

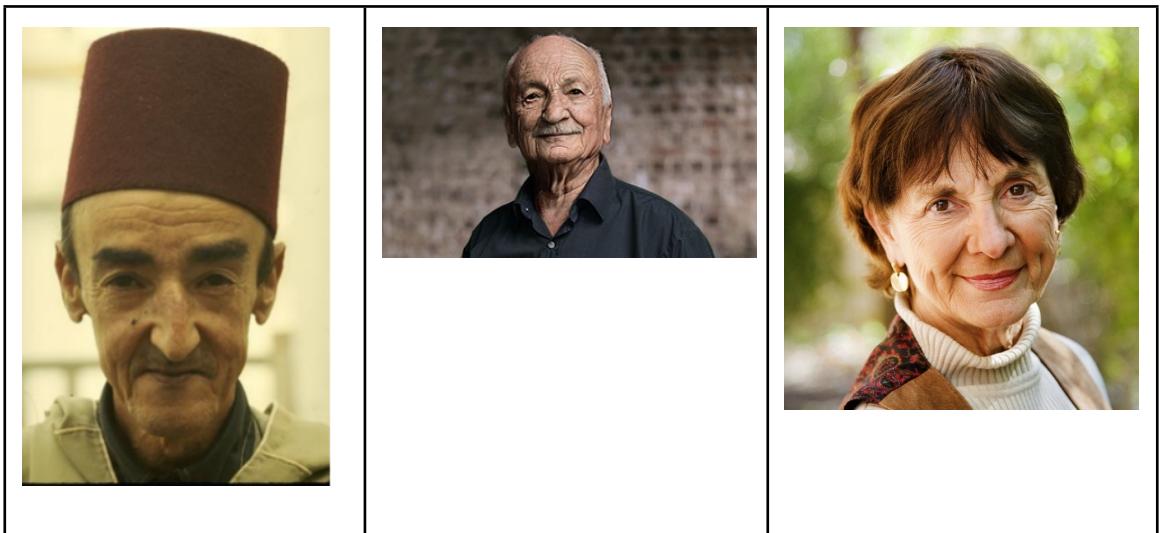
Assignment 1

Computer Vision

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Part 1

- Reading image
 - Reading colored image using cv2



- Reading grayscale image using cv2



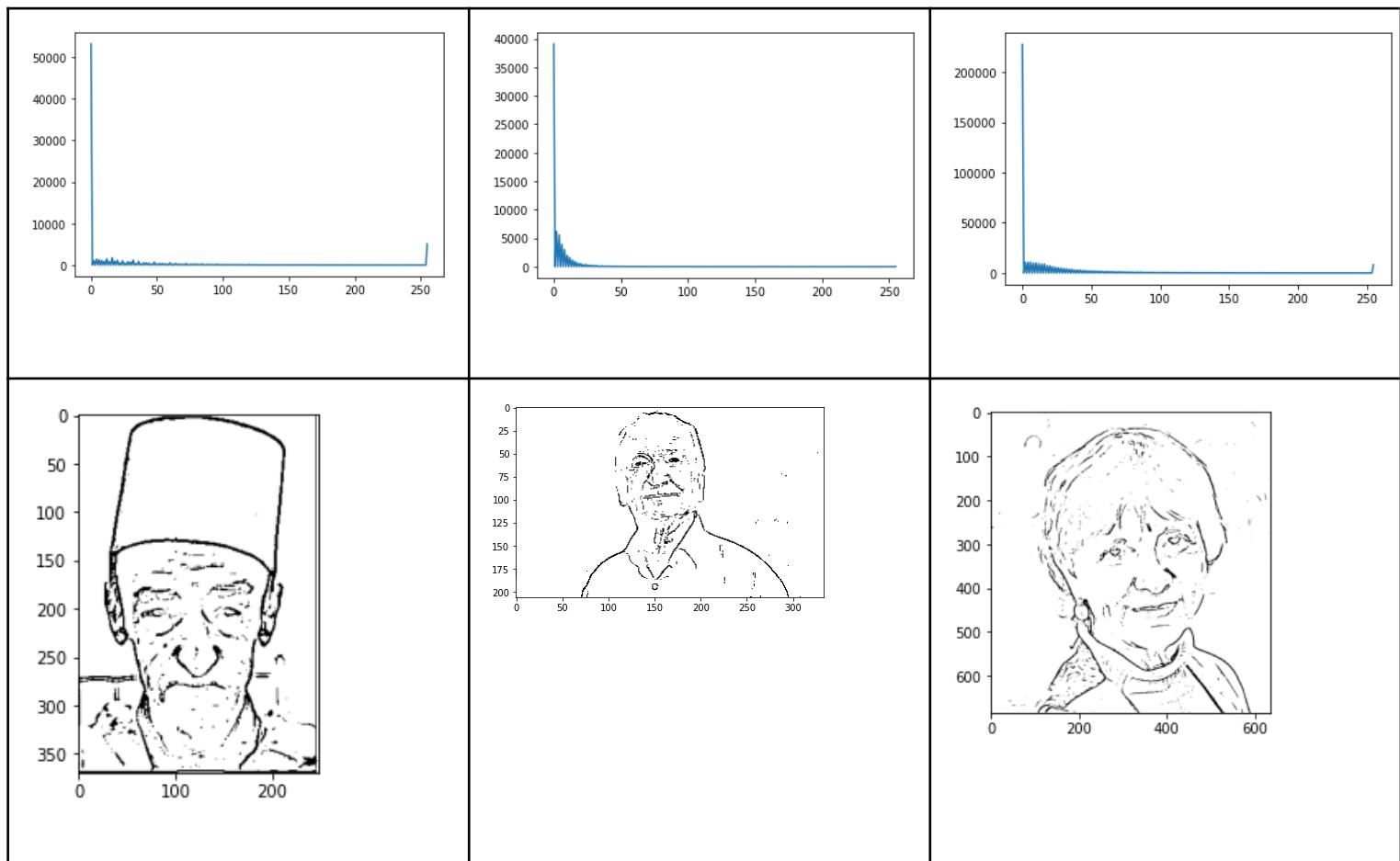
- Applying Median filter to remove noise (outliers)



