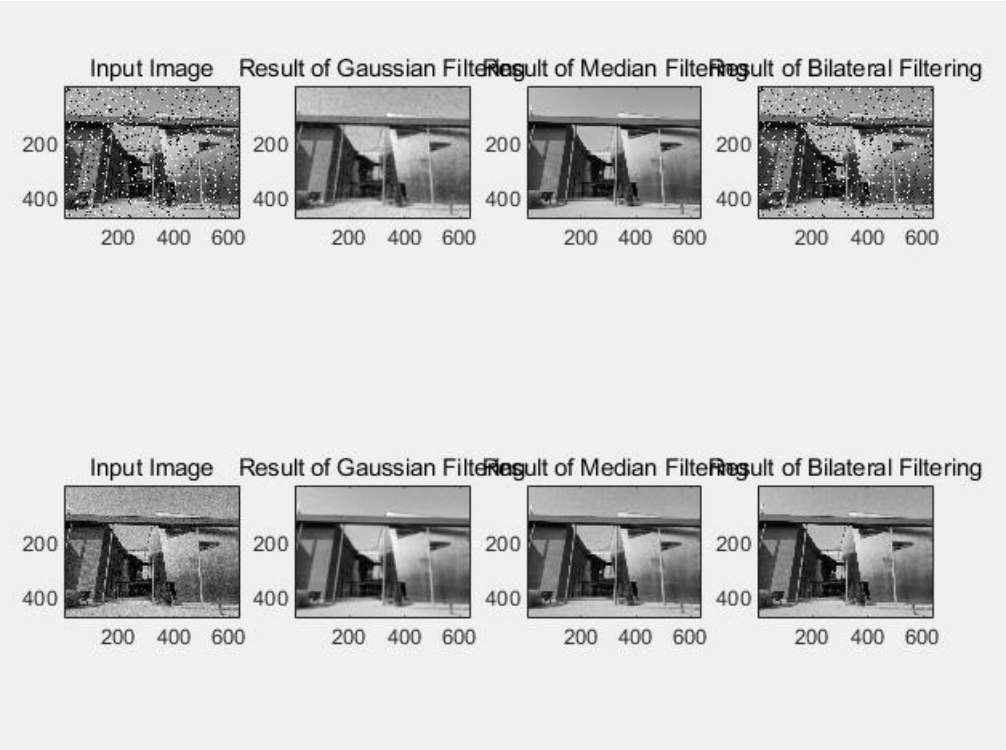
Exercise1

Result of Image denoising



Salt and Pepper Noise (Top Row):

- **Gaussian Filter**: Effectively reduced noise, but blurred edges and fine details.
- **Median Filter**: Best at removing the salt and pepper noise while preserving image details.
- **Bilateral Filter**: Provided a balance between noise removal and edge preservation, though not as effective as the median filter for this type of noise.

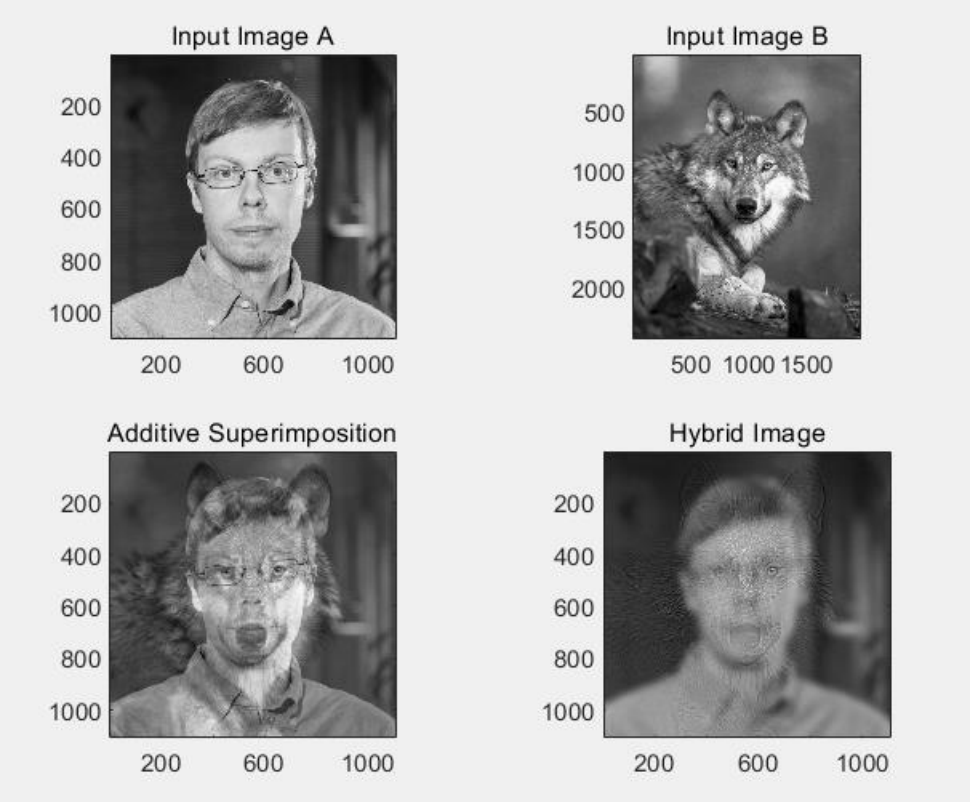
Gaussian Noise (Bottom Row):

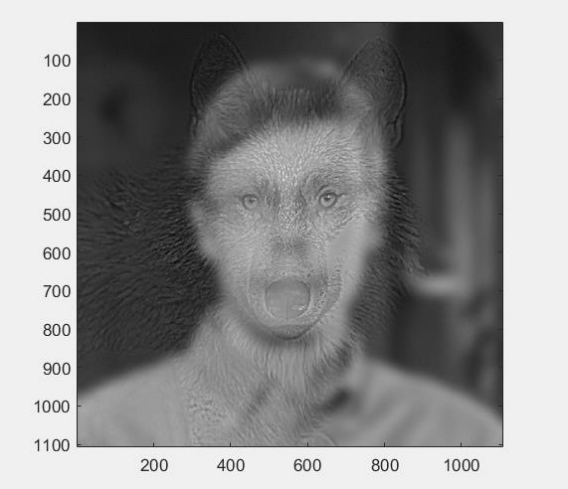
- **Gaussian Filter**: Successfully reduced the noise but introduced significant blurring.
- **Median Filter**: Reduced noise but less effectively compared to the Gaussian filter for this noise type.
- **Bilateral Filter**: Reduced noise while preserving most edges and details, making it

the best option for Gaussian noise in this case.

Exercise 2

Results of Hybrid Image





- **Low-pass Filtering**: Applied to the man's face, this filtering retained the overall shape and structure but removed fine details.
- **High-pass Filtering**: Applied to the wolf's face, this filtering enhanced edges and fine details, while removing low-frequency components.
- **Hybrid Image**: By combining the two filtering techniques, we achieved a visual effect where the wolf's details dominate up close, but the man's face is more visible from a distance. This illustrates the power of frequency-based image manipulation.

Exercise 3

During the implementation of **Exercise 3: Image Blending via Laplacian Pyramids**, I encountered an issue that prevented me from obtaining the final results. Specifically, the error occurred in the blending process:

Error using imageblending (line 83)

Array dimensions do not agree.

This error arose while performing the blending operation at a specific level of the Laplacian pyramid. The arrays (lpimga{p}, lpimgb{p}, gpmaska{p}, and gpmaskb{p}) did not have compatible sizes for element-wise operations, causing the operation to fail.

Due to this issue, I was unable to generate and visualize the final blended image.