Breaking inhibitions!

Laboratory 1
Duration: 1 week

Write a simple image processing application in C/C++ that sharpens a given image in the ppm format.

- The outline of the application is available as a git repository here. Clone the repository to get a copy of the source code. Then set up your own repository with this code on gitea and work with that.
- Usage:
  - To only compile: `make build-sharpen` (in the src folder)
    - (You can find a "make" tutorial here).
  - To compile and run: `make run-sharpen INPUT=<input-image-name> OUTPUT=<output-image-name>`
    - The application will take as input "*../images/<input-image-name>.ppm*" and will create the file "*../images/<output-image-name>.ppm*"
    - Example: `make run-sharpen INPUT=1 OUTPUT=1_app_output`
- The application works with ppm files. It is the simplest image format. It contains the RGB values of every pixel in the image. You can learn more about the format here.
- The folder "*images*" contains some sample images. You can make your own ppm files from other popular file formats like jpg by using the GNU Image Manipulation Program (GIMP) application.
- To sharpen the image, you only need to complete the three functions `S1_smoothen()`, `S2_find_details()`, and `S3_sharpen()`. Please see this page for a clear explanation of these three transformations.
- Write the resultant pixel matrix to a new *ppm* file.

Use gdb (tutorial) or the debugger in your preferred IDE for debugging. Don't rely only on debugging through print statements!

Experiment with input images of different dimensions. Study the variation in the times taken for the five phases: file read, *S1*, *S2*, *S3*, and file write. Use the C++ chrono library for measuring time. Repeat each experiment 5 times and take the average time. Use clever scripting.

Submit a zip file named *<roll-number-1>_<roll-number-2>_<roll-number-3>_lab0.zip*, containing:

- A report containing the variation in the times taken.
- The folder "src" containing the updated source code. Running make in this folder should work as described above. Include your scripts as well.