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escuela superior ingeniería informática

Programming Mobile Applications with Android

22-26 September, Albacete, Spain

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25 años
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Programming Mobile Applications with Android

- Lesson 2.- Android basics
  - Elements of an Android project.- Source code, layouts, and resources files.
  - Android applications life cycle.- How Android applications are managed in our mobiles devices?
  - Activities.- What are they used for?
  - Views.- What are they used for?
  - Android Lab II.- Create, compile and execute an application to understand the android life cycle.

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- Lesson 2.- Android basics
  - In this lesson, we will learn:
    - What are the basic elements of any android project
    - The life-cycle of the android applications
    - What are the basic of the activities and the views
    - We will create our first non-basic application

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- Elements of an Android project.- Source code, layouts, and resources files.
  - The last day, we introduced some of the elements of any android project.
  - Today, we will describe them more concretely
  - It is very important to maintain our project structured

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- Elements of an Android project.- Source code.
  - All the java classes or interfaces are stored in the src/ folder.
  - Java classes are devoted to the development of components:
    - Activities
      - Main android activity that is associated to the behavior of an interface
    - Views
      - Basic interface elements such as Buttons, Text field, etc

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- Elements of an Android project.- Source code.
  - Services
    - Components without an associated GUI
  - Widgets
    - Complex types that include both GUI and behavior
  - The source code of our first application consists of just an activity class.
  - Views, Services and Widgets are not so common

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- Elements of an Android project.- Layouts.
  - Are stored as xml files in the /res/layout folder
  - Are defined in a hierarchical way
    - A layout can contain
      - Basic interface elements
      - Other layouts
  - Basic layout types
    - FrameLayout,Gallery, GridView, LinearLayout, ListView, RelativeLayout
    - The type of layout defines the visualization of the elements added to the layout

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- Elements of an Android project.- Resource Files.
  - Are stored in the res/ folder
  - Several objectives and allows applications to be customized for different purposes
  - Main resources files
    - Layouts
    - Text
    - Images
    - Menus
    - Animations

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- Elements of an Android project.- Resource Files.
  - The resources stored in the res/ folder can be accessed both in the layout and source code files to:
    - Establish the text for a title
    - Establish the background image/sound for an applications
  - Thanks to the use of different resource files, we can release the same application with different language interfaces

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- Android applications life cycle.- How Android applications are managed in our mobiles devices?
  - The life cycle of Android applications is a key issue
    - Several peculiarities
    - An incorrect behavior of an application will affect the performance of the mobile device and would result in removing
  - Some basics
    - An application consists of a set of activities
    - When an application is launched, its main activity moves to the top

