A few explanations:

The image coffee used to solve this exercise is an RGB image, but I’ve worked with the greyscale version of it.

I’ve used the functions you have provided along the course but to plot the images I’ve written the code in each of the tasks (not the most efficient approach but I wrote it that way so I could get used to it).

To apply each of the noise types I’ve used the snippets of code provided at each of the links you have attached.

At task 4: We had to use the 3 noisy grayscale images from previous task (with Gaussian noise at different variances). Then we had to apply a Gaussian filter with varying sigma values to see how smoothing changes the image, so we had to denoise the images. Plot the results and comment on how sigma affects the output.

Sigma=0.5: Fine details and some noise remain visible. Good balance between noise removal and detail retention for low-noise images.

Sigma=1: Increased smoothing and removes more noise. Slight blur to edges and textures.

Sigma=2: Effective in removing heavy noise. Significant loss of image detail and sharpness.