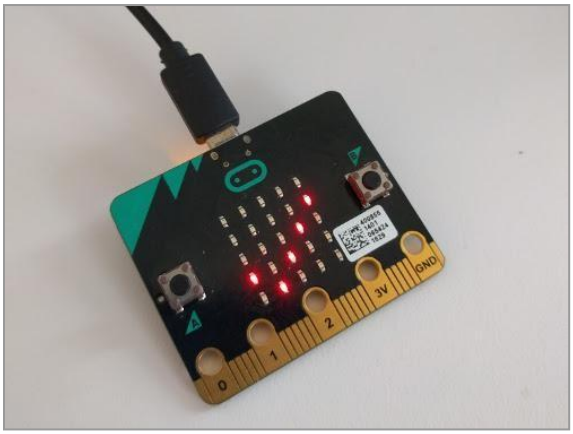
App Inventor + IoT: Micro:bit Magnetometer

This tutorial will help you get started with App Inventor + IoT and the magnetometer sensor on a micro:bit controller.



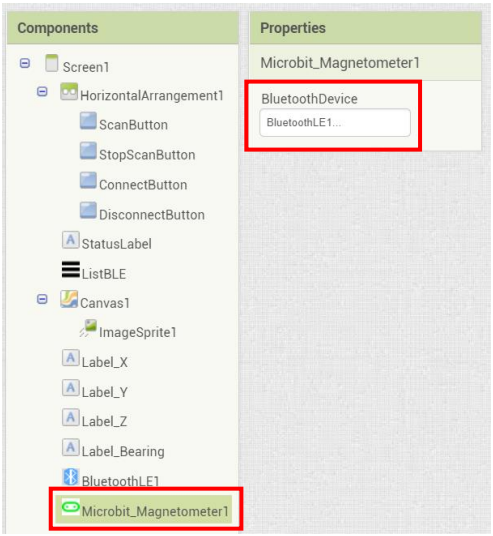
First, you will need to pair your phone or tablet to the micro:bit controller, using these directions. Your device must be paired with the micro:bit in order for the app to work.

Next, you should complete the App Inventor + IoT Basic Connection tutorial to make a basic connection to the micro:bit device. If you prefer, you can download the completed .aia file here.

App Inventor's micro:bit magnetometer component's document

The remaining steps all build off of the the starter code for Basic Connection tutorial and .aia.
First, we need to add the necessary extension.

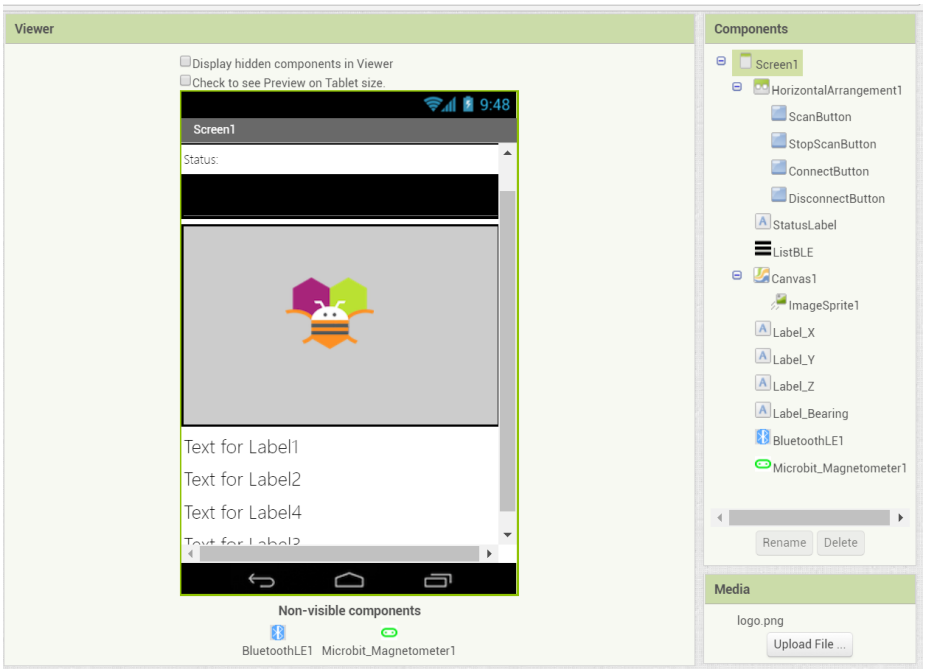
- In the Palette window, click on Extension at the bottom and then on "Import extension" and click on "URL".
    - Paste in this URL: http://iot.appinventor.mit.edu/assets/com.bbc.micro:bit.profile.aix
- Add a **Microbit_Magnetometer** extension to your app by dragging it onto the Viewer, set its *BluetoothDevice* to "BluetoothLE1"(Don't forget!).



Let’s add more components to our app to receive the magnetometer status.

- From the Drawing and animation drawer in the Palette, drag in a **Canvas** and a **ImageSprite**. Set Canva’s height to 320 pixels, width to fill parent (or any parameters you like).
    - Set **ImageSprite**’s Picture to some cute image (not bigger than the canvas).
- Add four Label to show Magnetometer’s X, Y, Z axis and bearing value.