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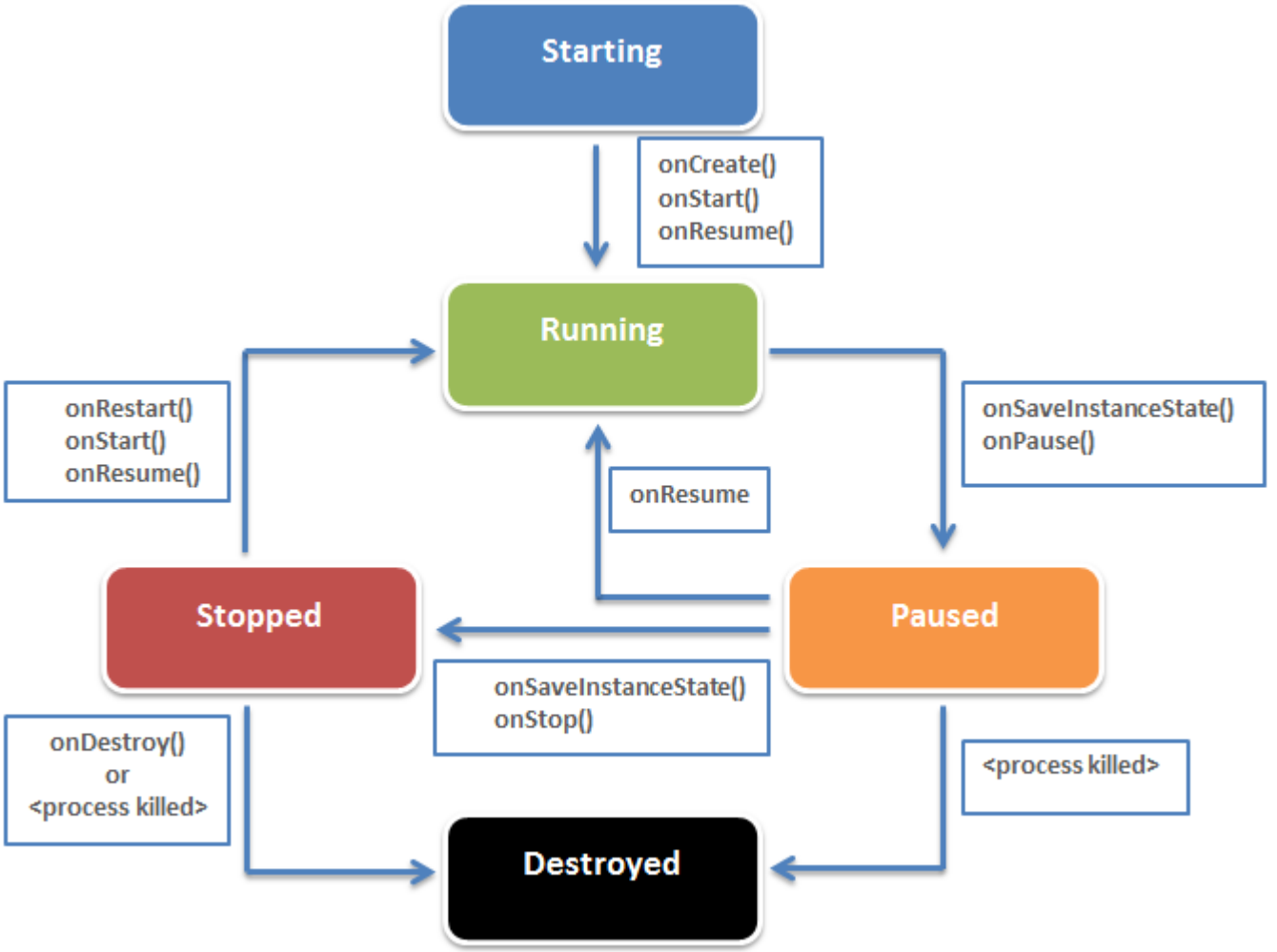

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- Android applications life cycle.- How Android applications are managed in our mobiles devices?
  - The Android operative system can directly stop or kill activities if resources are needed

    …

    but most of these modification are performed by the user (back button, launching other applications, etc)
  - There are some methods that are invoked each time the life cycle of the activity changes
    - OnCreate(), OnResume(), etc

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- Android activities.- What are they used for?
  - Each activity is used to manage the behavior of an graphical user interface
  - There are some basic that we need to start knowing
    - Basic Activities Methods.
    - Actions that can be done.
    - How to start/stop other activities.
    - How to send information between activities.

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- Android activities.- What are they used for?
  - The basic methods are
    - onCreate()
    - onStart()
    - onResume()
    - onPause()
    - onRestart()
    - onStop()
    - onDestroy()

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- Android activities.- What are they used for?
  - onCreate()
    - This method is called when the activity starts
    - It should establish the content view
      - Associate the visualization of the activy with a layout file
    - Some basic actions
      - Get the reference of the elements of the interface for its manipulation
      - Set the events that will manage the user actions
  - OnRestart()
    - If the activity has been stopped and started again, this method is automatically called

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- Android activities.- What are they used for?
  - onStart()
    - Called when the activity is visible to the user
  - onStop()
    - Called when the activity has been stopped, but can be restarted after
  - onDestroy()
    - Called if the activity has been definitely destroyed

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- Android activities.- What are they used for?
  - Activities can be started from the code using Intents
    - These elements are used to represent the information shared between two activities
  - Basic use

    Intent i = new Intent(this, nameOfNewActivity.class)

    startActivity(i)
  - Send information between activities
    - Example: activity A contains a password field and a button, when the button is pressed, the value of the password inserted is sent to the activity B that checks it

