
 Marwadi University <small>Marwadi Chandarana Group</small> 	Marwadi University Faculty of Engineering and Technology Department of Information and Communication Technology	
Subject: DSIP (01CT1513)	AIM: Image processing.	
Experiment No: 08	Date:	Enrolment No: 92301733046

Code:

```
import cv2
```

```
import numpy as np
```

```
from matplotlib import pyplot as plt
```

```
# Load the source and reference images
```

```
source_path = "D:/DSIP/codes/dark.jpg"
```

```
reference_path = "D:/DSIP/codes/reference.jpg"
```

```
source_image = cv2.imread(source_path, cv2.IMREAD_GRAYSCALE)
```

```
reference_image = cv2.imread(reference_path, cv2.IMREAD_GRAYSCALE)
```

```
# Calculate histograms for the source and reference images
```

```
source_hist = cv2.calcHist([source_image], [0], None, [256], [0, 256])
```

```
reference_hist = cv2.calcHist([reference_image], [0], None, [256], [0, 256])
```

```
# Normalize histograms to have sum equal to 1
```

```
source_hist /= source_hist.sum()
```

```
reference_hist /= reference_hist.sum()
```

```
# Calculate cumulative distribution functions (CDF) for histograms
```



```
source_cdf = source_hist.cumsum()
```

```
reference_cdf = reference_hist.cumsum()
```

```
# Perform histogram matching by mapping source CDF to reference CDF
```

```
mapping = np.interp(source_cdf, reference_cdf, range(256))
```

```
matched_image = mapping[source_image]
```

 Marwadi University <small>Marwadi Chandarana Group</small> 	Marwadi University Faculty of Engineering and Technology Department of Information and Communication Technology	
Subject: DSIP (01CT1513)	AIM: Image processing.	
Experiment No: 08	Date:	Enrolment No: 92301733046

Convert to uint8 data type

```
matched_image = matched_image.astype(np.uint8)
```

Display the images using Matplotlib

```
plt.figure(figsize=(12, 6))
```

```
plt.subplot(131)
```

```
plt.title('Source Image')
```

```
plt.imshow(source_image, cmap='gray')
```

```
plt.axis('off')
```

```
plt.subplot(132)
```

```
plt.title('Reference Image')
```

```
plt.imshow(reference_image, cmap='gray')
```

```
plt.axis('off')
```

```
plt.subplot(133)
```



```
plt.title('Matched Image')
```

```
plt.imshow(matched_image, cmap='gray')
```

```
plt.axis('off')
```

```
plt.tight_layout()
```

```
plt.show()
```

 Marwadi University Marwadi Chandarana Group 	Marwadi University Faculty of Engineering and Technology Department of Information and Communication Technology	
Subject: DSIP (01CT1513)	AIM: Image processing.	
Experiment No: 08	Date:	Enrolment No: 92301733046

Output:

