_010,
            R.drawable.pic_011, R.drawable.pic_012,
            R.drawable.pic_013, R.drawable.pic_014,
            R.drawable.pic_015, R.drawable.pic_016,
            R.drawable.pic_017, R.drawable.pic_018,
            R.drawable.pic_019, R.drawable.pic_020,
    };

    }
```

ImageAdapter.java

```java
public class ImageAdapter extends BaseAdapter {
    public ImageAdapter(Context mContext) {
        this.mContext = mContext;
    }

    @Override
    public int getCount() {
        return thumbImages.length;
    }

    @Override
    public Object getItem(int position) {
        return null;
    }

    @Override
    public long getItemId(int position) {
        return 0;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup viewGroup) {
        ImageView imageView;
        if (convertView == null) {
            imageView = new ImageView(mContext);
            imageView.setLayoutParams(new GridView.LayoutParams(200, 200));
            imageView.setScaleType(ImageView.ScaleType.CENTER_CROP);
            imageView.setPadding(8, 8, 8, 8);
        } else {
            imageView = (ImageView) convertView;
        }

        imageView.setImageResource(thumbImages[position]);
        return imageView;
    }
}
```



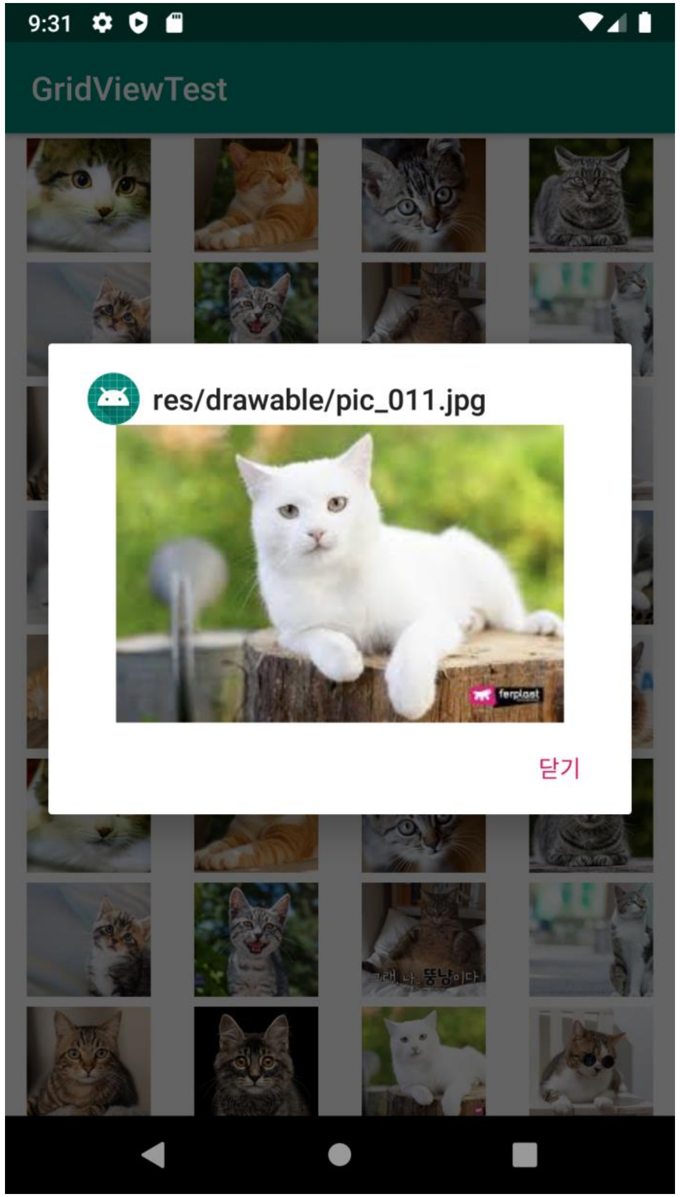
res/drawable/pic_011.jpg

dialog.xml

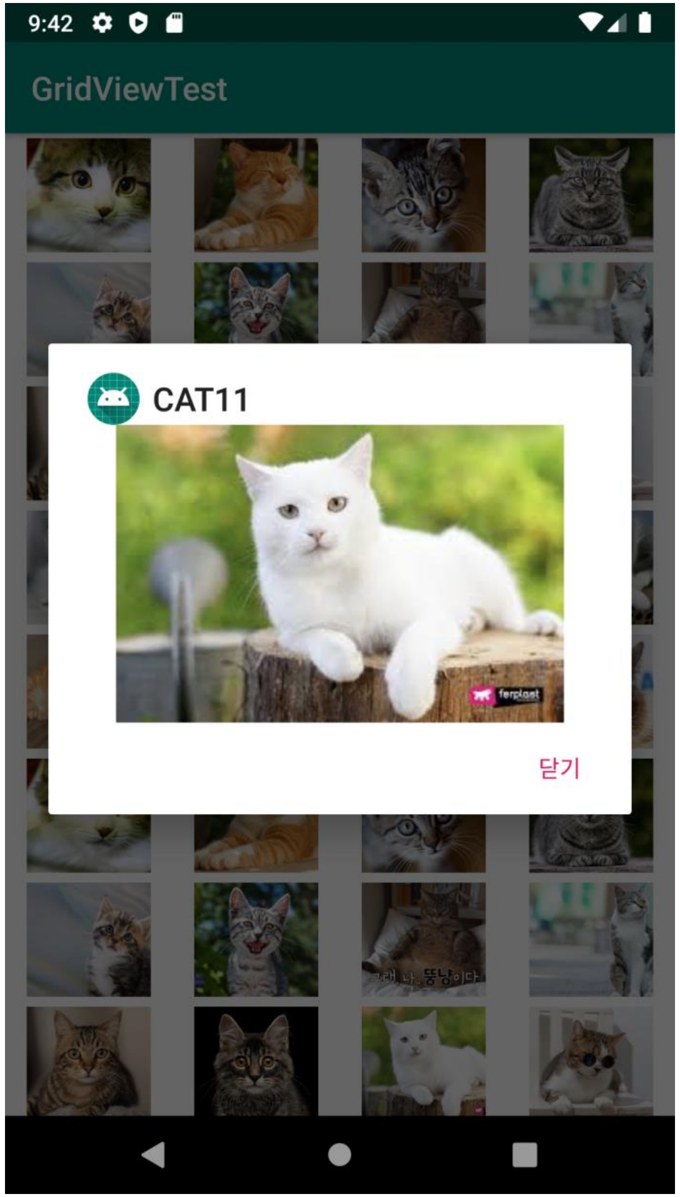
```xml
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:orientation="vertical" >

