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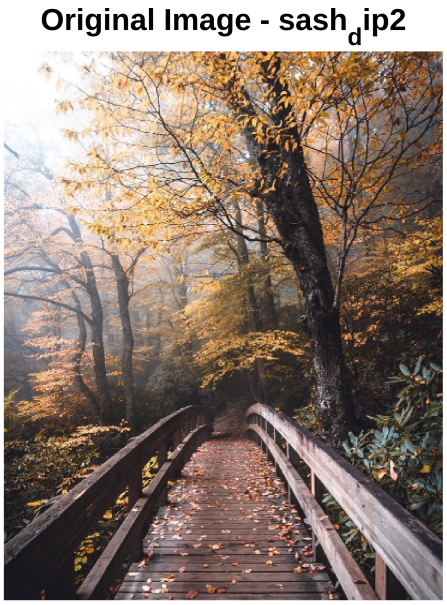
%% Sashi Assignment: Question 1 and Question 5 (MATLAB)
% This script answers both Question 1 and Question 5 for the assignment.

% Load the image (replace the file path with your own image path)
sash_dip2_img = imread('/MATLAB Drive/sashi_dip2_image.jpg');
figure, imshow(sash_dip2_img);
title('Original Image - sash_dip2');
```

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%% Question 1: Binary Mask and Low-Pass/High-Pass Filters
% Step 1: Convert to Grayscale
sash_dip2_gray = rgb2gray(sash_dip2_img);
figure, imshow(sash_dip2_gray);
title('Question 1: Grayscale Image - sash_dip2');
```

Question 1: Grayscale Image - sash$_d$ip2

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% Step 2: Create a Binary Mask (ROI)
mask_threshold = 130;  % Adjust threshold as needed
sash_dip2_binary_mask = sash_dip2_gray > mask_threshold;
figure, imshow(sash_dip2_binary_mask);
title('Question 1: Binary Mask for ROI - sash_dip2');
```

Question 1: Binary Mask for ROI - sash$_d$ip2

```
% Step 3: Apply Low-Pass Filters
% 3a. Gaussian Filter (Low-pass)
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sash_dip2_gaussian = imgaussfilt(sash_dip2_gray, 2.5);  % Slightly higher
sigma value
figure, imshow(sash_dip2_gaussian);
title('Question 1: Gaussian Low-pass Filter - sash_dip2');
```

Question 1: Gaussian Low-pass Filter - sash$_d$ip2

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% 3b. Average Filter (Low-pass)
average_filter_sash = fspecial('average', [7 7]);  % Larger 7x7 kernel
sash_dip2_avg = imfilter(sash_dip2_gray, average_filter_sash);
figure, imshow(sash_dip2_avg);
title('Question 1: Average Low-pass Filter - sash_dip2');
```

Question 1: Average Low-pass Filter - sash$_d$ip2

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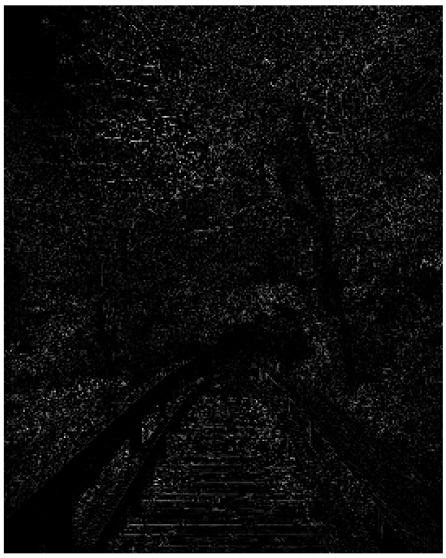
% Step 4: Apply High-Pass Filters
% 4a. Laplacian Filter (High-pass)
sash_dip2_laplace = imfilter(sash_dip2_gray, fspecial('laplacian', 0.3));
figure, imshow(sash_dip2_laplace);
title('Question 1: Laplacian High-pass Filter - sash_dip2');
```

Question 1: Laplacian High-pass Filter - sash$_d$ip2



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% 4b. Prewitt Filter (High-pass)
sash_dip2_prewitt = edge(sash_dip2_gray, 'prewitt');
figure, imshow(sash_dip2_prewitt);
title('Question 1: Prewitt High-pass Filter - sash_dip2');
```

Question 1: Prewitt High-pass Filter - sash$_d$ip2

```
%% Question 5: Quantize to 32 Grayscale Levels
% Step 1: Quantize the image to 32 grayscale levels
sash_dip2_num_levels = 32;
sash_dip2_quantized = floor(double(sash_dip2_gray) / (256 /
sash_dip2_num_levels)) * (256 / sash_dip2_num_levels);
sash_dip2_quantized = uint8(sash_dip2_quantized);  % Convert to uint8
figure, imshow(sash_dip2_quantized);
title('Question 5: 32-Level Grayscale Quantized Image - sash_dip2');
```

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% Step 2: Resize quantized image (optional)
sash_dip2_quantized_resized = imresize(sash_dip2_quantized,
size(sash_dip2_gray));
figure, imshow(sash_dip2_quantized_resized);
title('Question 5: Resized Quantized Image - sash_dip2');
```

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%% End of Script
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