



Choosing the Right Layout

Layout
Fundamentals

Overview

- Which Layout to Use?
- Hierarchy Viewer
- Merge, Include, ViewStub
- Case Studies



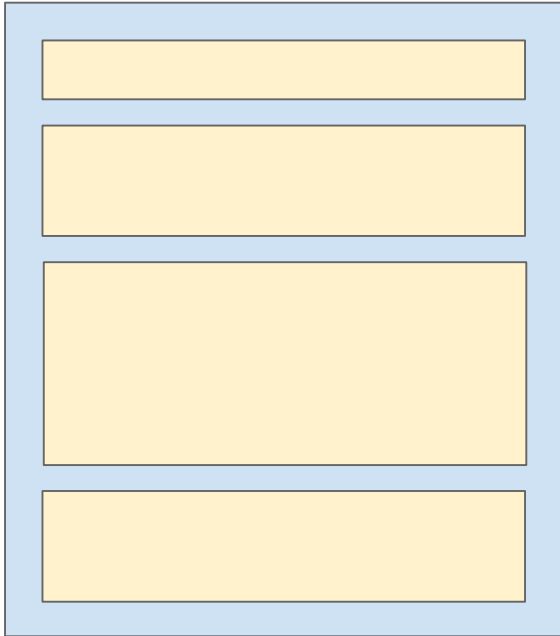
Which Layout to Use?

