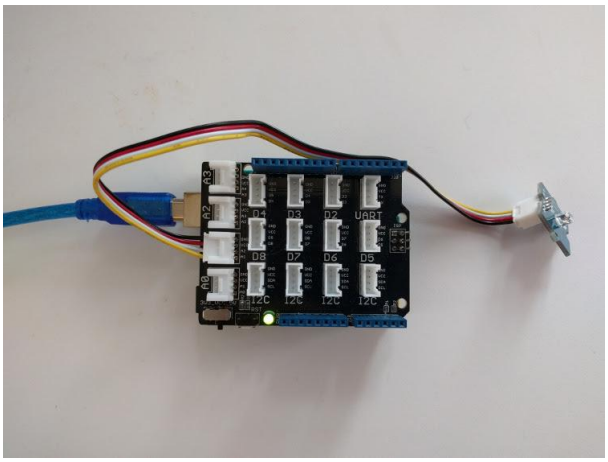
App Inventor + IoT: Light Sensor

20 min

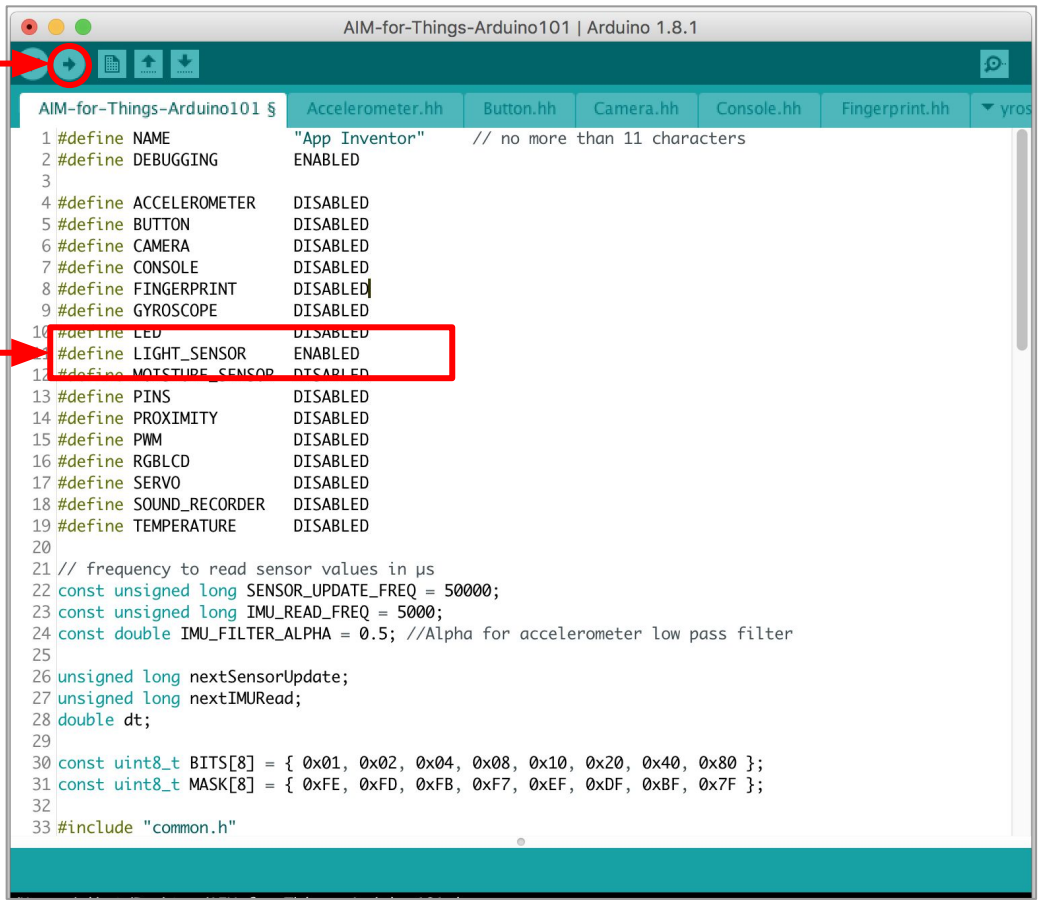
(with IoT Setup and Basic Connection tutorials completed)

This tutorial will help you get started with App Inventor + IoT with a light sensor on an Arduino 101 controller. We are also using a Seeed Grove shield for this tutorial. You do not need to use this board, but it does make things easier. The light sensor we recommend is the Grove light sensor.

Before you start you should have first completed the App Inventor + IoT Setup tutorial to set up your Arduino device.



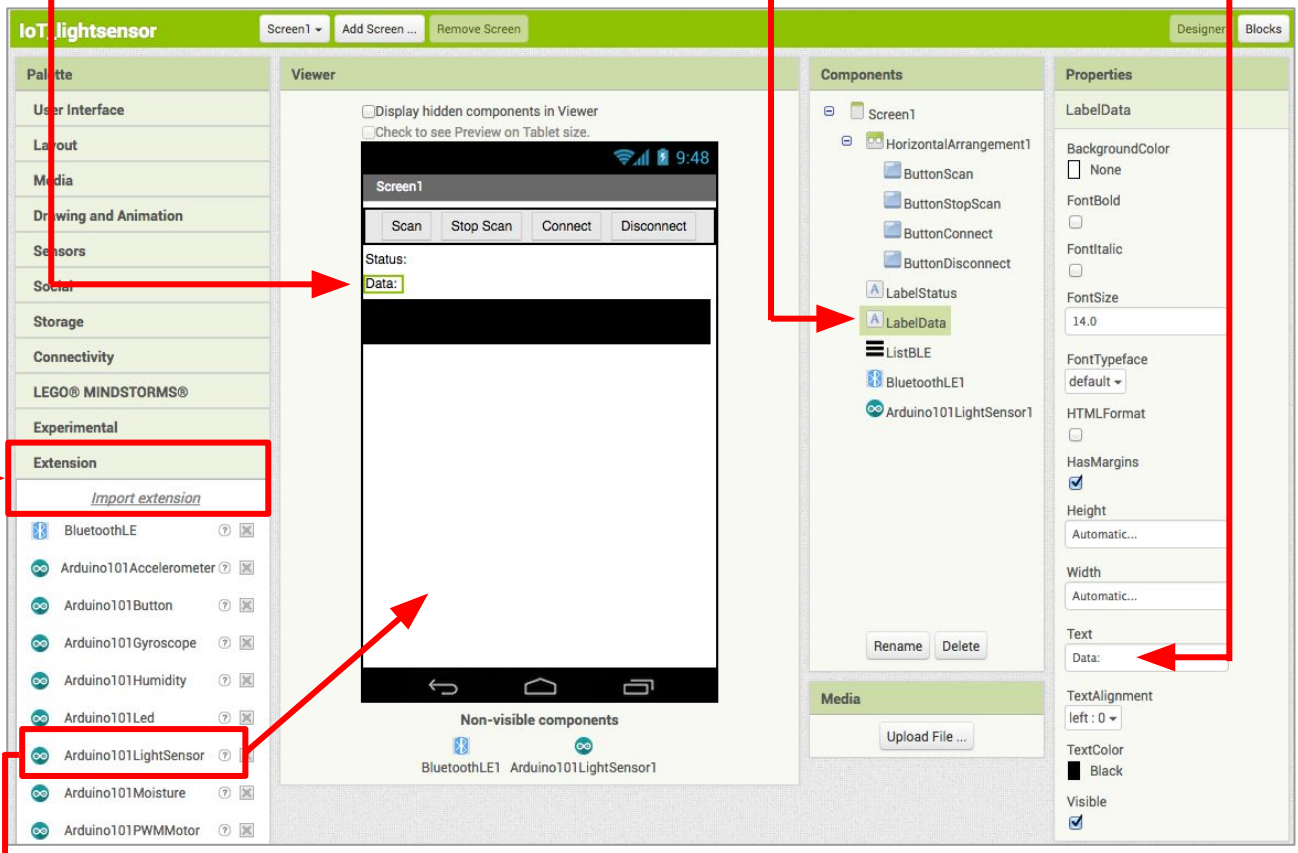
- Connect the light sensor to the Grove board in the A1 pin connector.
- For this tutorial make sure **LIGHT_SENSOR** is set to **ENABLED** and all others are set to **DISABLED**
- You should also click the arrow button in the top left to upload the code.



