5COSC023W - MOBILE APPLICATION DEVELOPMENT
Lecture 2: Activities, Intents, Displaying Images, ConstraintLayout

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Activities

- An Android component representing a whole window (screen)
- One Class
- To display a different screen a new `Activity` needs to be created.
- An activity needs to have a layout (typically created in XML but can be created or modified dynamically as well)
- **Important:** All of the created activities should be declared in the manifest of the application (file: `AndroidManifest.xml`).

Intents

- ▶ A description of an operation to be performed
- ▶ Can be used to start other activities
- ▶ Can be *explicit* (starting a specific activity) or *implicit* (letting the system or the user to choose which activity to start)

Example:
```
val in = Intent(this, NewActivity::class.java)
startActivity(in)
```

Displaying Images

1. Copy the file with the image in the `drawable` subdirectory of resources (`res`) (filename cannot contain capitals).
2. Use an `ImageView` with the `app:srcCompat` property to set the name of the image to be displayed:
   `app:srcCompat="@drawable/brittany_02625"/>`

   where `brittany_02625.jpeg` is the name of the image file.

The ConstraintLayout Manager

- ▶ A layout manager based on constraints.
- ▶ Unlike LinearLayout there is no need to nest multiple linear layouts to achieve the desirable positioning of elements.
- ▶ LinearLayout still very useful and simpler.

The Lost Dog Application

▶ Create an application which can notify owners of lost dogs if someone finds them.

The Layout of the main activity

File `activity_main.xml` contains:

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="105dp"
        android:text="Lost Dog - Have you found her?"
        android:textSize="24sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="368dp"
        android:layout_height="217dp"
        android:layout_marginTop="48dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.488"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:srcCompat="@drawable/brittany_02625" />
```

The Layout of the main activity (cont'ed)

```xml
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="91dp"
    android:text="Contact the Owner"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/imageView" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

The Main activity

File `MainActivity.kt` contains:

```kotlin
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val bt = findViewById<Button>(R.id.button)
        bt.setOnClickListener {
            val contactIntent = Intent(this, ContactDetails::class.java)
            startActivity(contactIntent)
        }
    }
}
```

The Layout of the second activity

File `activity_contact_details.xml` contains:

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ContactDetails">

    <Button
        android:id="@+id/call_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="116dp"
        android:text="Call the owner"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView2" />

    <Button
        android:id="@+id/email_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="108dp"
        android:layout_marginBottom="375dp"
        android:text="Email the owner"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/call_button" />
```

The Layout of the second activity (cont'ed)

```xml
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Contact the Owner"
        android:textStyle="bold"
        android:textSize="24sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        tools:layout_editor_absoluteY="16dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

The Second activity

File `ContactDetails.kt` contains:

```kotlin
package uk.ac.westminster.lostdog

import android.content.Intent
import android.net.Uri
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button

class ContactDetails : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_contact_details)

        val contact = findViewById<Button>(R.id.call_button)
        val email = findViewById<Button>(R.id.email_button)

        contact.setOnClickListener {
            val phoneUri = Uri.parse("tel:02079115000")
            val i = Intent(Intent.ACTION_DIAL, phoneUri)
            startActivity(i)
        }

        email.setOnClickListener {
            val i = Intent(Intent.ACTION_SEND)
            i.setType("text/plain")
            i.putExtra(Intent.EXTRA_EMAIL, arrayOf("recipient@my.westminster.ac.uk"))
            i.putExtra(Intent.EXTRA_TEXT, "Hello, I think I found your dog")
            i.putExtra(Intent.EXTRA_SUBJECT, "Your lost dog")
            startActivity(i)
        }
    }
}
```

The Manifest file

Do not forget to modify the `AndroidManifest.xml` file for your project by adding to it any new activity (in this case the `ContactActivity`):

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android">
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.TheLostDogApp">
        <activity
            android:name=".ContactActivity"
            android:exported="false" />
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

The Activity Lifecycle

- ▶ Created (not visible yet)
- ▶ Started (visible)
- ▶ Resume (visible)
- ▶ Paused(partially invisible)
- ▶ Stopped (hidden)
- ▶ Destroyed (gone from memory)

State changes are triggered by user action, configuration changes such as device rotation, or system action

The Activity Lifecycle (cont'ed)