- Simplest one that does the job
- Performance



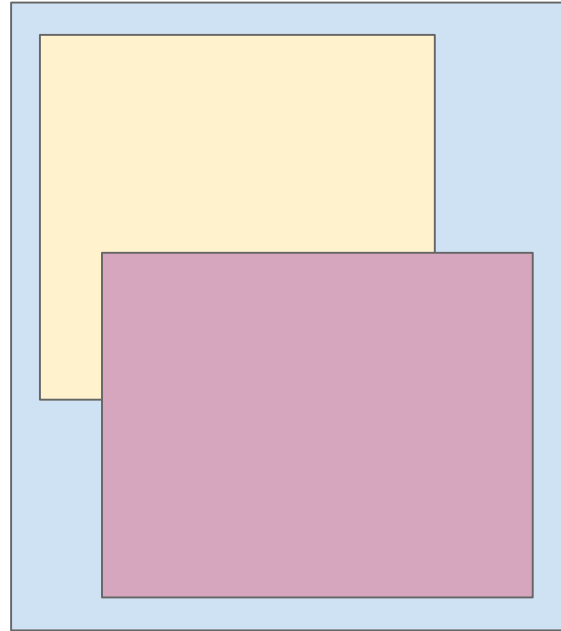
1 dimension

LinearLayout



x-axis or y-axis

FrameLayout

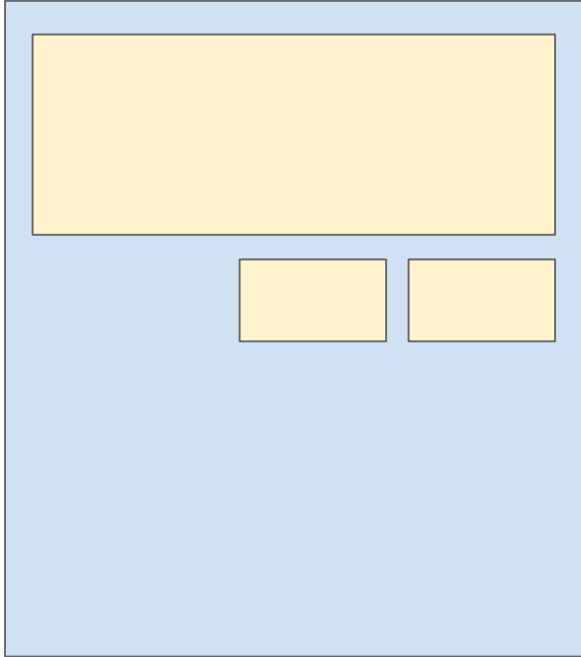


z-axis



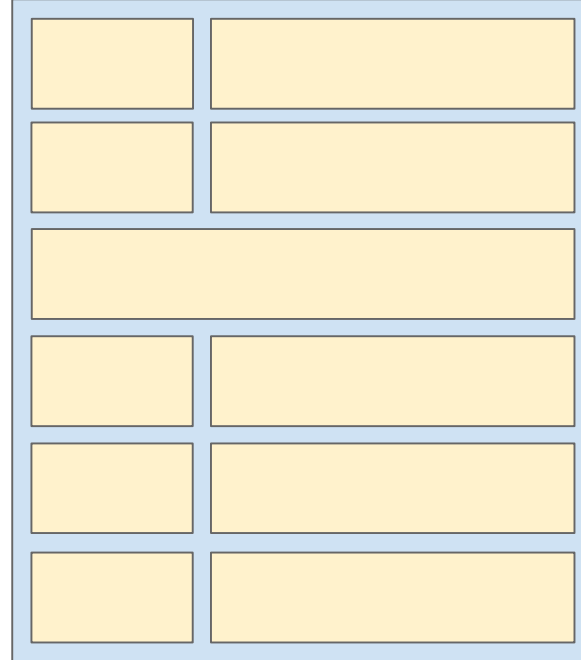
2 dimensions

RelativeLayout



Relative positions

TableLayout



Aligned columns



Performance

- Important when using a layout repeatedly e.g. in a ListView
- Fewer views → better
- Fewer measure passes → better



Measure

Layout

Draw



Measure, Layout, Draw

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>
```




```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Measure

	width	height	left	top	right	bottom
Hello						
World						



```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Measure

	width	height	left	top	right	bottom
Hello	65	38				
World						



```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Measure

	width	height	left	top	right	bottom
Hello	65	38				
World	74	38				



```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Hello

Layout

	width	height	left	top	right	bottom
Hello	65	38	0	0	65	38
World	74	38				



```
<LinearLayout
```

```
    android:layout_width="match_parent"
```

```
    android:layout_height="match_parent"
```

```
    android:orientation="horizontal">
```

```
        <TextView
```

```
            android:layout_width="wrap_content"
```

```
            android:layout_height="wrap_content"
```

```
            android:text="@string/hello"
```

```
            android:background="@color/purple" />
```

```
        <TextView
```

```
            android:layout_width="wrap_content"
```

```
            android:layout_height="wrap_content"
```

```
            android:text="@string/world"
```

```
            android:background="@color/blue" />
```

```
</LinearLayout>
```

Hello World

Layout

	width	height	left	top	right	bottom
Hello	65	38	0	0	65	38
World	74	38	65	0	139	38



```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Measure #1

	width	height	left	top	right	bottom
Hello		38				
World	74	38				



```

<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <TextView
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/hello"
        android:background="@color/purple" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/world"
        android:background="@color/blue" />
</LinearLayout>

```

Measure #2

	width	height	left	top	right	bottom
Hello	646	38				
World	74	38				



Hello

World

```
<TextView
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="@string/hello"
    android:background="@color/purple" />
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/world"
    android:background="@color/blue" />
```

</LinearLayout>

	width	height	left	top	right	bottom
Hello	646	38	0	0	646	38
World	74	38	646	0	720	38

Layout



How many passes?

Layout	Normal	Extra
LinearLayout	1	2 with weight
RelativeLayout	2	
FrameLayout	1	
TableLayout	2	3 with shrinking and stretching



Performance

- Important when using a layout repeatedly e.g. in a ListView
- Fewer views → better
- Fewer measure passes → better



Hierarchy Viewer



ViewServer

- Download ViewServer.java from <https://github.com/romainguy/ViewServer>
- Add INTERNET permission
- Enable ViewServer in your activity



Merge



Include



ViewStub

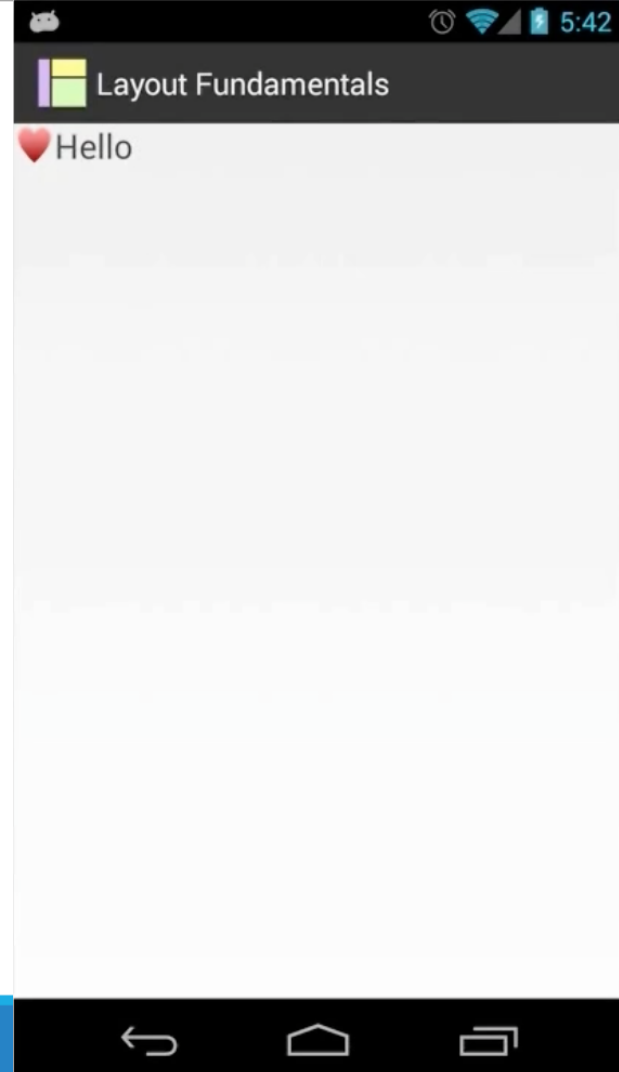


Case Studies





```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/heart" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="20sp"
        android:text="@string/hello" />
</LinearLayout>
```



```
<TextView
```

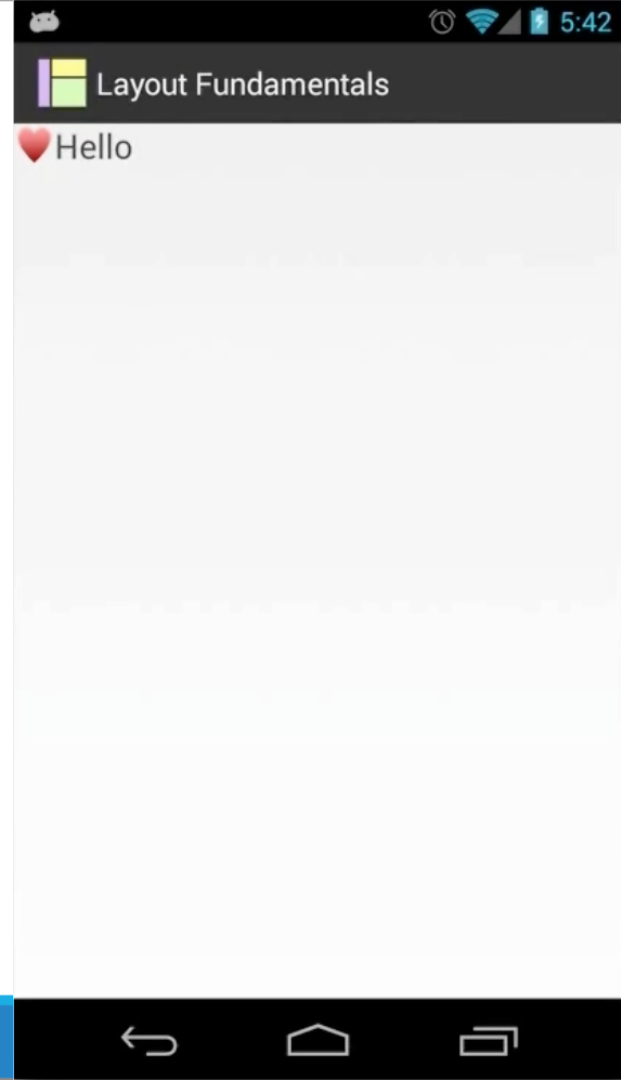
```
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
```

```
    android:drawableLeft="@drawable/heart"
```

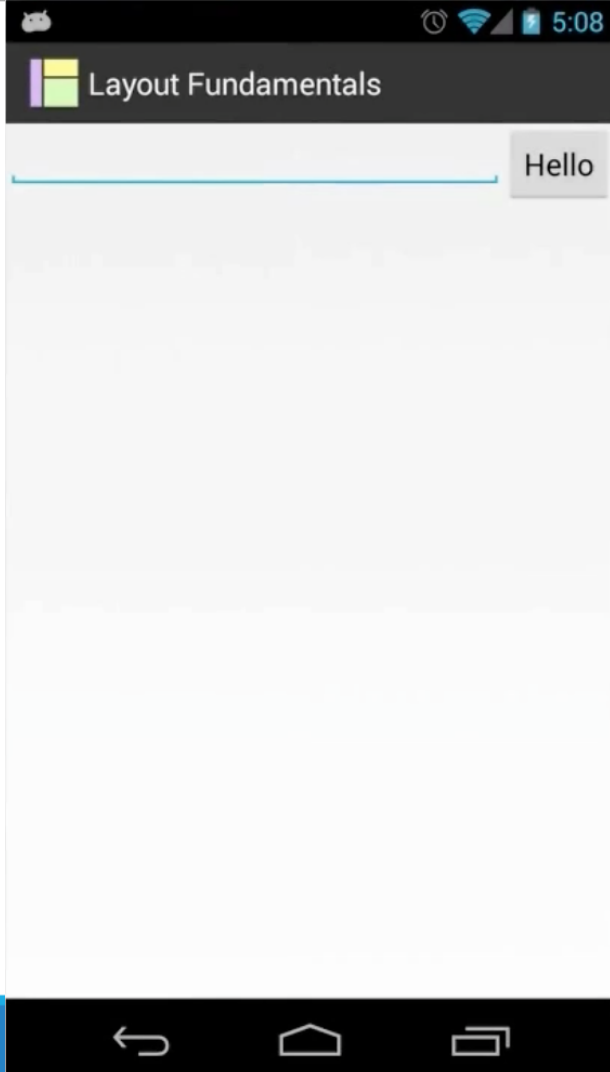
```
    android:textSize="20sp"
```

```
    android:text="@string/hello" />
```

