

```
import numpy as np

import scipy.ndimage as ndi

from skimage import io, color, filters

from skimage import util

from scipy.ndimage import uniform_filter

import matplotlib.pyplot as plt


# Load and convert image to grayscale

image = io.imread(r"C:\Users\admin\Desktop\abdul kalam.jpg")

gray_image = color.rgb2gray(image) # Convert to grayscale


# Mean Filter

def mean_filter(image, size=5):

    return ndi.uniform_filter(image, size=size)


# Median Filter

def median_filter(image, size=3):

    return ndi.median_filter(image, size=size)


# Gaussian Filter

def gaussian_filter(image, sigma=2.0):

    return ndi.gaussian_filter(image, sigma=sigma)


def box_filter(image, size=7):

    return uniform_filter(image, size=size)
```

```
# Apply filters
```

```
mean_result = mean_filter(gray_image)
```

```
median_result = median_filter(gray_image)
```

```
gaussian_result = gaussian_filter(gray_image)
```

```
box_result = box_filter(gray_image)
```

```
# Save or display results as needed
```

```
io.imwrite('mean_filtered_image.jpg', util.img_as_ubyte(mean_result))
```

```
io.imwrite('median_filtered_image.jpg', util.img_as_ubyte(median_result))
```

```
io.imwrite('gaussian_filtered_image.jpg', util.img_as_ubyte(gaussian_result))
```

```
io.imwrite('box_filtered_image.jpg', util.img_as_ubyte(box_result))
```

```
def display_image(image, title):
```

```
    plt.figure(figsize=(8, 8))
```

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

```
    plt.title(title)
```

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

```
    plt.show()
```

```
# Display results
```

```
display_image(mean_result, 'Mean Filter')
```

```
display_image(median_result, 'Median Filter')
```

```
display_image(gaussian_result, 'Gaussian Filter')
```

```
display_image(box_result, 'box Filter')
```