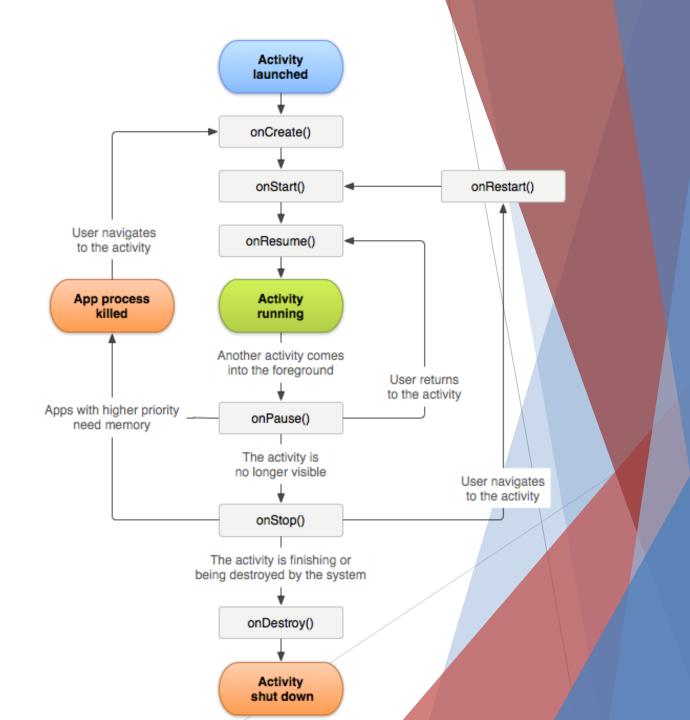
Android Programing

Gavrilut Dragos

Activity Life Cycle



Activities - onCreate

```
@Override
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.main_activity);
}
```

- savedInstanceState if different than null it represents a object with saved informations about the last state of the activity.
- ► It is set by <u>onSaveInstanceState</u> (Bundle outState)
- setContentView sets the view object that will be displayed in the current activity
 - public void setContentView (int layoutResID)
 - public void setContentView (<u>View</u> view)
 - public void setContentView (<u>View</u> view, ViewGroup.LayoutParams params)

"R" file

```
■ TestStudenti

  gen [Generated Java Files]

▲ ⊕ com.example.teststudenti

       BuildConfig.java
       ▶ I R.java
    Android 2.2
  Android Private Libraries
  Android Dependencies
    assets
  ь 👺 bin

    □ libs

     drawable-hdpi
      drawable-ldpi
     drawable-mdpi
     drawable-xhdpi
     drawable-xxhdpi
     activity_main.xml
     menu
         main.xml
     values
         dimens.xml
         strings.xml
         ☐ styles.xml
     values-sw720dp-land
    ☐ AndroidManifest.xml
```

```
package com.example.teststudenti;
public final class R {
    public static final class attr {
    public static final class dimen {
        public static final int activity_horizontal_margin=0x7f040000;
        public static final int activity_vertical_margin=0x7f040001;
    public static final class drawable {
        public static final int ic Launcher=0x7f020000;
    public static final class id {
        public static final int action settings=0x7f080004;
        public static final int button1=0x7f080000;
        public static final int button2=0x7f080002;
        public static final int button3=0x7f080003;
        public static final int button4=0x7f080001;
    public static final class layout {
        public static final int activity main=0x7f030000;
    public static final class menu {
        public static final int main=0x7f070000;
    public static final class string {
        public static final int action settings=0x7f050001;
        public static final int app_name=0x7f050000;
        public static final int hello world=0x7f050002;
    public static final class style {
        public static final int AppBaseTheme=0x7f060000;
        public static final int AppTheme=0x7f060001;
```

View

- ► The superclass for every UI design object in Android OS
- ▶ The following functions can be overwritten in a view