Your designer page should seem like this:



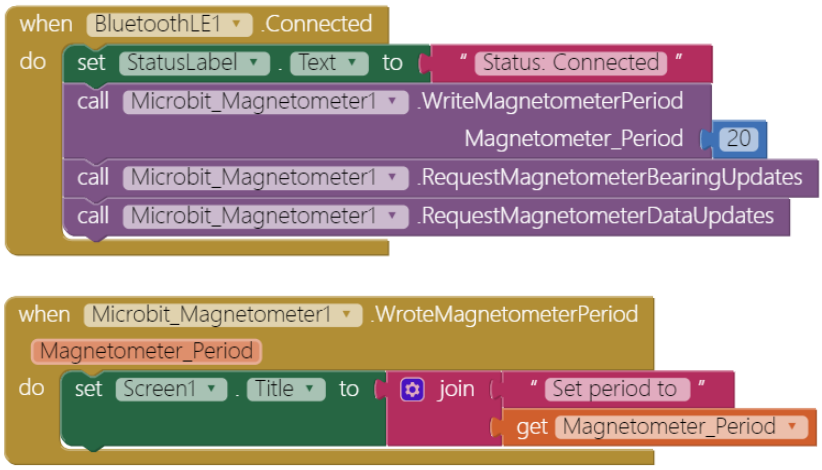
Now switch to the Blocks Editor view

We would like to control ImageSprite's heading by the Z-aixs movement of magnetometer on Micro:bit controller. Let's begin:

STEP1: Request updates when connected

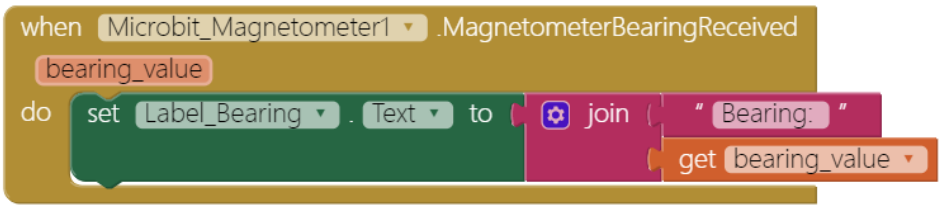
In BluetoothLE1.Connected event, we show message and request Microbit to update magnetometer's state.

And in **Microbit_Magnetometer1.WroteMagnetometerPeriod** event, we show related message and the period value just set.



STEP2: Show bearing value

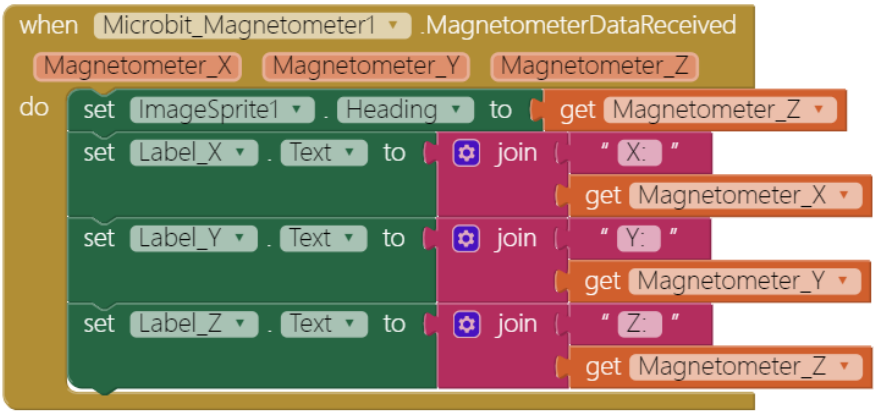
In **Microbit_Magnetometer1.MagnetoBearingReceived** event, we simply show bearing value on the label.

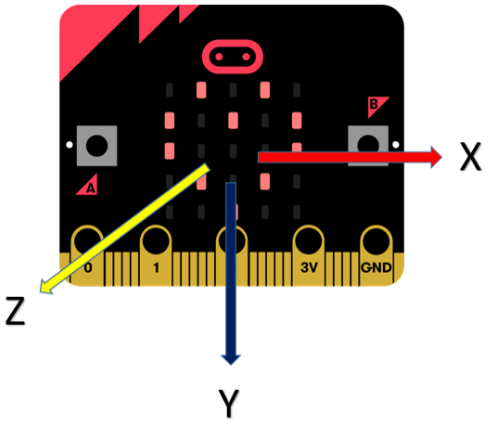


STEP3: Show XYZ data and control ImageSprite

In **Microbit_Magnetometer1.MagnetoDataReceived** event:

- Set ImageSprite's heading to Magnetometer_Z value.
- Show X, Y Z axis value on corresponding label, check image below for Micro:bit's axis.





(From https://makecode.microbit.org)

Your app should now be working! Test it out by connecting your micro:bit device using the MIT AI2 Companion (if you haven't already) or install by .apk. Make sure you have paired the Bluetooth on your Android device to your micro:bit first! Try to shake or flip around your Micro:bit or have a small magnet(not too strong or it may influent your device!) point toward it, you should see the App Inventor logo turning and turning!

Try to add more cute movement into your app, for example, you can use X, Y axis value to make ImageSprite moving leftward and

rightward and show something when it bumped to Canvas' edges. (Refer to our Micro:bit button tutorial).