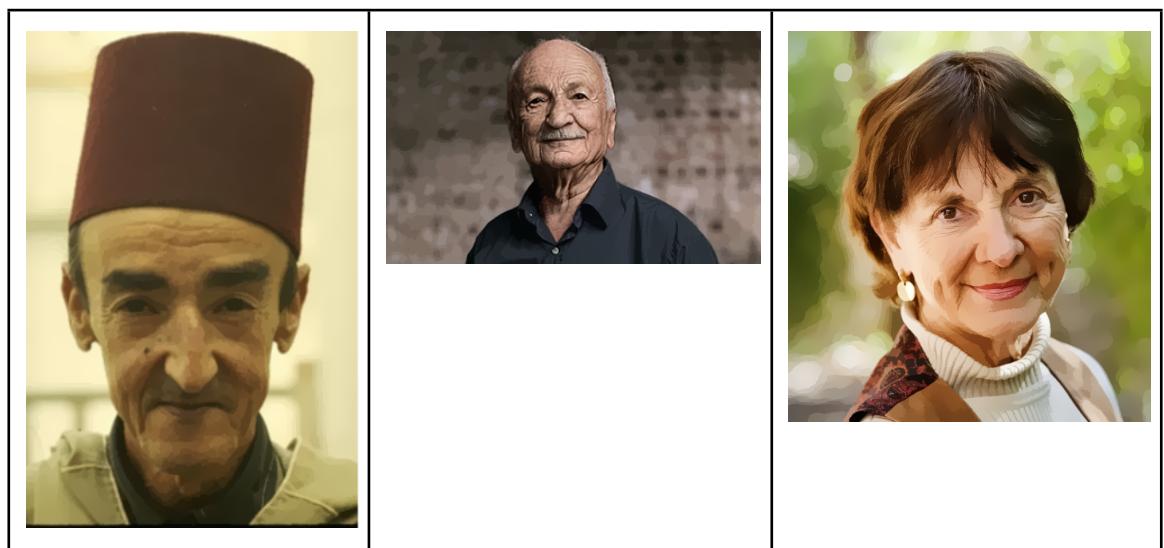
- Detecting edges using Laplacian Filter



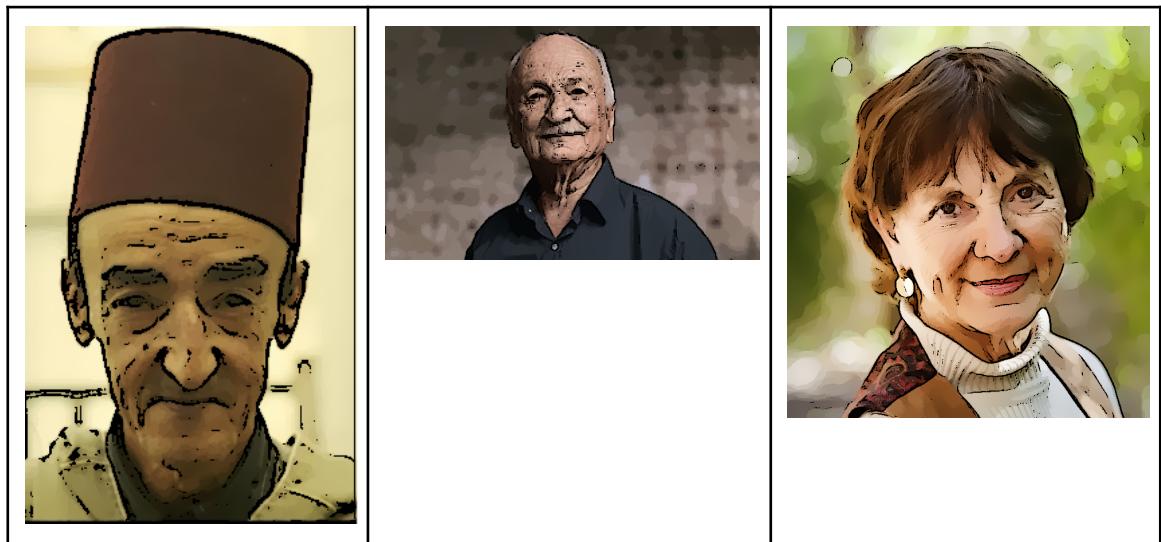
- Inverse Binary Thresholding
 - We used histogram to choose threshold



- Cartoonifying image using Bilateral Filtering

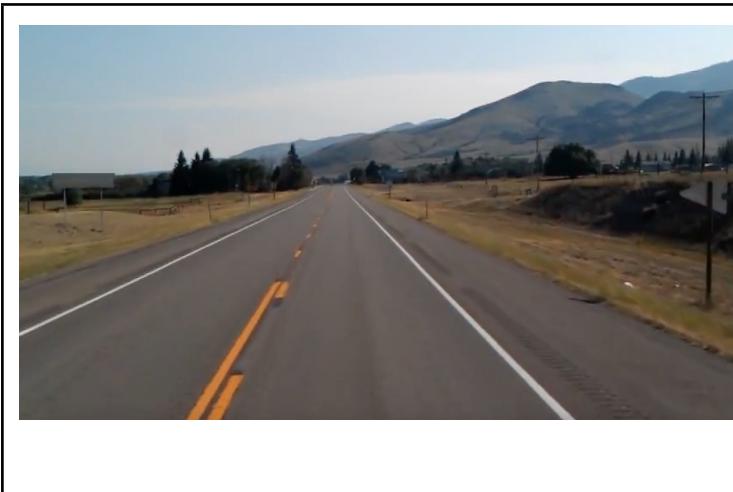


- overlay the edge mask "sketch" onto the bilateral filter "painting" (The Final Output)



Part 2

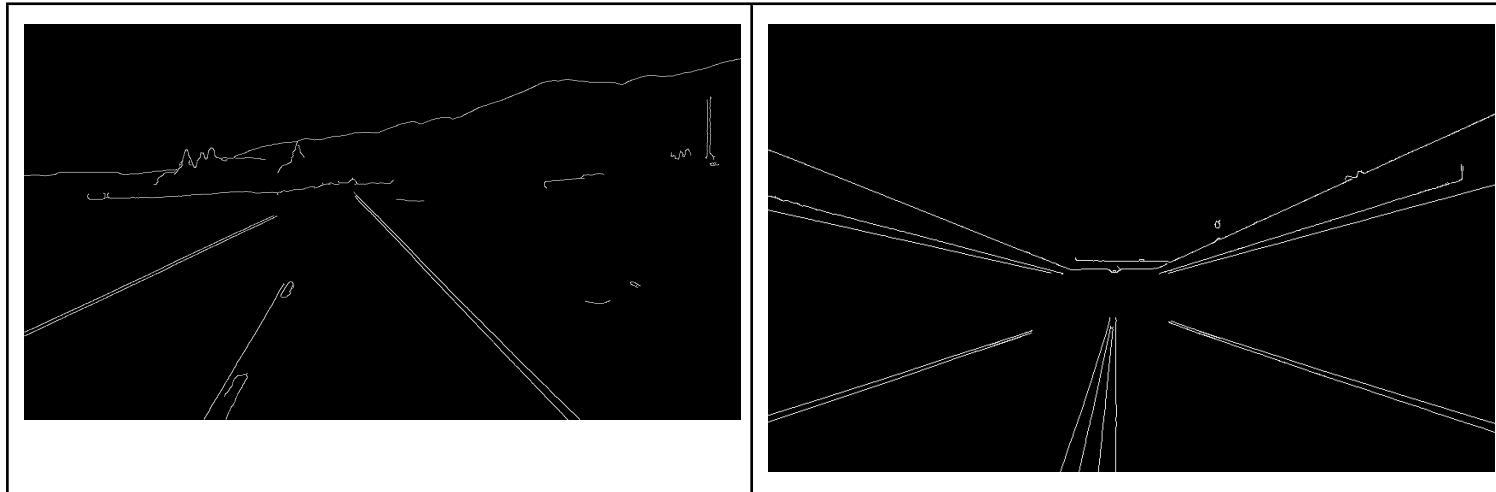
- Reading images
 - Reading coloured images using cv2