Function	Action
onMeasure(int, int)	Called to compute the size of the view
onLayout(boolean, int, int, int, int)	Called to compute its layout position
onSizeChanged(int, int, int, int)	Called when the size of the view changed
onDraw(android.graphics.Canvas)	Called to draw the content of the view
onKeyDown(int, KeyEvent)	Called when a key is presses
onKeyUp(int, KeyEvent)	Called when a key is release
onTrackballEvent(MotionEvent)	Called when a track ball event occurs
onTouchEvent(MotionEvent)	Calles when a touch event occurs

View

- UI Objects derived from view
 - ImageView
 - ► ImageButton
 - ▶ ZoomButton
 - ProgressBar
 - SurfaceView
 - TextView
 - ► Button
 - ► CheckBox
 - ► RadioBox
 - ► ToggleButton

View

- ► A view and its children can be design using 2 methods: XML design or direct code
- Using XML design means using different layouts to arrange the UI objects in a View.

Layout object	API	Description
AbsoluteLayout	1	Arrange its children after their absolute position (x,y). Deprecated since API Level 3
FrameLayout	1	Displays one child (in a frame)
LinearLayout	1	Arrange its childern in one row or one column
RelativeLayout	1	Arrange its children in relation one to another
TableLayout	1	Arrange its childern in a Table (similar to a table in a HTML view)
GridLayout	14	Arrange its children in a Grid (with columns and rows)

View layout XML parameters

- android:layout_width
- android:layout_height
 - ▶ fill_parent → as big as its parent (minus the padding).
 Deprecated since API Level 8 and replaced with math_parent
 - match_parent
 - ▶ wrap_content → as big as its childs require plus the padding. In case of Buttons, TextView,... it is as big as the text it contains.
 - or a unit (in pixels (px), density independent pixels (dp), inches (in), millimeters (mm)

View layout XML parameters

▶ android:id → object id (will be used in findViewByld function).

Exemple: android:id="@+id/button2"

- ▶ android:enabled → True/False
- ▶ android:onClick → name of the function to process the onClick event for the View

```
@Override
public void onCreate(Bundle savedInstanceState)
{
    super.onCreate(savedInstanceState);
    ...
}

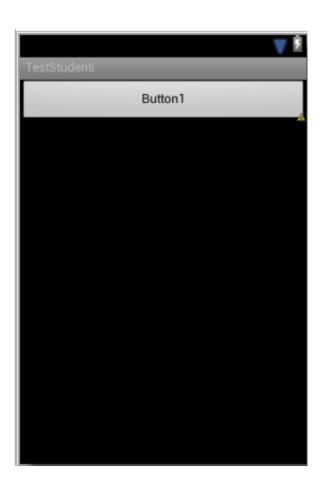
public void OnButton1Click(View button)
{
    ...
}

    android:onClick="OnButton1Click"
    android:ont="Putton" /
    android:ont="OnButton" /
    android:ont=
```

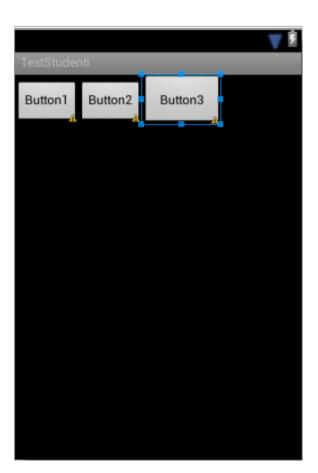
```
<LinearLayout</pre>
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical" >
    <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button1" />
    <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button2" />
    <Button
        android:layout width="fill parent"
        android:layout_height="wrap_content"
        android:text="Button3" />
</LinearLayout>
```



```
<LinearLayout</pre>
    android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:orientation="horizontal" >
    <Button
        android:layout width="fill parent"
        android:layout_height="wrap_content"
        android:text="Button1" />
   <Button
        android:layout width="fill parent"
        android:layout_height="wrap_content"
        android:text="Button2" />
   <Button
        android:layout width="fill parent"
        android:layout_height="wrap_content"
        android:text="Button3" />
</LinearLayout>
```



```
<LinearLayout</pre>
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="horizontal" >
    <Button
        android:layout width="wrap content"
        android:layout_height="wrap_content"
        android:text="Button1" />
    <Button
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:text="Button2" />
    <Button
        android:layout width="wrap content"
        android:layout height="wrap content"
        android:text="Button3" />
</LinearLayout>
```



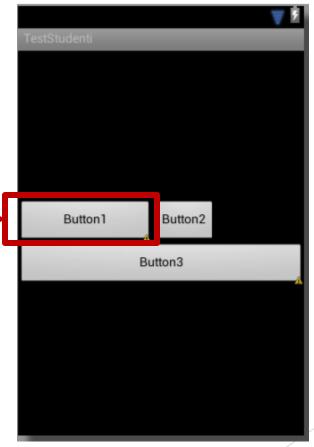
```
<LinearLayout</pre>
    android:layout width="fill parent"
    android:layout_height="fill_parent"
    android:orientation="vertical" >
   <LinearLayout</pre>
                                                                 Button1
                                                                                  Button2
        android:layout_width="fill_parent"
        android:layout height="wrap content"
                                                                              Button3
        android:orientation="horizontal" >
        <Button
            android:layout width="wrap content"
            android:layout height="wrap content"
            android:text="Button1" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button2" />
    </LinearLayout>
    <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button3" />
</LinearLayout>
```

```
<LinearLayout</pre>
    android:layout width="fill parent"
     ndnoid:layout hoight-"fill parent"
    android:gravity="bottom"
    android.orientation= vertical" >
    <LinearLayout</pre>
        android:layout width="fill parent"
        android:layout height="wrap content"
        android:orientation="horizontal" >
        <Button
            android:layout width="wrap content"
            android:layout height="wrap content"
            android:text="Button1" />
        <Button
            android:layout_width="fill_parent"
            android:layout height="wrap content"
            android:text="Button2" />
    </LinearLayout>
    <Button
                                                                     Button1
                                                                                      Button2
        android:layout width="fill parent"
        android:layout height="wrap content"
        android:text="Button3" />
                                                                                  Button3
</LinearLayout>
```

```
<LinearLayout</pre>
    android:layout_width="fill_parent"
    android:gravity="center"
   anuroid.orientation= vertical" >
    <LinearLayout</pre>
        android:layout width="fill parent"
        android:layout height="wrap content"
        android:orientation="horizontal" >
        <Button
            android:layout width="wrap content"
            android:layout height="wrap content"
            android:text="Button1" />
        <Button
            android:layout width="fill parent"
            android:layout height="wrap content"
            android:text="Button2" />
    </LinearLayout>
    <Button
        android:layout width="fill parent"
        android:layout height="wrap content"
        android:text="Button3" />
</LinearLayout>
```



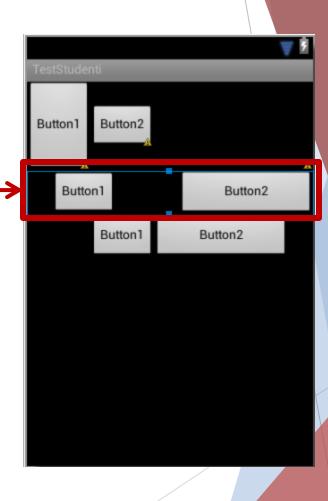
```
<LinearLayout</pre>
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
   android:gravity="center"
    android:orientation="vertical" >
    <LinearLayout</pre>
        android:layout width="fill parent"
        android:layout height="wrap content"
        android:orientation="horizontal" >
        <Button
            android:layout width="150px"
            android:layout height="wrap content"
            android:text="Button1" />
                                                                       Button1
        <Button
            android:layout width="wrap content"
            android:layout height="wrap content"
            android:text="Button2" />
    </LinearLayout>
    <Button
        android:layout width="fill parent"
        android:layout_height="wrap_content"
        android:text="Button3" />
</LinearLayout>
```



