CP3406_CP5307 Codelab 2.2: Create and run your first app for Android

Contents

1. Introduction

In this codelab, you will create your first Android app (Happy Birthday) from a basic Android Studio app template. You'll also explore the look of an Android project and learn how to use different windows on Android Studio. You'll need a computer with Android Studio installed (the PCs in the labs or your own laptop).

2. Create your first app

In this task, you will create an app for Android from an Android Studio project template.

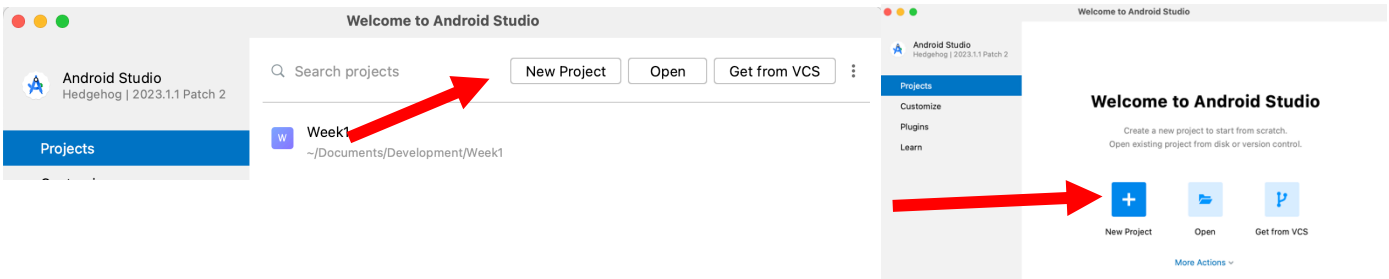
Project templates

On Android Studio, a project template provides you with the boilerplate code to get started on building an app. It aims to help you start faster and save you some work, by providing some starter files for common app designs. Some examples of Android Studio templates are an app with a map and an app with multiple screens.

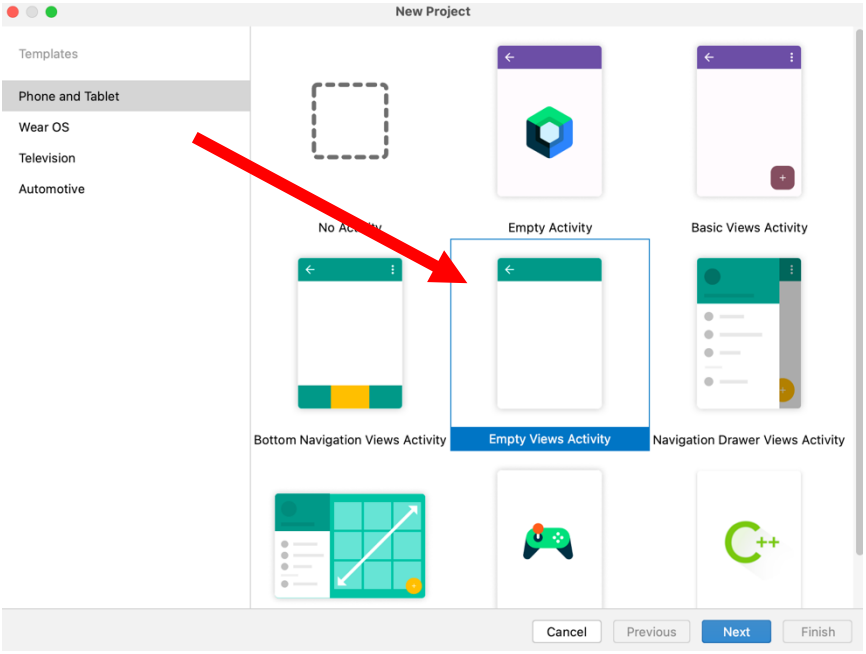
How to create an Empty Views Activity Project

These steps will help you create a new project on Android Studio with the **Empty Views Activity** template for your new app.

