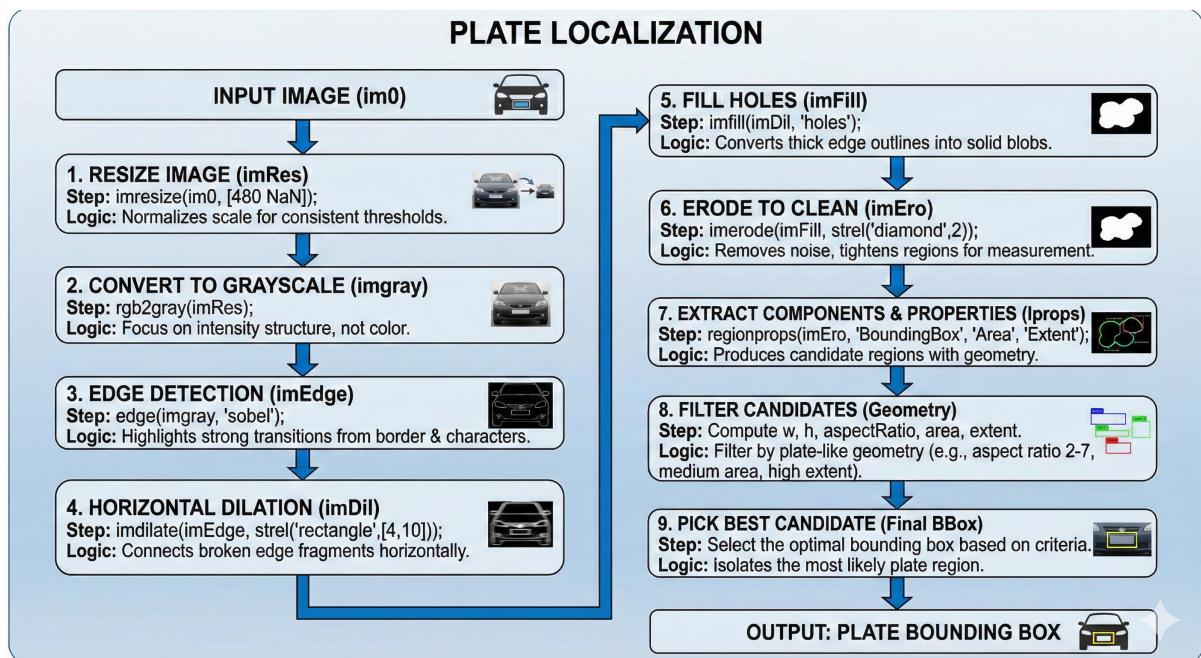


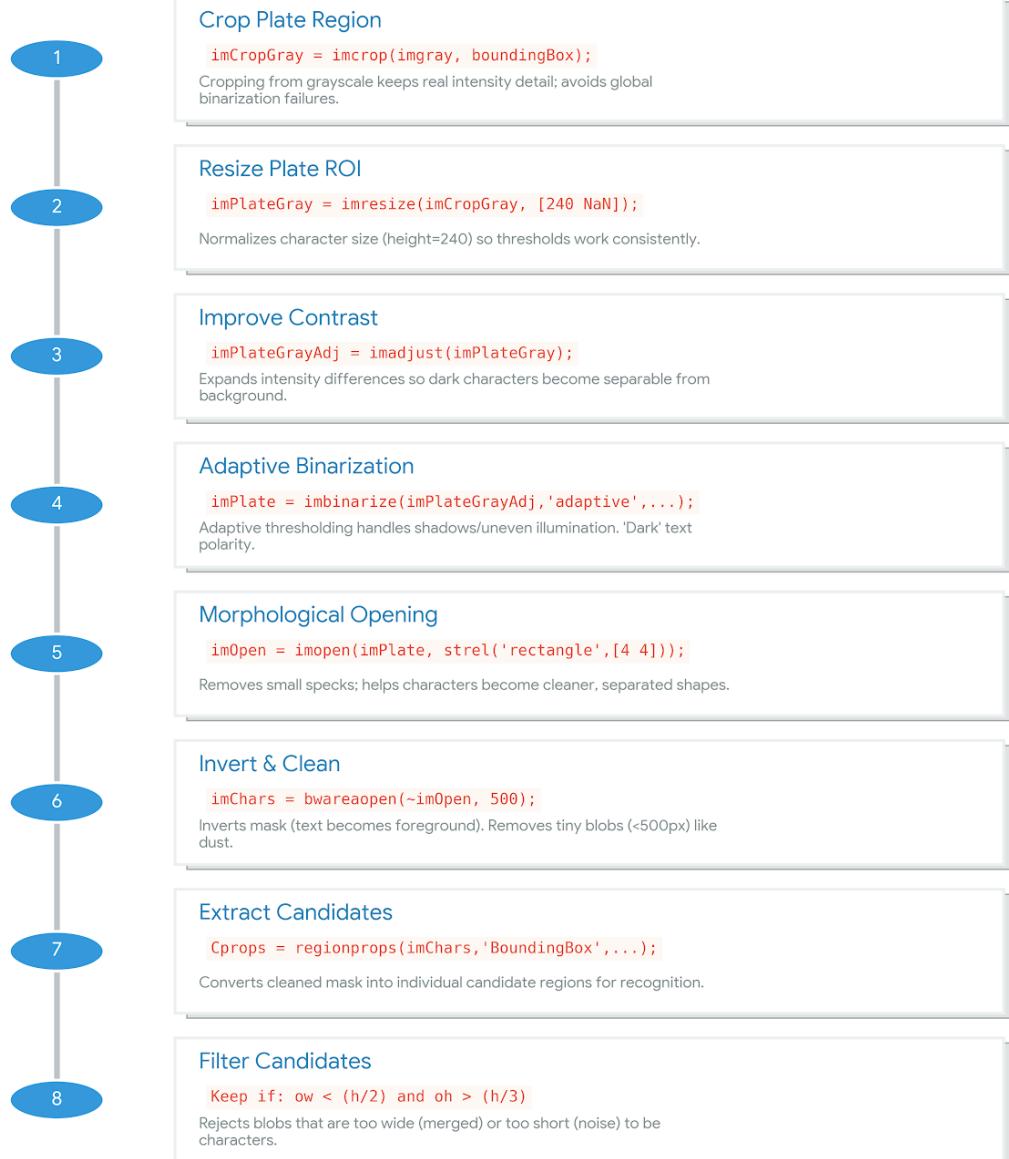
# License Plate Recognition: Visual Walkthrough (Examples 1–2)

## Overview

This document shows an ALPR pipeline visually: plate localization, character segmentation, and character recognition.



# Character Segmentation



# Character Recognition

- 1
- 2
- 3
- 4

## Load Template Library

```
if isempty(TemplateLibrary)
    load('NewTemplates.mat');
end
```

Uses 'persistent' memory to load templates only once, avoiding repeated file I/O for every character (speed optimization).

## Resize Input

```
snapResized = imresize(snap, [42 24]);
```

Standardizes input dimensions to match the templates ([42x24]) so pixel-wise comparison is possible.

## Compare vs Templates

```
correlations(n) = corr2(TemplateLibrary(n).Image, snapResized);
```

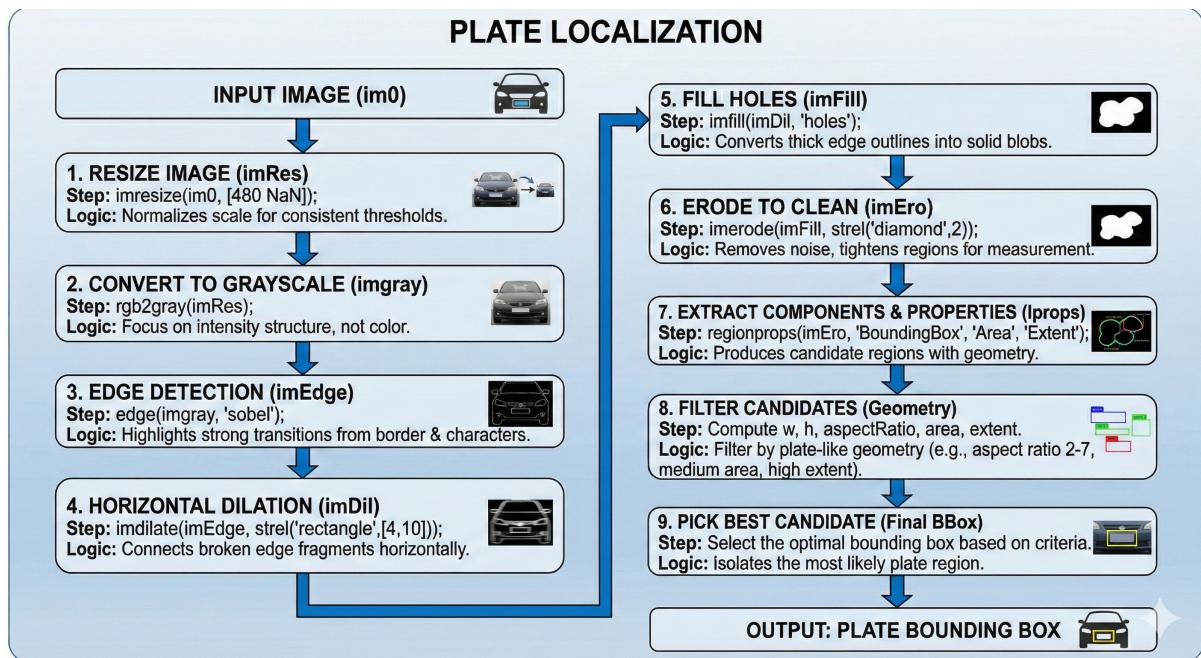
Calculates 2D correlation coefficient. Measures similarity between the input and each template (closer to 1 = better match).

## Select Best Match

```
[~, maxIndex] = max(correlations);
letter = TemplateLibrary(maxIndex).Label;
```

Identifies the template with the highest similarity score and assigns its label (e.g., 'A', '7') to the character.

## Plate localization (Example-1)



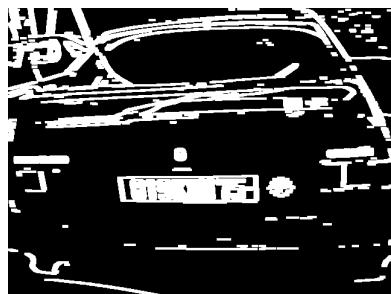
(a) Original (resized)



(b) Grayscale conversion



(c) Sobel edge detection



(a) Horizontal dilation



(b) Hole filling



(c) Erosion (diamond structuring element)



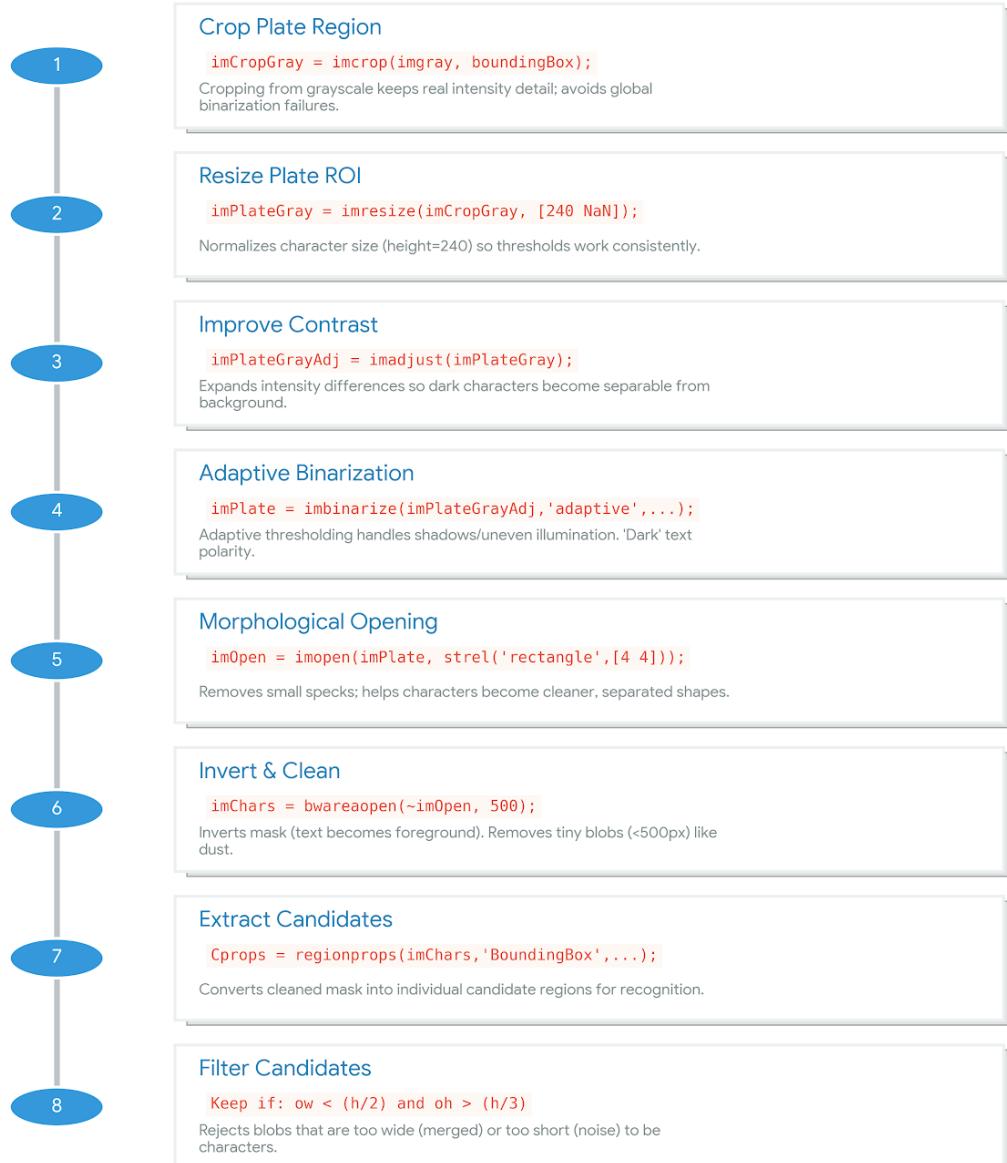
(a) Bounding box on original



(b) Plate cropped (from grayscale)

