

# Chapter 2 Make: A Mobile App

## Getting to Know App Inventor

---

App Inventor is a web-based tool for creating mobile apps for Android devices. In this exercise, you'll explore the App Inventor tool and begin working with your first app.

When using App Inventor (on a PC) to build an app, it is very helpful to have an Android device connected to the same wireless network as the PC. This allows you to see changes to your app live on the Android device as shown in the videos below:

## Before You Start

---

For this exercise, you'll need the following:

### **HARDWARE**

1. A computer connected to a WiFi network
2. An Android device (phone or tablet) that is connected to the same WiFi network as the computer. (**Note:** If you don't have an Android device, you can instead work with the emulator in App Inventor. A "phone" will appear on the screen and show what your app will look like running on a phone screen. For information on setting up the emulator, follow these instructions: <http://appinventor.mit.edu/explore/ai2/setup>)

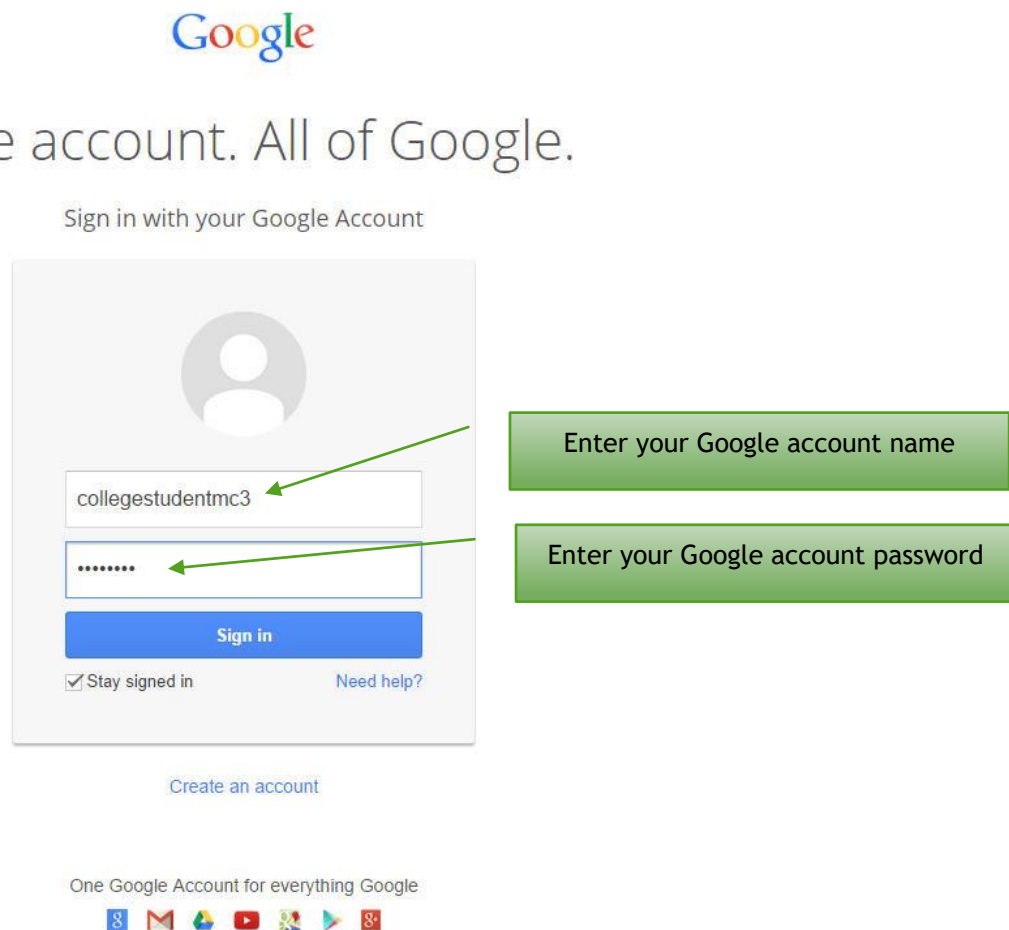
### **SOFTWARE**

3. The Chrome browser (free and available at <https://www.google.com/intl/en-US/chrome/browser/>)
4. A Google account (free and available at <https://accounts.google.com/signup?service=mail>). A Google account will work for all Google services like Gmail, Maps, and Google Play.
5. The MIT AI2 Companion app (free and available at Google Play). Make sure to download the *latest* version onto your Android device.

## Working with Your First App

It's a tradition in programming to make the first program you write in a new language print "Hello, World" on the screen. For App Inventor, the first program everyone sees is Hello Purr. In this exercise, you will set up your app inventor account and explore the Hello Purr app.

1. Navigate to <http://ai2.appinventor.mit.edu>. If you've never logged into App Inventor before, you'll be asked to sign in with your Google Account:



The image shows the Google sign-in page. At the top is the Google logo. Below it is the text "One account. All of Google." and "Sign in with your Google Account". The sign-in form includes a profile icon placeholder, a text input field containing "collegestudentmc3", a password input field with dots, a blue "Sign in" button, a checkbox for "Stay signed in", and a link for "Need help?". Below the form is a link for "Create an account". At the bottom is the text "One Google Account for everything Google" followed by icons for various Google services. Two green callout boxes with arrows point to the input fields: "Enter your Google account name" points to the email field, and "Enter your Google account password" points to the password field.

Google

One account. All of Google.

Sign in with your Google Account

collegestudentmc3

.....

Sign in

☒ Stay signed in [Need help?](#)

[Create an account](#)

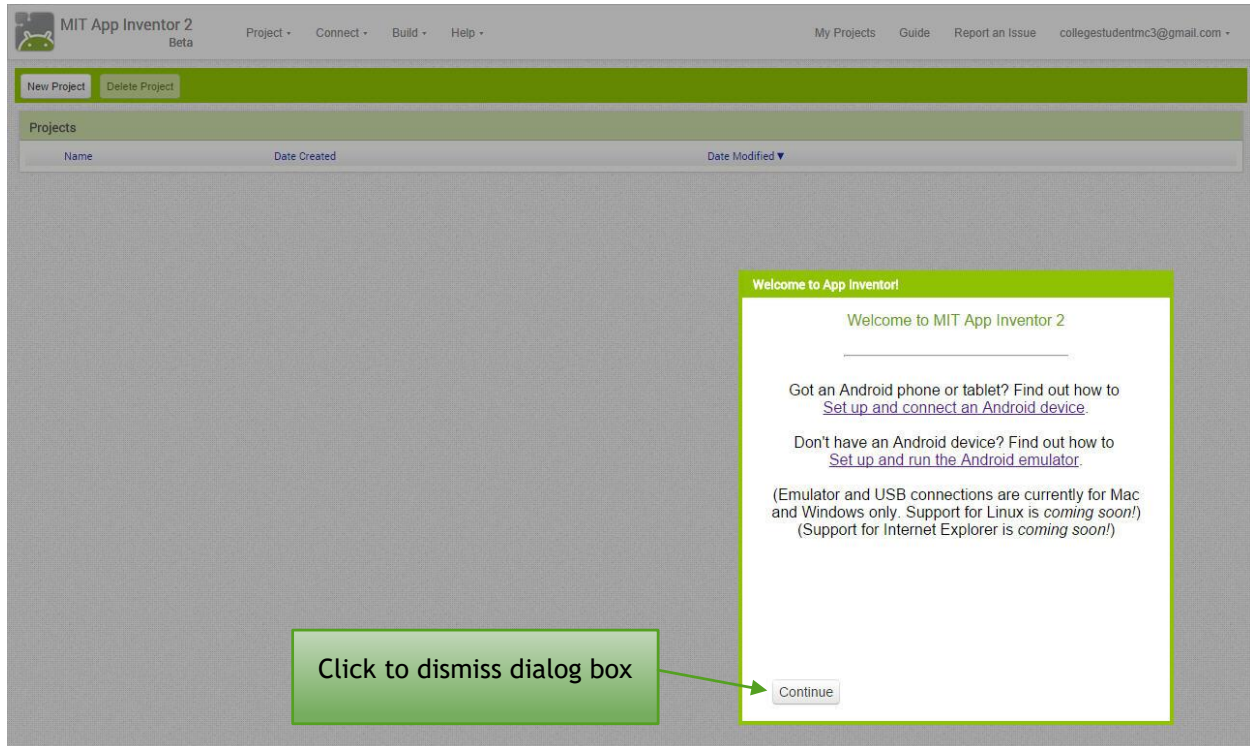
One Google Account for everything Google

Icons: Google, Gmail, Google Drive, YouTube, Google Maps, Google Play, Google+

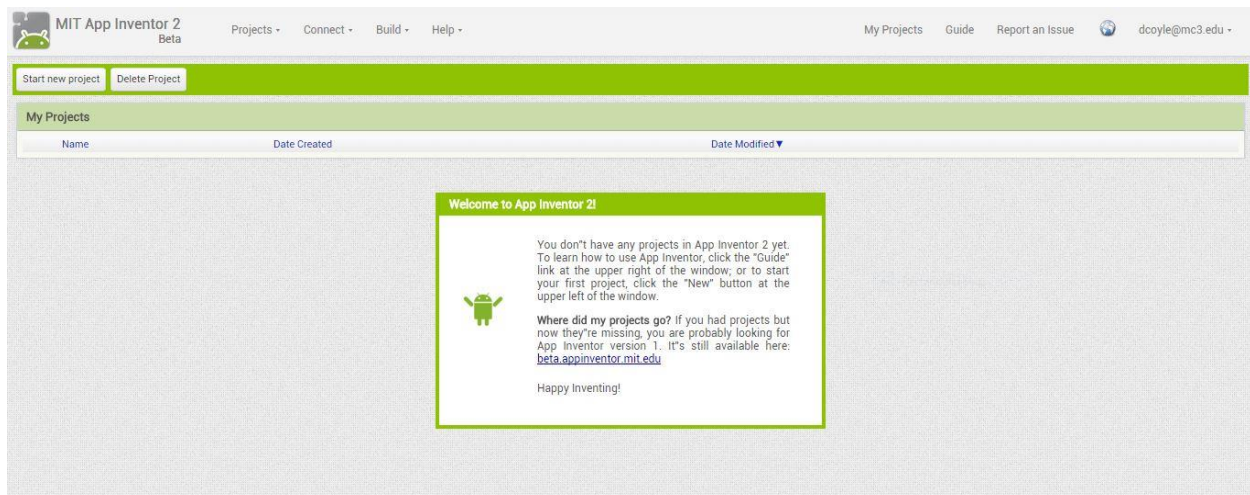
Enter your Google account name

Enter your Google account password

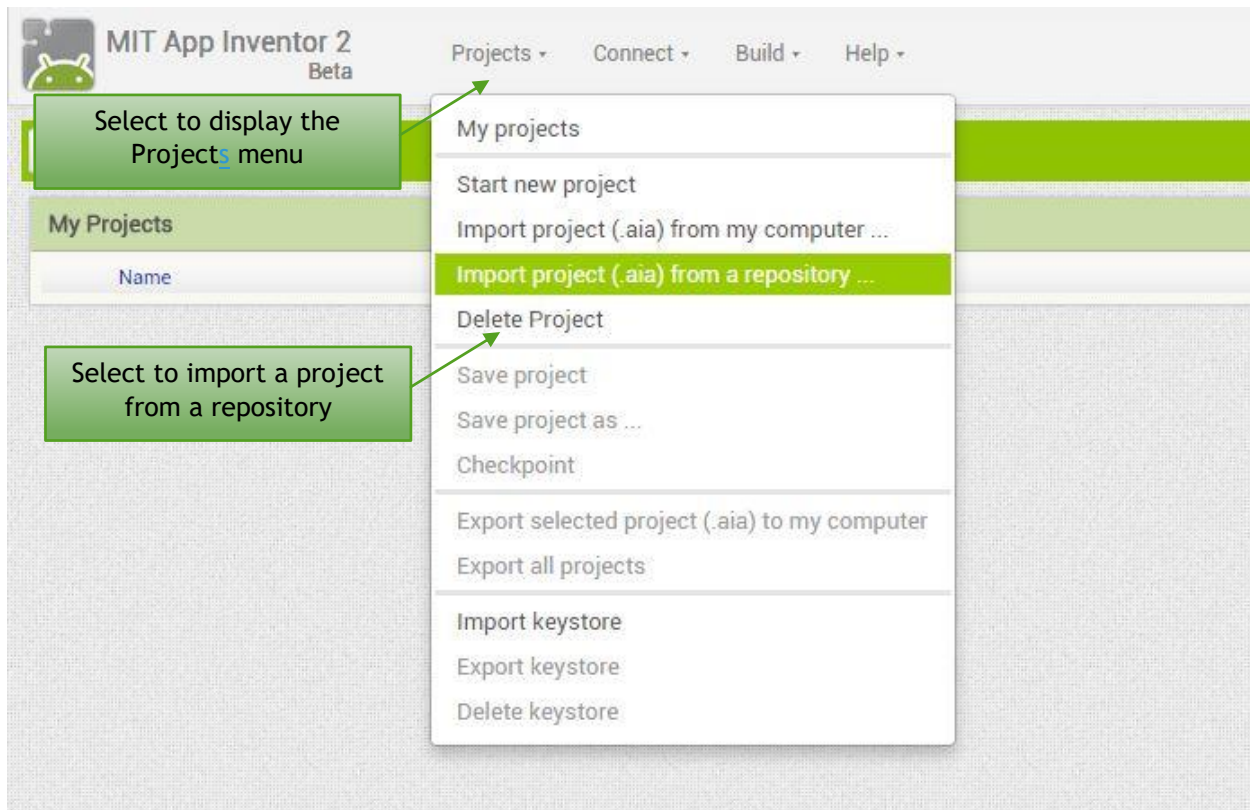
2. Enter your Google account name and password, and allow App Inventor access to your Google account. You'll only be asked to do this the first time you access your account. You will be asked to agree to the Terms of Service (you must accept the terms of service to use App Inventor) and you may be asked to take a voluntary survey.



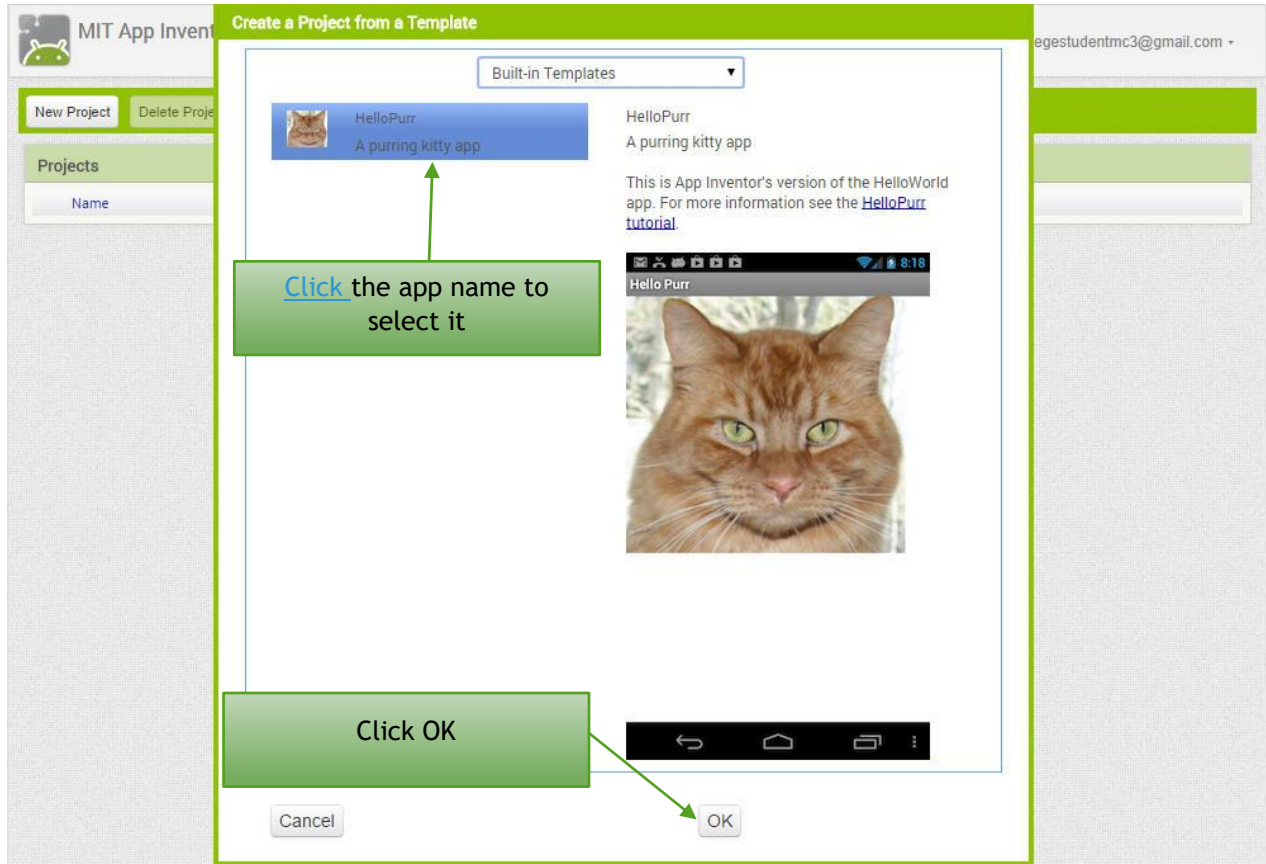
3. Click the **Continue** button to dismiss the Welcome to App Inventor dialog box. Your screen should now look like this:



