Controlling Devices Over the Internet > Controlling Devices over the Bolt

Controlling LED Intensity Over Bolt Cloud

In the previous lesson, we have learned about PWM, and how the Bolt IoT platform allows you to use PWM to control the voltage on any digital GPIO pin.

So in this lesson, we will learn how to write code to control the light intensity of an LED.

At this point, we believe that you guys are familiar with Bolt cloud i.e how to create a product and link it to the bolt device. In case you don't know, then you can refer 'Building your first IoT sensor project' lesson.

Step 1: Go to cloud.boltiot.com and create a new product. While creating the product, choose product type as Output Device and interface type as GPIO. After creating the product, select the recently created product and then click on configure icon.

Step 2: Move to the code tab and write the following code to control the LED.

In the header, we will include a javascript file which has some pre-defined function like DigitalRead, digitalWrite etc already hosted on our Bolt Cloud.

Script to be included is given below:

```
<script type="text/javascript"
src="https://cloud.boltiot.com/static/js/boltCommands.js"></script>
```

Note: If you want to see the source code of the same open https://cloud.boltiot.com/static/js/boltCommands.js link in the browser.

Now the next step is to set the API key and device name. The syntax for the same is given below:

```
<script>
setKey('{{ApiKey}}','{{Name}}');
```

Note: API key and Device name will be auto-initialized by Bolt cloud. You don't have to replace the device name and API key in the above code.

Next, we make a function, which reads the value from a slider input and uses the analogWrite function to send the PWM value to the Bolt.

```
var last_pwm_value=-1;
function updateLedIntensity(){
            var pwm_value=document.getElementById('pwm_value').value;
            if(last_pwm_value!=pwm_value){
                analogWrite(0,pwm_value);

document.getElementById('pwm_value_display').innerHTML=pwm_value;
            }
            last_pwm_value=pwm_value;
}
```

The above code looks for an HTML element with the Id ‘pwm_value’. This HTML element is a slider, which we will write into the code later.
It then pulls the value from the slider element, checks if that value has changed since the last time the function was called.
If the slider position has changed, it sends the new slider value to the Bolt, using the analogWrite function.
This function also updates this changed value to an HTML element with the Id ‘pwm_value_display’, which we will add into the code later.

We then make it so that this function is called over and over again so that it can do the necessary check and send the slider data to the Bolt. We do this using the setInterval function.

```
setInterval(updateLedIntensity,1000);
</script>
```

Now inside the <body> tag you have to add a lable text 'pwm value:' 2 HTML elements.
The first tag is a slider type input, with an Id 'pwm_value' as mentioned earlier. The minimum value that the slider can take is 0, the maximum is 255 and the default value is 0. This slider will allow us to set the PWM value that we want to send to the Bolt.
The second HTML element is a div tag, with the Id 'pwm_value_display' which was mentioned earlier. When you move the slider, the function will notice the change and update the value in this tag, so you know what value is being sent to the Bolt.

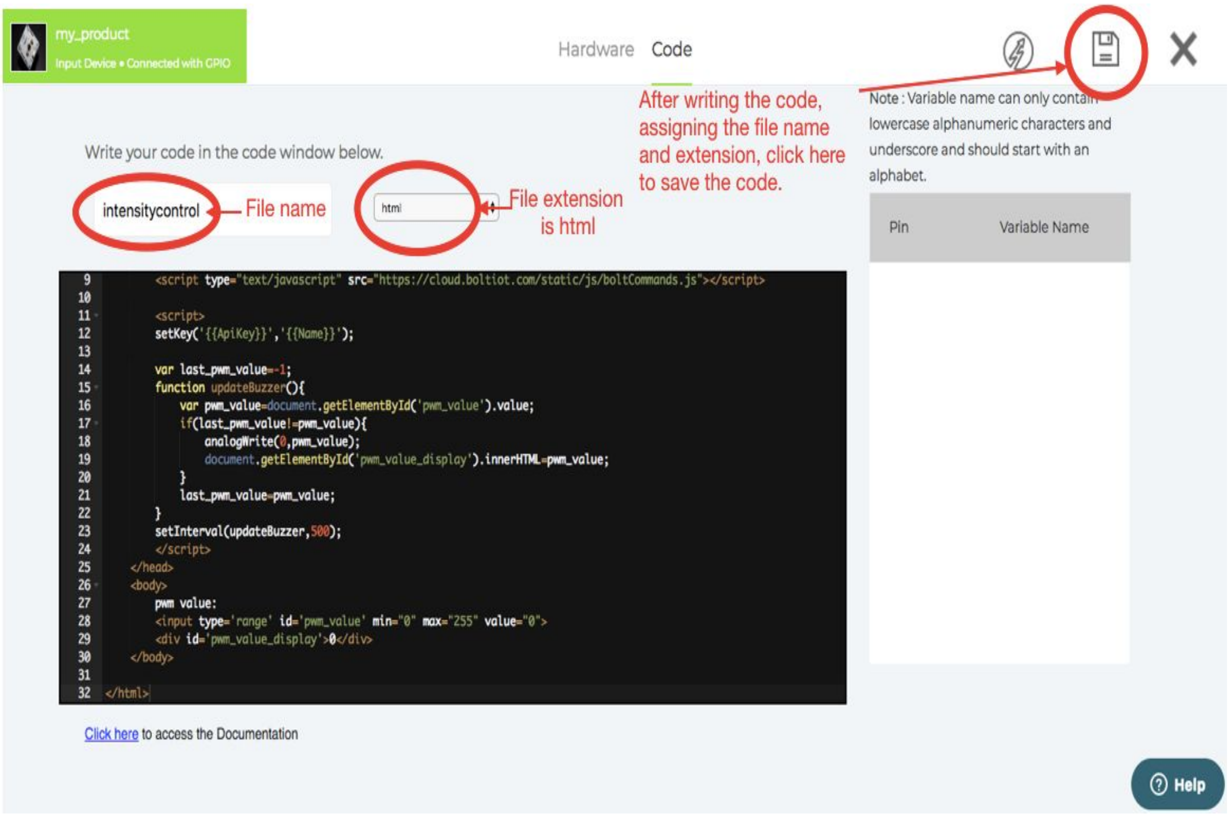
```
<body>

 pwm value:

           <input type='range' id='pwm_value' min="0" max="255" value="0">
          <div id='pwm_value_display'>0</div>

</body>
```

Below is the complete code:

```
<!DOCTYPE html>

<html>
```

```
    <head>

        <title>Bolt IoT Platform</title>

        <script type="text/javascript"
src="https://cloud.boltiot.com/static/js/boltCommands.js"></script>

        <script>
        setKey('{{ApiKey}}','{{Name}}');

        var last_pwm_value=-1;
        function updateLedIntensity(){
            var pwm_value=document.getElementById('pwm_value').value;
            if(last_pwm_value!=pwm_value){
                analogWrite(0,pwm_value);

document.getElementById('pwm_value_display').innerHTML=pwm_value;
            }
            last_pwm_value=pwm_value;
        }
        setInterval(updateLedIntensity,1000);
        </script>
    </head>
    <body>
        pwm value:
        <input type='range' id='pwm_value' min="0" max="255" value="0">
        <div id='pwm_value_display'>0</div>
    </body>

</html>
```

Step 3: Once you have written the complete code in the editor, give the file name as intensitycontrol and in the drop-down select the file extension as HTML. Below is the screenshot of how it looks after this step.



my_product
Input Device • Connected with GPIO
Hardware
Code
Write your code in the code window below.
intensitycontrol
File name
html
File extension is html
After writing the code, assigning the file name and extension, click here to save the code.
Note : Variable name can only contain lowercase alphanumeric characters and underscore and should start with an alphabet.
Pin
Variable Name
Help

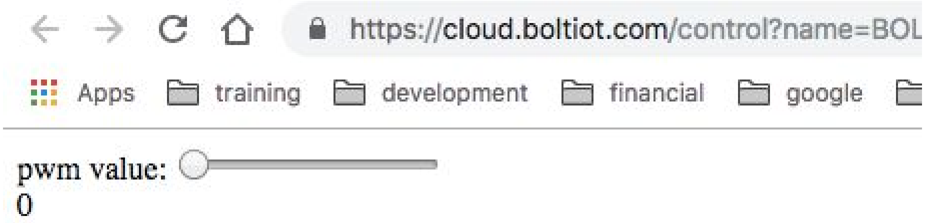
```
        <script type="text/javascript" src="https://cloud.boltiot.com/static/js/boltCommands.js"></script>

        <script>
        setKey('{{ApiKey}}','{{Name}}');

        var last_pwm_value=-1;
        function updateBuzzer(){
            var pwm_value=document.getElementById('pwm_value').value;
            if(last_pwm_value!=pwm_value){
                analogWrite(0,pwm_value);
                document.getElementById('pwm_value_display').innerHTML=pwm_value;
            }
            last_pwm_value=pwm_value;
        }
        setInterval(updateBuzzer,500);
        </script>
    </head>
    <body>
        pwm value:
        <input type='range' id='pwm_value' min="0" max="255" value="0">
        <div id='pwm_value_display'>0</div>
    </body>

</html>
```

Click here to access the Documentation

Step 4: Now click on save icon to save the code. Now go back to the dashboard by clicking on 'X' icon.

Step 5: In the products tab, select the product created and then click on the link icon. Select your Bolt device in the popup and then click the 'Done' button.

Step 6: Now click on view this device icon to view the page that you have designed. Below is the screenshot of the final output.



pwm value:
0

Once you are on this page, you can move the slider, and see the intensity of the LED rising and fading as you change the position of the slider.