1. Click on the Android Studio icon to start the environment (if not open yet!).
2. The Welcome **to Android Studio** window will open. Click on **New project** (one of below images).



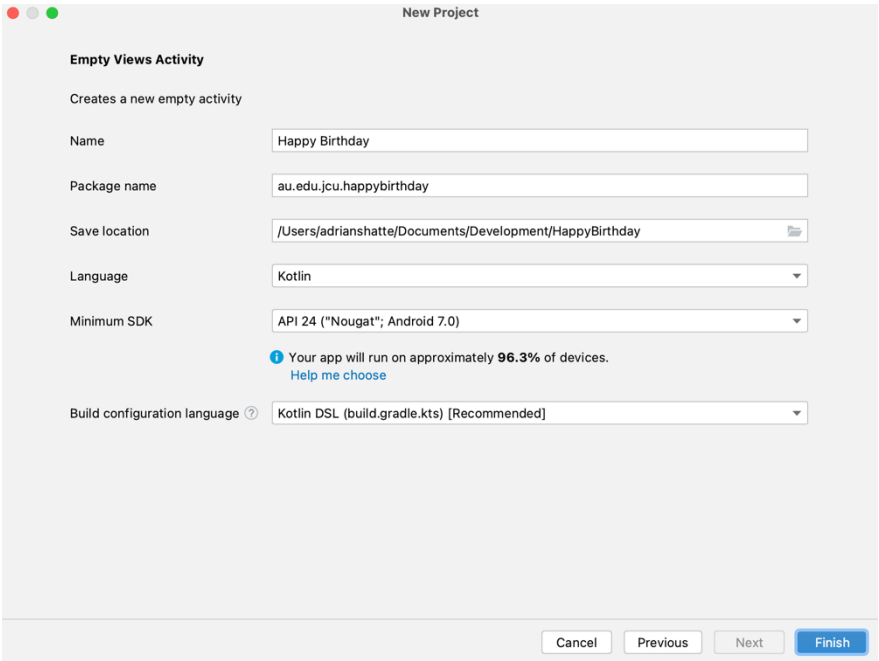
3. The **New Project** window will open with a list of templates offered by Android Studio.



4. Scroll through the tabs and templates to get an idea of what you could do. There are templates for many different types of devices (such as phones, tablets and watches) and for different types of apps.
5. At the top left of the window, click on the **Phone and Tablet** tab.
6. Click on the **Empty Views Activity** template to assemble your project with it.

The **Empty Views Activity** template is a very simple template you can use to create an app. It has only one screen that displays the simple message: "Hello World."

7. At the bottom of the window, click **Next**. The **New Project** dialog will open.



Set your project as follows:

8. **Name** is the name of your app. In the box below **Name**, enters `Happy Birthday` as your

project name.

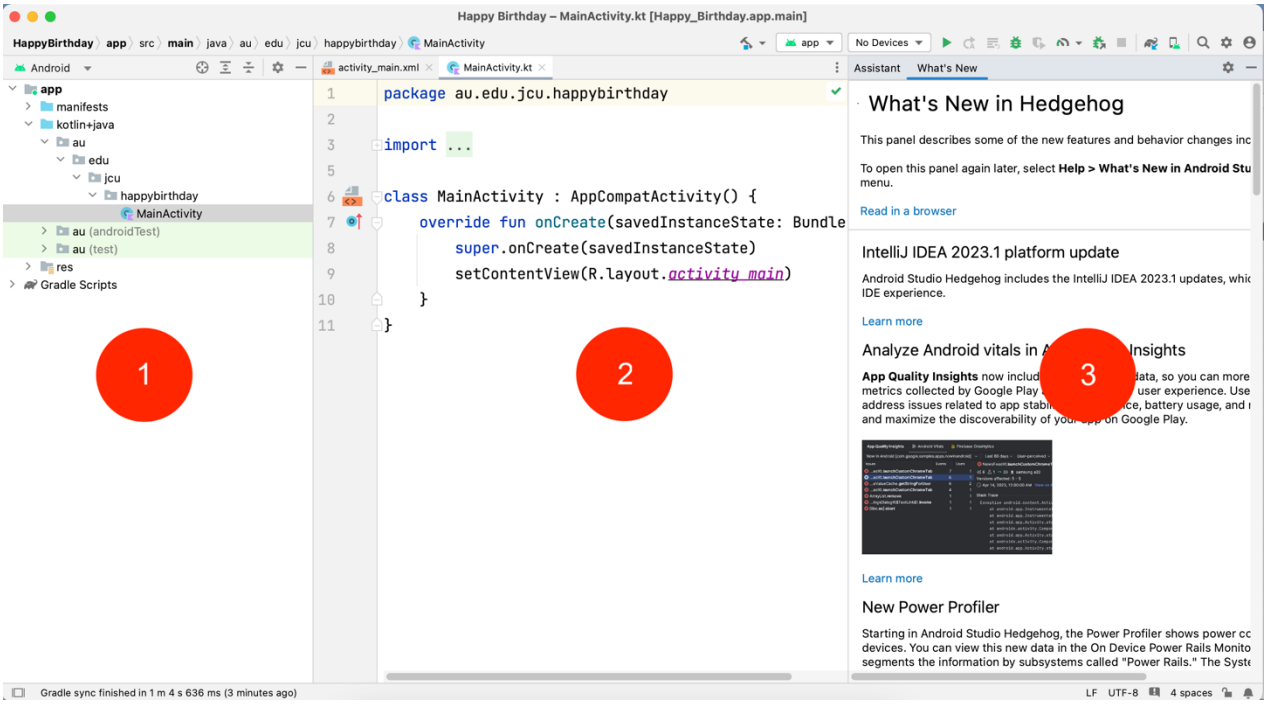
9. **Package name** is the name that uses the Android system to identify your app exclusively. Usually, the default value is the name of your organization followed by the name of the app, all in lowercase (in this case, "`au.edu.jcu.happybirthday`."
10. Save **location** indicates the location in which all files related to your project are saved. Take note of that location to find your files. For now, you don't need to modify the storage location.
11. In **Language**, the programming language you want to use for your project is defined. Make sure you select `Kotlin` in **Language**.
12. **Minimum SDK** indicates the minimal version of Android in which your app can run. Select `API 24 ("Nougat"; Android 7.0)` on the drop-down list.

Note: There are several different versions of the Android operating system. Each of them is given a name in alphabetical order as they launch.

13. See the note below **Minimum SDK**, which informs the number of devices on which your app can run with the API level chosen. If you are interested, click the **Help me choose** link to see a list of different versions of Android. Then go back to the **New Project** window.

14. Click **Finish**.

Android Studio will open the project and all its files.



When you open Android Studio for the first time, you'll see three windows:

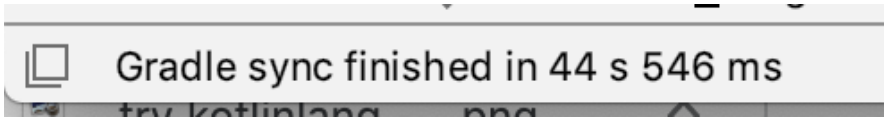
(1) In the **Project** pane, the files and folders of your project are displayed.

(2) In the **Editing** pane, the code is edited.

(3) In the **What's New** pane, you'll find useful news and suggestions.

In the lower right corner of Android Studio, a progress bar or message appears indicating whether your project is still being configured. For example:

15. Wait until Android Studio finishes setting up your project. In the bottom left corner, you'll see a message that will warn you when the project is complete, like the one shown below.



3. Run your app on a virtual device (emulator)

In this task, you will use the Device Manager to create a software version (an emulator) of a mobile device and run it on your computer. A virtual device, or emulator, simulates the configuration of a particular type of Android device, such as a phone, that can be any phone or tablet running the Android versions of your choice. Then, you'll use the virtual device to run the app you created with the **Empty Views Activity** template.