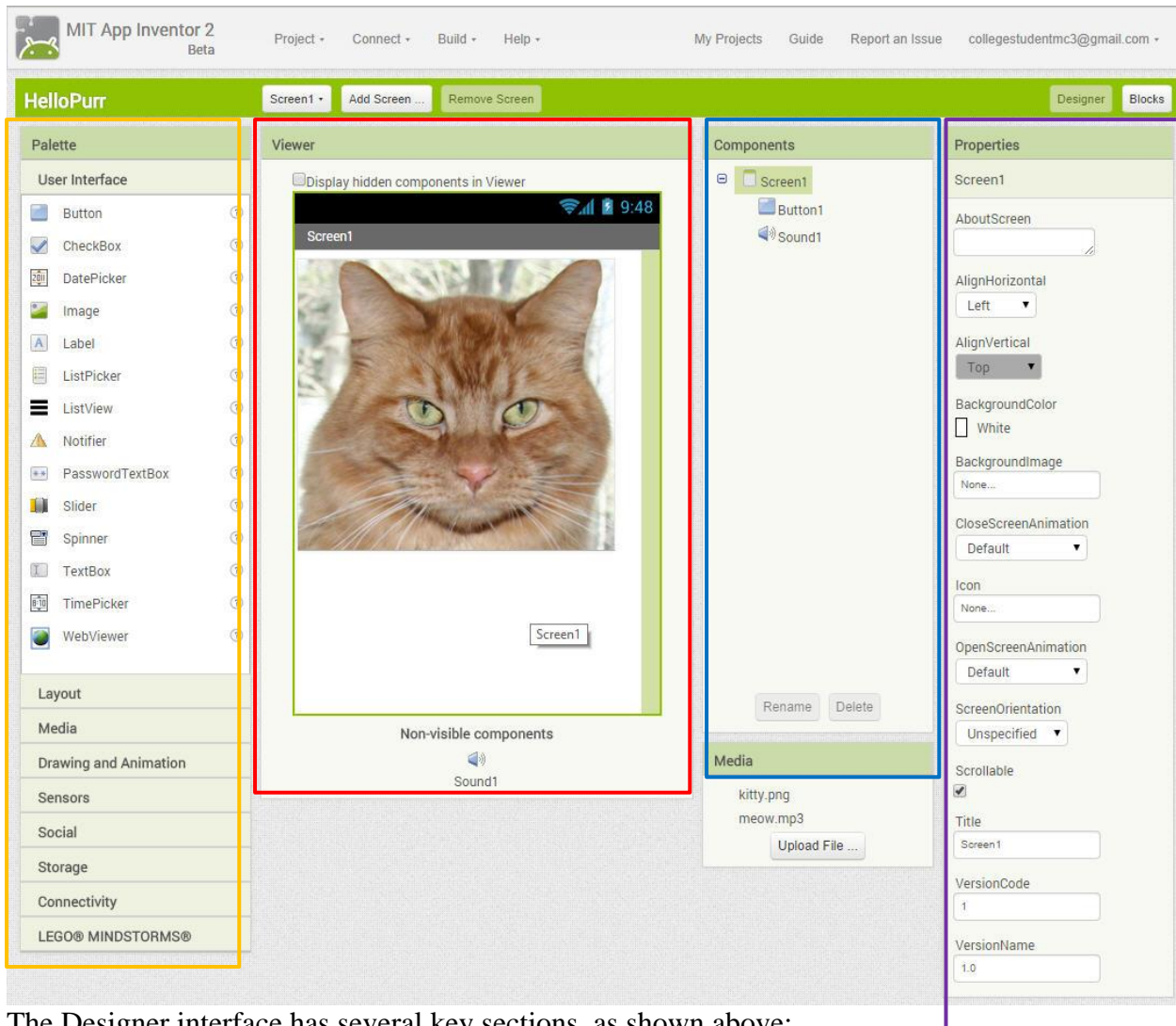
4. At the top of the screen, click **Projects** to display the Projects drop-down menu. From the Projects menu, select **Import Project (.aia) from a repository**. This will display the Built-in Templates screen.



5. Select the **HelloPurr** template from the list in the Built-in Templates group (**Note:** At the time this document was constructed, only one template was available. You may see additional templates listed.)
6. Click **OK** to load the HelloPurr template into AI2.




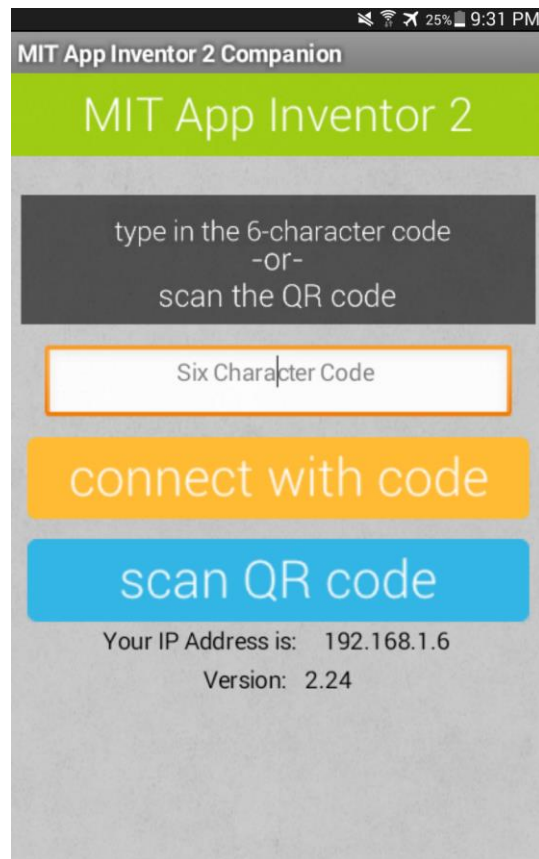




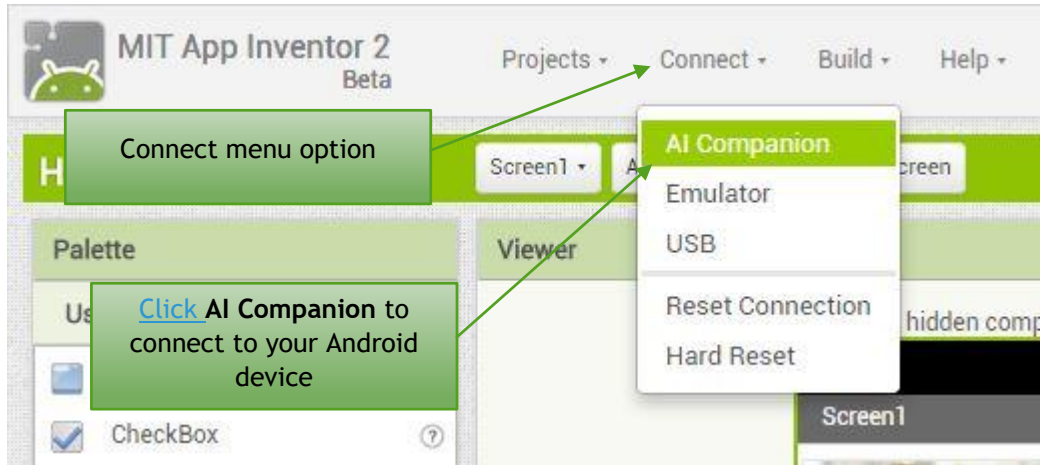
The Designer interface has several key sections, as shown above:

- **Palette:** This section contains the components you'll use to build apps.
- **Viewer:** This section shows the components that have been added to the app.
- **Components:** This section lists all screens in the app, plus the components on each screen. Selecting a screen or component displays the properties for that element in the Properties section.
- **Properties:** This section lists all properties of the element currently selected in the Components section.

7. Next you need to connect App Inventor and your Android device. Turn on your Android device and launch the AI Companion app.  You should see a screen on your Android device that looks like this:

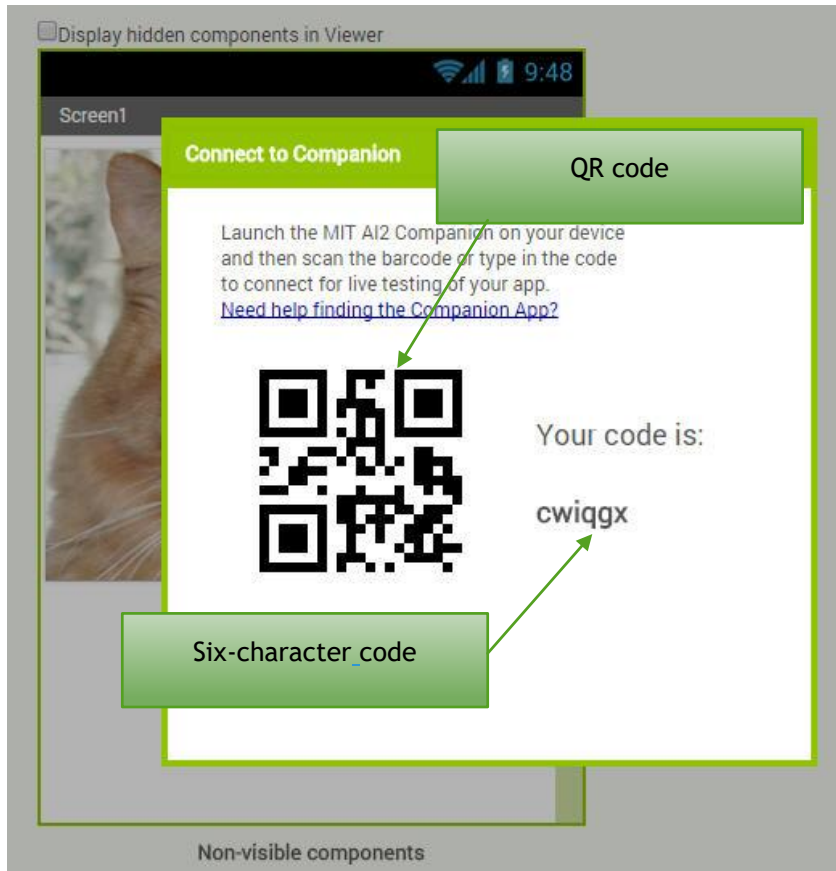


8. On your computer, in App Inventor, click the **Connect drop-down arrow** from the menu at the top of the screen, then click **AI Companion** from the drop-down menu. This launches the Connect to Companion dialog box. (**Note:** If you don't have an Android device, click *Emulator* from the drop-down menu.)





9. Click the button **scan QR code** on your device and hold it so the QR code on your computer screen is in focus. Wait for the two to synchronize. (**Note:** You can also just type the six-character code into the Six Character Code box in the Companion app on your Android device, and then press the orange **connect with code** button.)



If you successfully connected, the Connect to Companion dialog box should disappear, and the screen on your Android device (or the emulator screen) should now display the HelloPurr app, as shown below:

10. Now take some time to play with your device and see what the app does. Does it make noise? Does your device vibrate (**Note:** the emulator will not vibrate and neither will some tablets.)?



## Behind the App

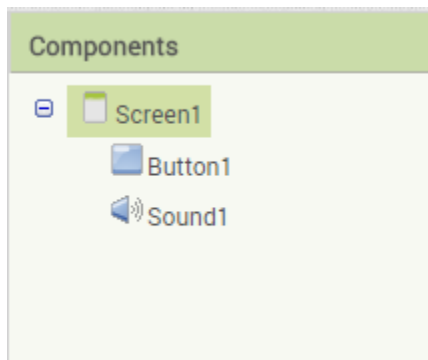
---

Now that you have loaded the HelloPurr app and played with it, let's examine how the HelloPurr app was designed. We will now explore [the](#) AI2 interface to familiarize you with its different components.

### User Interface

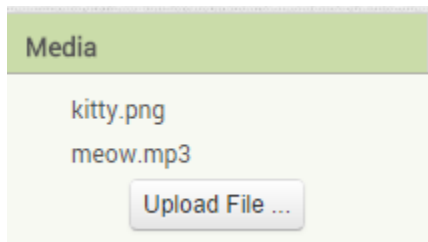
1. Navigate to the Components window. There you see the HelloPurr app uses one screen. That screen has:

- Button1
- Sound1

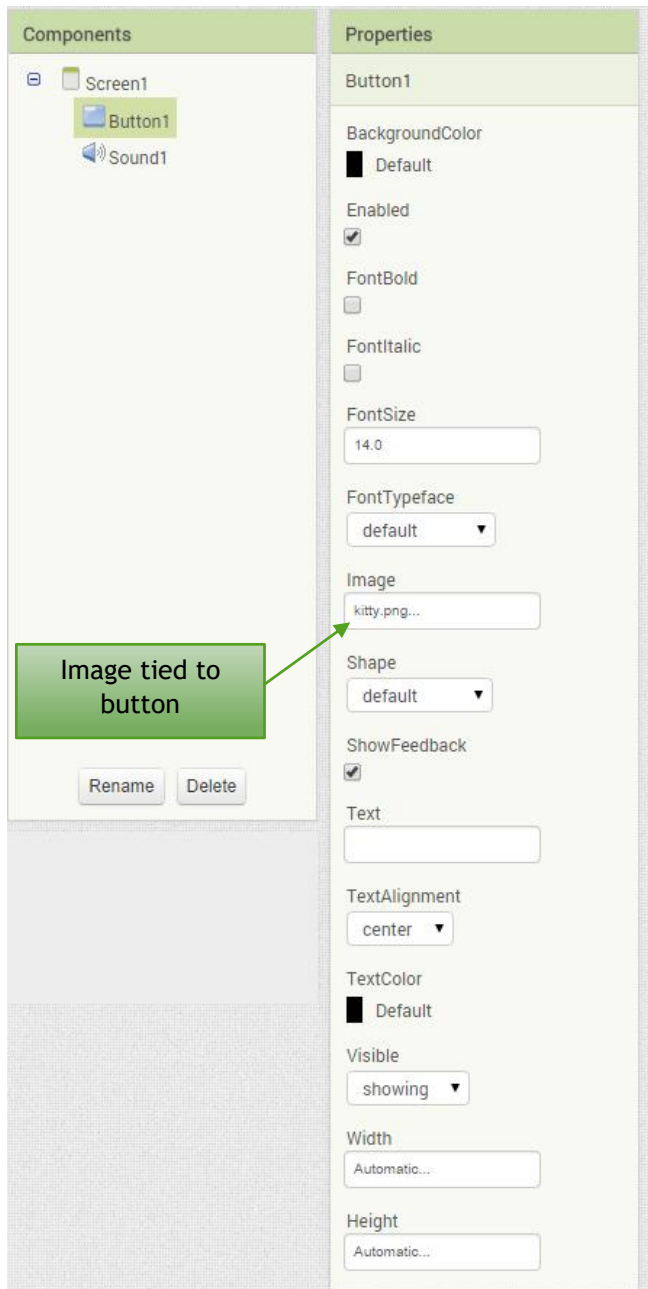


2. Navigate to the Media window, which shows that there are two files uploaded:

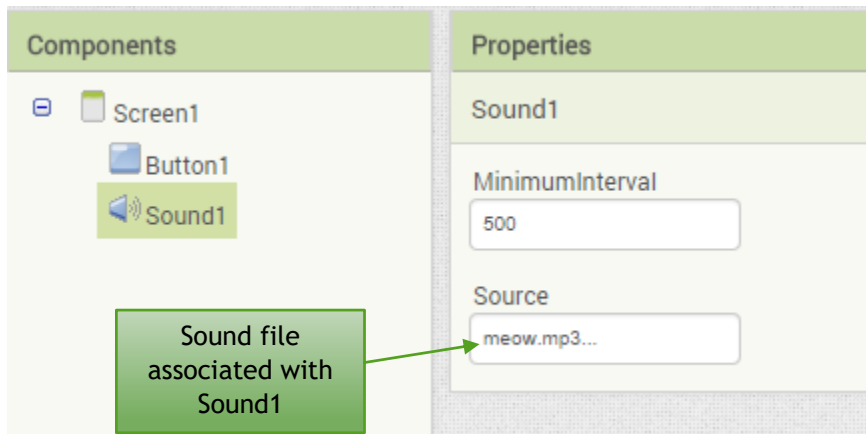
- the image **kitty.png**
- the sound **meow.mp3**



3. In the Components window, [click \*\*Button1\*\* to select](#) it. The Properties window shows all the details of that Button. Notice the Button has an image tied to it, kitty.png.



4. In the Components window, [click Sound1 to select it](#). The Properties window shows it has a Source file associated with it, meow.mp3.

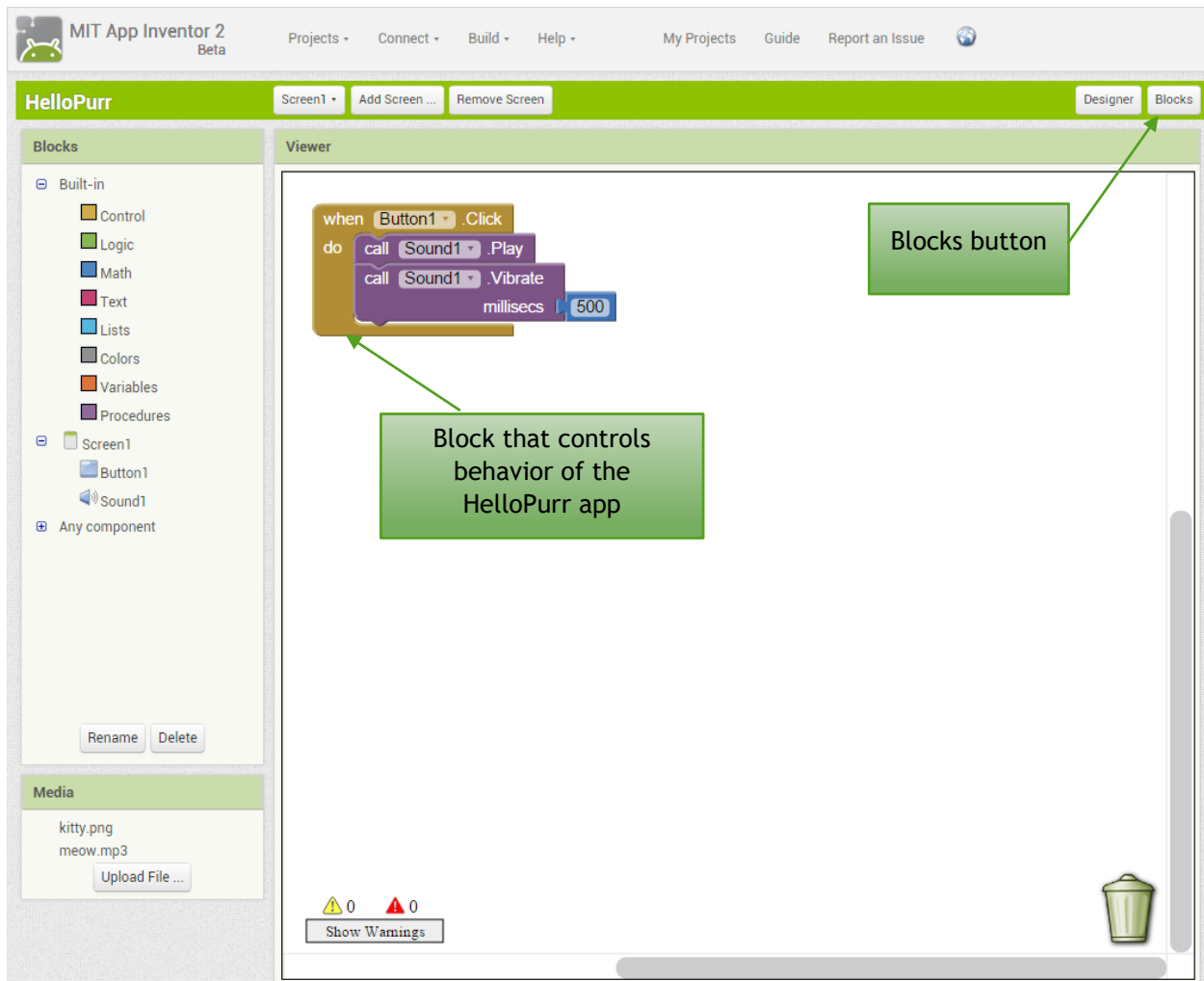


**Note:** As you make changes to the app in the AI2 user interface on your computer, the app will update automatically on your Android device (or in the emulator).