    <ImageView
        android:id="@+id/ivPoster"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />

</LinearLayout>
```

MainActivity.java

```java
ImageAdapter adapter = new ImageAdapter(this);

gridview.setOnItemClickListener(new AdapterView.OnItemClickListener() {
    @Override
    public void onItemClick(AdapterView<?> adapterView, View view, int position, long l) {
        Toast.makeText(MainActivity.this, "" + position, Toast.LENGTH_SHORT).show();

        View dialogView = (View) View.inflate(MainActivity.this, R.layout.dialog, null);
        AlertDialog.Builder dlg = new AlertDialog.Builder(MainActivity.this);
        ImageView ivPoster = (ImageView) dialogView.findViewById(R.id.ivPoster);
        ivPoster.setImageResource(adapter.thumbImages[position]);
        dlg.setTitle(adapter.thumbImages[position]);
        dlg.setIcon(R.mipmap.ic_launcher_round);
        dlg.setView(dialogView);
        dlg.setNegativeButton("닫기", null);
        dlg.show();

    }
});
```

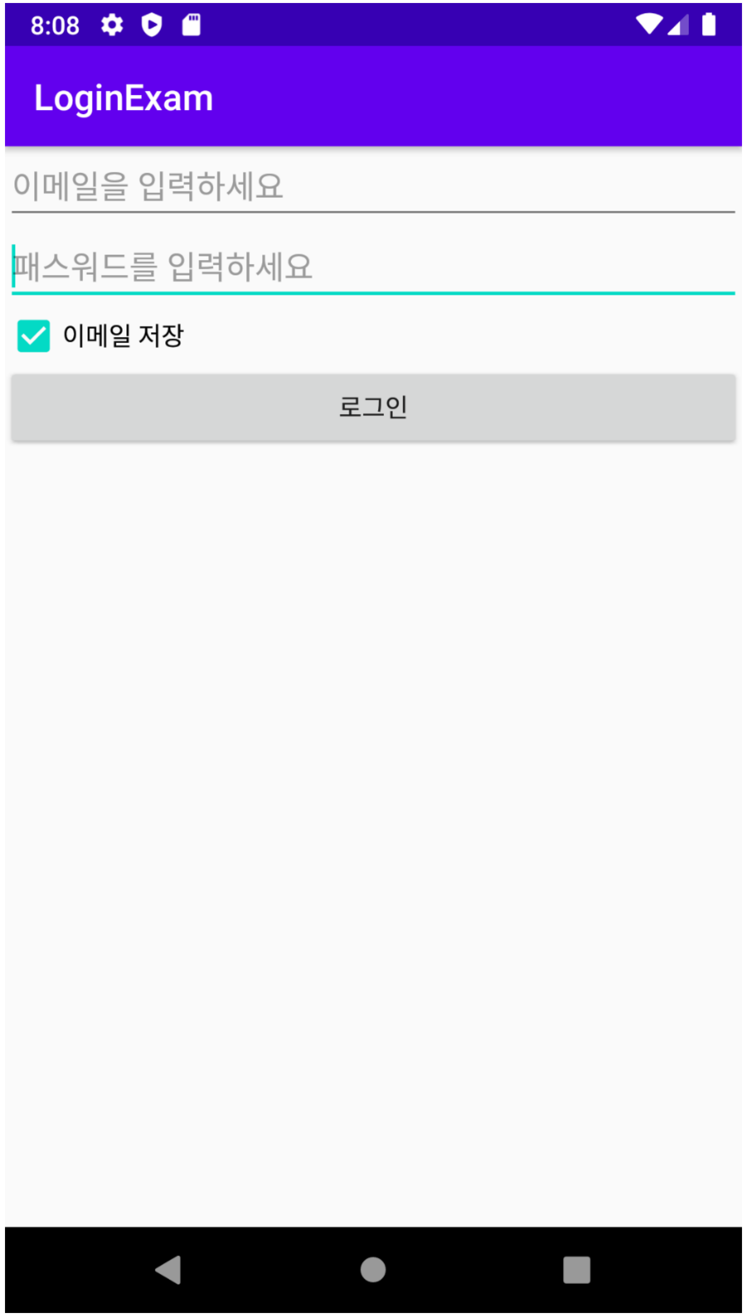


