Cloud, APIs and Alerts > Bolt Python Library

LED Intensity (Brightness) Control

In the previous section we see how to turn on and off Led's connected to Bolt, and now in this section, I will show you how to control the brightness of a LED using Bolt Pi.

When I watched movies while resting on beans bag and in between I want to slow down the speed of the fan, but I am very lazy to get up from the bean bag. That's a big problem for me but thanks to Bolt IoT they have PWM (analogWrite) to control the intensity of things.

What is PWM ?

Pulse width modulation is used in a variety of applications including sophisticated control circuitry.A digital device like a microcontroller can easily work with inputs and outputs that have only two states, on and off. So you can easily use it to control a LED’s state i.e. on or off. In the same way, you can use it to control any electrical device on/off by using proper drivers (transistor, relays etc). But sometimes you need more than just "on" & "off " control over the device.Like if you wanna control the brightness of a LED (or any lamp) or the speed of DC motor then digital (on/off) signals simply can’t do it. This situation is very smartly handled by a technique called PWM or Pulse Width Modulation.

In Bolt Python library analogWrite function is used as PWM for controlling the Intensity(brightness) of led. Syntax :

```
analogWrite('pin numer', 'intensity value')
```

analogWrite function takes two arguments the first argument is the pin number and the second argument is the Intensity(brightness). Intensity value ranges from 0 to 255. 0 means led is off and 255 means led is in full brightness mode.

Now, let's start writing code. First login to your ubuntu server using Putty and create a Python file using nano editor. For example :

```
sudo nano led_brightness.py
```

and write the below code and save the file by typing ctrl+x.

```
from boltiot import Bolt
api_key = "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"
device_id  = "BOLTXXXXX"
mybolt = Bolt(api_key, device_id)
```


```
response = mybolt.analogWrite('0', '10')
print (response)
```

In the above code, from the first line to the fourth line we are just exporting the Bolt Python library and creating an instance of Bolt Class. In the fifth line, we are calling the analogWrite function and passing the pin number 0 and intensity value 10.

Now save the file and run in terminal. For example

```
sudo python3 led_brightness.py
```

You will see the led glowing with low brightness. You brightness value could be anything between 0 to 255.