Note: Android Emulator is a standalone application that is used to configure a virtual device, and has its own system requirements. Virtual devices can take up a lot of space on the disk. If you have any problems, check How to run apps on Android Emulator.

How to create a virtual Android device (AVD)

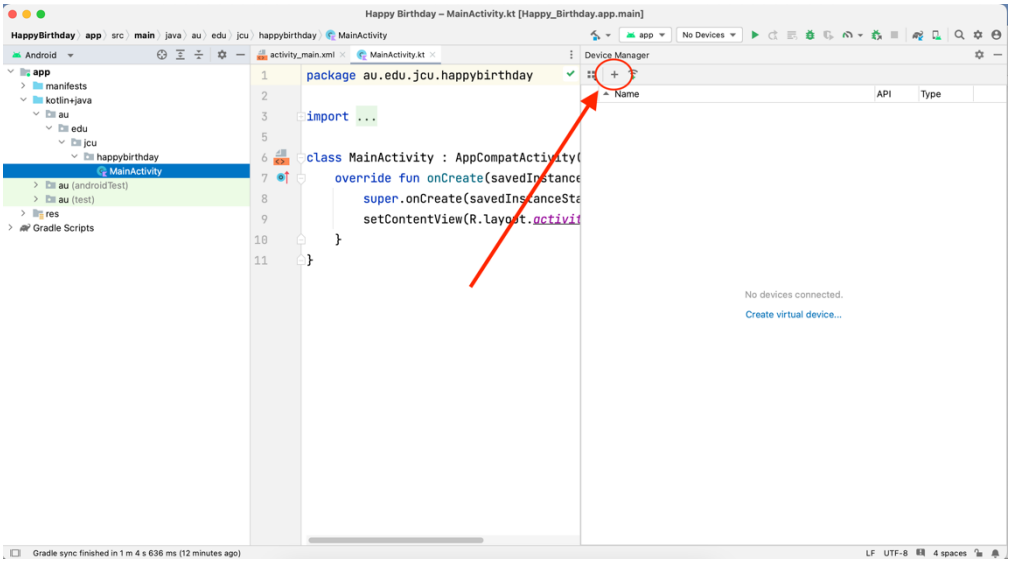
The first step to running an emulator on your computer is to create a configuration for the virtual device.

1. In the Android Studio menu bar, select **Tools > Device Manager**.

   Tip: To open the Device Manager you can also click on the toolbar icon.

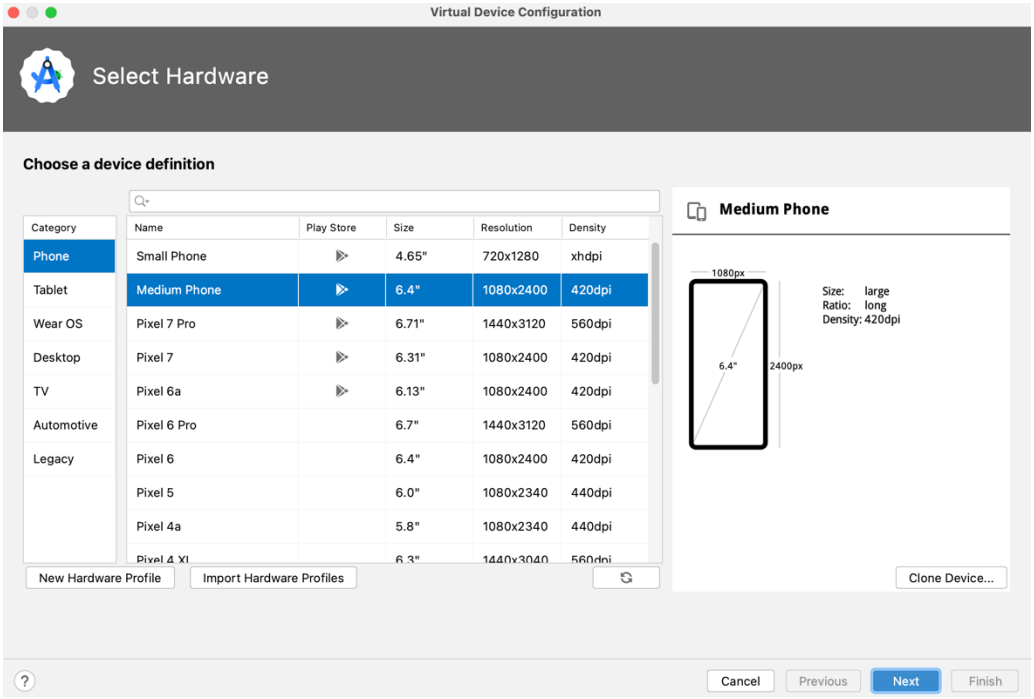
   The **Device Manager** is shown in the image below. (If you've already created a virtual device, it'll appearin the list.)

