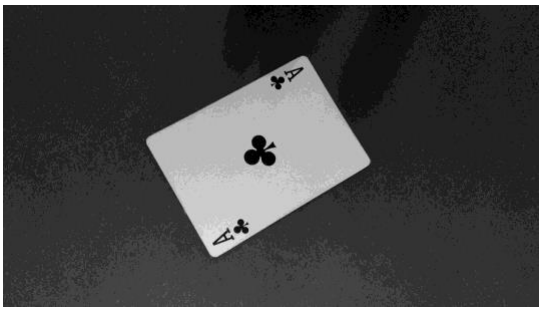
Image Processing Project 3

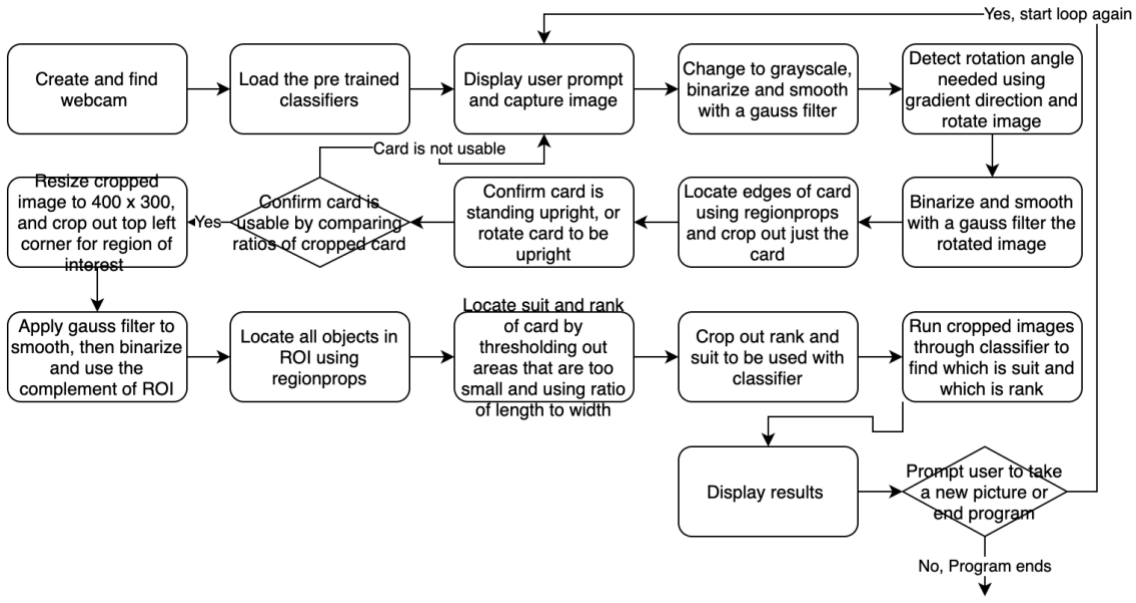
1. Assumptions

- Assuming that webcam image size is 720 x 1280
- Assuming that playing card is placed on a uniform dark background
    - Example input image



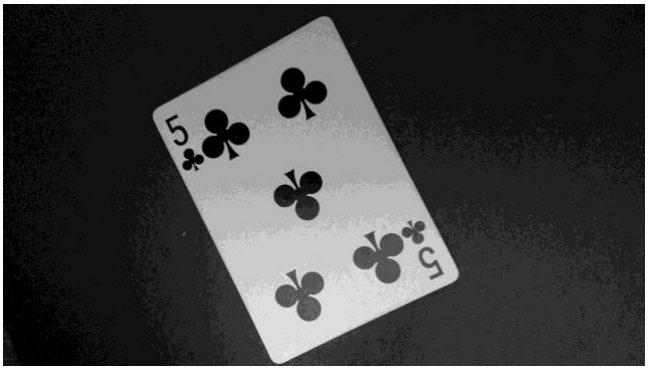
- Assuming that playing card in the input image can be rotated at any angle
- Assuming that only the background and card are in image no other objects such as fingers
- Assuming minimal to no light glare on card or background

