Assignment Documentation:

There are 2 python files:

1. **demo_code.py:** for explaining the algorithm
2. **cropper_Swati_Kanchan.py:** the actual algorithm that crops the image files stored in “data” folder.

The algorithm flow goes in this way:

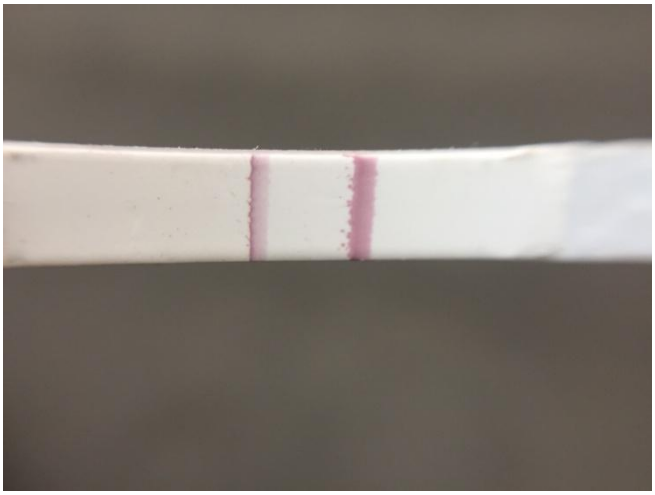
***demo_code*:**

```
import numpy as np
import cv2
```

Importing numpy and openCV modules

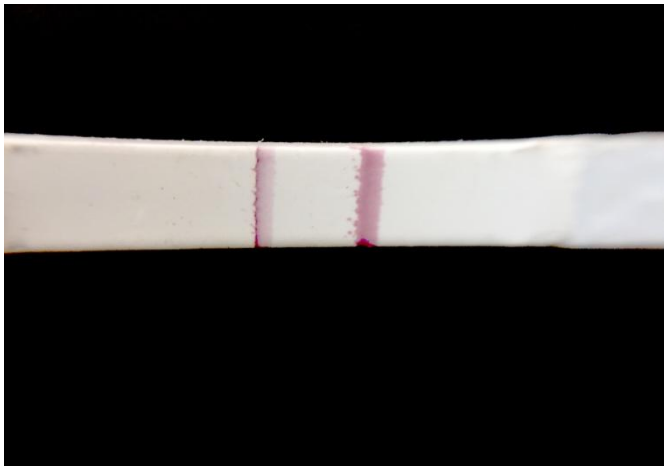
```
img = cv2.imread('./demo_image_input.JPG')
```

Reading the demo image demo_image_input.JPG.



```
ret, mask = cv2.threshold(img, 120, 255, cv2.THRESH_TOZERO)
```

Converting the image to a masked image using threshold of 120 and creating a black background.



```
rows, cols, channels = mask.shape
```

Getting the total number of row and column pixels and number of channels.

```
row_start = row_end = 0
col_mid = int(cols/2)
```

row_start and row_end stores the starting row pixel and ending row pixel of the white strip in the masked image.

```
i = rows - 1
while i >= 0:
    res = np.greater_equal(mask[i, col_mid], [150, 150, 150])
    if(np.array_equal(res, [True, True, True])):
        row_end = i
        break
    i -= 20
```

Calculates the end row pixel of the white strip in the image.

```
i = 0
while i < rows:
    res = np.greater_equal(mask[i, col_mid], [150, 150, 150])
    if(np.array_equal(res, [True, True, True])):
        row_start = i
        break
    i+=20
```

Calculates the start row pixel of the white strip in the image.

```
cropped = img[row_start:row_end, 0:cols]
```

Region of image from row_start to row_end(vertically) and 0 to cols(horizontally) is stored in cropped.

```
cv2.namedWindow('Cropped_Image', cv2.WINDOW_NORMAL)
cv2.namedWindow('Original_Image', cv2.WINDOW_NORMAL)
cv2.namedWindow('Masked_Image', cv2.WINDOW_NORMAL)
cv2.imshow('Original_Image', img)
cv2.imshow('Masked_Image', mask)
cv2.imshow('Cropped_Image', cropped)
```

Creates 3 different resizeable windows each showing all the 3 stages of the image.

```
cv2.waitKey(0)
cv2.destroyAllWindows()
```

All the windows wait for any key to be clicked and closes all the windows automatically.

```
cv2.imwrite('./demo_output_image.JPG', cropped)
```

Finally writes the cropped image into a new file named “demo_output_image.jpg”.

Resources:

1. Upto 7th tutorial on OpenCV by sentdex
2. Download link for OpenCV
3. Image thresholding CV2 function
4. Python - Install Anaconda, Jupyter Notebook, Spyder on Windows
5. Quick introduction to Jupyter Notebook
6. Download Anaconda3-5.0.1-Windows-x86_64