res/drawable/pic_011.jpg

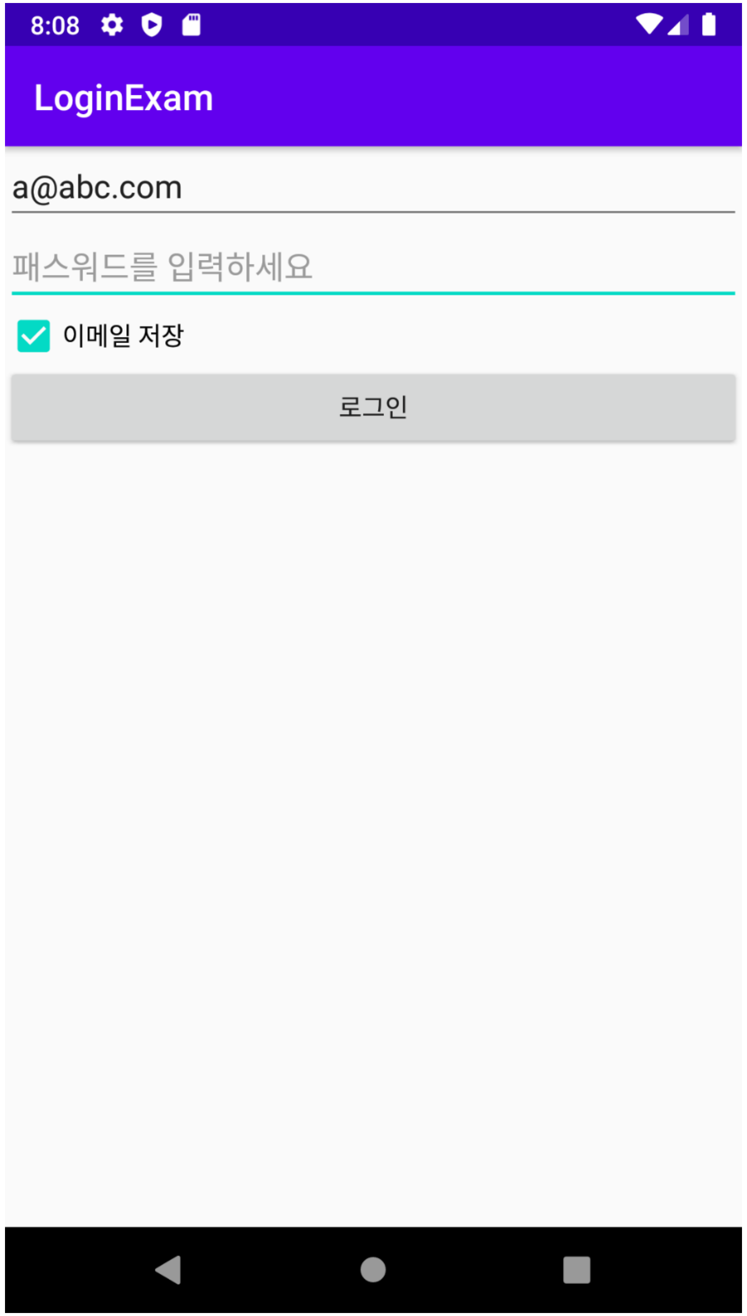


CAT11

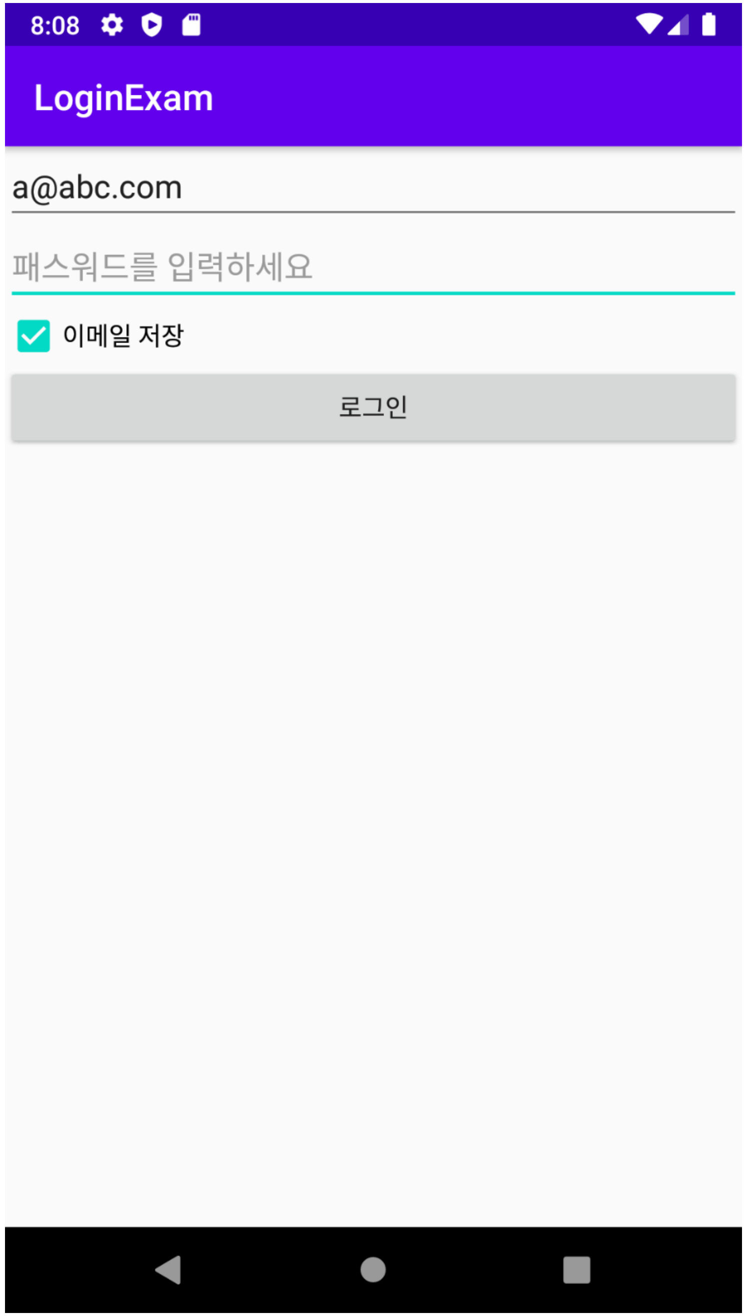
데이터 저장하기



8:08
LoginExam
이메일을 입력하세요
패스워드를 입력하세요
☑ 이메일 저장
로그인

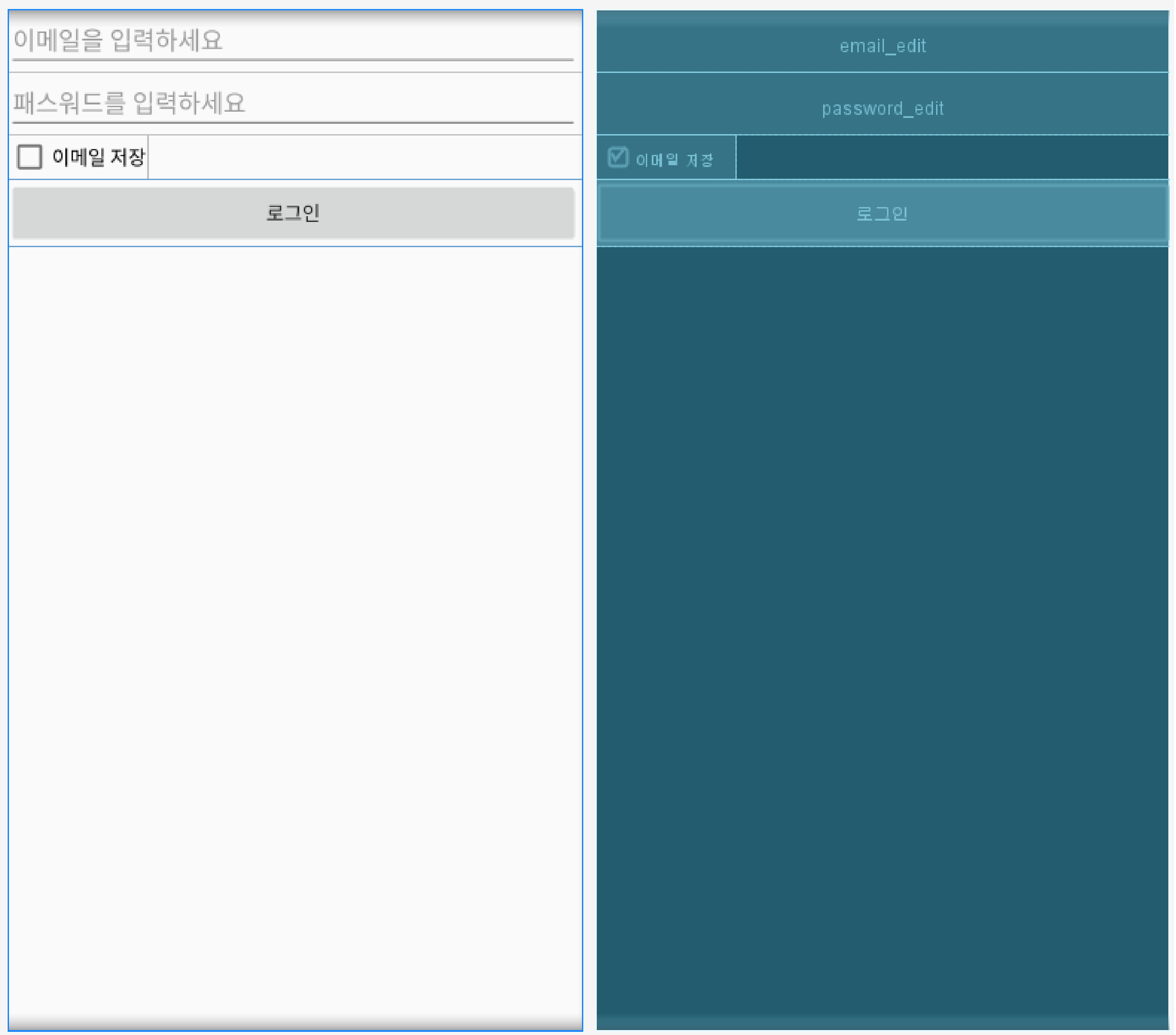


8:08
LoginExam
a@abc.com
패스워드를 입력하세요
☑ 이메일 저장
로그인



8:08
LoginExam
a@abc.com
패스워드를 입력하세요
☑ 이메일 저장
로그인