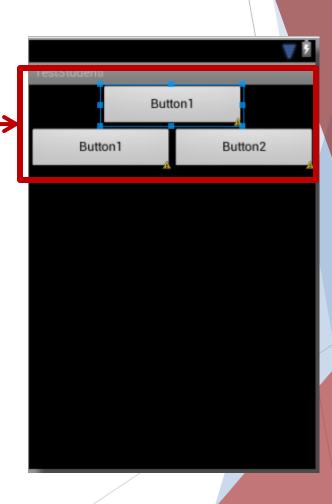
```
<TableLayout
   android:layout_width="fill_parent"
   android:layout height="fill parent" >
    <TableRow>
      <Button android:layout width="wrap content"</pre>
              android:layout height="100px"
              android:text="Rutton1" />
      <Button android:layout_width="10px"</pre>
              android:text="Button2" />
                                                                                                     Button2
    </r>
   <TableRow>
     <Button android:text="Button1" />
                                                                                       Button1
                                                                                                     Button2
     <Button android:layout width="150px"</pre>
              android:layout_height="50px"
              android:layout column="2"
              android:text="Button2" />
    </r>
    <TableRow>
      <Button android:layout column="1"</pre>
              android:text="Button1" />
      <Button android:text="Button2" />
   </TableRow>
</TableLayout>
```

Column size is set as the biggest width from all of the elements/View from that column

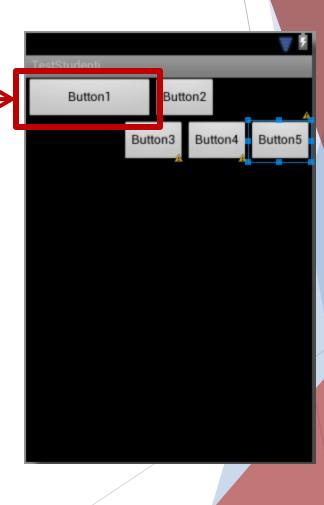
```
<TableLayout
    android:layout width="fill parent"
    android:layout_height="fill_parent" >
    <TableRow>
      <Button android:layout_width="wrap_content"</pre>
              android:layout height="100px"
              android:text="Button1" />
      <Button android:layout width="10px"</pre>
              android:text="Button2" />
    /TahlaRows
    <TableRow android:layout_gravity="right" >
      <Button android:text="Button1" />
      <Button android:layout width="150px"</pre>
              android:layout height="50px"
              android:layout column="2"
              android:text="Button2" />
   </TableRow>
    <TableRow>
      <Button android:layout_column="1"</pre>
              android:text="Button1" />
      <Button android:text="Button2" />
    </TableRow>
</TableLayout>
```



```
<TableLayout
    android:layout width="fill parent"
    android:layout_height="fill_parent"
   android:shrinkColumns="*"
   android:stretchColumns="*"
    <TableRow android:layout width="fill parent"
             android:gravity="center_horizontal">
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Button1" />
    </TableRow>
    <TableRow android:gravity="right" >
        <Button android:text="Button1" />
        <Button android:text="Button2" />
    </TableRow>
</TableLayout>
```