## Behavior (Blocks Screen)

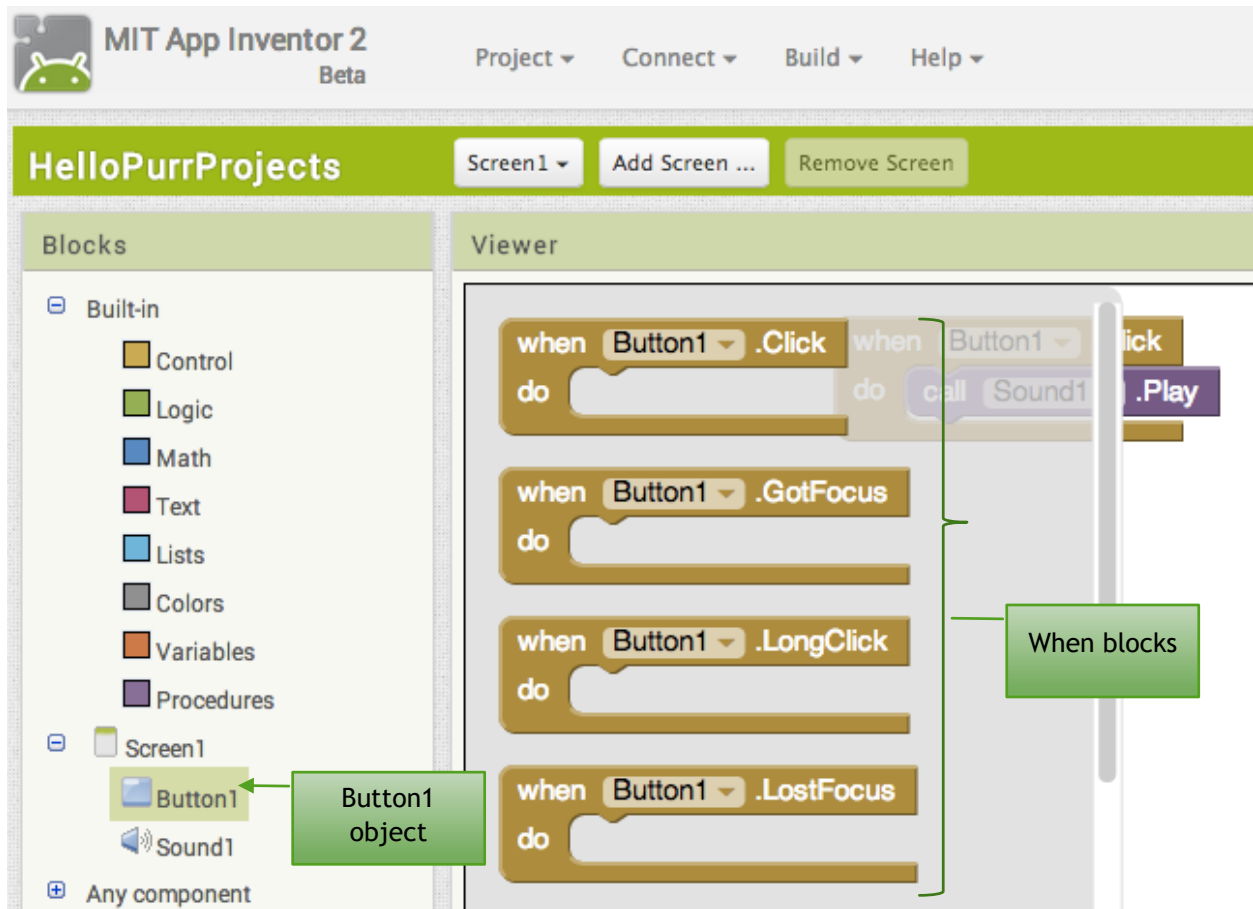
Now let's examine how the HelloPurr app is programmed. We will explore the Blocks view to see what is happening.

1. In the upper-right corner of the AI2 screen, click the **Blocks** button. This switches you to the Blocks view, which enables you to control the behavior of the app. **Blocks** are representations of programming code built into App Inventor. They make it possible for you to assign actions to components of your app without knowing the details of a complex programming language.



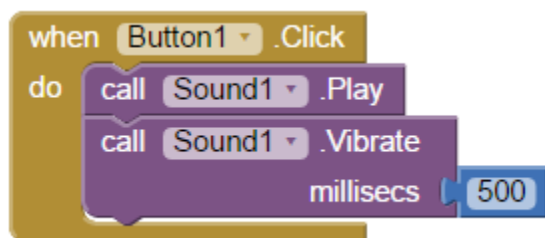


2. In the Blocks palette, [click](#) the **Button1** object. This opens the “drawer” of blocks that control the button’s behavior.



The **when blocks** are gold in color and are tied to actions the user may take. **Note:** There are other types of blocks, but we won't deal with them until future exercises.

The HelloPurr app uses the event block “when Button1.Click” (as shown below). This block controls what happens when a user presses Button1 (the picture of the cat) when the app is running. When Button1 is clicked, the Sound1 object is told to play the source file associated with it and the device will vibrate for 500 milliseconds (like a cat purring).



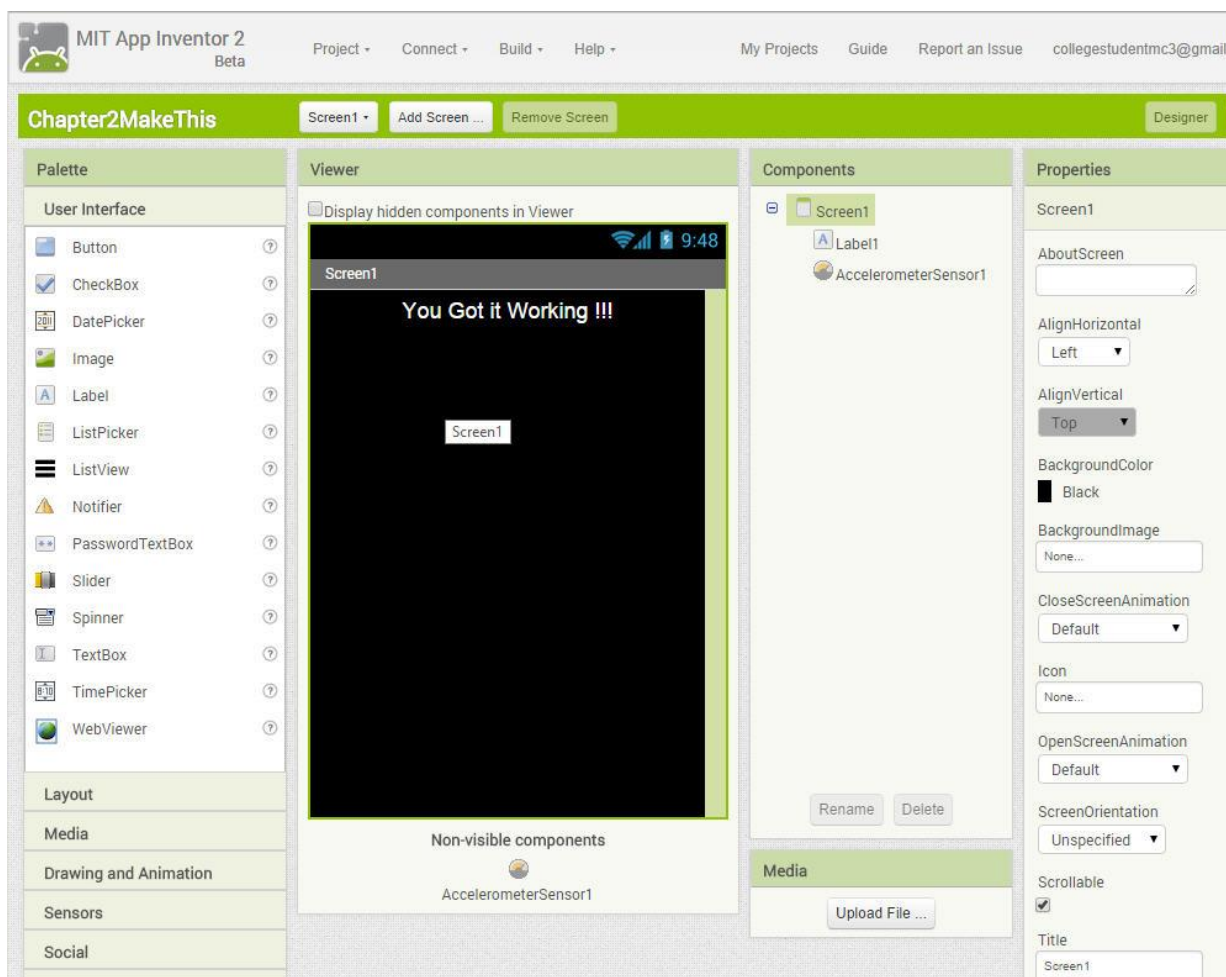
This is the basic pattern for all mobile apps you'll create with App Inventor:

- Design the user interface
- Decide which actions are important (pressing a button, select an item from a list, etc.)
- Program the behavior with blocks

## A Mystery App

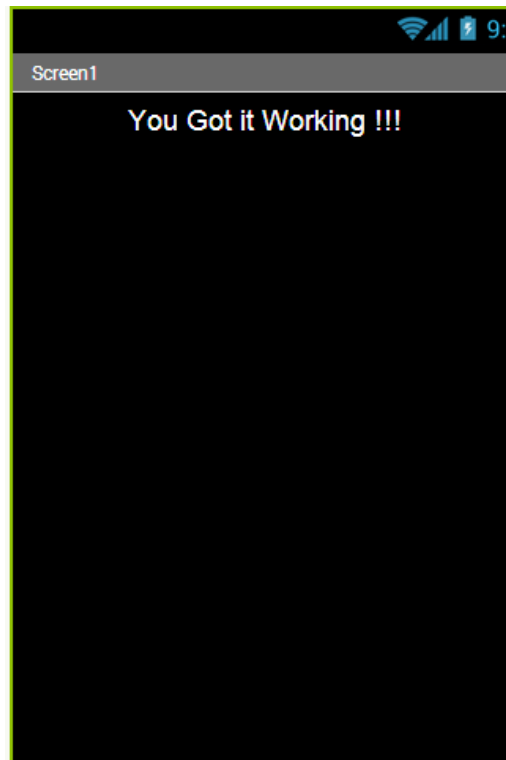
We have created a mystery app for you to explore. (**Note:** This app requires actions that are not supported in the emulator).

1. Download the file **Chapter2MakeThis.aia** from MyITLab and save it to your computer.
2. On the App Inventor menu, click **Connect->Reset Connection**.
3. Click **Projects->Import project (.aia) from my computer** and click the **Choose File** button. Navigate to the folder [where](#) you saved the Chapter2MakeThis.aia file and select it.
4. Click the **OK** button to load the app into App Inventor. Your screen should look like this:



5. Launch the AI companion app on your Android device.

6. On the App Inventor menu, click **Connect->AI Companion** and connect to your Android device. Enter the code either by typing or by scanning the QR code. Your device should look like this:



7. Now play with your device. Move it around. Shake it. What is changing? When are things changing? What kind of blocks might be behind this?
8. When you have an idea of what is happening, open the Blocks view and examine the code. Were you correct?
9. Try making some modifications or adding new behaviors. For example, try going to [Designer](#) view and adding a Text to Speech component (found in the Palette pane under the Media category) and a Text Box (in the User Interface category) and then using those to extend what the app can do (make the picture say the phrase typed in the text box by the user when the picture is touched).

Now that you know the basics of the App Inventor programming interface and how to connect an Android device to it, you can begin building your own apps!

## Extensions to This Project

---

1. Take a “selfie” and modify the HelloPurr app to use your picture as the button image instead of the cat image.
2. Record your voice saying something clever. Upload this sound file to the HelloPurr app and tie that sound to the button. Your picture will now have your voice!
3. Add a text to speech component to the HelloPurr app. Enable the user to type in the phrase that will be spoken when the picture button is pressed.

## Resources

---

- [User Guide for App Inventor 2](#)
- [Guide to Understanding Blocks](#)
- [MIT App Inventor Support Forum](#)
- [Beginner Tutorials \(with videos\)](#)

**Note:** If you want to build the HelloPurr app from scratch, a tutorial to construct it is located at <http://appinventor.mit.edu/explore/ai2/hellopurr.html>.

MIT App Inventor is a blocks-based programming tool that allows everyone, even novices, to start programming and build fully functional apps for Android devices. Google's Mark Friedman and MIT Professor Hal Abelson co-led the development of App Inventor while Hal was on sabbatical at Google. App Inventor runs as a Web service administered by staff at MIT's Center for Mobile Learning - a collaboration of MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and the MIT Media Lab. MIT App Inventor supports a worldwide community of nearly 3 million users representing 195 countries worldwide. App Inventor is an open-source tool that seeks to make both programming and app creation accessible to a wide range of audiences. App Inventor is the property of the Massachusetts Institute of Technology (MIT) and the work licensed under a [Creative Commons Attribution-ShareAlike 3.0 Unported License](#). For more information on App Inventor, go to [MIT App Inventor About Us page](#).