## Character segmentation (Example-1)

### Character Segmentation



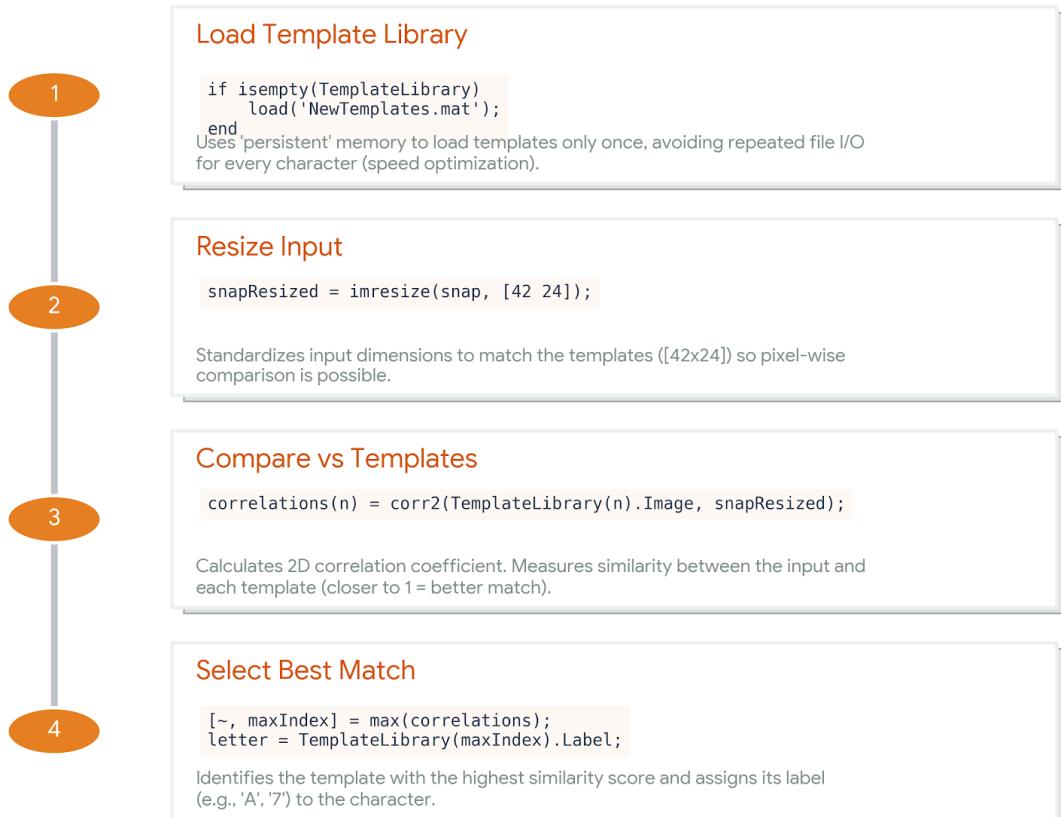
(a) Plate ROI (grayscale, resized) (b) Contrast adjustment (imadjust) (c) Binarization (from gray ROI)