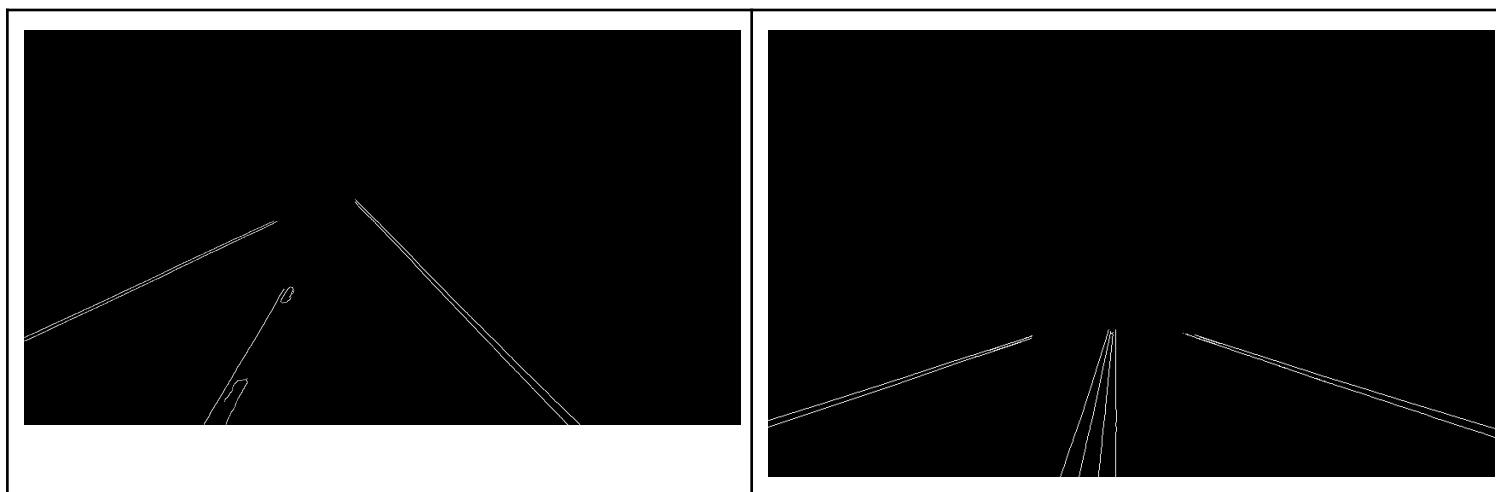
- Reading grayscale images using cv2



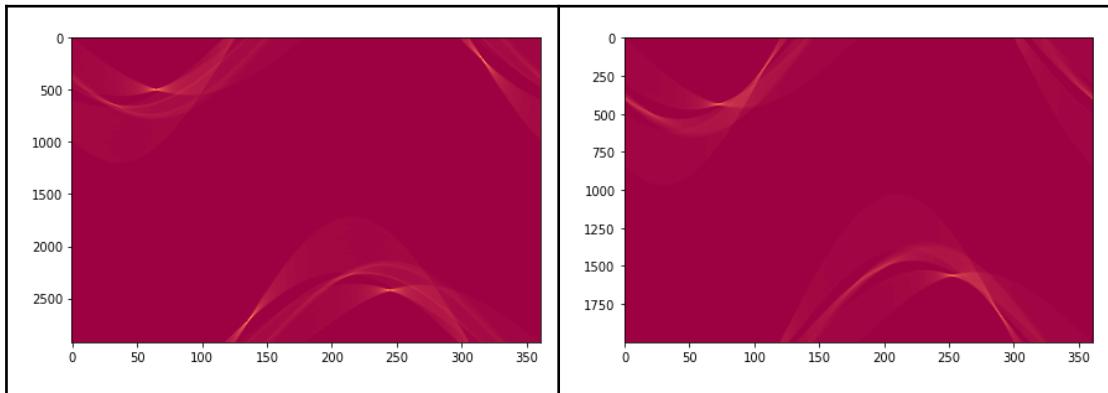
- Detecting Edges in the image using Canny's algorithm