Next, you should complete the App Inventor + IoT Basic Connection tutorial to make the app connect to the Arduino device. If you prefer, you can download the completed .aia file here.

The remaining steps all build off of the the starter code for Basic Connection tutorial and .aia:

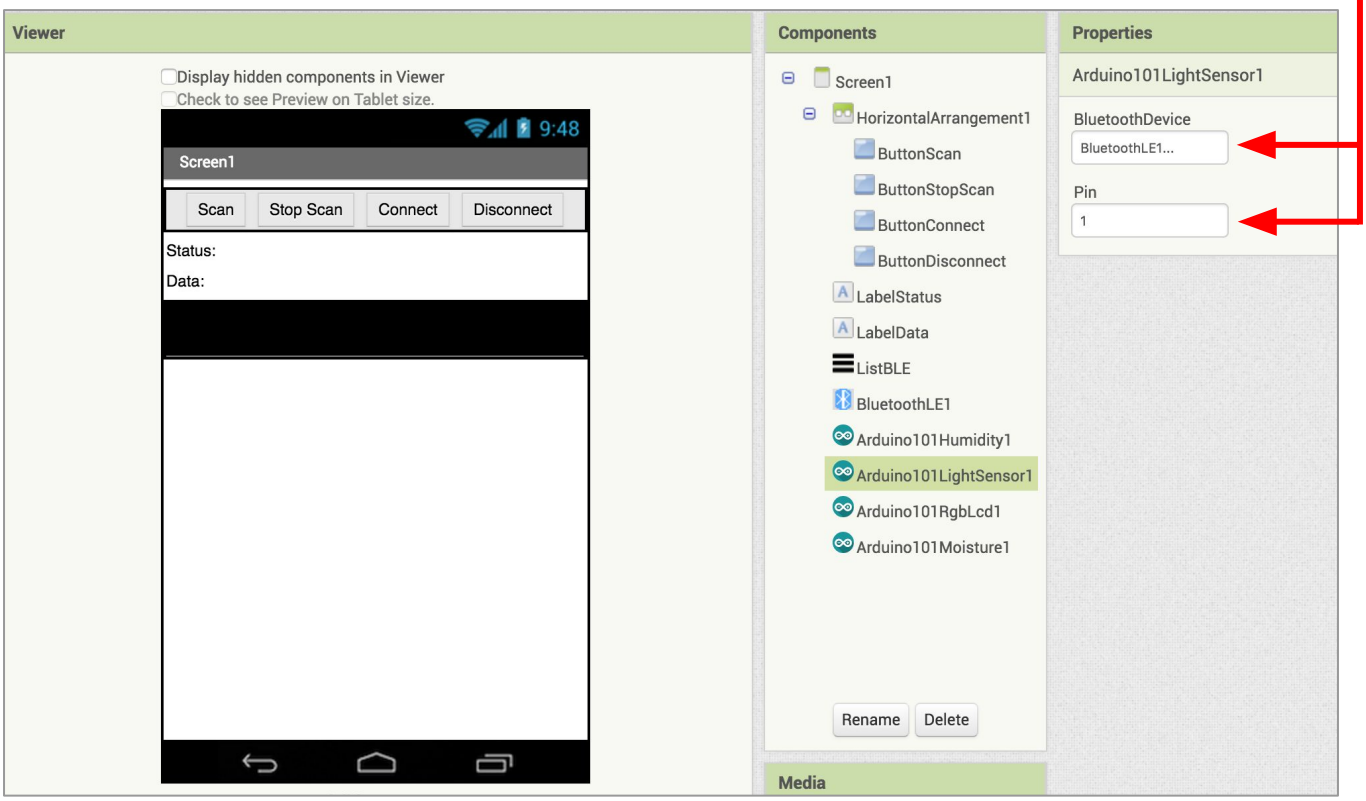
- Drag a **Label** from the User Interface Palette and drop it between **LabelStatus** and **ListBLE**
  - Rename the **Label** "LabelData".
  - Change its text to “Data:”.



