1) $X_1 = (1, -1)$ $X_2 = (3, -1)$
$X_3 = (0, 1)$ $X_4 = (-1, 0)$

$X_1 = \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$ $X_2 = \begin{bmatrix} 3 \\ -1 \\ 1 \end{bmatrix}$ $X_3 = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix}$ $X_4 = \begin{bmatrix} -1 \\ 0 \\ 1 \end{bmatrix}$

$L_1 : X_1 \times X_2 = \begin{bmatrix} -1 + 1 \\ 3 - 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 0 \\ 2 \\ 2 \end{bmatrix}$

$L_2 = X_3 \times X_4 = \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$

Intersection point: $L_1 \times L_2 = \begin{bmatrix} 4 \\ 2 \\ -2 \end{bmatrix}$

Intersection normalised: $\begin{bmatrix} 4/-2 \\ 2/-2 \\ 1 \end{bmatrix} = \begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix}$

$0x + 2y + 2 = 0$ $= x - y + 1 = 0$

$y = -1$ $y = x + 1$

   $-1 = x + 1$
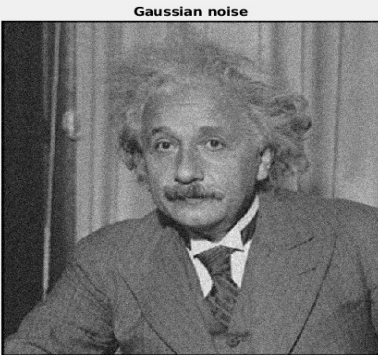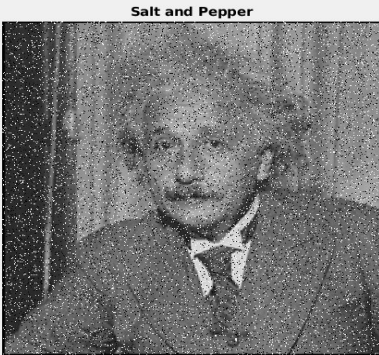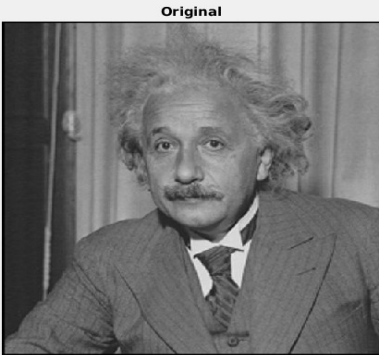
   $x = -2$

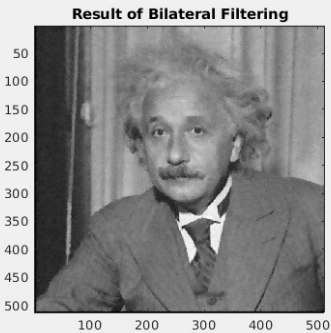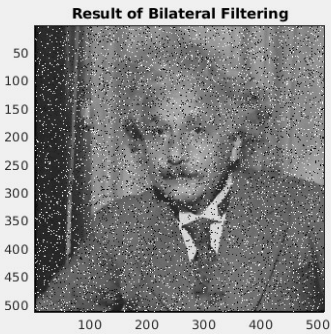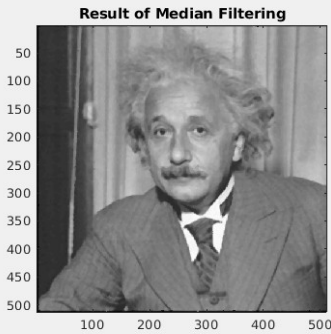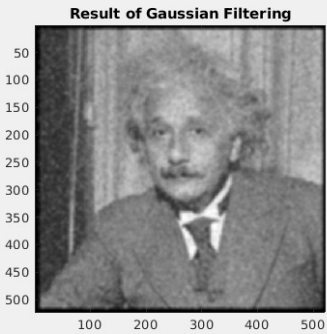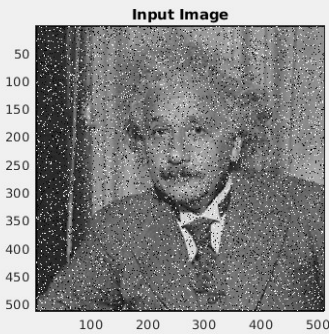$\Rightarrow$ intersection point is $x = -2 ; y = -1$

in homogeneous coordinates $\begin{bmatrix} -2 \\ -1 \\ 1 \end{bmatrix}$
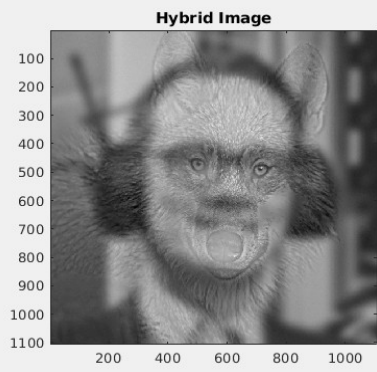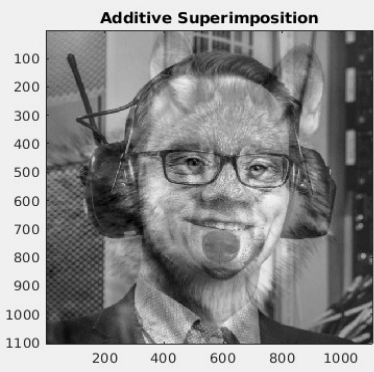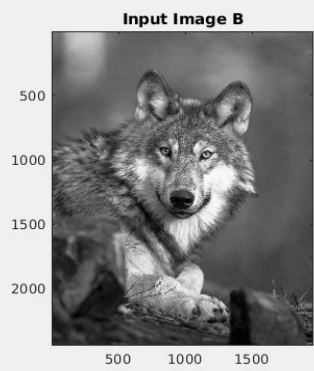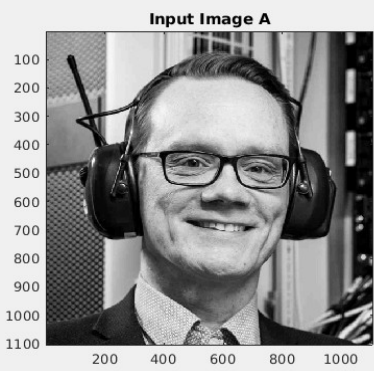
Exercise 2.
Denoising images

Original

Salt and Pepper

Gaussian noise

Images at start

Input Image

Result of Gaussian Filtering

Result of Median Filtering

Result of Bilateral Filtering

Input Image

Result of Gaussian Filtering

Result of Median Filtering

Result of Bilateral Filtering
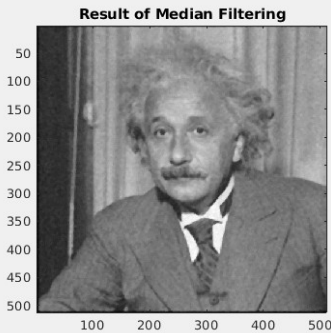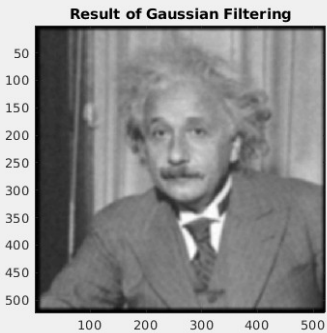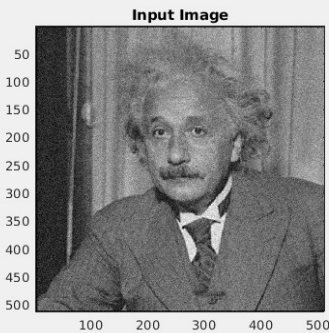
Result of the denoising

Exercise 3.