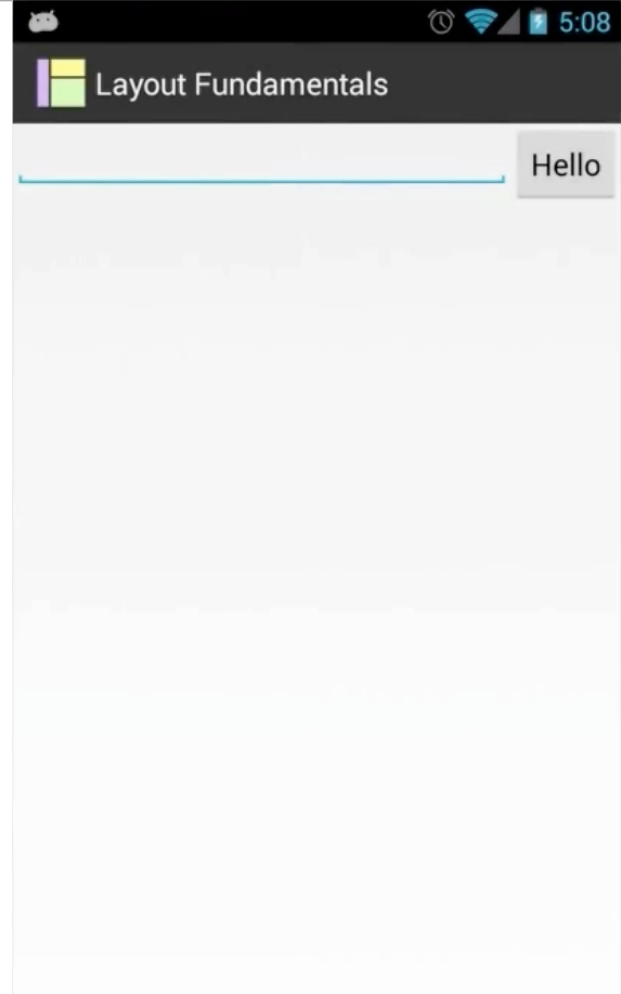




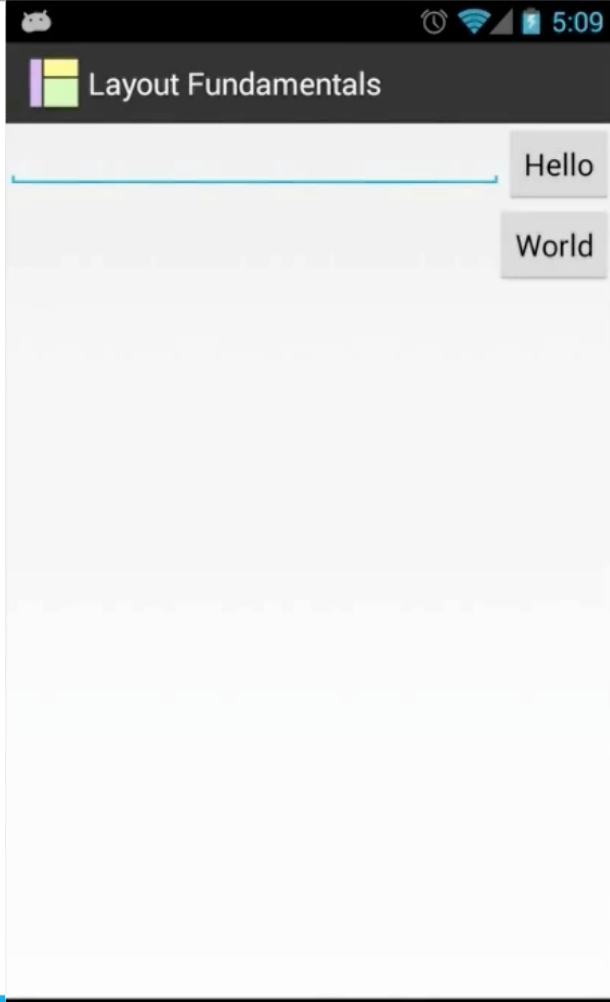
```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
    <EditText
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello" />
</LinearLayout>
```



```
<RelativeLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <Button
        android:id="@+id/hello"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="@string/hello" />
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_toLeftOf="@id/hello" />
</RelativeLayout>
```