2. Click the + icon to create a virtual device. The **Select Hardware** window will appear.



The **Select Hardware** window displays a list of device configurations from which you can choose. The

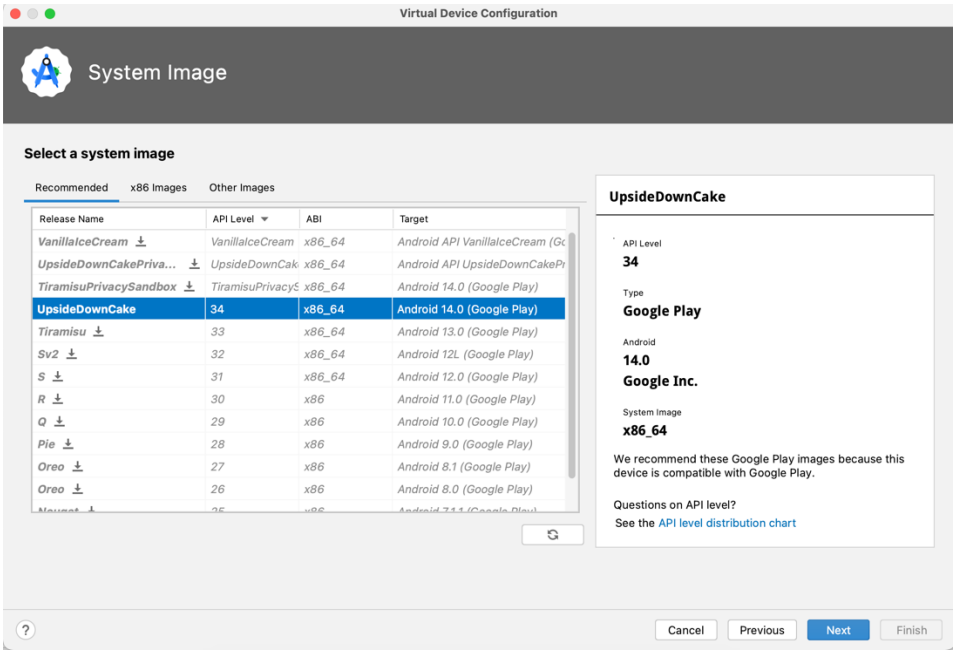
table provides columna showing the display size (**Size**), the screen resolution in pixels (**Resolution**) and the pixel density (**Density**) for each device.



3. Select the **category Phone**.

4. Select a phone (for example, **`Pixel 7`**) and click **Next**.

   The **System Image** window will appear. Here, choose the version of the Android system that will run on your virtual device. This will allow you to try your app on different versions of the system.



5. In the **Recommended** tab, select the version of the Android system that will run on the virtual device. You should select a recent, stable version.

