

COSC 3P93

Project – Step 4

Due date: Tentatively, November 30th and December 5th, 2022 at 23:59 (11:59pm)

Delivery method: the student needs to delivery the assignment only through Sakai.

Delivery contents: document with answers and [Java, C, C++] codes if applicable (see [Submission instructions](#)).

Attention: check the [Late Assignment Policy](#).

Project Overview

This project is intended for students to apply design patterns, as well as strategies, for parallel systems in a sequential solution. The patterns and strategies applied in the project for the design and implementation are the ones covered in classes and course reading materials. The final output of the project is a performance comparison between a sequential program and its respective parallel design. For both programs, students will have to write the codes themselves, as well as define performance analysis parameters and metrics for the comparative analysis. It is strongly recommended that the implementation language in this project be either C or C++. Mostly likely, student will need to familiarize with Linux/Unix systems, as well as bash command line, to compile, debug, and run their code. For each of the project steps, the students are expected to employ the concepts learned in class properly and report them in the document submitted together with their code.

Step 4 - Description

This Step 4 consists of a presentation, which is the final part of this project. The presentation should be made in groups, where students should summarize their work in a 13-min presentation. The presentation should introduce the topic but focus on the Parallel Computing aspects covered in class.

Step 4 - Specifics

For this presentation, it is assumed that the students have already completed the 3 previous Project Steps. The presentation should summarize all the work done, emphasizing on the course subjects related to each of the steps. In detail, the presentation is supposed to have the following format:

- 3.1. Brief **general description** of the project;
- 3.2. **Problems** faced in each of the steps;
- 3.3. The **solution** used in each step;
- 3.4. **Tools and library** used for coding;
- 3.5. Group members **responsibilities and role** in each step. Clear description and clear reasoning.

The presentation must be succinct and objective. Descriptions should be brief but complete and clear. The following aspects should be addressed when preparing the presentation:

- 3.1. **Opportunities of parallelism** in the serial code;
- 3.2. **Degree of parallelism** achieved in the final version of the code;
- 3.3. **Design and implementation** decisions to add parallelism;
- 3.4. **Directives** of OpenMP and OpenMPI used to generate the final code;
- 3.5. Proper **performance analysis**: metrics and parameters.

Keep in mind that the final report is set to be submitted later than its presentation. This means that students do not need to have the final report and final version of their code ready before their in-class presentation. However, students are expected to have made all the design decisions and most of the coding by the time

of their presentation. They are fully responsible for knowing details of design, flaws, proper justification on their decisions, and performance analysis of their project work.

Submission Material

The submission for this assignment will consist of two parts:

- 4.1. The presentation slides in PDF format submitted through Sakai. If students fail to submit their slides (for the group presentation) before the deadline, the whole group marks will receive late submission penalties (-25%).
- 4.2. The presentation itself will occur tentatively on December 1st and 6th, 2022, during class hours. Otherwise, presentations can be scheduled outside class hours: agreed with the classroom, groups, and instructor.

Marking Scheme

Marks will be awarded for completeness and demonstration of understanding of the provided material. Please note that the items described in **Step 4 – Specifics** will be the main elements used to mark this part of the project. It is important that you fully show your knowledge when providing solutions in a concise manner. Quality and conciseness of solutions are considered when awarding marks.

Submission

The submission is expected to contain one document: slides for oral presentation. The document may be in PowerPoint format or PDF. All content files should be organized and submitted through D2L. The submitted presentation must be done before the presentation day, as scheduled by the instructor.

Late Submission Policy

A penalty of 25% will be applied to late submissions. Late submission are accepted until the Late Submission Date, three days after the Submission Due Date. No excuses are accepted for missing deadlines. However, deadline extensions may be granted under extenuating circumstances, such as medical or physical conditions; please note that granting the extension is at the instructor's discretion.

Plagiarism

Students are expected to respect academic integrity and deliver evaluation materials only produced by themselves. Any copy of content, including text or code, from other students, books, the web, or any other source is not tolerated. If there is any indication that an activity contains any part copied from any source, a case will be opened and brought to a plagiarism committee's attention. If plagiarism is determined, the activity will be cancelled, and the author(s) will be subject to university regulations.

For further information on this sensitive subject, please refer to the document below:

<https://brocku.ca/academic-integrity/>