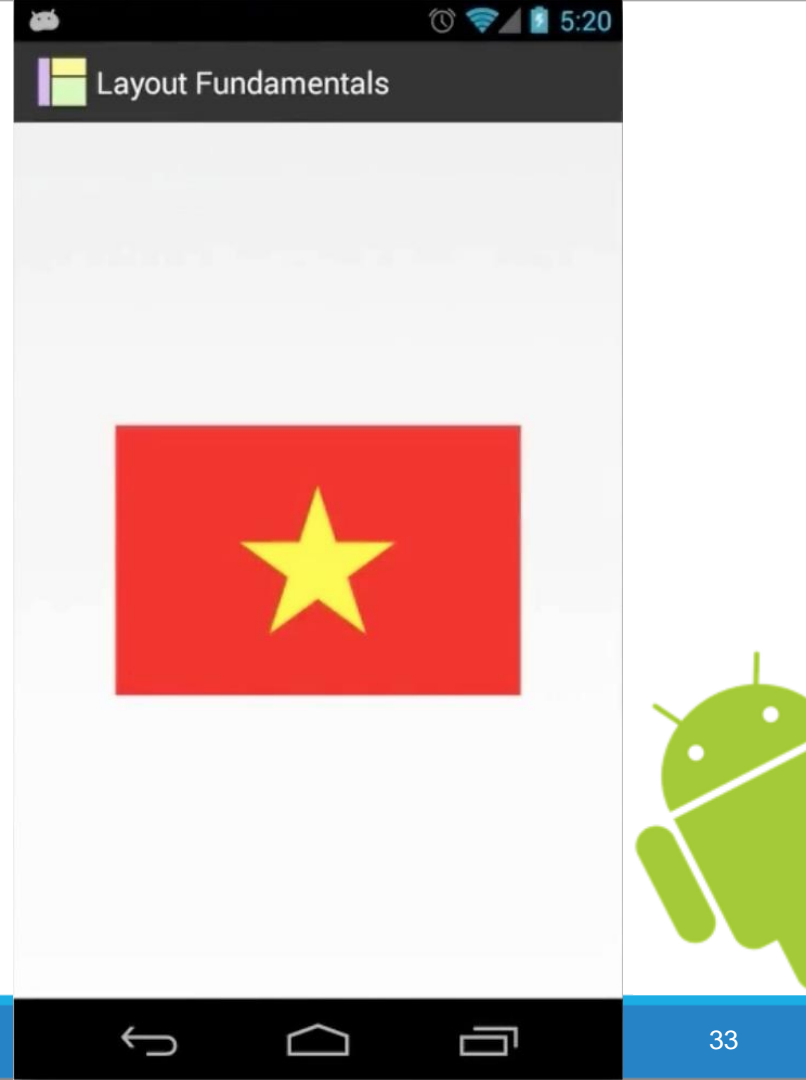


```
<RelativeLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <Button
        android:id="@+id/hello"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:text="@string/hello" />
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_toLeftOf="@id/hello" />
    <Button
        android:id="@+id/world"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentRight="true"
        android:layout_below="@id/hello"
        android:text="@string/world" />
</RelativeLayout>
```

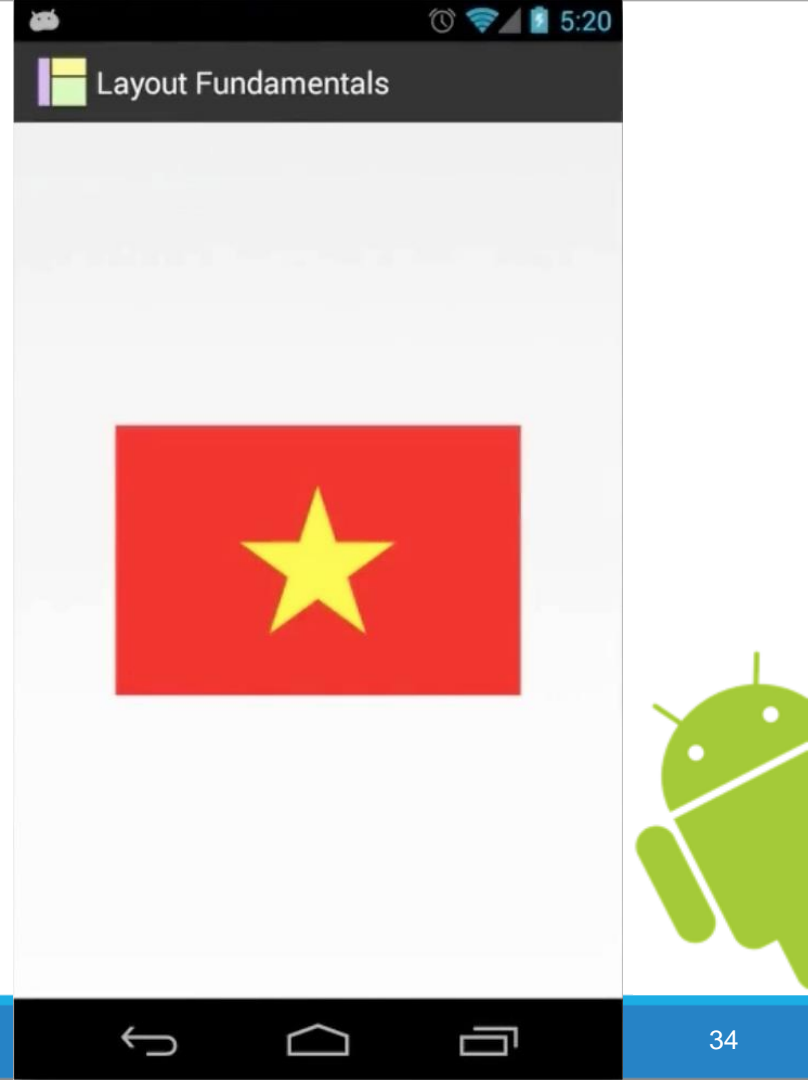





```
<FrameLayout
    android:layout_width="240dp"
    android:layout_height="160dp"
    android:layout_gravity="center">
    <View
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@color/vietnam_red" />
    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:src="@drawable/yellow_star" />
</FrameLayout>
```



```
<FrameLayout
    android:layout_width="240dp"
    android:layout_height="160dp"
    android:layout_gravity="center"
    android:background="@color/vietnam_red">
    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:src="@drawable/yellow_star" />
</FrameLayout>
```



```
<ImageView
```