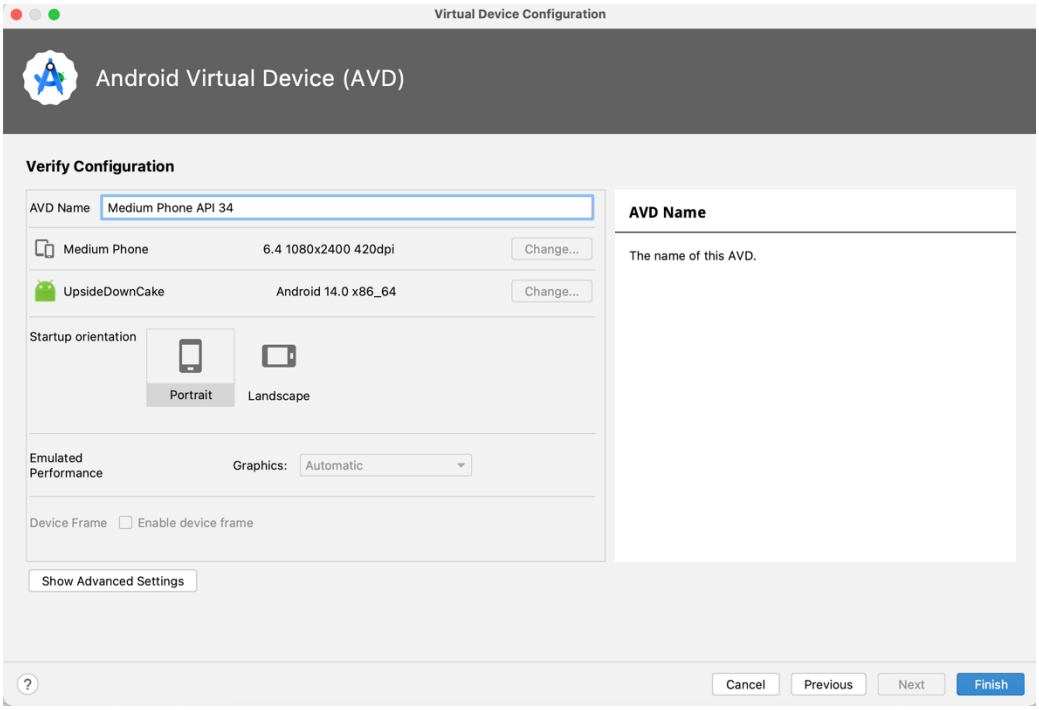
   Note: If there is a download icon or link next to the image of the system you want to use, it means that the image is not installed on the computer. You must install it before configuring the virtual device.

   To install a system image, click the **Download** link and follow the prompts. Keep in mind that the SDK is typically a large file size, so downloading can take quite a while. When it's completed, click **Finish**.

Important: These images of the Android system take up a lot of space on the disk, so only some of themare included in the original installation. There are many more versions of the Android system available that are displayed in the **Recommended** tab. Check the **x86 Images** and **Other Images tabs** to see them.

6. Press **Next**.

   The **Android Virtual Device (AVD)** window will open, where you can select additional configuration details for your device.



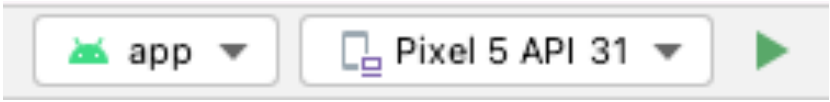
7. In the **AVD Name** field, enter a name for your virtual Android device. Leave the other fields as they are.

8. Click **Finish**.

   The new virtual device will be displayed in the **Device Manager** window and will be ready for use.

How to run your app on the virtual device

1. In Android Studio, go to the virtual device drop-down menu of the toolbar (it will look similar to the example below) and, in the drop-down list, select the virtual device you created.



   (You can also click **Run, Select Device...** and then select your virtual device from those available in the pop-up window.)

