Parul® University
Vadodara, Gujarat

NAAC GRADE A++

Information and Communication Technology

Working with Views and Fragment

Study Guide

Prof. Dr. Shiv Shakti Shrivastava
CSE, PIT
Parul University

MAD (MOBILE APP DEVELOPMENT)

1. Working with Views and Fragment
2. Views: GridView, WebView,
3. ScrollView, ListView, RecyclerView, CardView
4. Fragment: Introduction,
5. life Cycle, Implementation

Overview of Views and Fragments

Android Views are UI components that form the building blocks of user interfaces. Fragments, on the other hand, are reusable portions of UI with their own lifecycle, which can be managed independently within activities.

Views in Android

GridView

- Displays data in a two-dimensional, scrollable grid format.
- Ideal for image galleries or product grids.
- Key attributes: android:numColumns, android:columnWidth, etc.adapty

WebView

- Integrates web content (HTML/JavaScript/CSS) in an app.
- Used for displaying websites, online documents, or custom HTML renderings.
- Key methods: loadUrl(), getSettings().adapty

ScrollView

- Allows users to scroll through a list of child views in vertical or horizontal direction.
- Useful for forms or content longer than the screen.adapty

ListView

- Displays a vertically scrollable list of items.
- Requires an adapter to provide data.
- Commonly used before RecyclerView for simple lists, but less flexible.topcoder+1

RecyclerView

- Advanced replacement for ListView and GridView.
- Efficiently displays large sets of data by recycling item views using the ViewHolder pattern.developer.android+2
- Supports custom layouts with LinearLayoutManager, GridLayoutManager, etc.
- Requires an Adapter, ViewHolder, and LayoutManager.

CardView

- A FrameLayout-based widget used to display information in a card format.
- Useful for lists with rich UI, such as elevation, rounded corners.
- Often used with RecyclerView to create elegant lists or grids.geeksforgeeks+1

Views Comparison Table

View	Layout	Use Case	Key Features
GridView	Grid	Gallery, Products	Multiple columns, scrollable
WebView	Web page	Rendering web/HTML	loadUrl, interactive content
ScrollView	Vertical/Horizontal	Forms, Long Content	Scrollable child elements
ListView	List	Simple lists	Adapter-based, less flexible
RecyclerView	Customizable	Large/complex lists/grids	ViewHolder, LayoutManager
CardView	Card (with RV)	Rich item, UI previews	Elevation, rounded corners

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RecyclerView & CardView Implementation

- RecyclerView divides into Adapter, ViewHolder, and LayoutManager.
- CardView provides enhanced UI for list items.
- Example code outline:

java

```java
public class CourseAdapter extends RecyclerView.Adapter<CourseAdapter.ViewHolder> {
  // Adapter implementation uses ViewHolder class to bind data
  // CardView layout used for each item
}
```

- Implementation typically uses XML layouts for RecyclerView, CardView item layouts, and data binding patterns.edurev+2

Fragment: Introduction, Lifecycle, Implementation

Introduction

- Fragments represent UI sections within an activity, allowing modular design and code reuse.developer.android+1
- Each fragment can maintain its own state and layout.

Fragment Lifecycle

- Key methods for fragment lifecycle include:
  - onAttach(): Fragment attached to Activity
  - onCreate(): Fragment initialization
  - onCreateView(): Creates Fragment UIdeveloper.android+2
  - onViewCreated(): View configuration post-creation

- onStart(): Fragment visible
- onResume(): Fragment is active
- onPause(): Fragment paused
- onStop(): Fragment no longer visible
- onDestroyView(): Destroys fragment's view
- onDestroy(): Final clean-up
- onDetach(): Fragment detached from activity

Fragment Lifecycle Table

Lifecycle Method	**Purpose**
onAttach()	Attach to Activity
onCreate()	Fragment object initialized
onCreateView()	Create fragment's view
onViewCreated()	Configure view
onStart()	Fragment visible
onResume()	Fragment interacts with user
onPause()	Fragment paused
onStop()	Fragment stopped
onDestroyView()	Destroy fragment's UI
onDestroy()	Final cleanup
onDetach()	Detach from Activity

Fragment Implementation

- Fragments are defined in XML layouts or added programmatically through FragmentManager.
- Example (in XML):

xml

```
<fragment
  android:id="@+id/textFragment"
  android:name="com.example.TextFragment"
  android:layout_width="match_parent"
  android:layout_height="wrap_content"/>
```

- Example (programmatically):

java

```
FragmentManager fm = getSupportFragmentManager();

fm.beginTransaction().add(R.id.container, new TextFragment()).commit();
```

- Each fragment has its own layout file and Java/Kotlin class with lifecycle methods.digitalocean+2

Useful Figures and Diagrams

- Typical architecture diagrams will show multiple fragments within a parent activity.
- RecyclerView layouts with item decorations, grid and linear arrangements highlight the flexibility of views.topcoder+1

This material provides both theoretical foundations and practical reference for implementing views and fragments in Android apps, including explanations, comparative tables, lifecycle diagrams, and code samples. For fully annotated figures and detailed charts, reference comprehensive guides and textbooks linked above, and official Android documentation.centron+5

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