Input Image A

Input Image B

Additive Superimposition

Hybrid Image

The first set of images

File Edit View Insert Tools Desktop Window Help
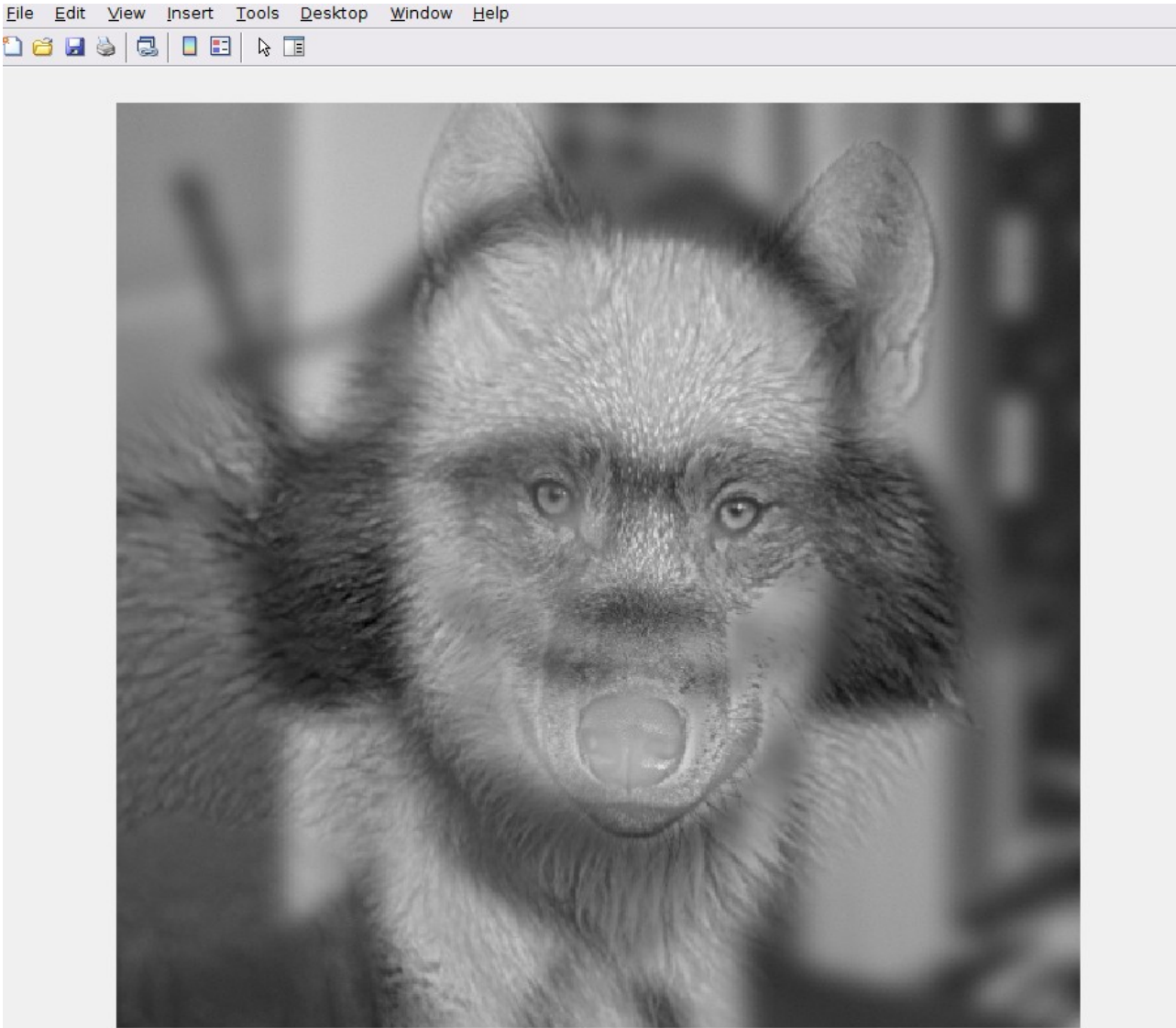
Hybrid image
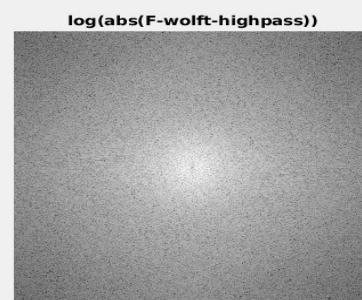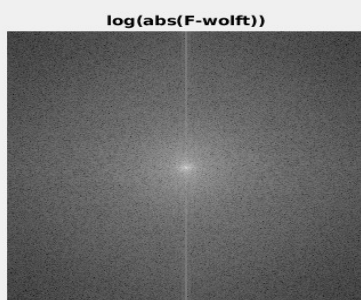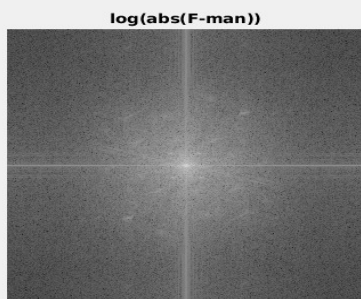
Fourier of man/wolf and their filtered versions