- Extracting Region of interest to get Required edges
(Remove unneeded edges).



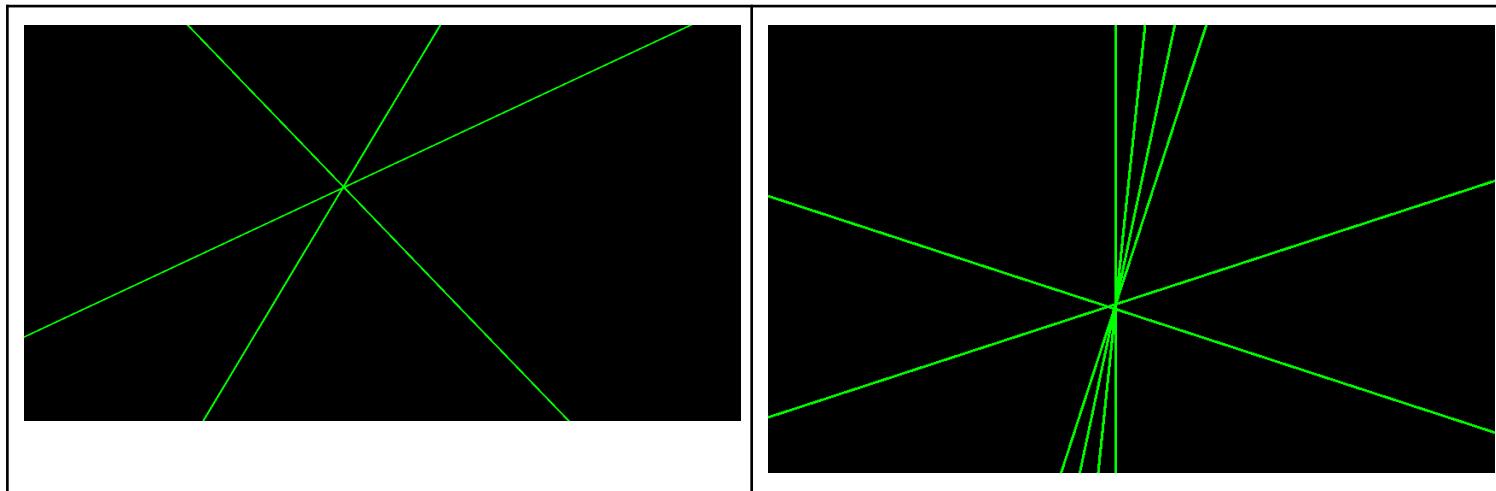
- Accumulation into (ρ, θ) -space using Hough transform.
 - Looping on all points (x, y) on edge and for each point loop on all Thetas and get corresponding ρ where $\rho = x \cos(\theta) + y \sin(\theta)$ then increase the vote of (ρ, θ) in the accumulator array by one.



