



Goodbye 버터나이프, Hello 데이터바인딩

박상권

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XML

2

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

    <TextView
        android:id="@+id/tvText1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
    />

    <TextView
        android:id="@+id/tvText2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
    />

    <TextView
        android:id="@+id/tvText3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
    />
```

```
        <TextView
            android:id="@+id/tvText4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
        />

        <TextView
            android:id="@+id/tvText5"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
        />

        <Button
            android:id="@+id/btnSample"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="button"
        />
    </LinearLayout>

    <android.support.v7.widget.RecyclerView
        android:id="@+id/rcContent"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
    />
```

기본

View

3

- findViewById() 노가다의 연속..
- 100개, 1000개의 View가 있는 레이아웃이라면?

```
TextView tvText1;
TextView tvText2;
TextView tvText3;
TextView tvText4;
TextView tvText5;
Button btnSample;

RecyclerView rcContent;

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

    tvText1 = (TextView) findViewById(R.id.tvText1);
    tvText2 = (TextView) findViewById(R.id.tvText2);
    tvText3 = (TextView) findViewById(R.id.tvText3);
    tvText4 = (TextView) findViewById(R.id.tvText4);
    tvText5 = (TextView) findViewById(R.id.tvText5);
    btnSample = (Button) findViewById(R.id.btnSample);
    rcContent = (RecyclerView) findViewById(R.id.rcContent);
}
```

버터나이프

View

4

- 버터나이프의 마법
- 한번도 안 써본 사람은 있어도 한번만 써본 사람은 없다
- 사랑합니다 Jake Wharton

```
@BindView(R.id.tvText1)
TextView tvText1;
@BindView(R.id.tvText2)
TextView tvText2;
@BindView(R.id.tvText3)
TextView tvText3;
@BindView(R.id.tvText4)
TextView tvText4;
@BindView(R.id.tvText5)
TextView tvText5;
@BindView(R.id.btnSample)
Button btnSample;

@BindView(R.id.rcContent)
RecyclerView rcContent;

@Override
protected void onCreate(@Nullable Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.butterknife_activity);
    ButterKnife.bind(this);
}
```

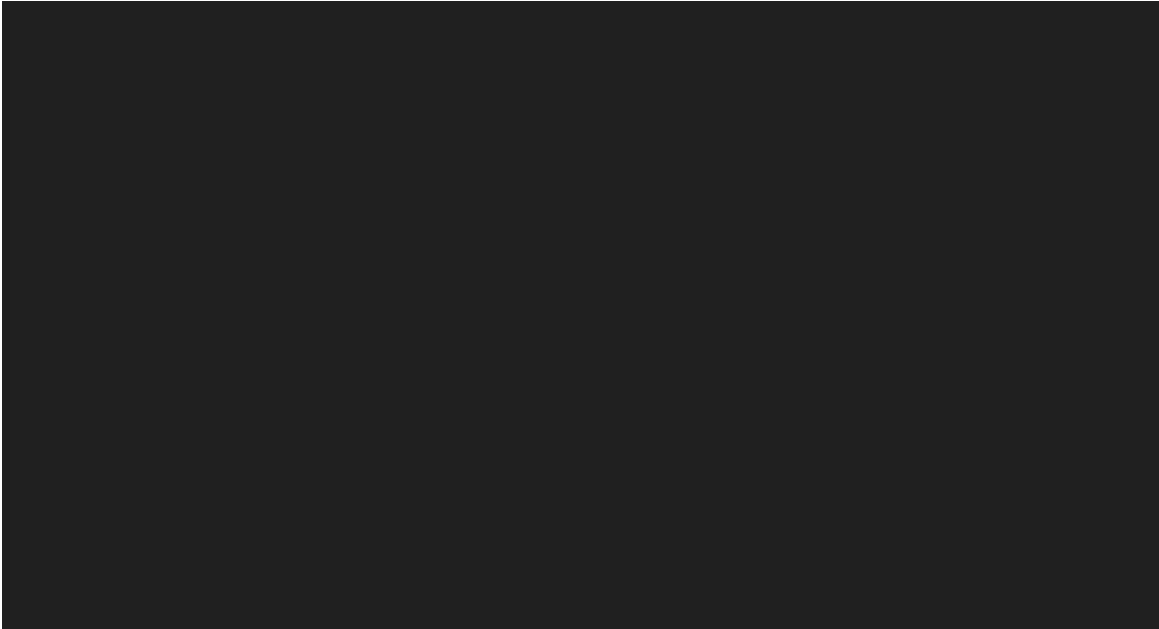
하지만
데이터바인딩을 쓴다면
어떨까?

데이터바인딩

View

6

- 아무것도 안해도 됨 (~~사실 몇 개 해줄거 있음~~)
- 실화임



데이터바인딩

필요사항 및 설정

7

필요사항

- Android 2.1 (API 레벨 7) 이상
- Android Plugin for Gradle 1.5.0-alpha1 이상
- Android Studio 1.3 이상

build.gradle (Module: app)

```
android {  
    // ...  
    dataBinding {  
        enabled = true  
    }  
}
```

설정 끝!

데이터바인딩

xml

8

— xml의 최상위에는 항상 <layout></layout>

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <layout xmlns:android="http://schemas.android.com/apk/res/android"
3      >
4
5      <LinearLayout
6          android:layout_width="match_parent"
7          android:layout_height="match_parent"
8          android:orientation="vertical">
9
10         <!--
11             ...
12         -->
13
14     </LinearLayout>
15
16 </layout>
17
```


데이터바인딩

Java파일

9

— setContentView()대신 DataBindingUtil.setContentView()

```
DatabindingActivityBinding binding;  
  
@Override  
protected void onCreate(@Nullable Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
  
    binding = DataBindingUtil.setContentView(this, R.layout.databinding_activity);  
}
```

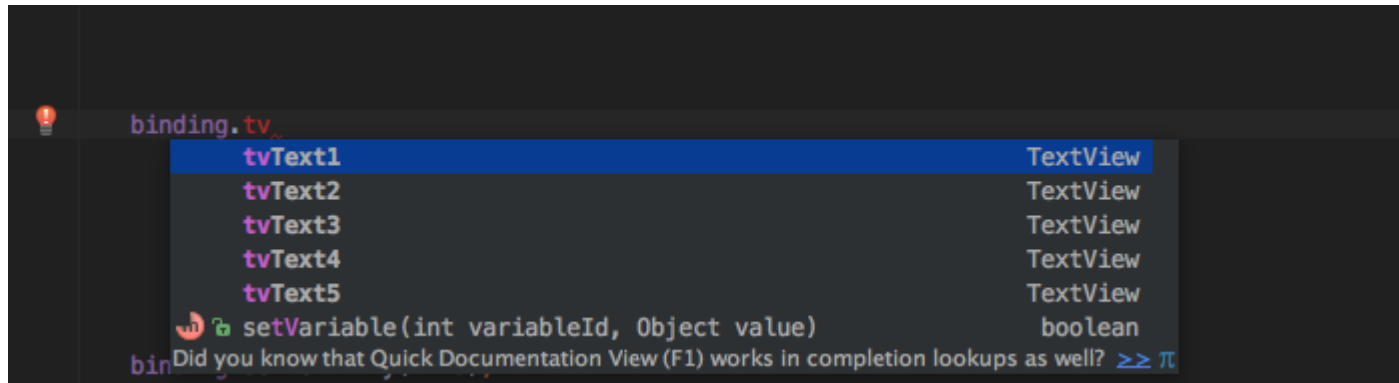
- XXXBinding 클래스는 자동으로 생성
- xml 이름 기준으로 생성되며 파스칼 표기법 기준으로 변경
- ted_park_activity.xml -> TedParkActivityBinding 클래스 생성

데이터바인딩

View접근

10

- 생성된 binding.xxx 로 View접근
- View이름은 카멜 표기법으로 생성
- @+id/tv_text_name -> tvTextName



- 만약 @+id/tv_text 와 @+id/tvText 인 TextView가 있다면 어떻게 될까?

기본

Click Event

11

- `setOnClickListener(this)` + implements `View.OnClickListener`
- `setOnClickListener(new ...)`

```
//btnSample.setOnClickListener(this);  
btnSample.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View view) {  
        onClick(view);  
    }  
});
```

```
public void onClick(View view){  
    Toast.makeText(this,"Button Click",Toast.LENGTH_SHORT).show();  
}
```

버터나이프

Click Event

12

— @OnClick(R.id.xxx)

```
@OnClick(R.id.btnSample)
public void onButtonClick(View view) {
    Toast.makeText(this, "Button Click", Toast.LENGTH_SHORT).show();
}
```

데이터바인딩

Click Event

13

— xml에서 함수 지정

```
<Button
    android:id="@+id/btnSample"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:onClick="@{activity::onButtonClick}"
    android:text="button"
/>
```

데이터바인딩

Click Event

14

- xml에서 쓰고자 하는 변수가 있는 경우 <data></data>안에 <variable/> 생성

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

    <data>
        <variable
            name="activity"
            type="gun0912.databinding.compare.databinding.DataBindingActivity"/>
    </data>
```

- Java파일에서 변수 지정

```
DatabindingActivityBinding binding;

@Override
protected void onCreate(@Nullable Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    binding = DataBindingUtil.setContentView(this, R.layout.databinding_activity);
    binding.setActivity(this);
}
```

데이터바인딩

Click Event

15

- xml에서 함수 지정

```
<Button
    android:id="@+id/btnSample"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:onClick="@{activity::onButtonClick}"
    android:text="button"
/>
```

- @ {activity.함수이름()} , @ {activity::함수이름()}
- MVP, MVVM등 아키텍처에 따라 Handler interface를 만들고 handler.xxx()로 활용

```
public interface CompanyClickHandler {
    void onRootClick(View view);
    void onAAAClick(View view);
    void onBBBClick(View view);
}
```

RecyclerView안의 item view

16

— 리스트 화면을 만들어 봅시다



```
<?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:orientation="horizontal"
    android:padding="16dp"
    android:gravity="center_vertical"
    >
    <gun0912.databinding.common.view.CircleImageView
        android:layout_width="40dp"
        android:layout_height="40dp"
        android:id="@+id/ivProfile"
    />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="16dp"
        android:orientation="vertical"
    >

        <TextView
            android:id="@+id/tvName"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
        />

        <TextView
            android:id="@+id/tvAge"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginTop="3dp"
        />
    </LinearLayout>
</LinearLayout>
```


RecyclerView안의 item view

Class

17

— 사용자 Class

```
public class User {  
  
    String name;  
    int age;  
  
    String imgUrl;  
  
    public User(String name,int age,String imgUrl){  
        this.name=name;  
        this.age=age;  
        this.imgUrl=imgUrl;  
    }  
  
    public String getName() { return name; }  
  
    public void setName(String name) { this.name = name; }  
  
    public int getAge() { return age; }  
  
    public void setAge(int age) { this.age = age; }  
  
    public String getImgUrl() { return imgUrl; }  
  
    public void setImgUrl(String imgUrl) { this.imgUrl = imgUrl; }  
}
```

RecyclerView안의 item view

18

— 샘플 데이터

```
List<User> users = new ArrayList();  
users.add(new User("Ted",32,"http://cfile25.uf.tistory.com/image/251F6B4C558E627E26807B"));  
users.add(new User("Jane",20,"http://image.celebtide.com/celeb/new/ve/279_ve_1452259300.jpg"));  
users.add(new User("Paul",40,"http://res.heraldm.com/content/image/2013/12/01/20131201000224_0.jpg"));  
users.add(new User("Ailee",25,"http://cfile8.uf.tistory.com/image/194599374F7049A9010251"));
```

데이터바인딩

View 바인딩

19

— ViewHolder

```
public class ViewHolder extends RecyclerView.ViewHolder {  
  
    TextView tvName;  
    TextView tvAge;  
    ImageView ivProfile;  
  
    public ViewHolder(View itemView) {  
        super(itemView);  
        tvName = (TextView) itemView.findViewById(R.id.tvName);  
        tvAge = (TextView) itemView.findViewById(R.id.tvAge);  
        ivProfile = (ImageView) itemView.findViewById(R.id.ivProfile);  
    }  
}
```

