LOGBOOK

1. Started learning python basics.

   SOURCE: https://automatetheboringstuff.com/

2. Learning how to use GitHub and creating an account on the website.
   SOURCE: Complete Git and GitHub Tutorial for Beginners

   >>Learnings:
   i) What is git?
   ii) Uses of git?
   iii) How to use GitHub?
   iv) Creating a repository.
   v) Committing a change.

3. Learning the basics of NumPy.

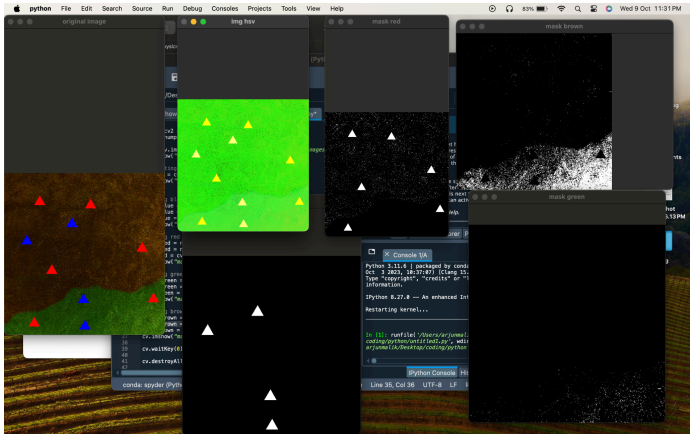
4. Installing Anaconda and Python.

5. Understanding what is OpenCV and how does it work.
   SOURCE:
   i) OpenCV Course - Full Tutorial with Python
   ii)https://youtube.com/playlist?list=PLfP3JxW-T70G5FB9vcmT6T3xnmvFvqV7w&si=nKd28LGRYn5jAcqA
   iii) Multiple websites for learning things like contours, masking, bitwise operators etc.

6. Installing OpenCV on the system.

7. Started writing the code.

- Wrote a small code to understand and practice how to input an image into the code, turn BGR to HSV, turn to grayscale, masking etc.
- Tried to create masks for : red houses, blue houses, green grass, brown grass.



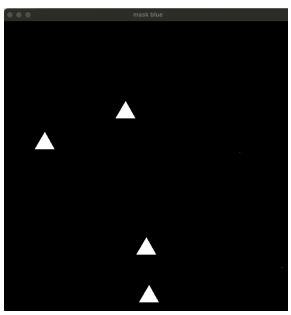
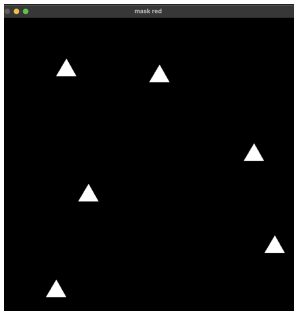
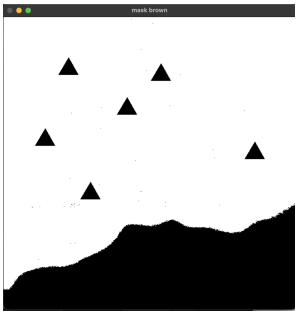
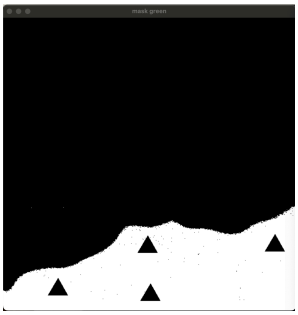
[TEST CASE 1]

Encountered several errors:

i) Many white dots were visible in the masked image of red houses.
ii) Brown color was not getting properly masked. So much part of it remained in black instead of white.
iii) Whole screen became black.

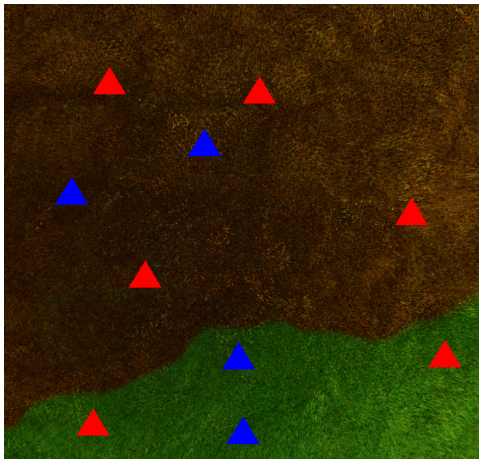
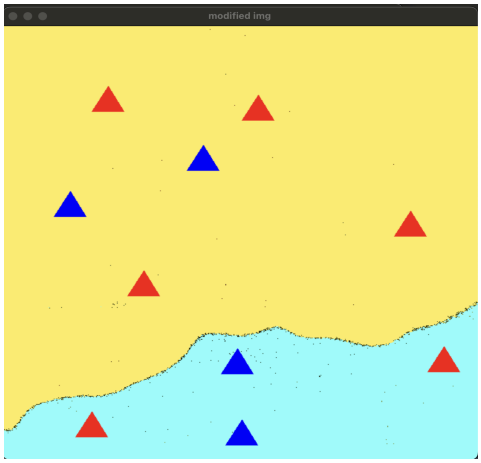
Solving the errors:
Understanding that all of the above errors were due to setting wrong lower and upper values for each color.
The range that I set for masking was inaccurate.
Tried changing the values of the range by hit and trial and by using the following tool:
[HSL Color Picker; HTML Color Picker; Web, HEX, CSS, HSLa]

- The masking got much better by changing the range values.

