Practical Assigment 1

CT reconstruction

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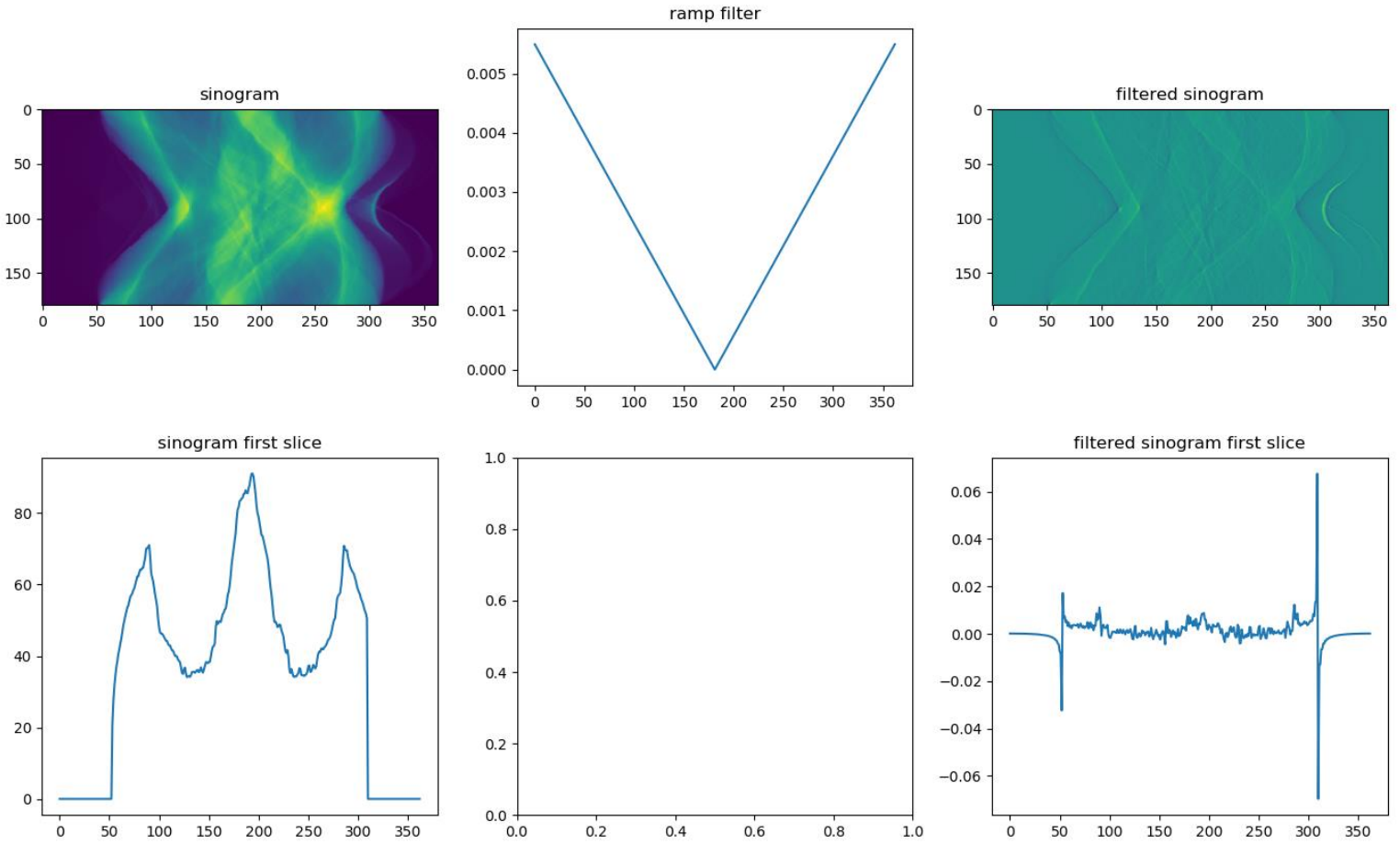
Assignment 1

- Write python code to:
  - Generate sinogram
  - Reconstruct original image from sinogram with a backprojection
  - Reconstruct original image using projection slice theorem and interpolation of Fourier space
  - Reconstruct original image from sinogram with filtered backprojection
  - Compute RMSE of intensities to compare reconstructions with the original image

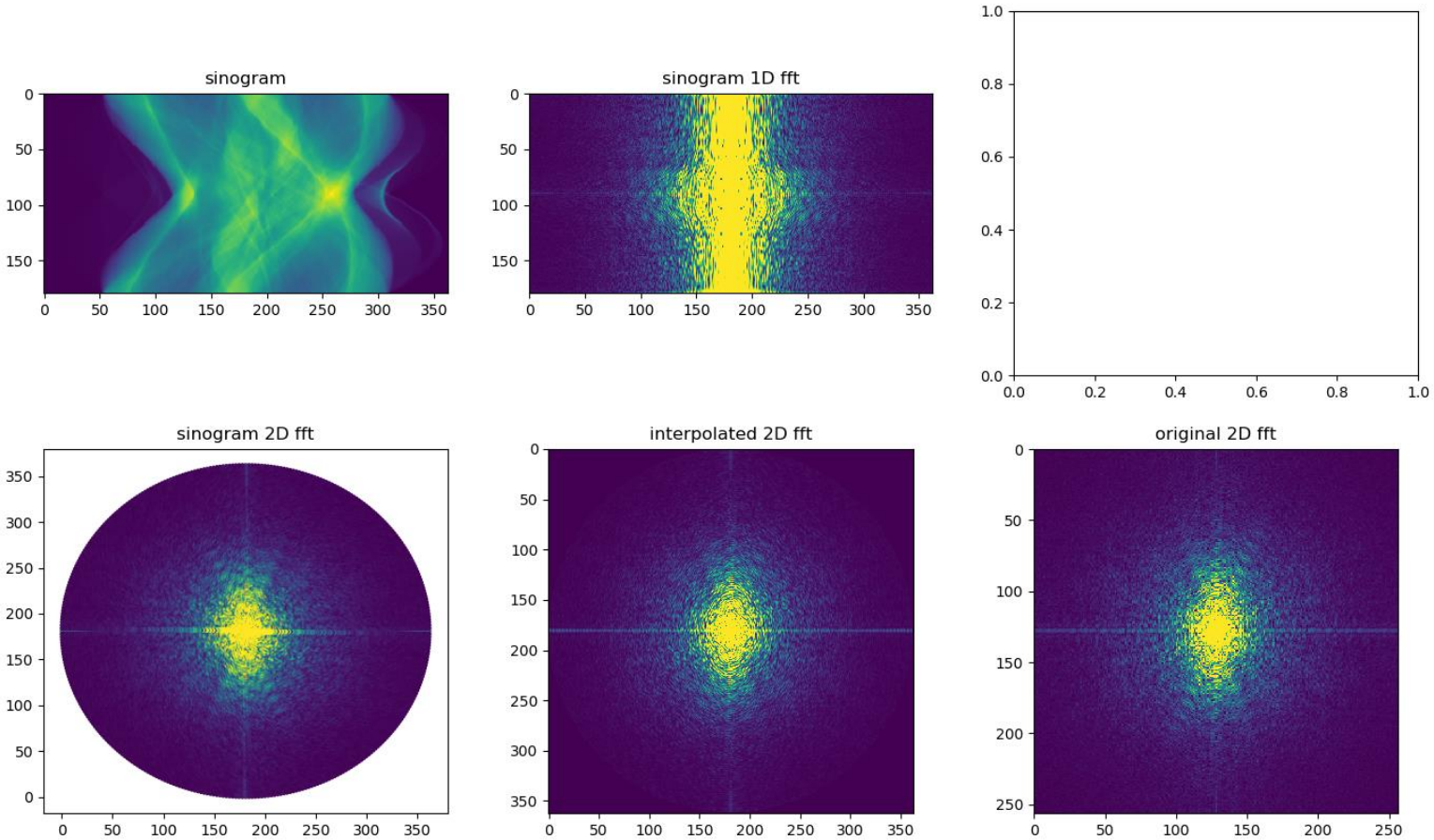
Assignment 1

- Used the template code for your assignment!
- Implement the functions according to the description given in the function header.
- Do not change the input/output parameters of the function (there is no need for that).
- Your code should generate the following three figures:

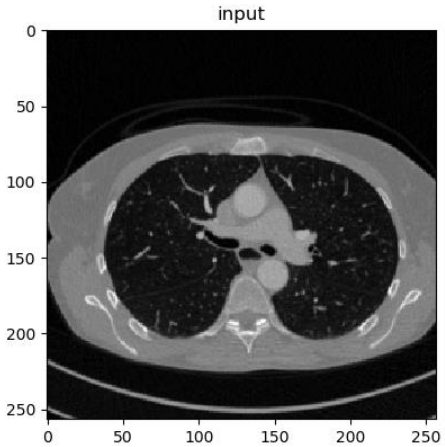
Assignment 1

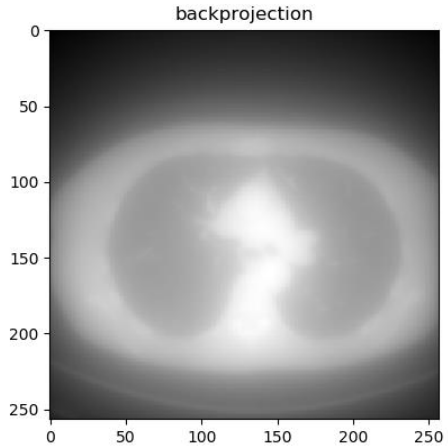


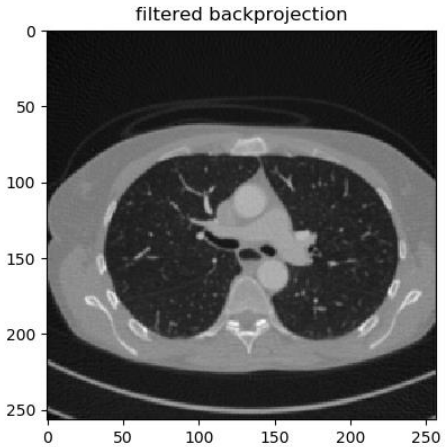
Assignment 1

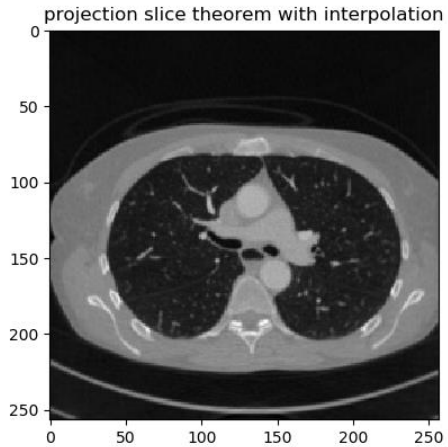


Assignment 1









Assignment 1

- Deliverables (due to 11.4.2021. latest at 23:59).
  - Python source code file
  - Scientific Report (pdf file) for a group of two:
    - Aim of the exercise
    - Summary of the required theoretical background
    - The outcome of the practical experiment
      - What is RMSE for each approach
      - How RMSE changes with the number of projections (graphic and reconstructed images)
      - An additional experiment you consider relevant for the reconstruction (e.g. testing of one parameter)
      - Conclusion
    - References