
- **Course:** CMPUT 402/501, University of Alberta
- **Assignment:** Individual Assignment 3 (I3): Performance Assessment
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I3 - Performance Assessment

Overview

In this assignment, you will assess the performance of a given system and reflect on how such assessment can be done effectively.

The learning goals of I3 are:

- Deciding which performance concerns are important for a system
- Deciding between different approaches to performance assessment and understanding their limitations
- Learn how to use JMeter for load testing and performance assessment

Performance analysis of book website

In this assignment, you are being asked to assess the performance of a web site that can list and search book covers (with title, author, categories, publication date, cover image, etc.), for which we provide a runnable (through Docker Compose) setup in a GitHub repository with about 800 book covers. This assignment intentionally gives you a lot of flexibility in deciding what performance characteristics (e.g., throughput, latency) are important and how they should be assessed. Make sure to assess performance of all endpoints. Justify your decisions, conduct a reasonable performance assessment with limited time, and discuss what additional steps you would take with more time.

The main deliverable is a report (4 pages, max) which should cover the following questions:

- **Performance concerns:** What are (likely) important performance concerns or requirements for the system? Justify your answer.
- **Measures:** How can those performance concerns be assessed? (define the measure, be clear about units, characterize how you would distinguish good from bad performance with this measure).
- **Measurement process:** What measurements did you conduct to collect the measures in the previous point and how? Justify your design (e.g., overall setup, workload selection) and describe your process briefly but with sufficient detail to reproduce it. You can attach screenshots of your JMeter test plan, if that helps.
- **Measurement results:** What were the results from your performance assessment? Discuss how well the system achieves the performance qualities. Include plots (charts, graphs, etc.) if they help your discussion of results.
- **Next steps:** If you had more time, what additional steps would you take for performance assessment of this system? Would you automate tasks or integrate them in the development process? Why/why not?

Notes

Resource limits. You might see resource limits set up in `docker-compose.yml` file. That is done on purpose. Do not modify the file, otherwise the results might not be what we expect. You should only work with JMeter and not change anything in the code. However, you are welcome to explore the source code, as well as the data set, if you want to.

Fatal errors. It is possible that the application will crash due to too heavy load. That's an example of stress testing where your goal is to estimate what is the maximum load that the system can handle before crashing. If you experience this issue, try to determine what is the maximum load it can handle before failing (e.g., number of requests) and mention that in the report. You do not need to find the exact number (e.g., "1227 requests"), but try to be as precise as possible (e.g., "about 1200 requests").

Acceptance criteria for I3

Submit the report as a **PDF** (max 4 pages including any screenshots, plots, etc.) with clear subsections to eClass. Keep all sections under half a page if possible, except for the process description, which might be longer and might include additionally screenshots or scripts if that simplifies your description.

The following criteria must be satisfied for I3 to be accepted as complete.

Criteria	Grade
Reasonable, comprehensive, and clearly justified performance goals.	5
Well defined performance measures.	5
Well described and reproducible measurement process.	10
Clearly described measurement results (in a form understandable by the target audience of your performance goals).	10
A plausible discussion of next steps.	5

Useful resources

- How to Use JMeter for Performance and Load Testing,
- How to Run a Stress Test in Jmeter,
- API Load Testing Best Practices