```
public class ViewHolder extends RecyclerView.ViewHolder {  
  
    @BindView(R.id.tvName)  
    TextView tvName;  
    @BindView(R.id.tvAge)  
    TextView tvAge;  
    @BindView(R.id.ivProfile)  
    ImageView ivProfile;  
  
    public ViewHolder(View itemView) {  
        super(itemView);  
        ButterKnife.bind(this, itemView);  
    }  
}
```

```
public class ViewHolder extends RecyclerView.ViewHolder {  
  
    DatabindingItemBinding binding;  
  
    public ViewHolder(View itemView) {  
        super(itemView);  
        binding = DataBindingUtil.bind(itemView);  
    }  
}
```

기본, 버터나이프

onBindView()

20

— onBindView()에서 각 item 내용 설정

```
@Override
public void onBindView(UserViewHolder holder, int position) {

    User user = getItem(position);

    String name = user.getName();
    holder.tvName.setText(name);

    int age = user.getAge();
    holder.tvAge.setText(Integer.toString(age));

    String imgUrl=user.getImgUrl();
    ImageUtil.loadImage(holder.ivProfile, imgUrl, ContextCompat.getDrawable(getContext(), R.drawable.no_pic));
}
```

```
public static void loadImage(ImageView imageView, String url, Drawable errorDrawable) {
    Glide.with(imageView.getContext()).load(url).error(errorDrawable).into(imageView);
}
```

데이터바인딩

onBindView()

21

— onBindView()에서는 변수만 설정

```
@Override  
public void onBindView(UserViewHolder holder, int position) {  
    User user = getItem(position);  
    holder.binding.setUser(user);  
}
```

데이터바인딩

xml

22

— 변수 생성

```
<?xml version="1.0" encoding="utf-8"?>
<layout
  xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  >
  <data>
    <variable
      name="user"
      type="gun0912.databinding.common.model.User"/>
    </data>
```

데이터바인딩

xml

23

— 값 할당

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginLeft="16dp"
    android:orientation="vertical"
>

    <TextView
        android:id="@+id/tvName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@{user.name}"
    />

    <TextView
        android:id="@+id/tvAge"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="3dp"
        android:text="@{Integer.toString(user.age)}"
    />

</LinearLayout>
```

@BindingAdapter

24



Ted
32

```
users.add(new User("Ted", 32, "http://cfile25.uf.tistory.com/image/251F6B4C558E627E26807B"));
users.add(new User("Jane", 20, "http://image.celebtide.com/celeb/new/ve/279_ve_1452259300.jpg"));
users.add(new User("Paul", 40, "http://res.heraldm.com/content/image/2013/12/01/20131201000224_0.jpg"));
users.add(new User("Ailee", 25, "http://cfile8.uf.tistory.com/image/194599374F7049A9010251"));
```

— ImageView에는 Drawable이 아니라 이미지 주소라서 Glide로 불러와야 하는데?

```
public static void loadImage(ImageView imageView, String url, Drawable errorDrawable) {
    Glide.with(imageView.getContext()).load(url).error(errorDrawable).into(imageView);
}
```

— @BindingAdapter를 이용해서 xml에서 처리가능

```
<gun0912.databinding.common.view.CircleImageView
    android:layout_width="40dp"
    android:layout_height="40dp"
    android:id="@+id/ivProfile"
    app:imageUrl="@{user.imgUrl}"
    app:error="@{@drawable/no_pic}"
/>
```


@BindingAdapter

25

- @BindingAdapter에 설정한 변수이름으로 xml에서 접근가능
- app:imageUrl, app:error

```
@BindingAdapter({"bind:imageUrl","bind:error"})  
public static void loadImage(ImageView imageView, String url, Drawable errorDrawable) {  
    Glide.with(imageView.getContext()).load(url).error(errorDrawable).into(imageView);  
}
```

```
<gun0912.databinding.common.view.CircleImageView  
    android:layout_width="40dp"  
    android:layout_height="40dp"  
    android:id="@+id/ivProfile"  
    app:imageUrl="@{user.imgUrl}"  
    app:error="@{@drawable/no_pic}"  
/>
```

@BindingAdapter

응용

26

— 라이브러리 사용 없이 커스텀 폰트설정

```
@BindingAdapter({"bind:font"})  
public static void setFont(TextView textView, String fontName) {  
    textView.setTypeface(Typeface.createFromAsset(textView.getContext().getAssets(), "fonts/" + fontName));  
}
```

```
<TextView  
    app:font="@{`Source-Sans-Pro-Regular.ttf`}"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"/>
```

@BindingConversion

27

— 어떤 Date타입의 정보를 12:34:56 같은 텍스트로 표현하고 싶다면?

```
<TextView
    android:id="@+id/tvUserTime"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@{user.timeDate}"
/>
```

— @BindingConversion을 활용해서 원하는 형태로 변경

```
@BindingConversion
public static String convertDateToDisplayedText(Date date) {
    return new SimpleDateFormat("yyyy:MM:dd").format(date);
}
```

@BindingConversion

응용

28

— true/false 에 따라 보여주기/숨기기

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:visibility="@{user.age > 20}"
/>
```

```
<RelativeLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:visibility="@{user.loaded}"
>
```

```
@BindingConversion
public static int convertBooleanToVisibility(boolean visible) {
    return visible ? View.VISIBLE : View.GONE;
}
```

식 언어

xml에서 사용 가능한 식

29

- 수학 + - / * %
- 문자열 연결 +
- 논리 && ||
- 이항 & | ^
- 단항 + - ! ~
- 시프트 >> <<
- 비교 == > < >= <=
- instanceof
- 그룹화 ()
- 리터럴 - 문자, 문자열, 숫자, null
- 형변환
- 메서드 호출
- 필드 액세스
- 배열 액세스 []
- 삼항 연산자 ? :

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@{String.valueOf(index + 1)}"
    android:visibility="@{age < 13 ? View.GONE : View.VISIBLE}"
    android:transitionName="@{"image_" + id}"
/>
```

Include

30

— 하나의 xml 을 <include/> 태그로 재사용하는 경우



124
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32세 비정상인

Korean / English / Thailand

#일상#음식#셀카

Now or Never

Include

하나의 xml 을 <include/> 태그로 재사용하는 경우

31

- 재사용될 xml 구조
- 변수 생성

```
<layout
    xmlns:android="http://schemas.android.com/apk/res/android">

    <data>
        <variable name="count" type="int"/>
        <variable name="title" type="String"/>
    </data>

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

        <TextView
            style="@style/CustomText_Subhead"
            android:text="@{Integer.toString(count)}"
            android:textStyle="bold"
            />

        <TextView
            style="@style/CustomText_Body"
            android:text="@{title}"
            android:textColor="@color/txt_midiumgray"/>

    </LinearLayout>
</layout>
```

Include

하나의 xml 을 <include/> 태그로 재사용하는 경우

32

— <include/> 사용하면서 변수 전달

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

    <include
        layout="@layout/sns_counter"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        app:count="@{user.postCount}"
        app:title="@{@string/post}"/>

    <include
        layout="@layout/sns_counter"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        app:count="@{user.followerCount}"
        app:title="@{@string/follower}"/>

    <include
        layout="@layout/sns_counter"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        app:count="@{user.followingCount}"
        app:title="@{@string/following}"/>

</LinearLayout>
```


Observable

33

— 데이터 값이 변경되면 알아서 View도 변경 시켜주고 싶어요

**124**

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Now or Never

Observable

34

- BaseObservable을 상속받아 정의

```
public class User extends BaseObservable {
```

- getXXX() 함수에는 @Bindable
- setXXX() 함수에는 notifyPropertyChanged()

```
    int postCount;

    @Bindable
    public int getPostCount() { return postCount; }

    public void setPostCount(int postCount) {
        this.postCount = postCount;
        notifyPropertyChanged(BR.postCount);
    }
}
```

ObservableField

35

— getter, setter 만들기 귀찮아요

```
public class User2 {  
  
    public final ObservableField<String> name = new ObservableField<>();  
    public final ObservableField<String> imgProfile = new ObservableField<>();  
    public final ObservableField<String> introduce = new ObservableField<>();  
  
    public final ObservableInt postCount = new ObservableInt();  
    public final ObservableInt followerCount = new ObservableInt();  
    public final ObservableInt followingCount = new ObservableInt();  
  
    public final ObservableBoolean follow = new ObservableBoolean();  
    public final ObservableBoolean loaded = new ObservableBoolean();  
  
