

MINI PHOTOSHOP

Team Members

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I. INTRODUCTION

Our project 'Mini Photoshop' is an image editing interface where we provide 10 features for the user to edit the image using 'MATLAB software'. The editing features include image properties, darkening image, brightening image, increasing contrast, decreasing contrast, sharpening, smoothing, crop, negative & rotate. The user is able to view both original & edited images side by side & can compare the changes in the image. The user has been provided a list of all features in the form of a menu where they can select & try any of the ten features for their image.

II. IMPLEMENTATION

This project is implemented using various image processing concepts.

- Initially the image is read by 'imread' where we define the path of the image in the user's system.
- The window is designed for the view which includes two sections side by side for original image & edited image. The background of window is set using 'set' function with color '#fbbc58'.
- The position of the image is set using the 'subplot' function & title is set using the 'title' function.
- List of features are displayed to users using the 'menu' option. · Various features are implemented & connected to the menu using 'switch & case' statements.
- **Properties:** The property of the image is produced as output using the 'iminfo' function. This function reads the image & displays all details of the image in the console. Information is image size, image format, image coding format etc.
- **Darken:** The darkening of the image is implemented using the minus operator. The original image is subtracted with some pixel value to obtain the darkened image.
- **Brighten:** The brightening of images is implemented using the addition operator. The original image is added with some pixel value to obtain the brightened image.
- **Increasing Contrast:** The original image is multiplied with 2 to get the Increased contrast of the image.
- **Decreasing Contrast:** The original image is divided with 2 to get the decreased contrast of the image.
- **Sharpening:** The sharpened image is obtained using the 'imsharpen' function.

- **Smoothing:** The sharpened image is obtained using 'imgaussfilt' function.
- **Crop:** Two diagonal corners are obtained & the cropped image is displayed.
- **Negative:** The original image is subtracted with a pixel value of 255 to get the negative of the image.
- **Rotate:** The rotate function rotates a graphics object in threedimensional space. rotate(h,direction,alpha) rotate the graphics object h by alpha degrees. Specify h as a surface, patch, line, text, or image object. direction is a two- or three-element vector that describes the axis of rotation in conjunction with the origin of the axis of rotation. The default origin of the axis of rotation is the center of the plot box. This point is not necessarily the origin of the axes. Positive alpha is defined as the right hand-rule angle about the direction vector as it extends from the origin of rotation. If h is an array of handles, all objects must be children of the same axes. rotate(...,origin) specifies the origin of the axis of rotation as a three-element vector $[x_0, y_0, z_0]$.

III. RESULTS

When we run the code ,we get the menu with all the options and an output window,where it shows original image and result image when we apply any functionality.



Figure1:Menu

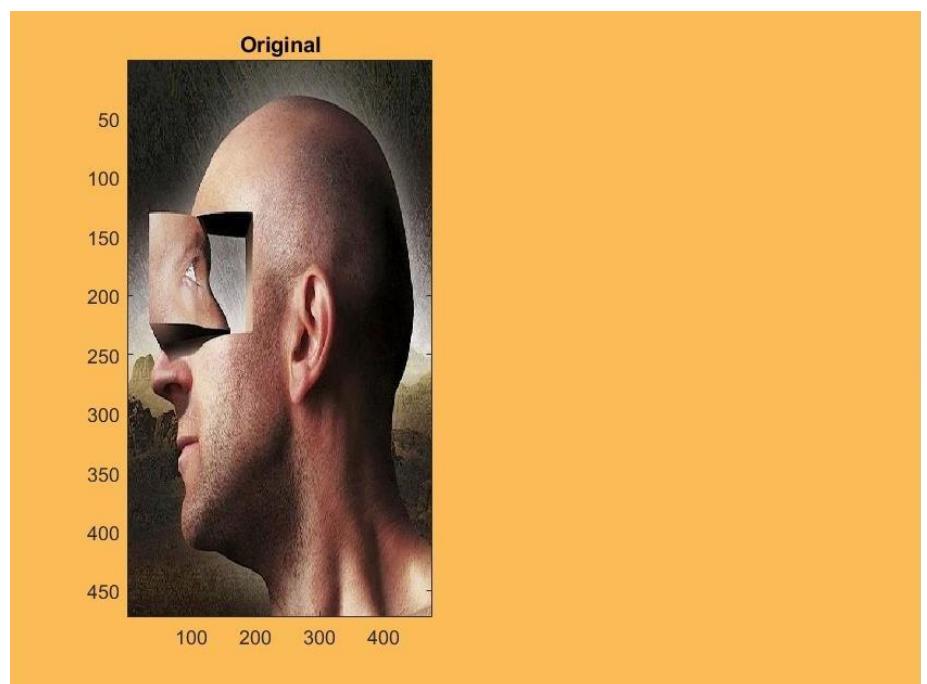


Figure 2:Output Window

1)Properties

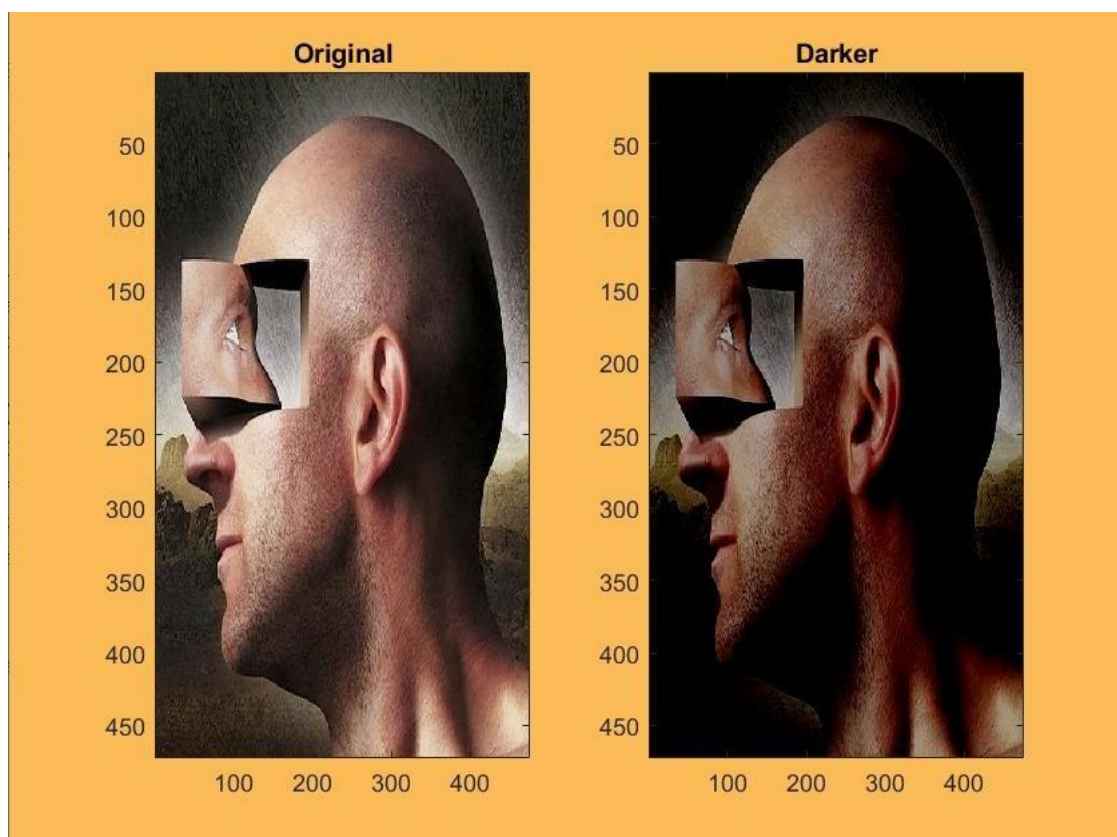
This functionality will display all the properties of image in the console window.

```
info =  
  
  struct with fields:  
  
    Filename: 'D:\5th_sem\IP_Project\img.jpg'  
    FileModDate: '30-Dec-2021 18:29:44'  
    FileSize: 44569  
    Format: 'jpg'  
    FormatVersion: ''  
    Width: 475  
    Height: 472  
    BitDepth: 24  
    ColorType: 'truecolor'  
    FormatSignature: ''  
    NumberOfSamples: 3  
    CodingMethod: 'Huffman'  
    CodingProcess: 'Progressive'  
    Comment: {}  
  
fx >>
```

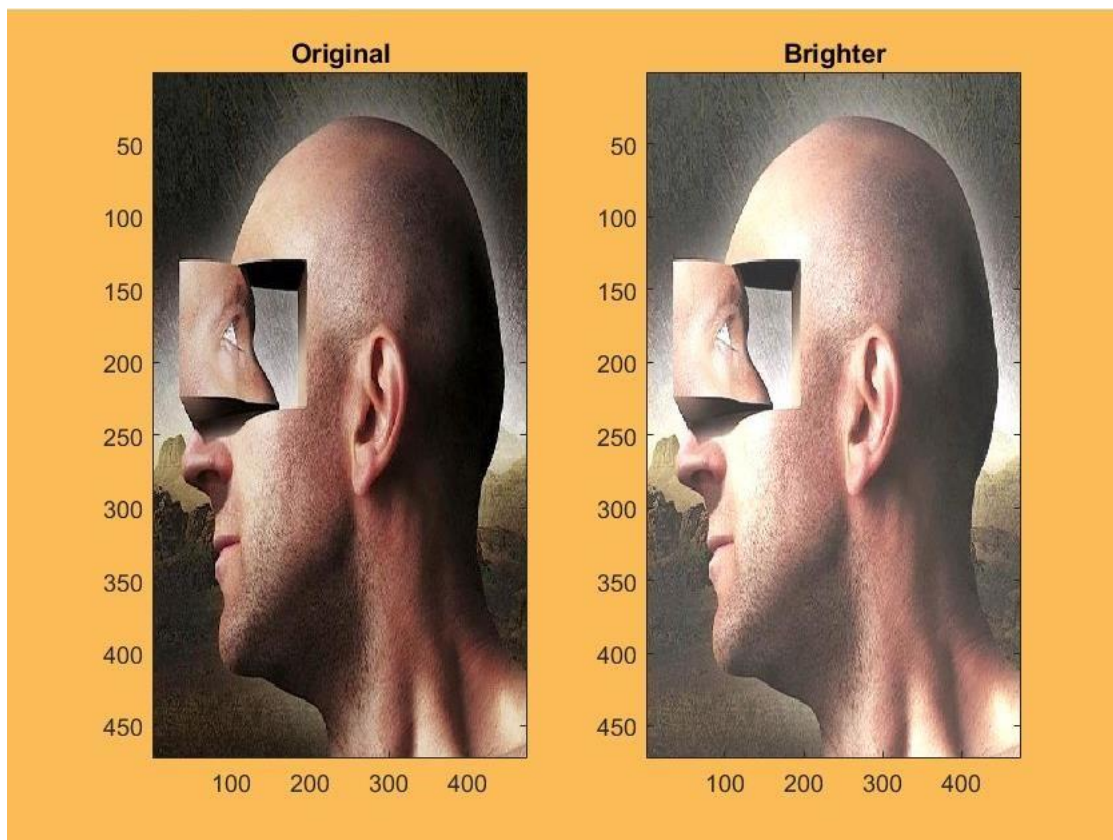
2)Darken

This functionality will display darkened image in the output window.

3)Brighten

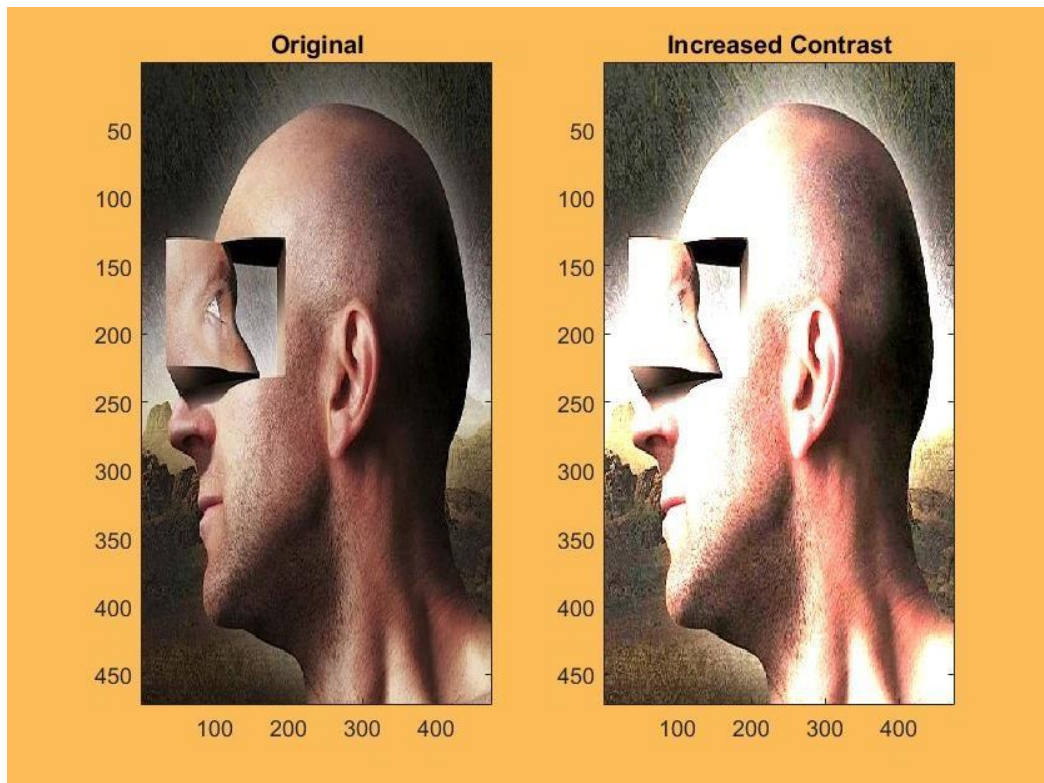


This functionality will display brightened image in the output window.



4)Increase contrast

This functionality will increase the contrast of the input image and display in the output window.



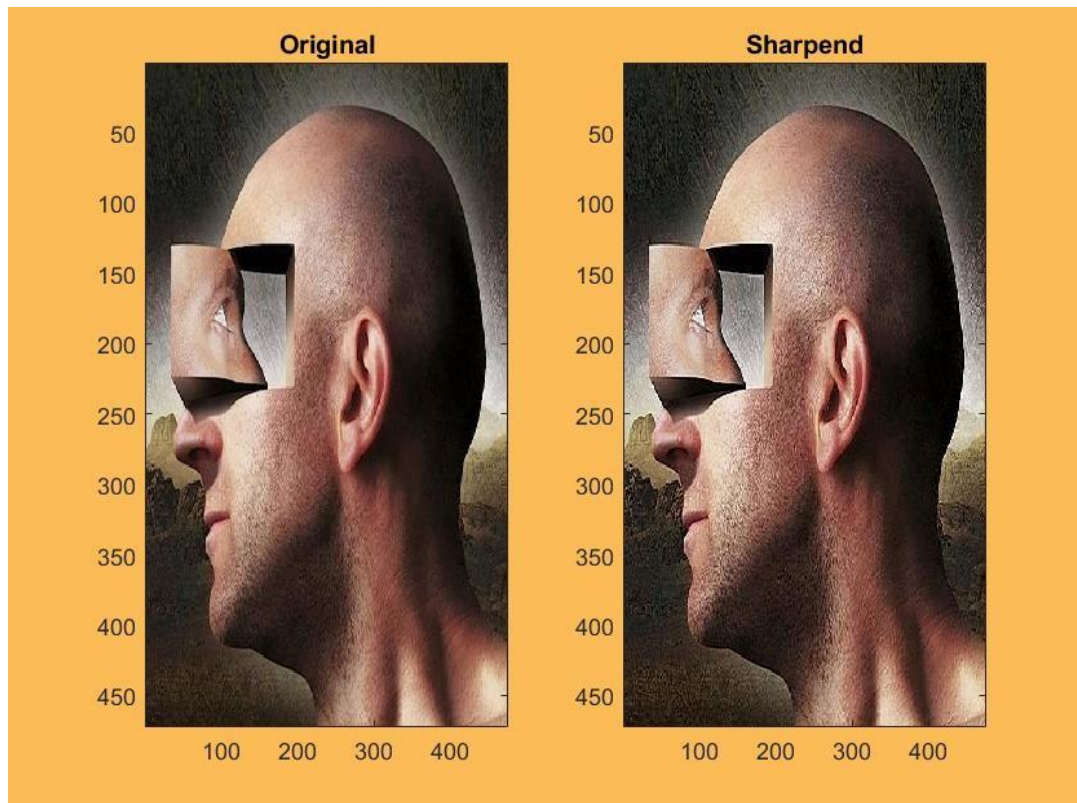
5) Decrease contrast

This functionality will decrease the contrast of the input image and display in the output window.



6)Sharpen

This functionality will display sharpened image in the output window.



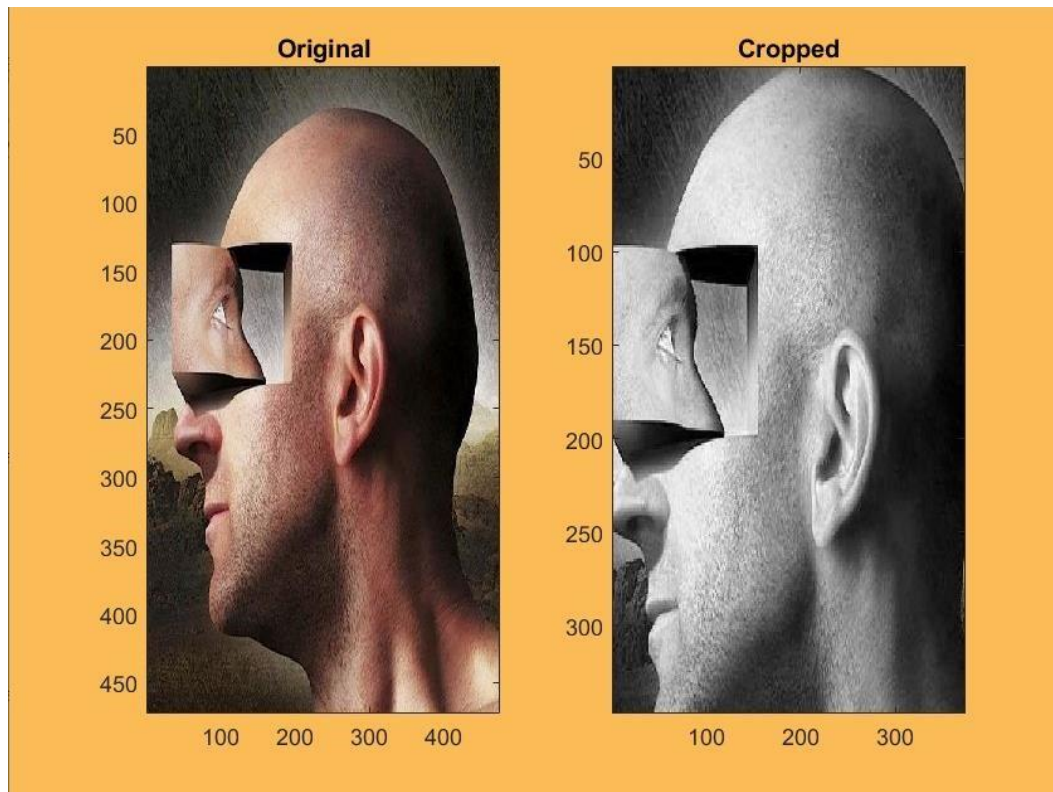
7)Smoothing

This functionality will display smoothed image in the output window.



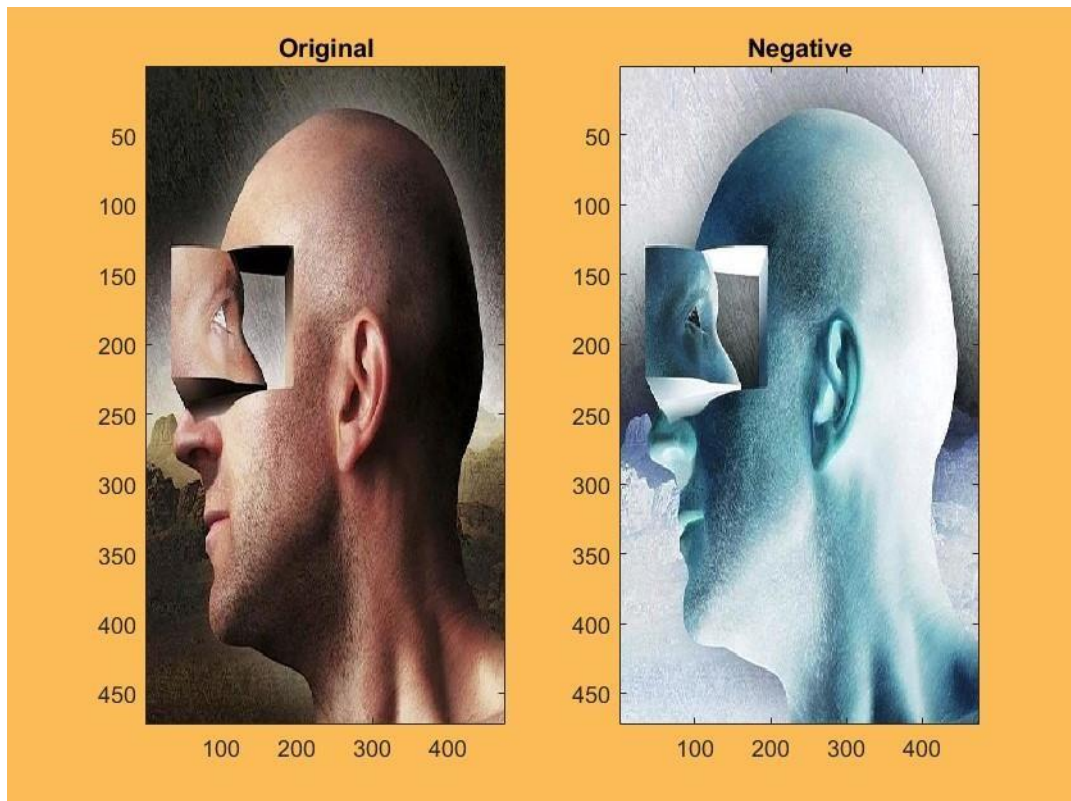
8)Crop

This functionality will crop the image as user input and display cropped image in output window.



9)Negative

This functionality will display the negative of image in output window.



10) Rotate

When user click on Rotate option in menu, one more menu will pop up to get the angle of rotation from the user. After selecting the angle, resulting image will be displayed on output window.