```
<?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=".MainActivity">

    <EditText
        android:id="@+id/email_edit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="이메일을 입력하세요"
        android:inputType="textEmailAddress" />

    <EditText
        android:id="@+id/password_edit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="패스워드를 입력하세요"
        android:inputType="textPassword" />

    <CheckBox
        android:id="@+id/save_check"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="이메일 저장" />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="로그인" />

</LinearLayout>
```



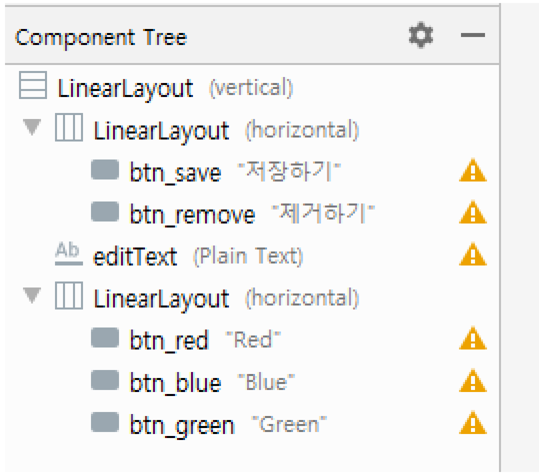
onDestory()

- **액티비티가 종료될때 호출되는 콜백 메서드**
  - 이메서드를 재정의 하면 액티비티가 종료될때 필요한 처리를 할 수 있음

```
public class MainActivity extends AppCompatActivity {

    @Override
    protected void onDestroy() {
        super.onDestroy();