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- Android activities.- What are they used for?
  - Sending information between activities
  - Activity A (method called when the button is pressed)

```
Intent i = new Intent(this, nameOfActivityB.class)
i.putExtra("password",passField.getText().toString())
startActivity(i)
```

  - Activity B (method onCreate)

```
Bundle bundle = getIntent.getExtras()
if(bundle.getString("password").equals("TEMPUS"))
    Toast.makeText(this ,"The password is OK",Toast.LENGTH_LONG)  .show();
```

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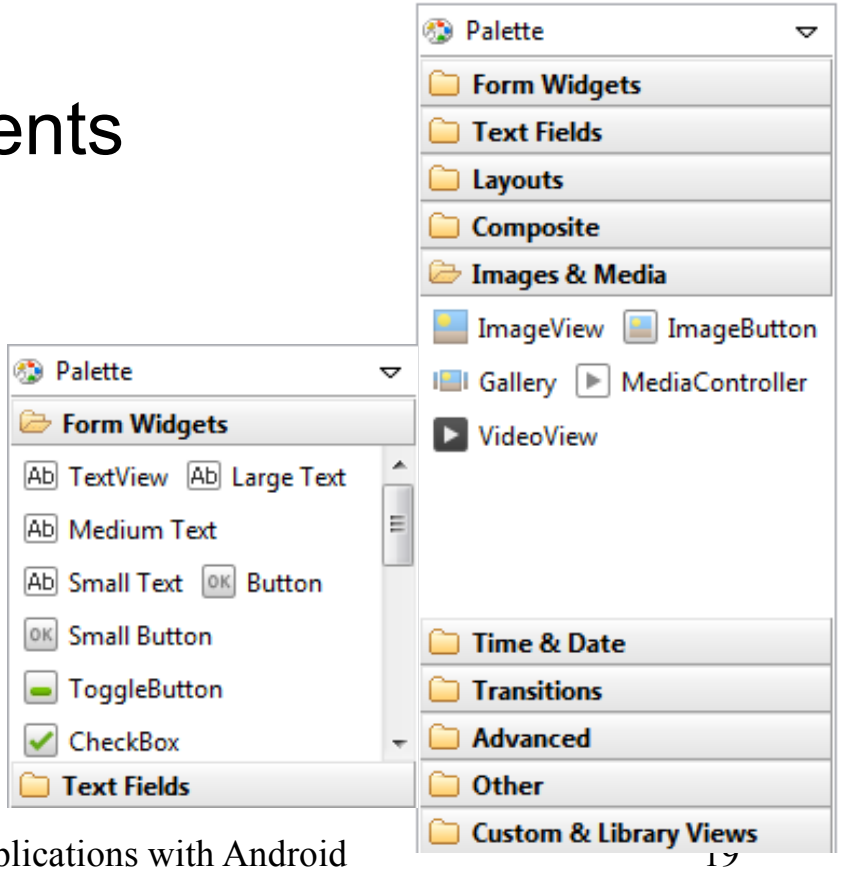
- Android views.- What are they used for?
  - All the elements that can be added to a layout field are android Views
  - We can use the standard elements
    - Button
    - ImageButton
    - TextArea
    - Labels

      .. or create our specific elements



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- Android views.- What are they used for?
  - We should create a new View only when none of the basis elements does not fit our requirements
  - We will create a new class that extends the View class

    import android.view.;*
  - It should be defined a constructor

    public NameOfTheClass(Context context, AttributeSet attrs)

    { super(context, attrs); }
  - Main method for visualization

    public void onDraw(Canvas canvas)

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- Android views.- What are they used for?
  - Example of use

```
import android.content.Context;
import android.util.AttributeSet;
import android.graphics.*;
import android.view.*;
public class ExampleView extends View {
    public ExampleView(Context context, AttributeSet attrs)
    { super(context, attrs); }
    Paint paint = new Paint();
    public void onDraw(Canvas canvas)
    {
        paint.setColor(Color.BLACK);
        canvas.drawRect(0, 0, 250, 250, paint);
        paint.setColor(Color.WHITE);
        canvas.drawLine(10,10,240,240, paint);
} }
```

