ELEC4010N: Assignment 3

Submission requirement:
You are required to submit a PDF file to answer the following questions.

Problem 1. About imaging principles of X-ray and CT

1.) [10%] Explain the imaging principles of X-Ray.
2.) [10%] Explain filtered back projection.
3.) [10%] Explain the imaging principles of Computed Tomography (CT).
4.) [20%] Describe one existing method for CT reconstruction from multi-view X-Rays.

You are allowed to answer questions by citing papers or websites and rephrasing the answers in your own words, but it is important to ensure that you have understood the information correctly. This section should consist of no more than two A4 pages, with Times New Roman font size 12 and single line spacing.

Problem 2. Using ITK-SNAP to visualize medical images.

1.)   [10%] What types of medical images are supported by ITK-SNAP?
2.)   [40%] Please use ITK-SNAP to visualize four medical image cases along with their corresponding segmentation labels. Along with this, provide a detailed explanation of the process of visualizing raw CT images and uploading segmentation labels onto them. For each case, please specify the segmented region and explain the correlation between the segmentation labels (such as 0, 1, 2) and the corresponding tissues. For example, 0 refers to the background, 1 refers to liver, 2 refers to liver tumor. Accurately showing each case can earn 10% of the total score.

This section should consist of no more than one A4 pages, with Times New Roman font size 12 and single line spacing. You are free to download 4 cases of medical images from any public website. Here is one example:
https://drive.google.com/drive/folders/1HqEgzS8BV2c7xYNrZdEAnrHk7osJJ--2