- In the Palette window, click on Extension at the bottom and then on "Import extension" and click on "URL".
  - Paste in this URL: http://iot.appinventor.mit.edu/assets/resources/edu.mit.appinventor.iot.arduino101.aix
- Add the **Arduino101LightSensor** extension to your app by dragging it onto the Viewer.

Next, we need to let App Inventor know which pin on the Grove board the light sensor is connected to.

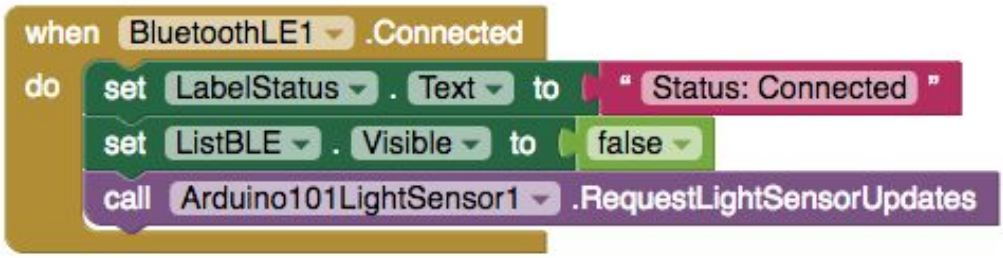
- Click on **Ardunio101LightSensor1** in the Components pane.
- In the Properties pane, click on BluetoothDevice and select **BlutetoothLE1**. Under **Pin**, enter the analog pin that matches the one the light sensor is plugged into on the Grove board (in this case A1).
    - *Note: You only need to set the number (1) not the letter (A).*



Now switch to the Blocks Editor view

First, we want to set it up so that we request data updates when the sensor value on the Arduino changes.

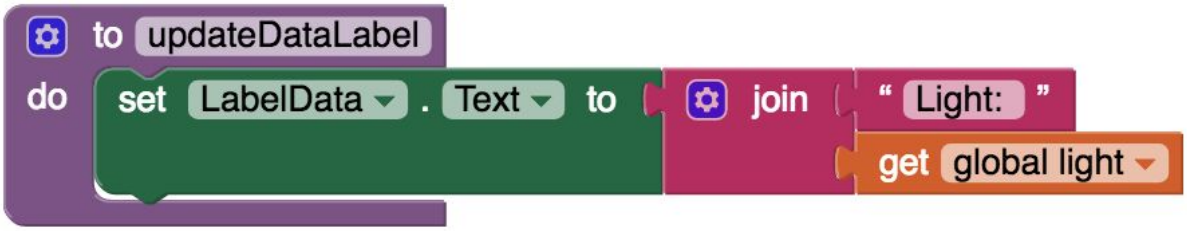
- from the Arduino101LightSensor1 drawer in the Blocks pane, add **call Arduino101LightSensor1 .RequestLightUpdates** to the existing **when BluetoothLE1.Connected** block



Next we need to store the data we receive from the sensor. From the Variables drawer in the Blocks pane, drag an **initialize global name to** block and name it "light". From the Math drawer add a number block and set it to "0". We'll use this to keep track of the sensor value.

Let's make a new procedure to display the current readings in the **LabelData** when we get new data. You can create a procedure by dragging out a purple procedure block from the Procedures drawer in the Blocks pane. Let's rename it **updateDataLabel.**

- from the LabelData drawer in the Blocks pane, add **set LabelData.Text to.**
  - from the Text drawer, add a **join** block.
  - from the Text drawer, add a text block and type **"Light: ".**
  - from the Variables drawer, add **get global light.**



Finally, we need to call the procedure when this data is received.

- From Arduino101LightSensor1 drag **when Ardunio101LightSensor1.LightSensorDataReceived**
  - from the Variables drawer, add **set global light.**
  - Hover over the orange "reading" in the **.LightSensorDataReceived** to see the **get reading** block. Drag the **get reading** block from this window and snap to **set global light.**
- from the Procedures drawer, add **call updateDataLabel.**

Your app should now be working! Connect your Arduino device using the companion (if you haven't already). Test it out by shining a light at, or covering, the light sensor. If it is working, you should see the data label change.