Assignment 1

Name Surname
Matriculation number

Denoising

1. **Problem.** Briefly describe the problem.
2. **Motivations.** Describe the reasons and motivations behind this problem.
3. **Derivation of gradient.** In this section you should:
   - Write the finite difference approximation of the objective function E.
   - Compute the gradient of the objective function $\nabla_u E$.
4. **Implement gradient descent for denoising.** In this section you should:
   - Show some images, as the the gradient method progresses iteration by iteration. Display the initial and the final image and 3 more images in between.
5. **Show images obtained by very high, very low and optimal λ.** In this section you should:
   - Display 3 images with different λ (very low, very high and optimal).
   - Describe the effect of λ on the solution.
6. **Find optimal λ.** In this section you should:
   - Display the SSD vs. λ graph.
   - Describe the effect of λ with respect to the SSD between the ground truth and the solution image.