

# Introduction to Android App Development

## Android Intents and Developing Basic Android App

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# Outline

- 1 Tools of the Trade
- 2 Android
- 3 Enhancing the Basic Android App
- 4 Using Android Intents
  - Starting and Stopping Second Activity
  - Passing Data to Second Activity
  - Returning Data to First Activity
- 5 Demo
- 6 Questions?

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# Technical Readiness Preparation

Provide a technical readiness for

- ▶ Version Control Systems
- ▶ Develop simple Android Apps with Android Activities and Android Intent
- ▶ Test Android Apps

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# Lecture Module Outline

- ▶ An introduction to Android
- ▶ The Android OS
- ▶ The IDE and build system
- ▶ Basic App Development
  - ▶ Understand Android Studio projects
  - ▶ Create basic Android app

*Note: this is not an Android class!*

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# Activities and Intents

## Creating basic apps using Activities and Intents

- ▶ Activity roughly corresponds to a screen in an app
  - ▶ A typical app has many of these
  - ▶ Reusable screen parts are encapsulated in a Fragment
- ▶ *Intents allow activities to communicate with each other*
  - ▶ *Including passing data to one another*



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# Android Intents

We can understand an Android Intent as "envelop" for an Activity – a passive data structure holding an abstract description of an action (Activity) to be performed

- ▶ Use it to launching activities (invoking methods like `startActivity`, `startActivityForResult` – deprecated, `ActivityResultLauncher<Intent>`)
- ▶ Pass data between activities
- ▶ Two types of intents
  - ▶ Explicit intents include the destination Activity – typically used with an application
  - ▶ Implicit intents are matched to any Activity that has registered to process such intents

## Starting Another Activity: No Return Code

In the Activity that starts the other Activity,

```
1 Intent intent = new Intent(ThisActivity.this, AnotherActivity.  
    class);  
2  
3 startActivity(intent);  
4
```

Question: what type of Intent is this? explicit or implicit?

## Stopping the Other Activity: No Data Back

In the other Activity,

```
1 // .... done all the work ... then  
2 finish();  
3
```

## Sending Data: 1st Activity

Consider two Activities – when an Activity (1st Activity) starts another Activity (2nd Activity), pass data from the 1st to the 2nd.

```
1 // request code is used to differentiate the activities started by
  this
2 // activity when the activity is starting more than one
  activity,
3 final int USER_LOGIN_REQUEST_CODE = 1;
4 Intent intent = new Intent(this, AnotherActivity.
  class);
5
6 intent.putExtra("name", "Jane Doe");
7
8 startActivity(intent);
9
```

## Sending Data: 2nd Activity

In the 2nd Activity,

```
1  // In a life cycle method or an event handler, do
2  // 1. Get the data passed from the 1st activity
3  Bundle extras = getIntent().getExtras()
4  String name = extras.getString("name");
5  // 2. .... do some work ... then
6
7  // (Typically) In an event handler do,
8  // 3. Return to the 1st activity
9  finish();
10
```

## Preparing Returning Data in 2nd Activity

There are two categories of return data

- ▶ Activity result code indicating whether the Activity is successful, failure, or canceled.
- ▶ Additional data that the activity wishes to return to the launching activity

In the 2nd Activity,

```
1 // 1. Create a return 'envelope'  
2 Intent resultIntent = new Intent();  
3  
4 // 2. Put some data in it if necessary  
5 resultIntent.putExtra("hobby", userHobby);  
6  
7  
8 // 3. Set a status message (based on activity result ...)  
9 setResult(RESULT_OK, resultIntent);  
10  
11 finish();  
12
```

## Receiving Returned Data in 1st Activity

```
1  // 1. set up an activity launcher
2  final ActivityResultLauncher<Intent>
   activityResultLauncher = registerForActivityResult(
3      new ActivityResultContracts.StartActivityForResult(),
4      new ActivityResultCallback<ActivityResult>() {
5          @Override
6          public void onActivityResult(ActivityResult result
   ) {
7              if (result.getResultCode() == RESULT_OK) {
8                  Intent data = result.getData();
9                  Bundle extras = data.getExtras();
10                 int data = extras.getInt("data_key");
11                 // ...
12             }
13         }
14     });
15
16 // 2. launch the 2nd activity (instead of using
   startActivity)
17 Intent intent = new Intent(ThisActivity.this, ThatActivity
   .class);
18 activityResultLauncher.launch(intent);
```



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## Let's play with several UI widgets and related methods

Let's look at how to get two activities to exchange data via intents

- ▶ Intent class, startActivity, ActivityResultLauncher<Intent>, putExtra, finish, onActivityResult, Toast, Log

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# Questions?

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  - ▶ **Model-View-Controller**
  - ▶ **Event-driven Programming**
  - ▶ Android Activities and Intent
  - ▶ Android Fragments (online tutorials and future discussion)