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- Android views.- What are they used for?
  - Once the view has been created, we can now add ExampleView elements in our layouts
  - In the palette, open the Custom and library Views section
  - We can combine both standard and custom view elements

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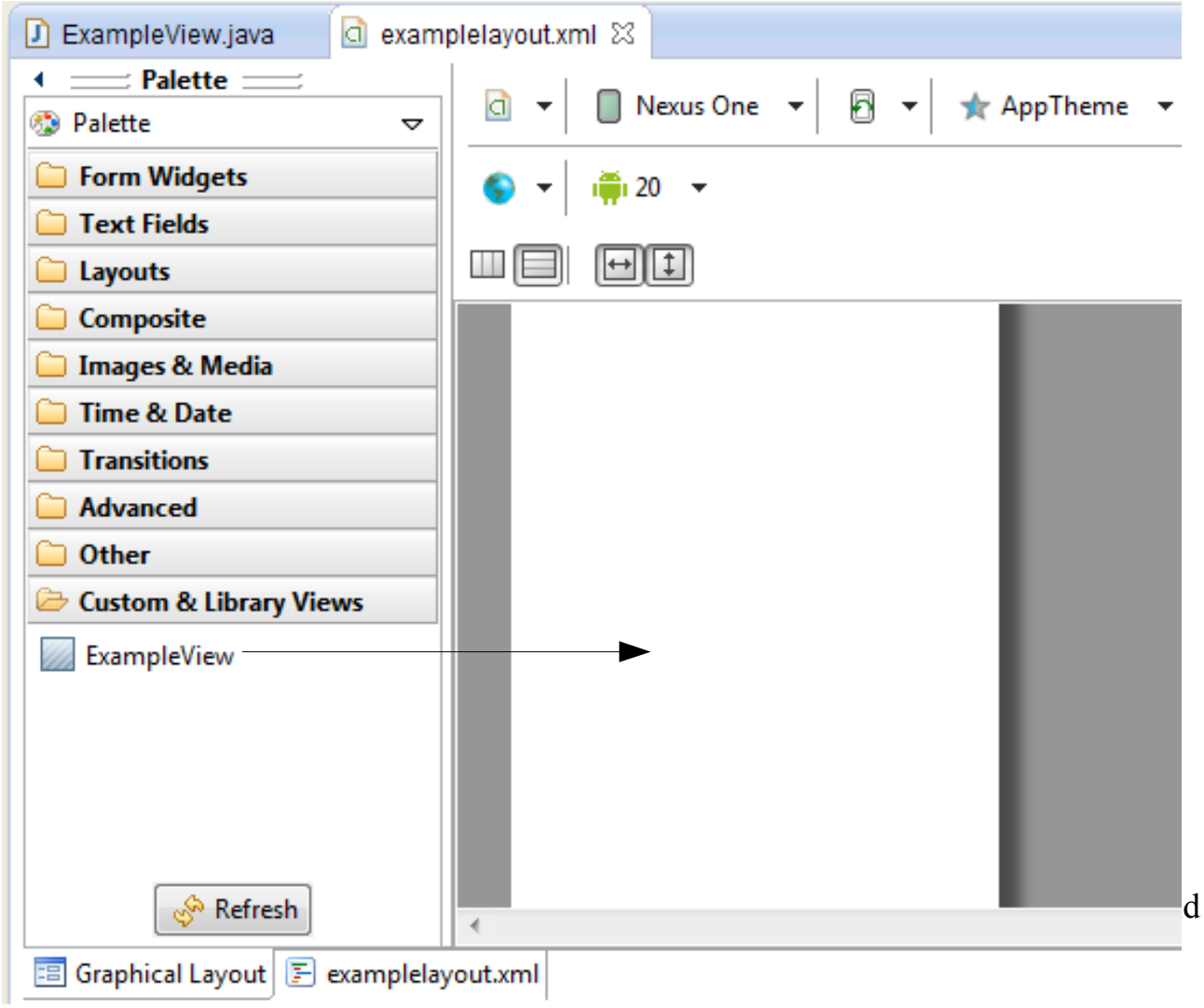
- Android views.- What are they used for?



