

START

Get file name from user

Read image as grayscale

Blur image using Gaussian kernel

Find gradient magnitude and angle using Sobel filters

Threshold gradient magnitude to keep only card edges

Find largest value of gradient angle in card edge mask which corresponds to longest side of the playing card

Calculate rotation angle to make card upright

Get new rotated edge mask using magnitude from Sobel filters

Use warpAffine to rotate image, borderMode=cv2.BORDER\_REPLICATE to get rid of border as a false edge

Compute sine and cosine of the rotation angle

Use getRotationMatrix to calculate rotation matrix

Find center of image using h/2 and w/2 from image.shape

Add 180 degrees to rotation angle to account for negative angles

Rotation angle < 0?

Threshold rotated edge mask to ignore border made from rotation

Find coordinates around thresholded rotated edge mask and crop off those coordinates on rotated image

Plot original image and rotated & cropped image

END

NO

YES