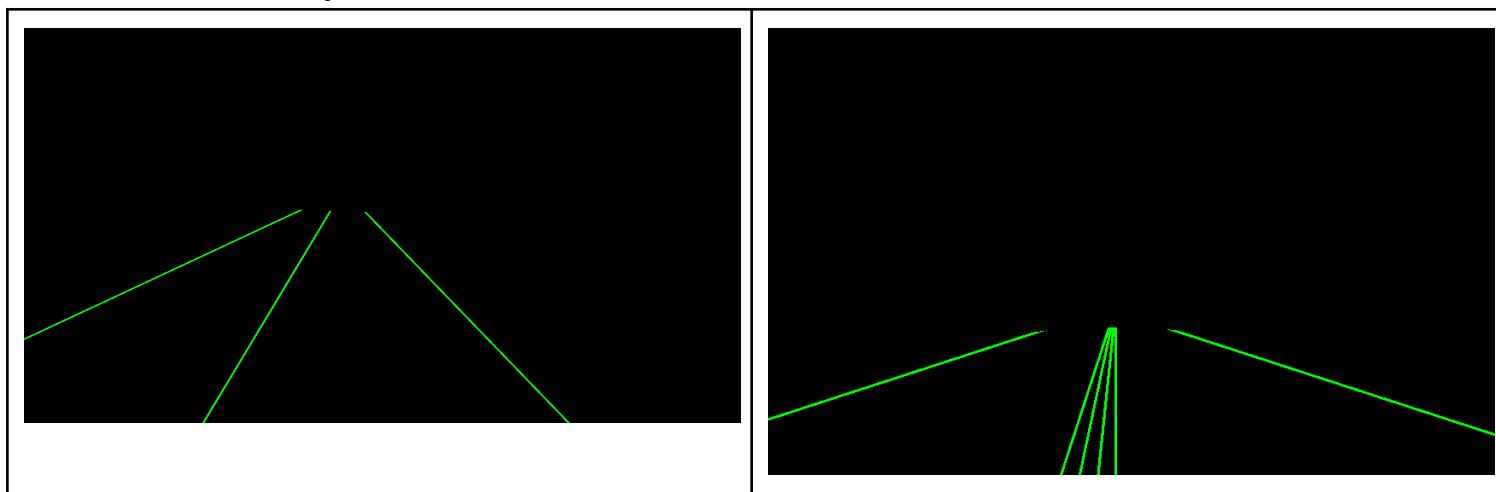
- Thresholding on Accumulator array to Remove lines that have votes below the threshold.
- Applying Non-maximum suppression on Resulting accumulator array after thresholding to get maximum voted lines by looping on the accumulator array with max filter with a specific kernel.



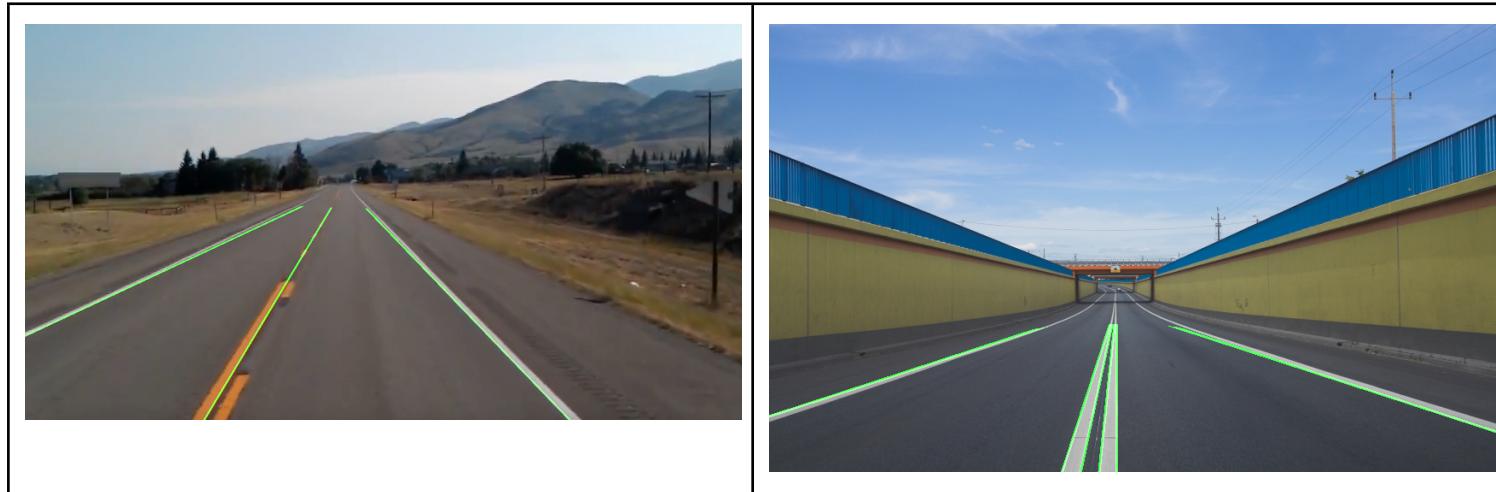
- Drawing lines got after Non-maximum suppression on a black canvas



- Masking the unwanted parts from the lines using fillPoly from cv2.



- Drawing the final lines on the image (The Final Output)



Colab links

- [Part 1 image in the lab + part 2 first image](#)
- [Part 1 more image cases](#)
- [Part 2 second image](#)