Assignment #3

Problem1- Color Recognition

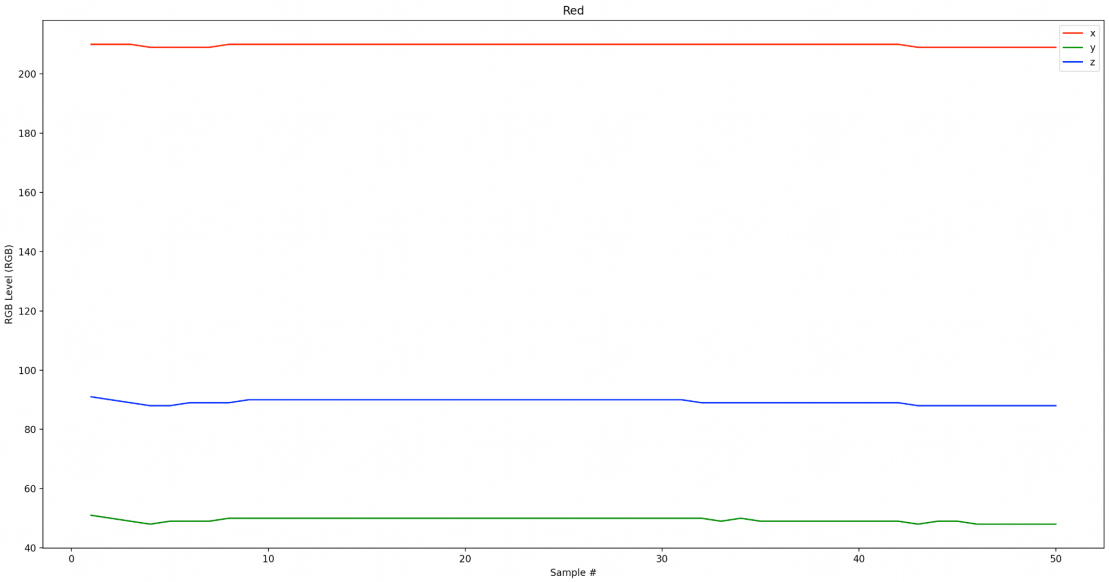
1. Color recognition with 6 categories/classes: “ red” “orange” “yellow” “green” “blue””purple”

   2a. I initiate a sample window by notifying the user that the Arduino is ready to take samples of color detection.

   2b. My sample window consists of 50 total samples with a color reading taken every half second.

   2c. I collected 50 total samples for each category.

   2d. I did save my data from the serial monitor and then graph it using matplotlib before exporting it to the model. For example my red.csv looked like:



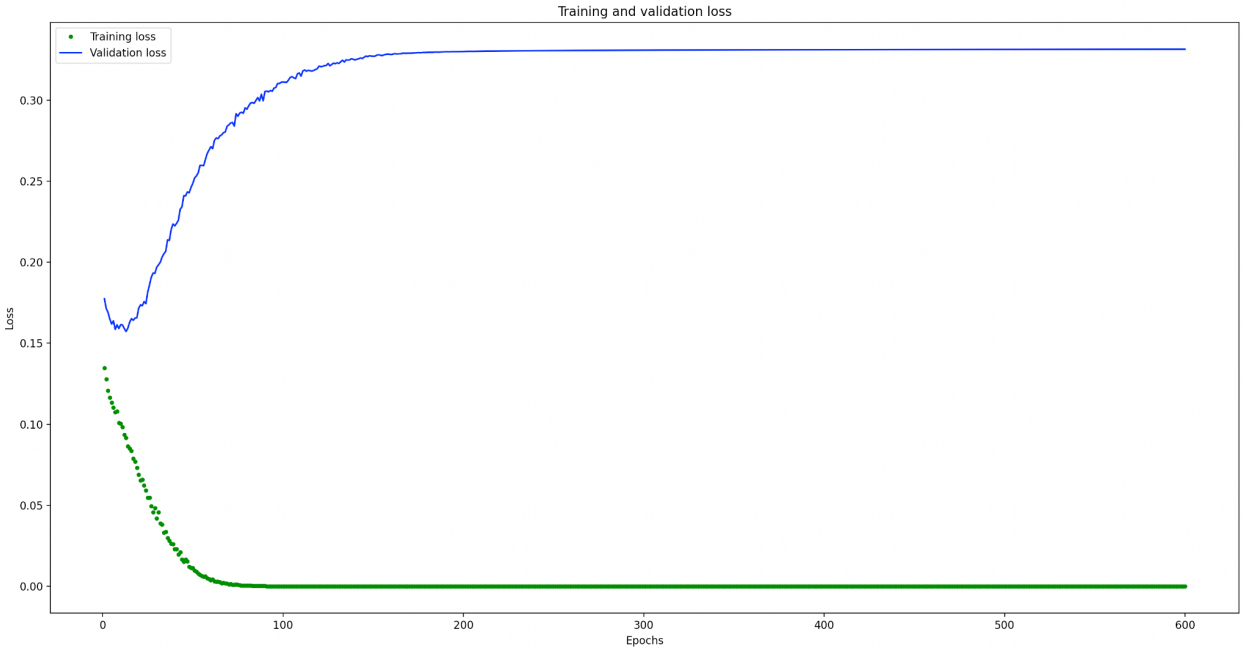
   2e. The APDS9960 sensor didn’t have any user changeable settings like sampling rate, gain etc. However, I did have to take into account the distance the sensor was from the color I was trying to sample, I found that about 5 inches away gives the best output.

3a. My model is a Sequential model with 3 layers. The first two layers use relu as their activation for better performance, and the last layer uses softmax since each input is one color detection sample. My model summary is:

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
dense (Dense)                (1, 50)                   7550

dense_1 (Dense)              (1, 15)                   765

dense_2 (Dense)              (1, 6)                    96

=================================================================
Total params: 8,411
Trainable params: 8,411
Non-trainable params: 0
_________________________________________________________________
```

3b.

My Loss curves seem to show that my model may be over fit since the validation loss begins to increase again.



My Mean Absolute Error curve: