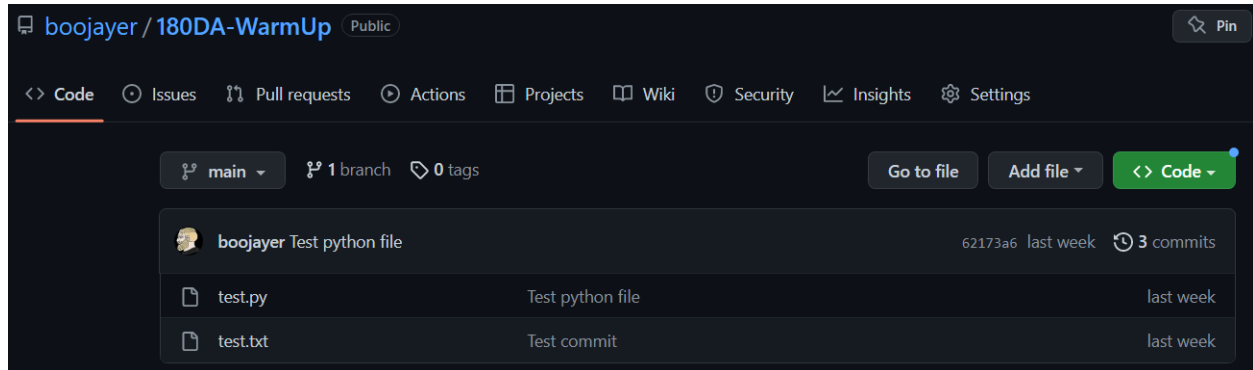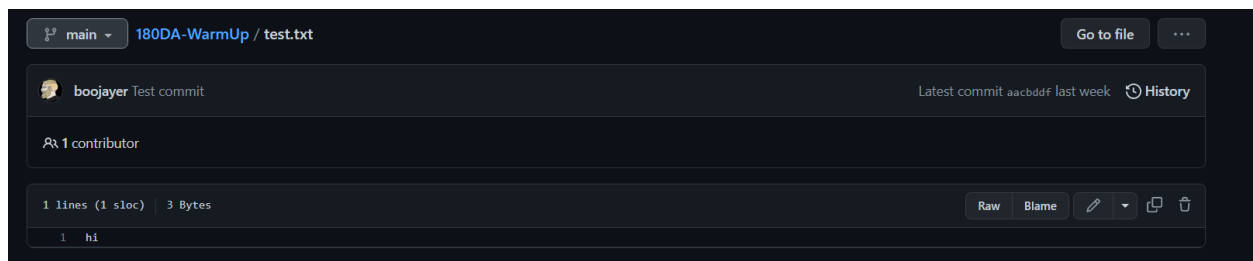Jaden Booher

405-333-407

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ECE 180D Lab 1 Writeup
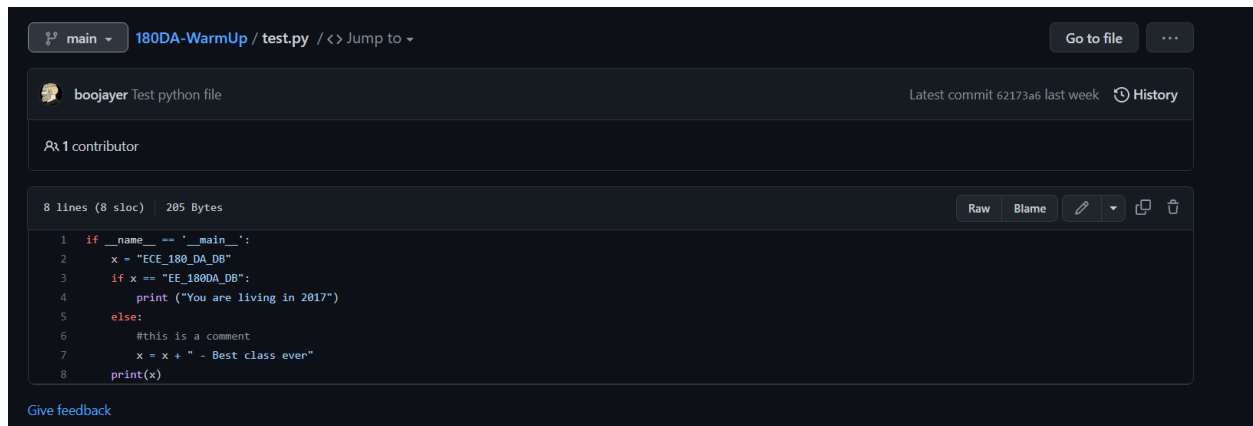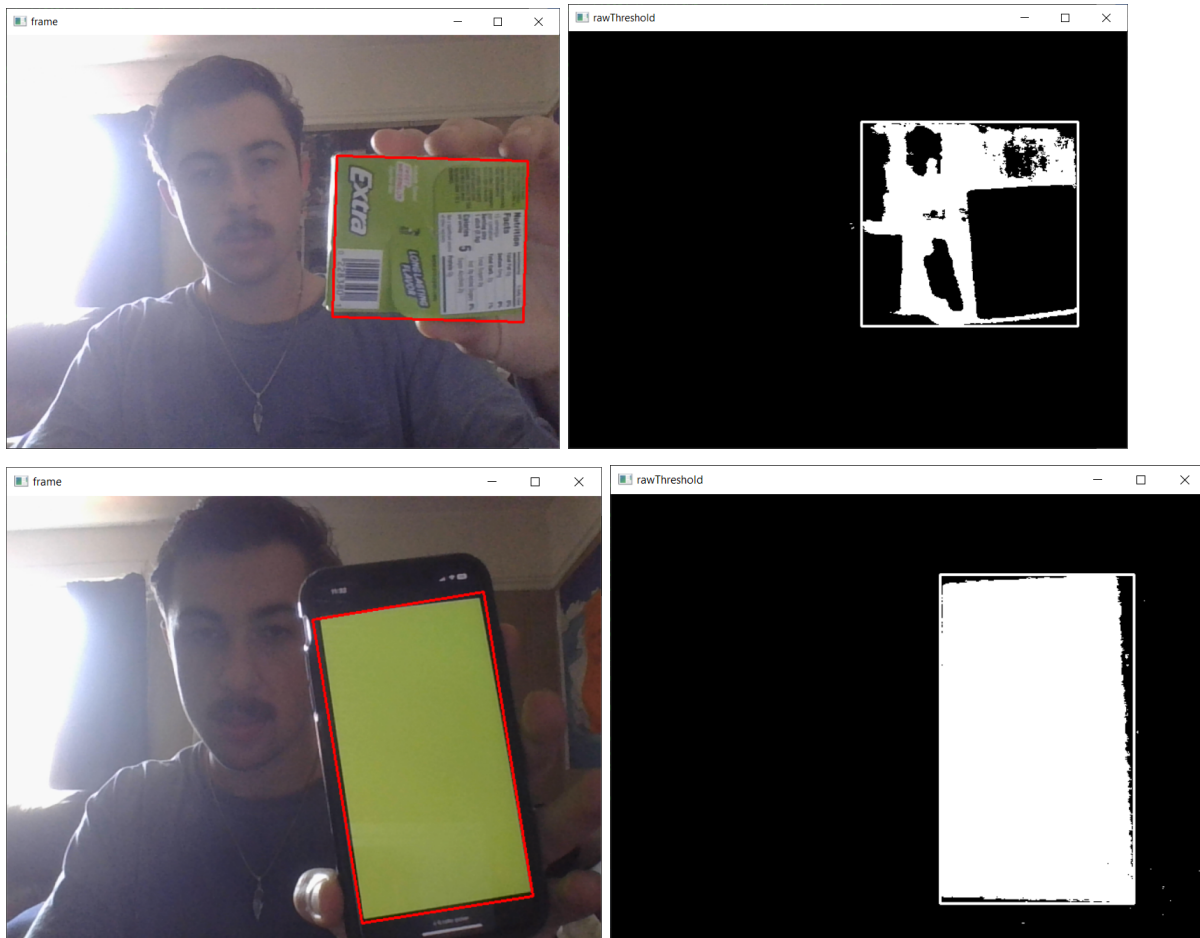
Task 1 screenshot:

Task 2 screenshot:

Task 3 screenshots:


```
(base) C:\Users\Jaden\180DA-WarmUp>python test.py
ECE_180_DA_DB - Best class ever
```
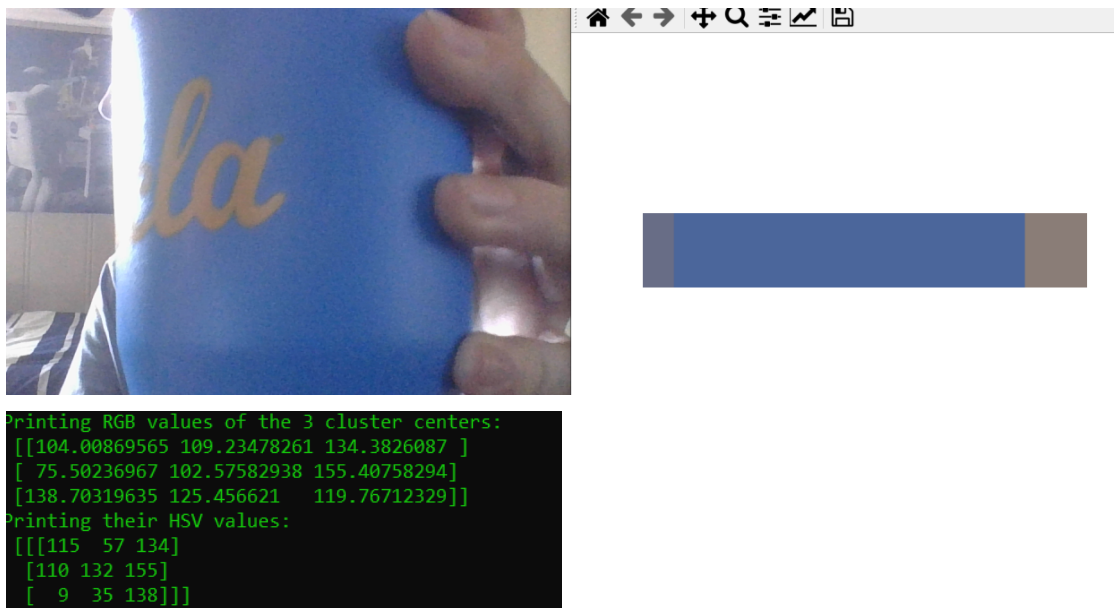
Task 4 screenshots:

Color contour:

Dominant color:


```
Printing RGB values of the 3 cluster centers:
[[104.00869565 109.23478261 134.3826087 ]
 [ 75.50236967 102.57582938 155.40758294]
 [138.70319635 125.456621   119.76712329]]
Printing their HSV values:
[[[115  57 134]
  [110 132 155]
  [  9  35 138]]]
```

Task 4 Write-Up:

1. Both HSV and RGB have their advantages and disadvantages for color detection. One of the benefits of using RGB is the drawback of using HSV: defining the color range for HSV. Defining the color range allows for more accuracy when using HSV, but slight variations outside of the bounds of the color could lead to messing up the image. This would also include different shades of the color, different lighting, etc. To effectively track an object, the range should be decently large when using HSV, where it doesn't have to be as big when using RGB.

2. Lighting definitely plays a decent role in the ability of my software to track an object, especially when using HSV. If the color threshold of HSV is not suitable given the lighting, the software may not work as intended and won't detect the color we were searching for. Additionally, the brighter lighting, the more clarity that the software has when detecting what it is searching for, providing less opportunities to detect incorrectly.

3. Yes, changing the brightness on my phone did help with how my code was able to track the color, but only a limited amount. The higher the brightness, generally, the clearer the image nad less opportunities for the software to run into any errors.

4. The normal object is definitely more susceptible to backround/ external light than the phone is. Since the phone uses an array of LED's to display the image, they all give off their own light, in contrast to a static object. This means that conflicting light in the image is less impactful when the software is trying to differentiate light/colors.