        // SharedPreferences의 수정 가능한 객체 얻기
         SharedPreferences.Editor editor = mPreferences.edit();
        // 저장할 데이터
         editor.putBoolean("save", mSaveCheckBox.isChecked());
        editor.putString("email", mEmailEditText.getText().toString());
        // 저장
         editor.apply();
    }
}
```

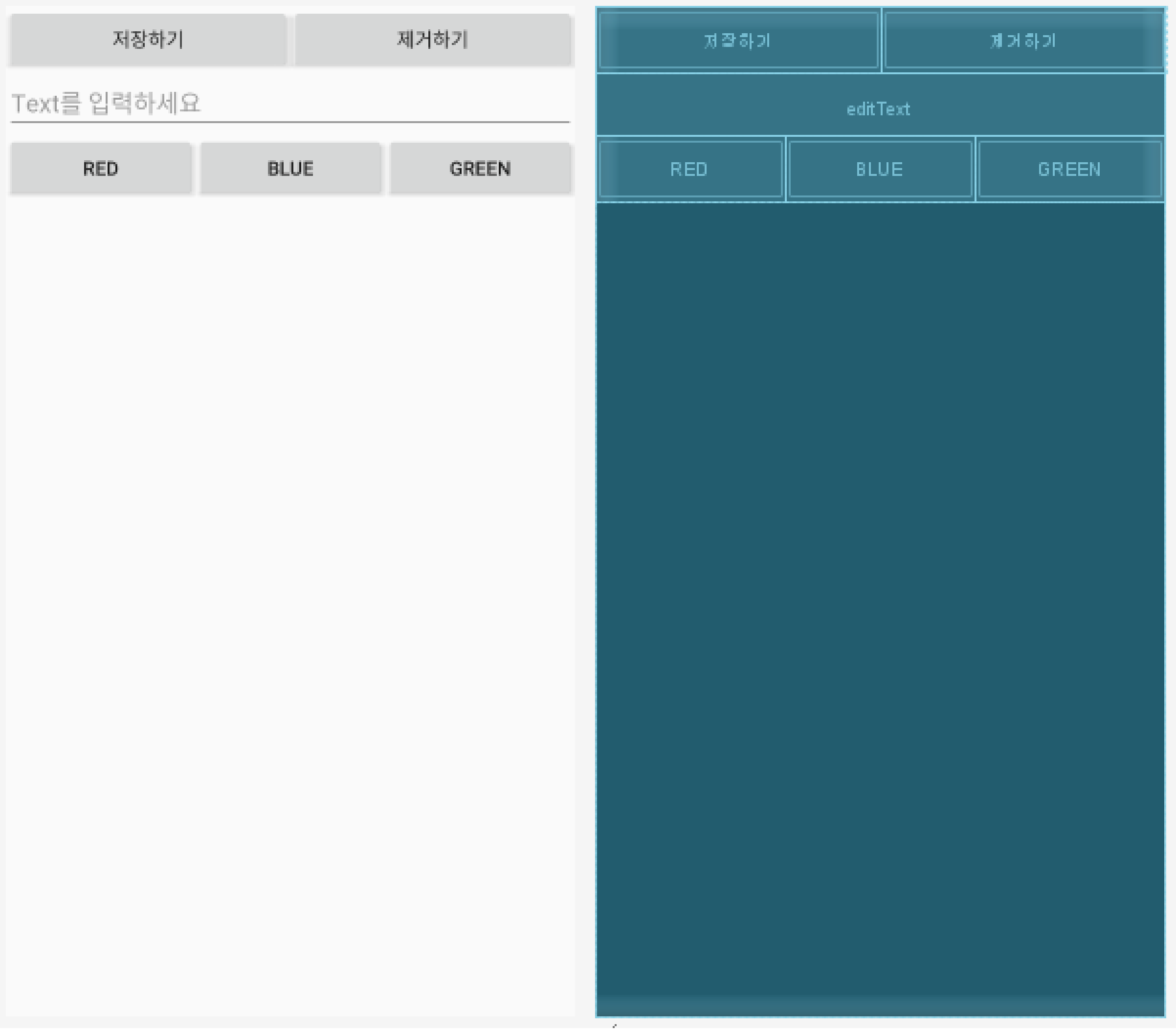
```
public class MainActivity extends AppCompatActivity {

    private EditText mEmailEditText;
    private CheckBox mSaveCheckBox;

    // 설정 정보 저장 객체
    private SharedPreferences mPreferences;

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

        mEmailEditText = (EditText) findViewById(R.id.email_edit);
        mSaveCheckBox = (CheckBox) findViewById(R.id.save_check);

        // Preference 객체 초기화
        mPreferences = PreferenceManager.getDefaultSharedPreferences(this);

        // 저장된 이메일을 불러와서 복원
        Boolean isChecked = mPreferences.getBoolean("save", false);
        mSaveCheckBox.setChecked(isChecked);
        if (isChecked) {
            String email = mPreferences.getString("email", "");
            mEmailEditText.setText(email);
        }
    }
}
```

```java
public class MainActivity extends AppCompatActivity {

    private EditText mEmailEditText;
    private CheckBox mSaveCheckBox;
    // 설정 정보 저장 객체
     private SharedPreferences mPreferences;

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

        mEmailEditText = (EditText) findViewById(R.id.email_edit);
        mSaveCheckBox = (CheckBox) findViewById(R.id.save_check);

        // Preference 객체 초기화
         mPreferences = PreferenceManager.getDefaultSharedPreferences(this);

        // 저장된 이메일을 불러와서 복원
         Boolean isChecked = mPreferences.getBoolean("save", false);
        mSaveCheckBox.setChecked(isChecked);
        if (isChecked) {
            String email = mPreferences.getString("email", "");
            mEmailEditText.setText(email);
        }
    }
    @Override
    protected void onDestroy() {
        super.onDestroy();

        // SharedPreferences의 수정 가능한 객체 얻기
        SharedPreferences.Editor editor = mPreferences.edit();
        // 저장할 데이터
        editor.putBoolean("save", mSaveCheckBox.isChecked());
        editor.putString("email", mEmailEditText.getText().toString());
        // 저장
        editor.apply();
    }
}
```



Component Tree

```
LinearLayout (vertical)
  ▼ LinearLayout (horizontal)
      btn_save "저장하기" ⚠
      btn_remove "제거하기" ⚠
    editText (Plain Text) ⚠
  ▼ LinearLayout (horizontal)
      btn_red "Red" ⚠
      btn_blue "Blue" ⚠
      btn_green "Green" ⚠
```



```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <Button
            android:id="@+id/btn_save"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="저장하기" />

        <Button
            android:id="@+id/btn_remove"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="제거하기" />
    </LinearLayout>

    <EditText
        android:id="@+id/editText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Text를 입력하세요"
        android:inputType="textPersonName" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <Button
            android:id="@+id/btn_red"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Red" />

        <Button
            android:id="@+id/btn_blue"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Blue" />

        <Button
            android:id="@+id/btn_green"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Green" />
    </LinearLayout>

</LinearLayout>
```

```java
public class MainActivity extends AppCompatActivity {

    private SharedPreferences preferences;
    private SharedPreferences.Editor editor;
    private int SelectedColor;
    EditText editText;
    Button btn_red,btn_green,btn_blue,btn_save,btn_remove;

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

        editText = findViewById(R.id.editText);
        btn_red = findViewById(R.id.btn_red);
        btn_blue = findViewById(R.id.btn_blue);
        btn_green = findViewById(R.id.btn_green);
        btn_save = findViewById(R.id.btn_save);
        btn_remove = findViewById(R.id.btn_remove);

        setListenerColorbtn();
        setListenerPreferencebtn();

        preferences = PreferenceManager.getDefaultSharedPreferences(this);
        editor = preferences.edit();

        initializeValue();

    }

}
```

```
public class MainActivity extends AppCompatActivity {

    public void setListenerColorbtn()  {
        View.OnClickListener Listener = new View.OnClickListener(){
            @Override
            public void onClick(View view)
            {
                switch(view.getId())
                {
                    case R.id.btn_red:
                        SelectedColor = Color.RED;
                        editText.setTextColor(Color.RED);
                        break;
                    case R.id.btn_blue:
                        SelectedColor = Color.BLUE;
                        editText.setTextColor(Color.BLUE);
                        break;
                    case R.id.btn_green:
                        SelectedColor = Color.GREEN;
                        editText.setTextColor(Color.GREEN);
                        break;
                }
            }
        };

        btn_red.setOnClickListener(Listener);
        btn_blue.setOnClickListener(Listener);
        btn_green.setOnClickListener(Listener);
    }
}
```

```
public class MainActivity extends AppCompatActivity {
    public void setListenerPreferencebtn() {
        View.OnClickListener Listener = new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                switch (view.getId()) {
                    //데이터 저장하기
                      case R.id.btn_save:
                        editor.putInt("color", SelectedColor);
                        editor.putString("text", editText.getText().toString());
                        editor.apply();
                        break;
                    //데이터 제거하기
                      case R.id.btn_remove:
                        editor.remove("color");
                        editor.remove("text");
                        editor.apply();
                        break;
                }
            }
        };
        btn_save.setOnClickListener(Listener);
        btn_remove.setOnClickListener(Listener);
    }

    public void initializeValue()
    {
        editText.setText(preferences.getString("text","저장된 데이터가 없어요"));
        editText.setTextColor(preferences.getInt("color", Color.BLACK));
    }
}
```