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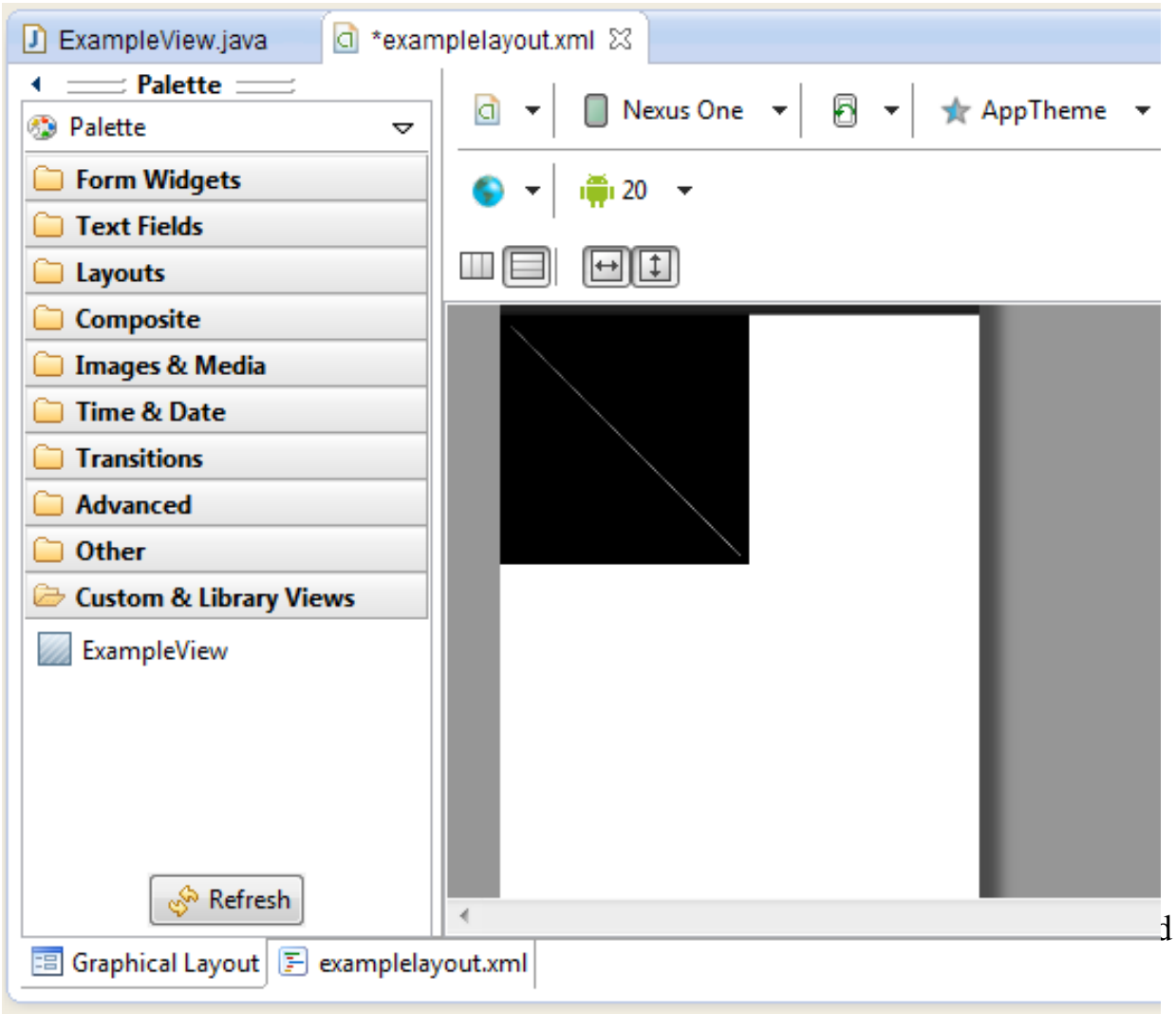
- Android views.- What are they used for?



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- Android Lab II.- Create, compile and execute an Android application to understand the Android life cycle
  - Follow the instructions to add information messages that will be shown in the different stages of the life cycle of our application
  - We also create a View class to include it in our layout

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