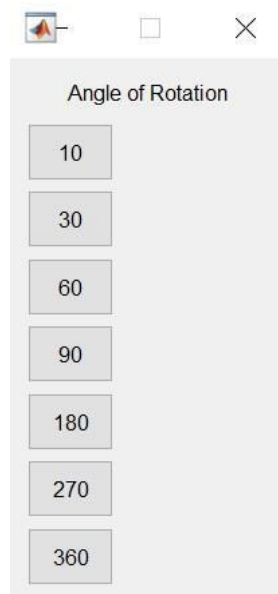


Figure: Options for angles

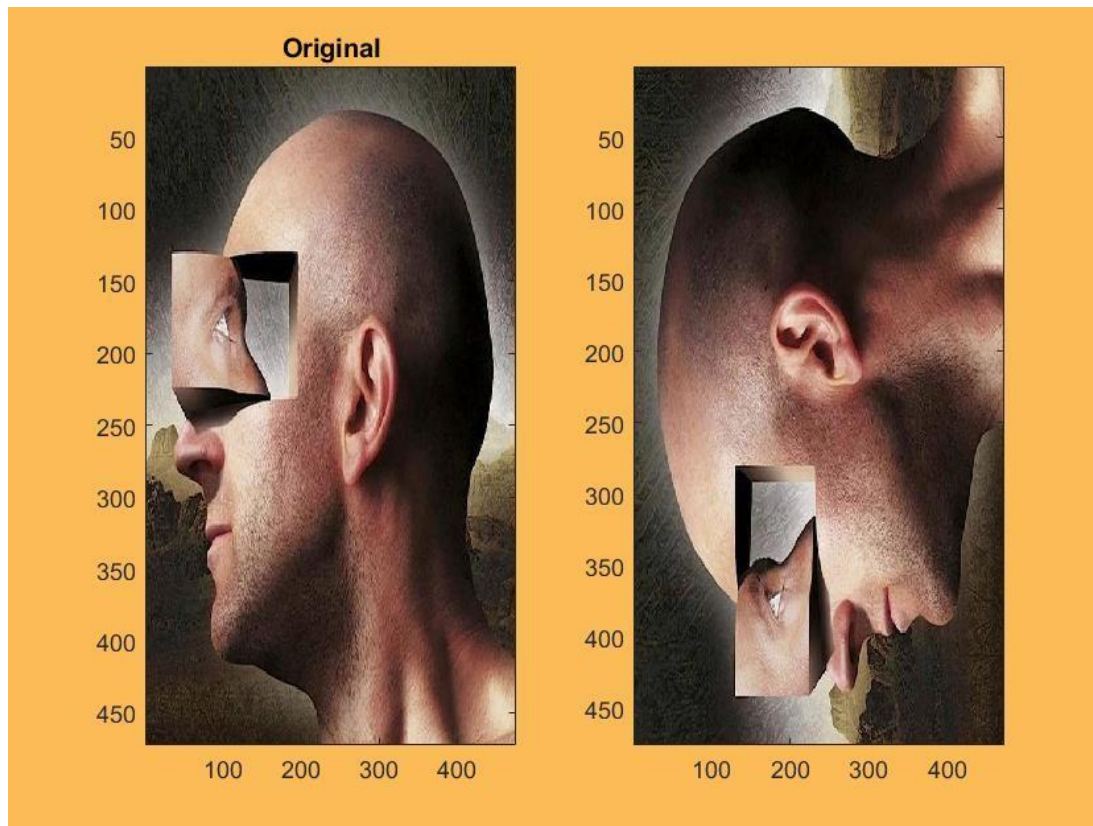


Figure: Image is rotated at an angle of 90

IV CONCLUSION

Here through this mini photoshop project, we get to know the various simple methods used in the backend of all the editing apps to perform various image enhancement operations. We also get to know the various pixel manipulation operations performed to get the outputs to an image of our choice.

By using Matlab to implement this project, we also get to know the various inbuilt operations and functions present in this platform for image enhancement and manipulation.

REFERENCES

1. Matlab Documentation :<https://in.mathworks.com/help/matlab/>
2. Matlab Onramp Course:
<https://in.mathworks.com/learn/tutorials/matlab-onramp.html>



Course Completion Certificate

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