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Pseudocde for Dilation and Erosion

```
# Preprocessing function
def preprocess_image(image_path):
# Read the image
img = cv2.imread(image_path, cv2.IMREAD_GRAYSCALE)

# Convert to binary
_, binary_img = cv2.threshold(img, 127, 255,
cv2.THRESH_BINARY)

# Resize to 720x480
resized_img = cv2.resize(binary_img, (720, 480))

return resized_img

# Function to perform dilation and erosion
def dilate_erode(image):
# Define square and circular structuring elements
square_kernel = np.ones((5,5), np.uint8)
circular_kernel =
cv2.getStructuringElement(cv2.MORPH_ELLIPSE, (5, 5))

# Perform dilation
```

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```
dilated_square = cv2.dilate(image, square_kernel,
iterations=1)
dilated_circular = cv2.dilate(image, circular_kernel,
iterations=1)

# Perform erosion
eroded_square = cv2.erode(image, square_kernel,
iterations=1)
eroded_circular = cv2.erode(image, circular_kernel,
iterations=1)

return dilated_square, dilated_circular, eroded_square,
eroded_circular

# Load and preprocess the image
image_path = "your_image.jpg"
preprocessed_image = preprocess_image(image_path)

# Perform dilation and erosion
dilated_square, dilated_circular, eroded_square,
eroded_circular = dilate_erode(preprocessed_image)

cv2.destroyAllWindows()
```

This code snippet performs the following

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steps:

Reads the input image and converts it to binary.
Resizes the image to 720x480.
Applies dilation and erosion operations using both square and circular structuring elements.
Displays the original image along with the results of dilation and erosion using both types of kernels.

Observation and Conclusion:

The square structuring element tends to produce more angular and blocky shapes during dilation and erosion, while the circular structuring element results in smoother and rounded shapes.
Dilation expands the shapes in the image, while erosion shrinks them.
Opening (erosion followed by dilation) is useful for removing small objects or noise from the image, while closing (dilation followed by erosion) can fill in small gaps or holes in objects.
Experimenting with different structuring elements and iterations can yield various effects on the processed image, allowing for fine-tuning based on specific requirements.