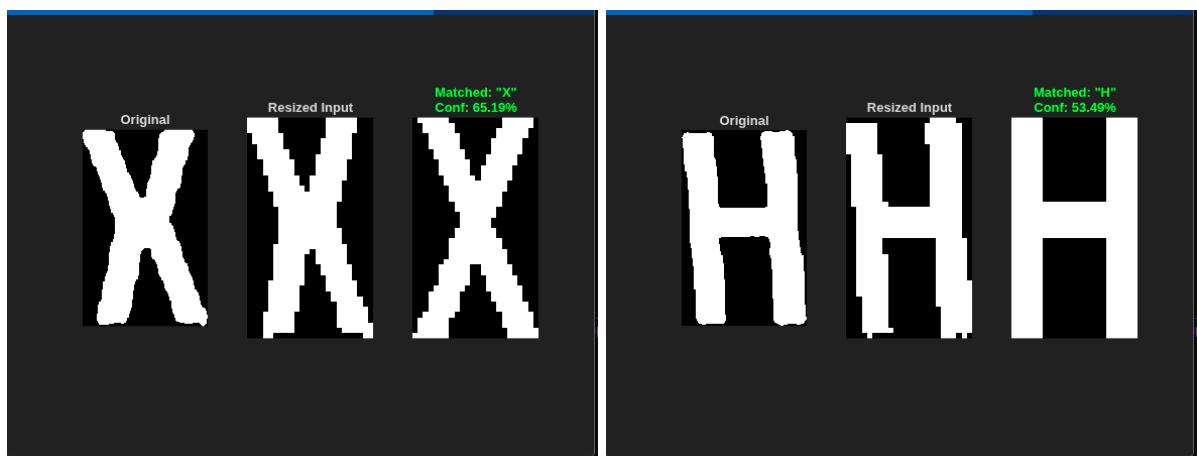
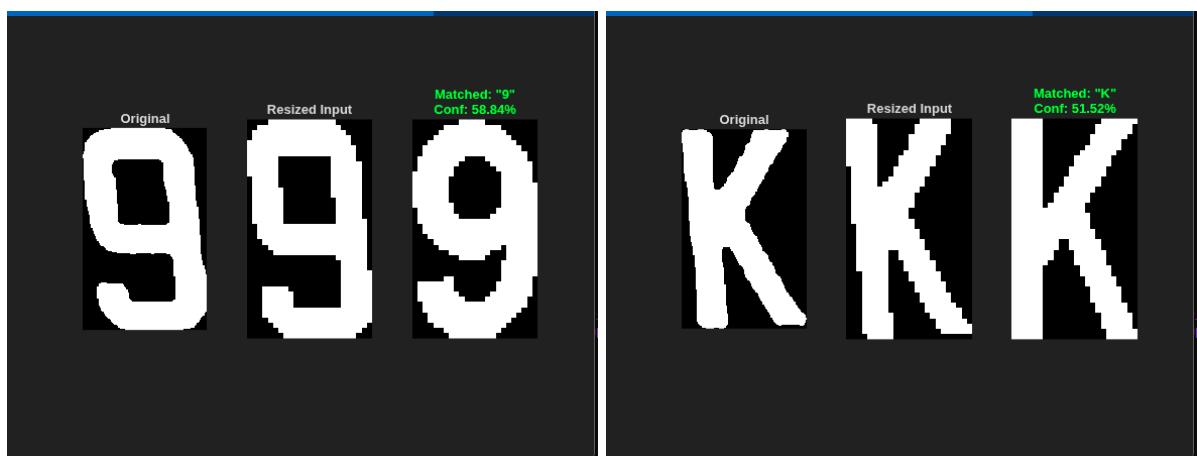
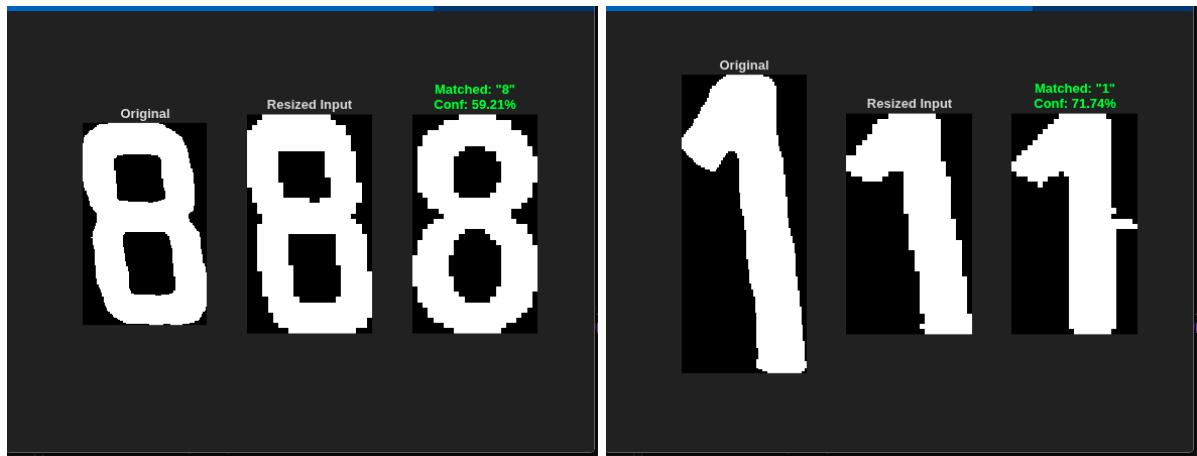


- (a) Morphological opening (rect 4 x 4)  
 (b) Small component removal (bwareaopen, 500)  
 (c) Character candidates (boxed)

## Character recognition (Example-1)

### Character Recognition







## Example-2: End-to-end (whole process)



(a) Original (resized)

(b) Grayscale conversion

(c) Sobel edge detection



(a) Horizontal dilation

(b) Hole filling

(c) Erosion (diamond structuring element)



(a) Bounding box on original

(b) Plate cropped (from grayscale)

(c) Plate ROI (grayscale, resized)