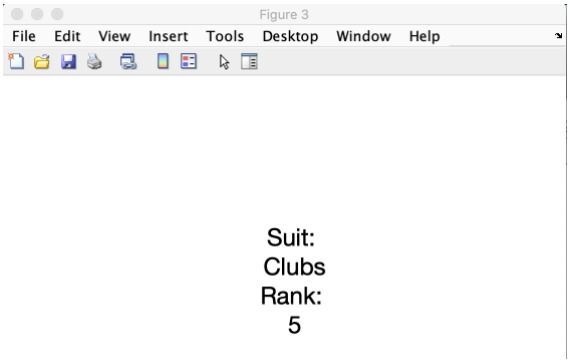
2. Algorithm pipeline

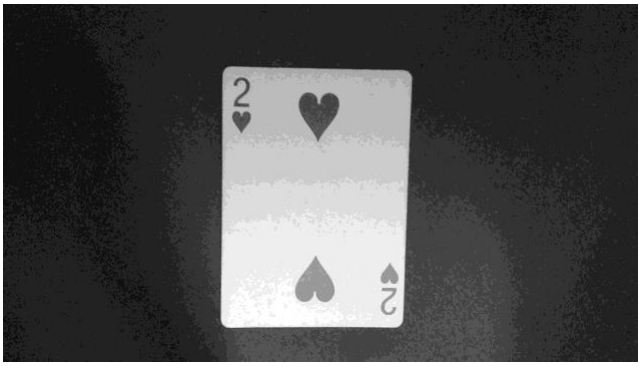


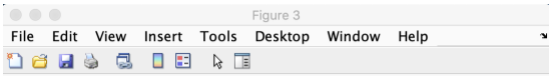
3. Subset of results

Inputs Results

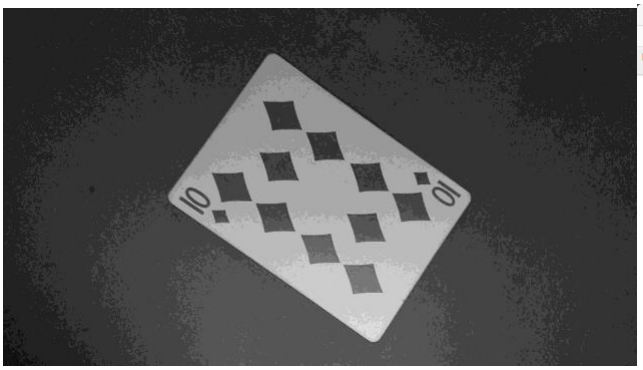


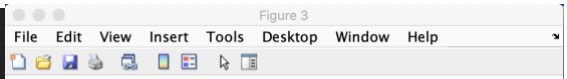




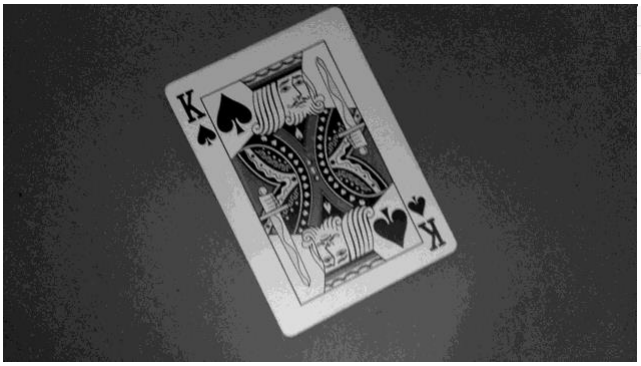


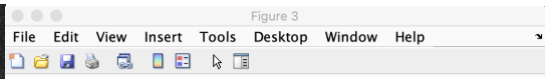
Suit:
Hearts
Rank:
2





Suit:
Diamonds
Rank:
10





Suit:
Spades
Rank:
K

4. Group Member Contributions

- Peter Wharton's contributions
    - Focused on image acquisition, card rotation process, and suit/rank segmentation to be used in classifying. Helped create some datasets for classifiers.
- Farshad Bolouri's contributions
    - Researched different classifiers that are suitable for our input images and datasets. Tested and found best classifier to be used for suit and rank. Trained and implemented suit and rank classifiers.

5. List of References

1. MATLAB documentation help files.
2. R. C. Gonzalez, and R. E. Woods, *Digital Image Processing*, 4th Edition, Pearson, 2018.
3. Image Category Classification using Bag of Features approach https://www.mathworks.com/help/vision/ug/image-category-classification-using-bag-of-features.html