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Roll No: 33

In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
import cv2
```

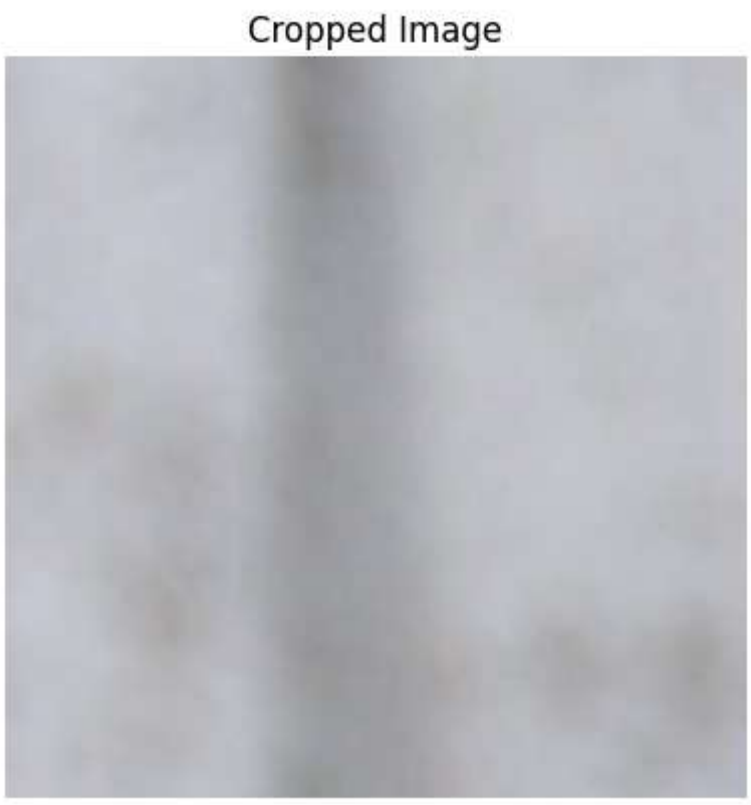
In [2]:
```
image = cv2.imread('sample.jpg')
```

In [3]:
```
image_rgb = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
```

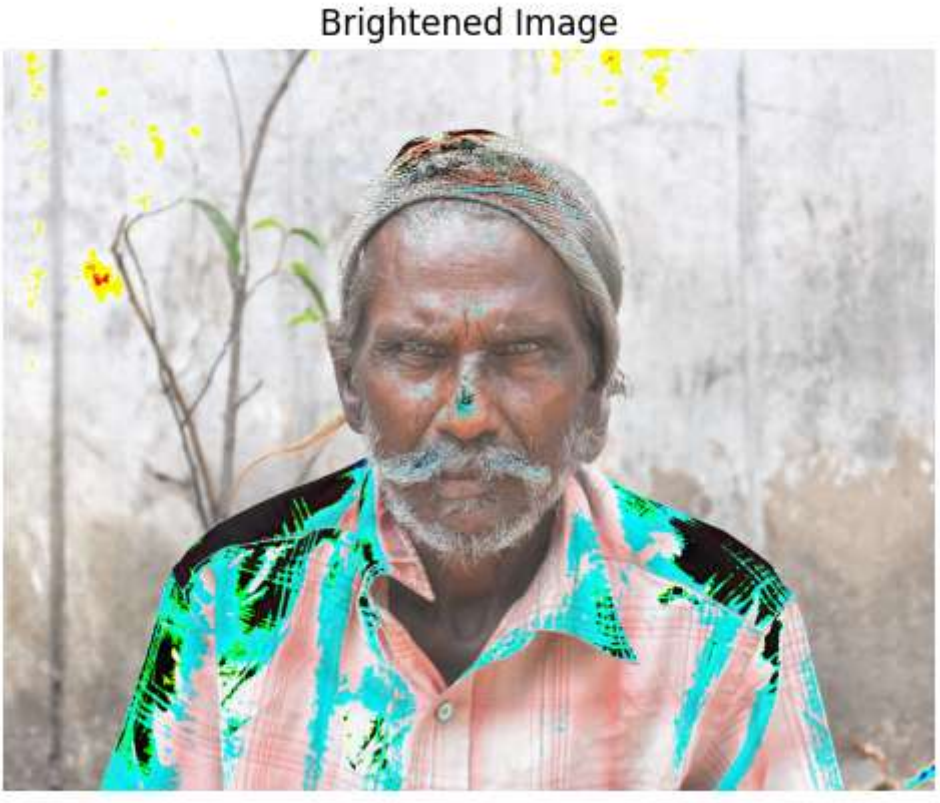
In [4]:
```
plt.imshow(image_rgb)
plt.title("Original Image")
plt.axis("off")
plt.show()
```

In [5]:
```
image_gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)
plt.imshow(image_gray, cmap='gray')
plt.title("Grayscale Image")
plt.axis("off")
plt.show()
```

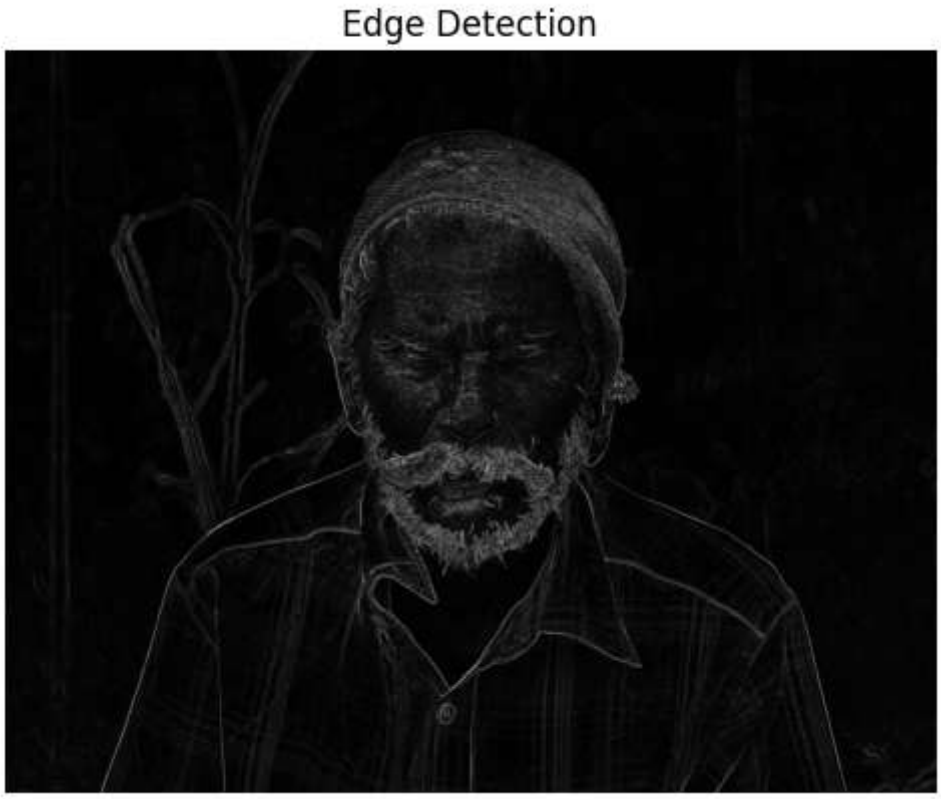
In [6]:
```
cropped_image = image_rgb[50:200, 50:200]
plt.imshow(cropped_image)
plt.title("Cropped Image")
plt.axis("off")
plt.show()
```



In [7]:
```
bright_image = np.clip(image_rgb + 50, 0, 255)
plt.imshow(bright_image.astype(np.uint8))
plt.title("Brightened Image")
plt.axis("off")
plt.show()
```



In [8]:
```
sobel_x = cv2.Sobel(image_gray, cv2.CV_64F, 1, 0, ksize=5)
sobel_y = cv2.Sobel(image_gray, cv2.CV_64F, 0, 1, ksize=5)
edge_image = np.sqrt(sobel_x**2 + sobel_y**2)
plt.imshow(edge_image, cmap='gray')
plt.title("Edge Detection")
plt.axis("off")
plt.show()
```



In [9]:
```
cv2.imwrite('modified_image.jpg', cv2.cvtColor(bright_image, cv2.COLOR_RGB2BGR))
```

Out[9]: True

In [ ]: