

Iris recognition

Phase 3

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K-Means Clustering method:

```
import numpy as np
import matplotlib.pyplot as plt
import cv2

# Read in the image
image = cv2.imread(image destination)

# Change color to RGB (from BGR)
image = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

plt.imshow(image)

# Reshaping the image into a 2D array of pixels and 3 color values (RGB)
pixel_vals = image.reshape((-1,3))

# Convert to float type
pixel_vals = np.float32(pixel_vals)

#the below line of code defines the criteria for the algorithm to stop running,
#which will happen is 100 iterations are run or the epsilon (which is the required accuracy)
#becomes 85%
criteria = (cv2.TERM_CRITERIA_EPS + cv2.TERM_CRITERIA_MAX_ITER, 100, 0.85)
```

```
# then perform k-means clustering with number of clusters defined as 3
```

```
#also random centres are initially choosed for k-means clustering
```

```
k = 3
```

```
retval, labels, centers = cv2.kmeans(pixel_vals, k, None, criteria, 10,  
cv2.KMEANS_RANDOM_CENTERS)
```

```
# convert data into 8-bit values
```

```
centers = np.uint8(centers)
```

```
segmented_data = centers[labels.flatten()]
```

```
# reshape data into the original image dimensions
```

```
segmented_image = segmented_data.reshape((image.shape))
```

```
plt.imshow(segmented_image)
```