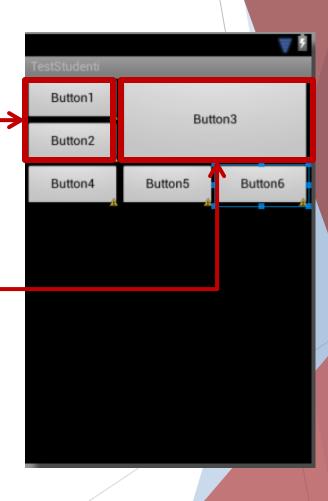


```
<TableLayout
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">
    <TableRow android:layout_width="fill_parent">
        <Button
            android:layout width="fill parent"
            <u>android·lavout height="wrap content"</u>
           android:layout_span="2"
            android:text="Button1" />
        <Button android:text="Button2" />
    </TableRow>
    <TableRow android:gravity="right" >
        <Button android:text="Button3" />
        <Button android:text="Button4" />
        <Button android:text="Button5" />
    </TableRow>
</TableLayout>
```



```
<TableLayout
    android:layout width="fill parent"
    android:layout_height="fill_parent"
   android:shrinkColumns="*"
    android:stretchColumns="*"
                                                                               Button1
                                                                                                Button2
    <TableRow android:layout width="fill parent">
                                                                          Button3
                                                                                     Button4
                                                                                                Button5
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:layout span="2"
            android:text="Button1" />
        <Button android:text="Button2" />
    </TableRow>
    <TableRow android:gravity="right" >
        <Button android:text="Button3" />
        <Button android:text="Button4" />
        <Button android:text="Button5" />
    </TableRow>
</TableLayout>
```

```
<TableLayout
    android:layout width="fill parent"
    android:layout height="fill parent"
    android:stretchColumns="*" >
    <TableRow android:layout width="fill parent">
       <LinearLayout android:orientation="vertical"</pre>
              android:layout width="wrap content"
              android:layout height="wrap content">
            <Button android:text="Button1"</pre>
                android:layout width="fill parent"
                android:layout height="wrap content" />
            <Button android:text="Button2"</pre>
                android:layout width="fill parent"
                android:layout height="wrap content" />
        </LinearLayout>
        <Button android:text="Button3" android:layout span="2"</pre>
            android: layout width= fill parent
            android:layout height="fill parent"/>
     </TableRow>
    <TableRow >
        <Button android:text="Button4" />
        <Button android:text="Button5" />
        <Button android:text="Button6" />
    </TableRow>
</TableLayout>
```



Relative Layout

```
<RelativeLayout
   android:layout width="fill parent"
   android:layout height="fill parent" >
   <Button
        android:id="@+id/button1"
       android:layout width="wrap content"
       android:layout height="wrap content"
       android:layout alignParentLeft="true"
       android:layout alignParentTop="true"
        android:layout marginLeft="28dp"
        android:layout marginTop="32dp"
       android:text="Button1" />
    <Button
        android:id="@+id/button4"
       android:layout width="wrap content"
       android:layout height="wrap content"
        android:layout alignBottom="@+id/button2"
       android:layout alignTop="@+id/button1"
        android:layout marginLeft="29dp"
        android:layout toRightOf="@+id/button2"
       android:text="Button4" />
     <Button
       android:id="@+id/button2"
       android:layout width="wrap content"
        android:layout height="wrap content"
        android:layout below="@+id/button1"
        android:layout centerHorizontal="true"
```

```
android:layout marginTop="39dp"
       android:text="Button2" />
   <Button
       android:id="@+id/button3"
       android:layout width="wrap content"
       android:layout height="wrap content"
       android:layout alignLeft="@+id/button1"
       android:layout centerVertical="true"
       android:layout toLeftOf="@+id/button4"
       android:text="Button3" />
</RelativeLavout>
                                       Button1
                                           Button3
```

Button4

Button2

Relative Layout

XML Attributes

- layout_toRightOf
- layout_toLeftOf
- layout_above
- layout_below
- ▶ layout_alignLeft
- ▶ layout_alignTop
- ► layout_alignRight
- ► layout_alignBottom

- ▶ layout_alignParentLeft
- ▶ layout_alignParentRight
- ▶ layout_alignParentTop
- ▶ layout_alignParentBottom
- ▶ layout_marginLeft
- ► layout_marginRight
- ▶ layout_marginTop
- ▶ layout_marginBottom