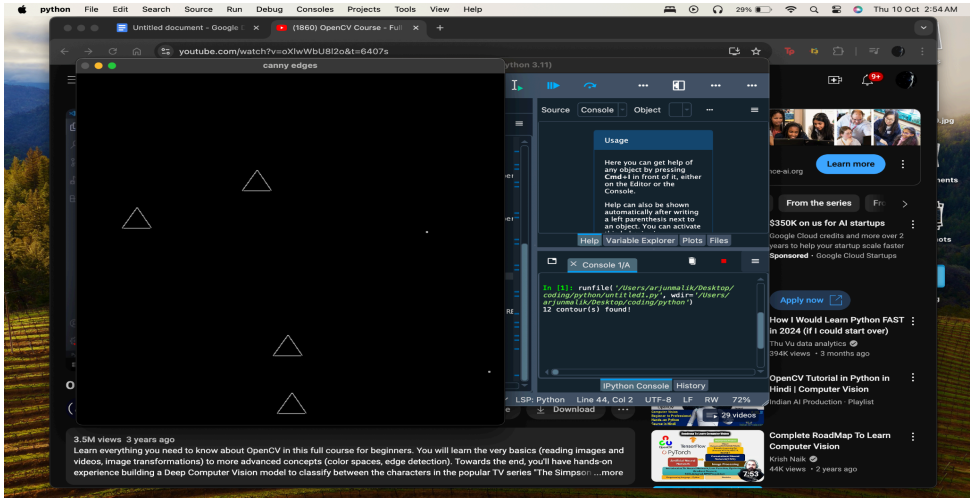
(masking of blue) *(masking of red)* *(masking of brown)* *(masking of green)*

- Learned how to change any particular color in OpenCV.
- Wrote the code for changing the colors of burnt grass and unburnt grass.

(Original image- Test case1) *(Modified image after changing the colors)*

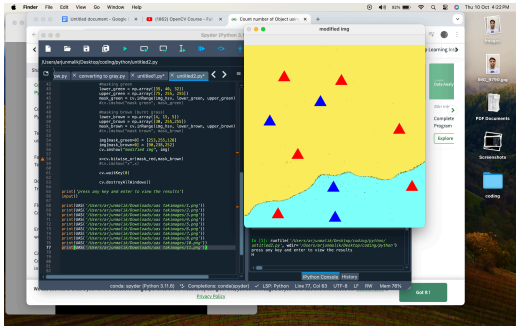
- Trying to find the contours (no. of triangles) in an image. Took masked blue image as sample for testing the code for finding contours.
  Encountered error: The output is 12 contours instead of expected 4. This may again be because of some very few white dots still left in the black region of the masked image.



- Learned about image processing and noise reduction by blurring the image.
- Tried to reduce noise in the image and get accurate no. of contours. The number of contours did come from 12 to 8, but it still isn't accurate.
- Started writing the final code for the output of images showing a contrast between unburnt and burnt grass. Defined and function for the same and called it for all the images separately.

  Encountered error:

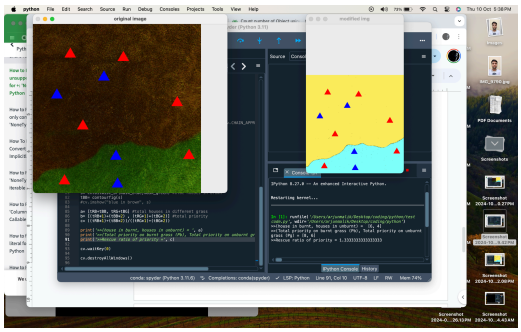
  The first image is getting processed completely fine but the following images are not giving any output even though the code seems completely fine.

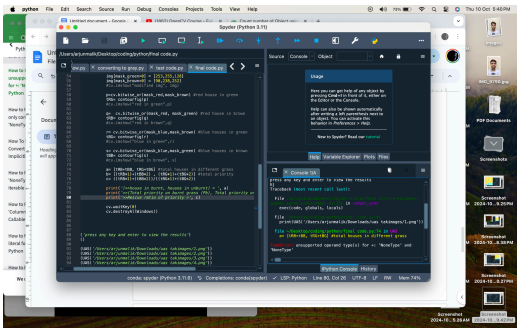


Tried to do the task by creating a list and running a loop but again encountered the same problem.

- Solved the “detecting the no. of contour” problem by defining a different function and using polyDPP.

- Test code is running just fine. Giving the image output. Printing the values of houses in unburnt and burnt grass. But the final code is showing error even though they are the exact same codes.





- *The test code is showing all the outputs properly:*
  i) The output image showing the contrast between two grasses
  ii) No. of houses on each grass
  iii) Total priority of houses in each grass
  iv) Rescue ratio of priority

- The final code that was generalized and contained the function for all the images is showing the above error even though both codes are same.