Understanding Activities and Activity Layout Interaction

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What to Expect from This Module

What is an Activity?

Activity UI

Layout Classes

ConstraintLayout Class

Activity/Layout Relationship

Populating a Spinner

What is an Activity?

An activity is a single, focused thing that the user can do.

A Little More Detail About Activities

Serve as the place to present the UI

- Provide a window
- UI is built with View-derived classes

Have a lifecycle

- More than just a “screen”
- Lifecycle calls a series of methods
- Use the onCreate method to initialize the Activity

Activity UI

View

- Basic building block of UI
- Drawing and event handling
- Many specialized classes available

ViewGroup

- Special View that holds other views

Layout

- Special invisible ViewGroup
- Handle View positioning behavior
- Many specialized classes available

Layout Classes

Activity UIs need to be responsive

- Device display characteristics vary
- UI must adapt
- Absolute positioning would be limiting

Layout classes provide positioning flexibility

- Arrange child Views
  - Children can include other layout classes
- Specific positioning behavior depends on the layout class

Some Common Layout Classes

FrameLayout
- Provides a blocked-out area
- Generally has only one direct child

ScrollView
- Provides a scrollable area

LinearLayout
- Horizontal or vertical arrangement
- Supports weighted distribution

RelativeLayout
- Relative positioning
- Relative to one another or parent

Simplifying Layout Creation

Traditional layout classes have challenges

- UIs have become much richer

Run-time challenges

- Sometimes have to nest layout classes
- Deep/complex nesting impacts speed

Design-time challenges

- Achieving desired result with designer sometimes challenging
- In some cases end up working in the XML

ConstraintLayout Class

Extremely flexible layout class

- Often the only layout class needed

First-class design-time experience

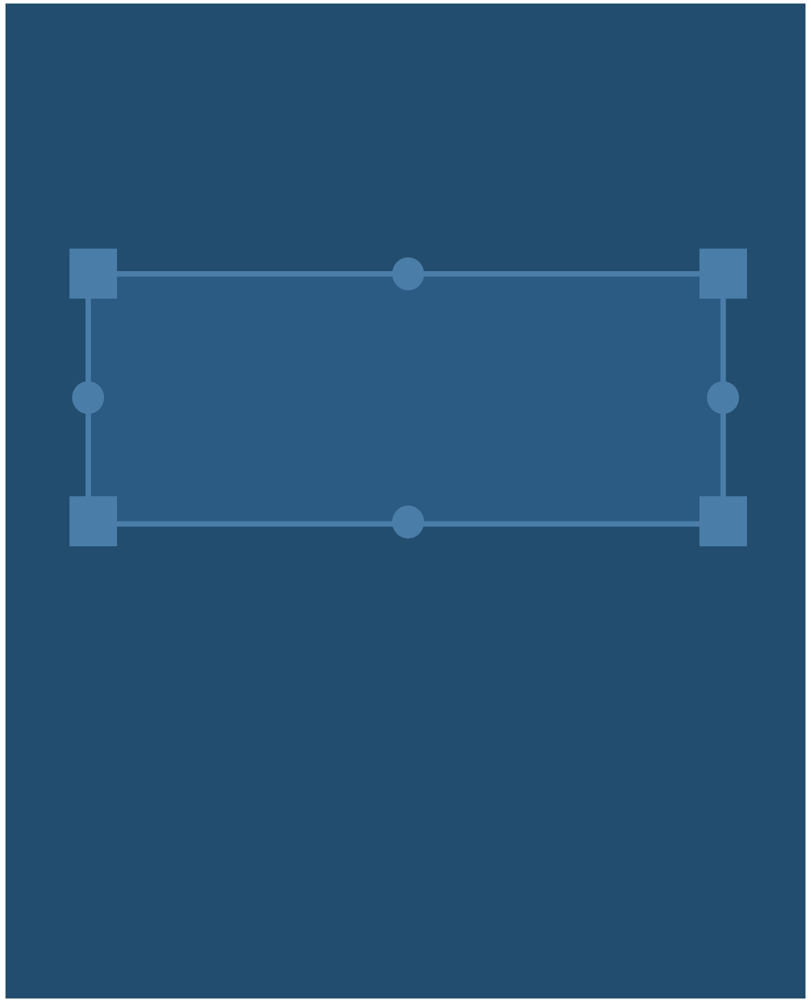
- Closely integrated with designer
- Rarely need to resort to XML

ConstraintLayout Class

Children leverage constraints

- Relative size/position
- Ratio-base size/position
- Group size/position distribution
  - Known as “chains”
- Weighted relationships
- Guideline-based size/position

ConstraintLayout



Should set horizontal & vertical constraints

- Positions at 0,0 without constraints
- Can set more than one of each

Setting constraints with the designer

- Drag circle at mid-line to relationship

Setting fixed size with the designer

- Drag corner squares

Creating the Activity UI

Programmatically

- Use Java code to create class instances
- Relationships and properties set in code

Layout files

- XML files describe View hierarchy
- Usually created using the Android Studio UI Designer

Activity/Layout Relationship

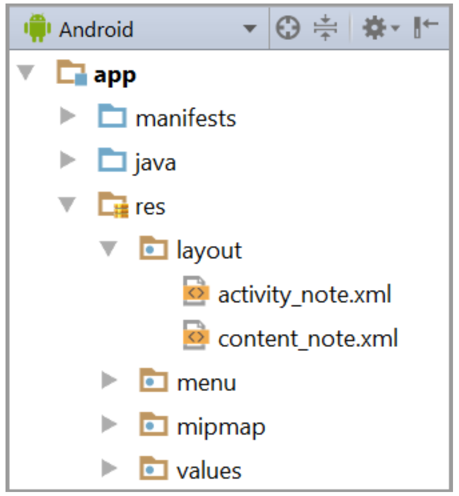
There is no implicit relationship

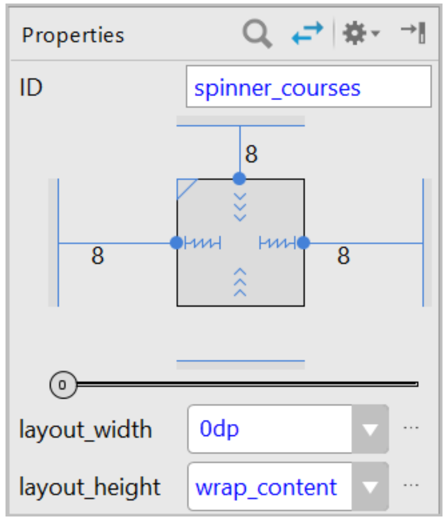
- Activity must load layout
  - Use setContentView
- Activity must request View reference
  - Use findViewById

Relies on generated class R

- Contains nested classes
- Layouts names in R.layout
- Id names in R.id

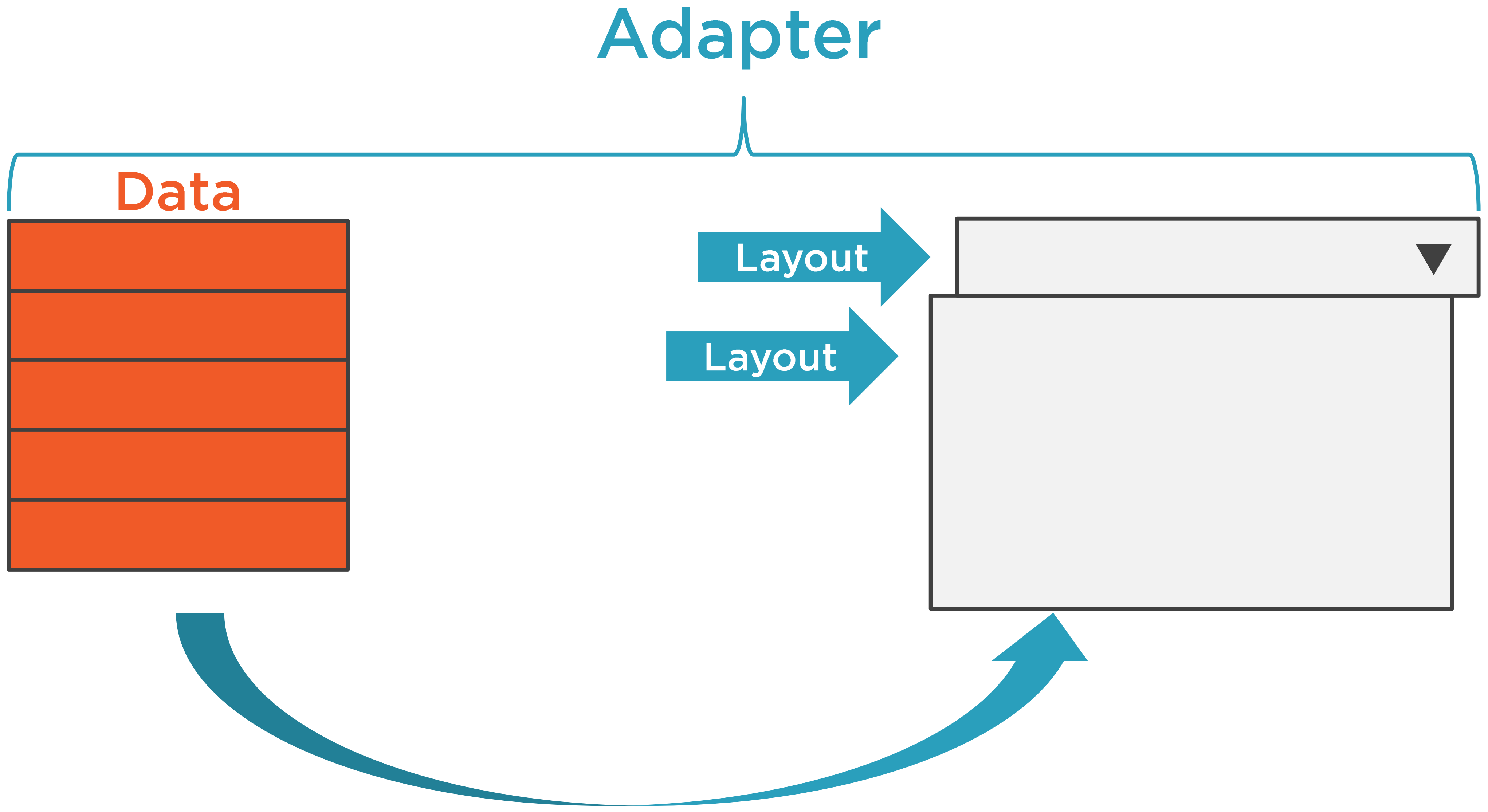
```
public final class R {
  public static final class layout {
    public static final
        int activity_note = ... ;
    // ...
  }
  public static final class id {
    public static final
        int spinner_courses = ... ;
    // ...
  }
}
```





ID: spinner_courses
layout_width: 0dp
layout_height: wrap_content

Populating a Spinner



Summary

Activities present the UI

Views are the basic UI building blocks

Layouts

- Handle positioning behavior
- Important for creating responsive UI

ConstraintLayout class

- Powerful and flexible
- Closely integrated with Android Studio Designer

Summary

Activity/layout relationship

- No implicit relationship exists
- Must load layout
  - Use setContentView
- Must request layout View references
  - Use findViewById

R class provides important constants

- Layout resources
  - R.layout
- View Id's
  - R.id