}
```

- ObservableField
- ObservableBoolean, ObservableByte, ObservableChar, ObservableShort, ObservableInt, ObservableLong, ObservableFloat, ObservableDouble, ObservableParcelable

ObservableField

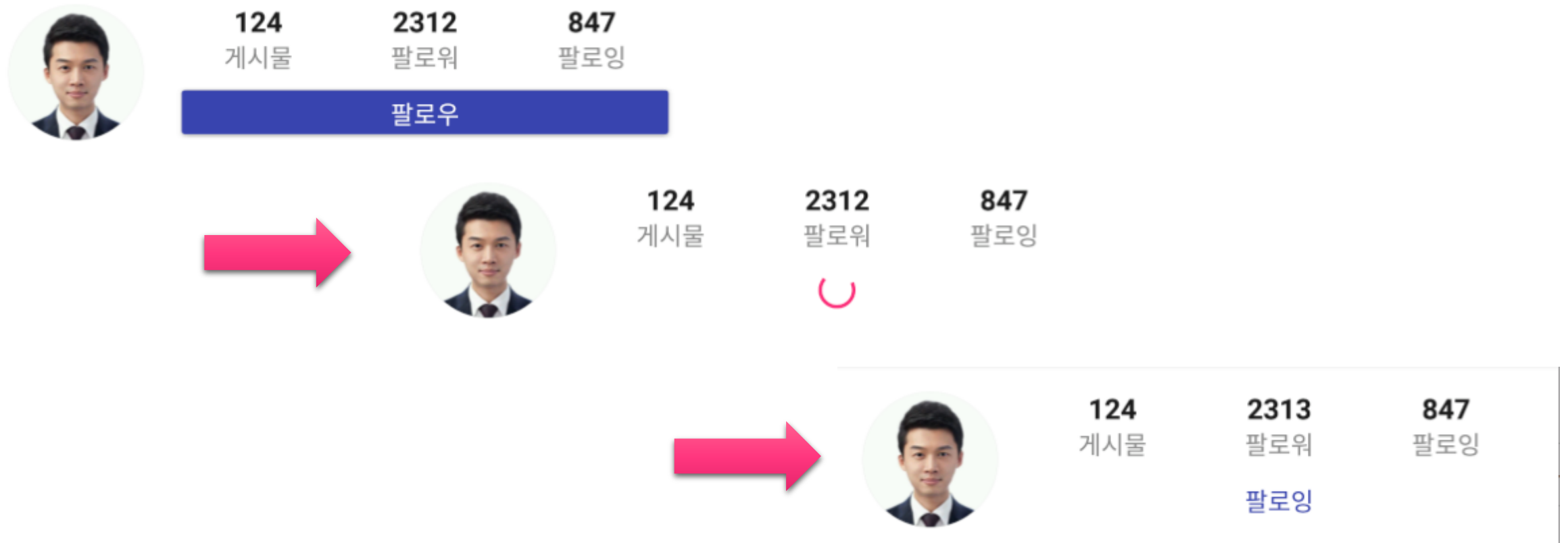
36

— set, get 방법

```
user.name.set("Ted Park");  
  
String name = user.name.get();  
  
user.postCount.set(123);  
  
int postCount = user.postCount.get();
```

응용

37

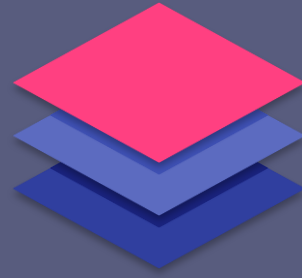


불편사항

점점 발전하겠지..

38

- 버터나이프에서 사용하는 Resource binding은 사용할 수 없다(@BindString, @BindDimen, ...)
- Android Studio 최신버전인데도 제대로 반영이 안된다
- 여러 군데에서 같은 변수이름의 @BindingAdapter 을 사용해도 오류가 없다고 한다
- 인코딩 문제때문인지 xml에서 '& &' 대신 '& amp; & amp;'로 써야한다
- Java소스코드는 줄어들지만 xml소스코드는 늘어난다



Thank You

Questions?