Receipt Image Segmentation using MATLAB

Complete MATLAB Code:

```
% Load the original image
I = imread("IMG_007.jpg");

% Convert image to grayscale
gs = rgb2gray(I);

% Enhance contrast
gs = imadjust(gs);

% Create a 3x3 averaging filter
H = fspecial("average", 3);

% Apply the filter with "replicate" padding to smooth the image
gssmooth = imfilter(gs, H, "replicate");

% Binarize the smoothed image using adaptive thresholding
BWsmooth = imbinarize(gssmooth, "adaptive", "ForegroundPolarity", "dark");

% Display grayscale and binary image side-by-side
imshowpair(gs, BWsmooth, "montage");
title("Grayscale Image vs Binary Image after Filtering");

% Create a structuring element (disk with radius 8)
SE = strel("disk", 8);

% Perform morphological closing to isolate the background
Ibg = imclose(gs, SE);
figure, imshow(Ibg);
title("Background Estimated using Morphological Closing");

% Subtract grayscale from background image to remove background
gsSub = Ibg - gs;
figure, imshow(gsSub);
title("Text Extraction by Subtraction");

% Binarize the result and invert it to restore text as foreground
BWsub = ~imbinarize(gsSub);
figure, imshow(BWsub);
title("Final Binary Image with Text Isolated");
```