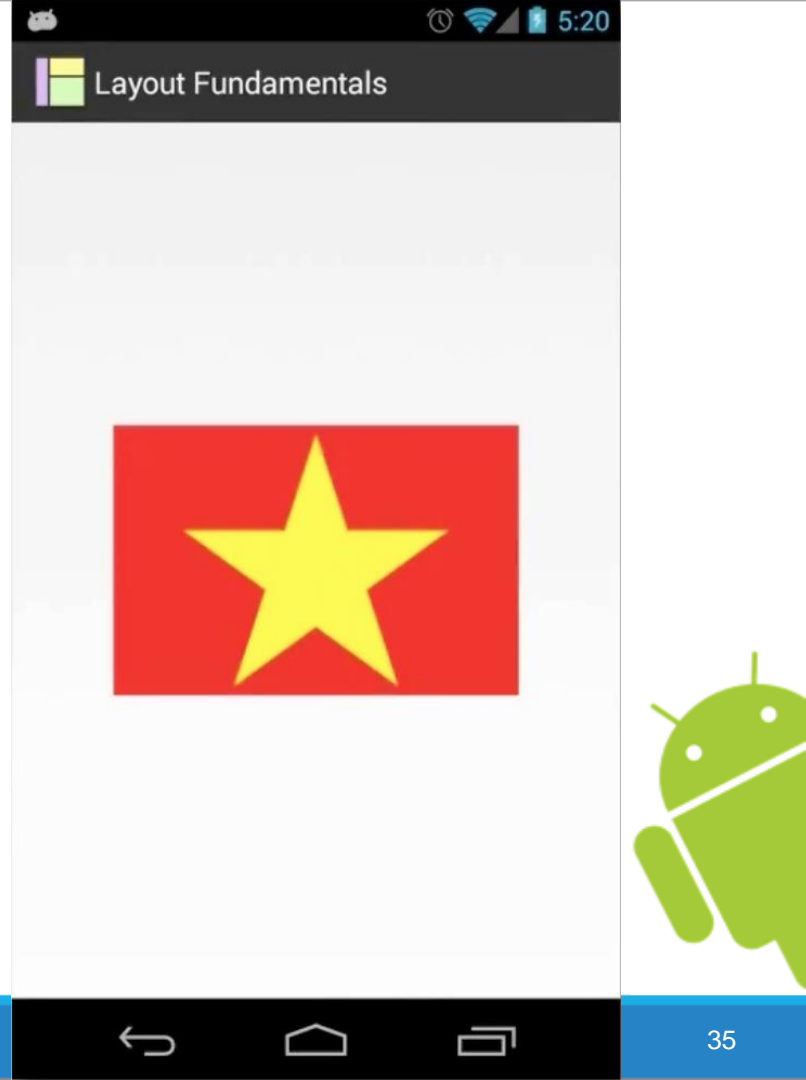
```
    android:layout_width="240dp"
```

```
    android:layout_height="160dp"
```

```
    android:layout_gravity="center"
```

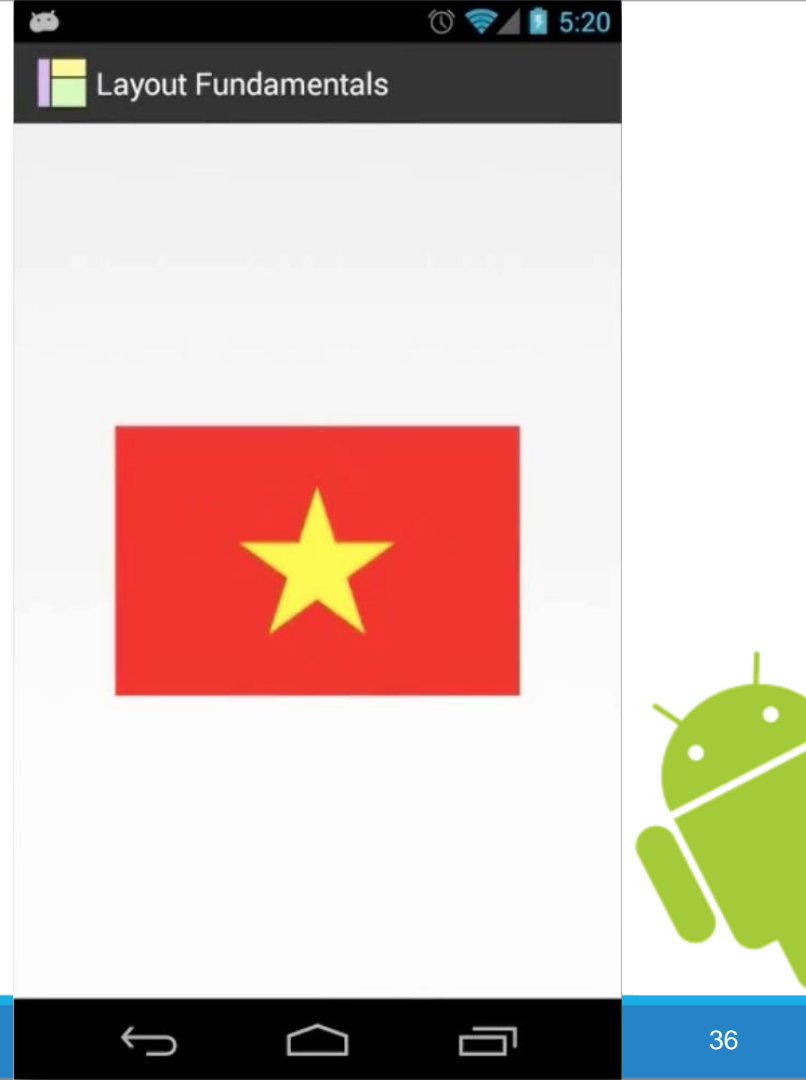
```
    android:background="@color/vietnam_red"
```

```
    android:src="@drawable/yellow_star" />
```



<ImageView

```
    android:layout_width="240dp"  
    android:layout_height="160dp"  
    android:layout_gravity="center"  
    android:background="@color/vietnam_red"  
    android:src="@drawable/yellow_star"  
    android:scaleType="center" />
```





```
<LinearLayout
    android:layout_width="240dp"
    android:layout_height="160dp"
    android:layout_gravity="center"
    android:orientation="vertical">
    <View
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:background="@color/austria_red" />
    <View
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:background="@android:color/white" />
    <View
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:background="@color/austria_red" />
</LinearLayout>
```



```
<LinearLayout
    android:layout_width="240dp"
    android:layout_height="160dp"
    android:gravity="center"
    android:weightSum="3"
    android:orientation="vertical">
    <View
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:background=
            "@android:color/white" />
</LinearLayout>
```



```
<LinearLayout
    android:layout_width="240dp"
    android:layout_height="160dp"
    android:layout_gravity="center"
    android:gravity="center"
    android:orientation="vertical"
    android:background="@color/austria_red">
    <View
        android:layout_width="match_parent"
        android:layout_height="53dp"
        android:background=
            "@android:color/white" />
</LinearLayout>
```



Summary

- Which Layout to Use?
- Hierarchy Viewer
- Merge, Include, ViewStub
- Case Studies



