How to use Arduino (Nano etc) and NeoPixels to build a colorful blinking SantaHat

I wanted to build a nice Santa hat that uses colorful NeoPixels for the Christmas days. Here are the materials is used.

* Arduino Nano (you use any small Arduino or ESP32)
* [NeoPixel Strip](https://www.amazon.ca/CHINLY-Individually-Addressable-Waterproof-waterproof/dp/B01LSF4QDM)  - Use some water proofed once
* [Small Power Booster](https://www.aliexpress.com/item/32891706812.html)
* [Cables](https://www.amazon.ca/Elegoo-120pcs-Multicolored-Breadboard-arduino/dp/B01EV70C78/)
* [Ble Modul (optional)](https://www.amazon.ca/DSD-TECH-SH-HC-08-Transceiver-Compatible/dp/B01N4P7T0H)
* [LiPO USB Charger (optional)](https://www.amazon.ca/Lithium-Overcharge-Over-Discharge-Over-Current-Protection/dp/B07KYGL71L/)
* [Battery 500maH](https://www.amazon.ca/Fytoo-500mAh-Battery-battery-Charger/dp/B0794ZPVSX/)
* [1 Diffused NeoPixel 8mm](https://www.amazon.ca/EDGELEC-Tri-Color-Multicolor-Resistors-Included/dp/B077X95LRZ/) (optional)
* [Some heat shrink](https://www.amazon.ca/Yosawa-Pieces-Heat-Shrink-Tubing/dp/B07SPRNMD5)
* [Christmas Hat](https://www.amazon.ca/Confortable-Velvet-Christmas-Favors-Adults/dp/B07G44K67L)
* A Switch
* [You may also want to add Capacitor , Diode and resistor](https://www.mathworks.com/matlabcentral/mlc-downloads/downloads/submissions/64467/versions/2/previews/html/NeoPixelExample_Basic.html) to be proper

Of course we will need some soldering iron and tools.

You can find these parts on the internet at various place like AliExpress or Amazon etc.

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I started building the prototype on a bread board 1st and then fit it into the hat.

Of course we will need some soldering iron, cables and tape etc.

You can find these parts on the internet at various place like AliExpress or Amazon etc.

![](/images/PXL\_20201205\_210550338.jpg)

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![](/images/PXL\_20201206\_200006135.jpg)

Once you got this working you will need to solder the cables onto the Nano. My little boster had only 3 ports Vin,Ground,Vout. I Soldered 2 male cable for the Battery (Vin,Ground) and 2 cables as bridge (Ground,Vout) to the Gnd Vin at the Nano. The Nano has one more Gnd and 5V Port which i use for the Single NeoPixel which goes into the Bommel.

Technically you should use a capacitor and a diode between the Nano and the NeoPixel Ring.

Make sure you wrap all open connection in heat shrink.