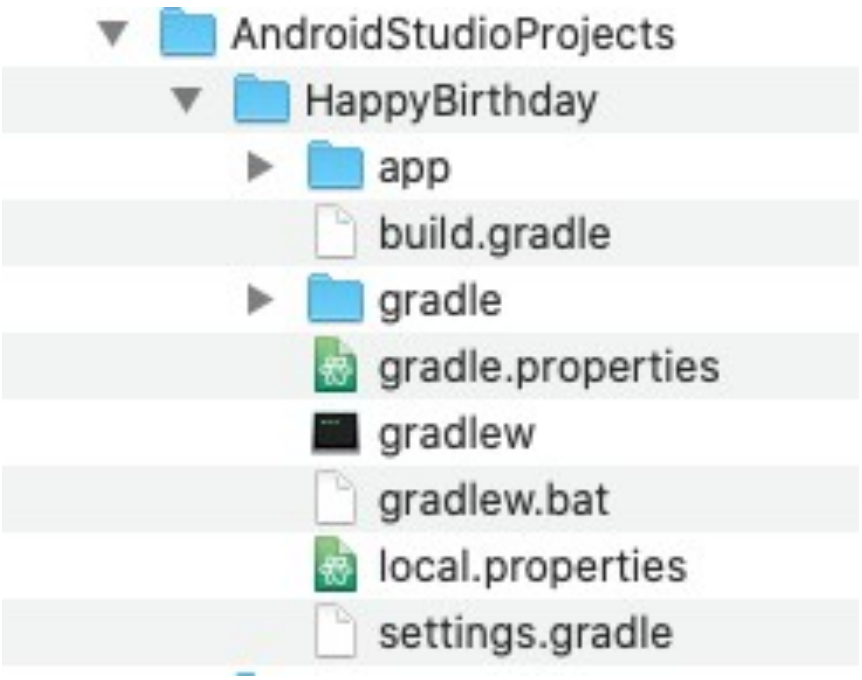
2. On Android Studio, select **Run > Run app** or click the **Run** icon located in the toolbar. The virtual device will turn on and start in the same way as a physical device. Depending on the speed of the computer, this process can take a little while (patience is a virtue).

   When your app is ready, it will open on the virtual device, as in the image below.

Well done. Your virtual device is ready and running. You'll see that now the title is "`Happy Birthday`" and shown on the screen "`Hello World!`"

4. Look for your project files

When you set up a project, Android Studio creates a folder on your computer called **AndroidStudioProjects** for all your Android projects. In the **AndroidStudioProjects** folder, a folder is also created with the name of your app (in this case, **HappyBirthday**).



HappyBirthday is your project folder. Android Studio saves in the project folder the files you create and the ones you create.

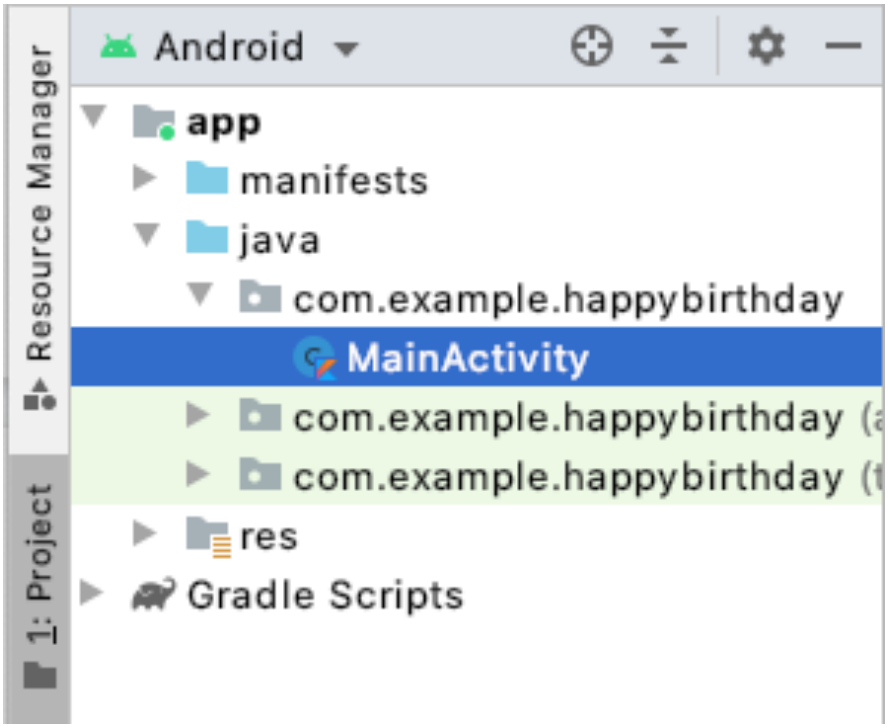
1. On Android Studio, take a look at the **Project** pane on the left. In the **Project** pane, the files and folders of your project are displayed.

The **files** in the **Project** pane are organized so that they facilitate navigation between project files when you write the code. However, if you access the files from a browser, such as Finder or Windows Explorer, the organization of the hierarchy is very different.

In this task, you will explore these two different views of the project folder hierarchy.

2. In Android Studio, in the **Project** pane, select **Android** from the drop-down menu in the top left corner.

You should see a list of files similar to this one:

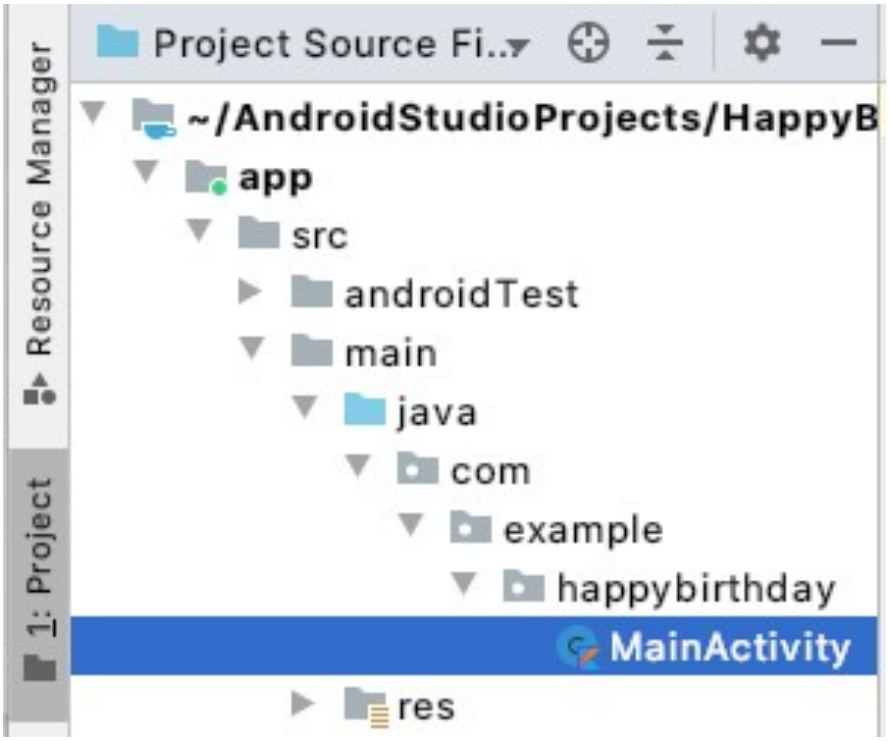


This view and organization of your files is useful when you write code for your project.

You can also view the files as they would appear in a file browser, such as Finder (for macOS) or Explorer (for Windows).

3. From the **Project** drop-down menu, select **Project Source Files**.

You will see that the title changes to the folder in which the project files are stored.



Now you can browse between the files the same way you would with any browser.

4. To return to the previous view, in the **Project** pane, re-select **Android**.

Excellent. Now you can create and run an app from a template and find your project files.

5. Summary

- To create a new project, start Android Studio, click on **File > New > New Project.** Start a new Android Studio project, assign a name to your project, select template and complete the details.
- To create a virtual Android device (an emulator) that runs your app, choose **Tools and Device Manager** and use the Device Manager to select a hardware device and system image.
- To run your app on a virtual device, make sure you created one, select it from the toolbar drop-down menu and then click on the **Run** toolbar icon to run your app.
- To find your project files, select **Project Source Files** from the **Project** drop-down menu.