

Term Project Report

Version 0.1

Due Date: Saturday December 17th, 2022 @ 11:59 pm

Objective

To capture the results of your term project, each team should submit up to a four-page project report summarizing your serverless application implementation approach and the ensuing case study results. Case studies examine trade-offs of alternate design decisions. Trade-offs are typically evaluated using performance, throughput, and cost evaluation metrics to quantify results of the alternate design approaches.

Individual completing a gap analysis / research survey project, should submit the gap analysis / research survey paper that examines 5 or more related papers to summarize state-of-the-art research on a specific cloud computing research problem.

Please use the provided ACM template to format your project report.

The template can be found here:

MS Word Template:

<https://faculty.washington.edu/wlloyd/courses/tcss562/project/acm-word-template-f2022.docx>

PDF Template:

<https://faculty.washington.edu/wlloyd/courses/tcss562/project/acm-word-template-f2022.pdf>

Template Instructions:

<https://faculty.washington.edu/wlloyd/courses/tcss562/project/acm-word-template-f2022-instructions.docx>

For the Latex template, or for the source template files, see this website:

<https://www.acm.org/publications/proceedings-template>

The Template Instructions describe how to approach writing each section of the paper and what to include. Please review the Template Instructions for suggestions on how to assemble your research paper. The major sections are:

- I. Introduction
 - A. Research Questions
 - i. Research Question #1 (RQ-1)
 - ii. Research Question #2 (RQ-2)
- II. Comparison Study
 - A. Design Tradeoffs

- B. Application Implementation
 - C. Experimental Approach
- III. Experimental Results
 - A. Results of experiments for RQ-1
 - B. Results of experiments for RQ-2
 - C. Analysis and Discussion of Results
- IV. Conclusions
 - A. Summary
 - B. Future Work – if applicable
- V. References

In TCSS 462/562, we focused primarily on implementing a serverless application and conducting a case study to compare alternate design tradeoffs. The case study evaluation then involved running experiments to evaluate performance (e.g. runtime, throughput, latency) and cost implications. The term project paper serves to capture the results of your work. Papers are not expected to be highly “polished” at this stage, however, they must provide a clear explanation of your project and include the relevant results.

Given the compressed timeframe of the course, if your data and experiments are complete and presented well with supporting tables and graphs, but the narrative in the paper still needs work, but the work shows promise, the group will likely receive a good grade.

Groups who have produced very high quality papers will be encouraged to pursue the project further after the class and submit a paper to an IEEE or ACM workshop or conference. The instructor will work with students to craft a high quality presentation for the conference/workshop. The instructor will work to arrange travel support for students whose papers are accepted for publication to attend the conference. For online conferences, the instructor will make arrangements to support conference registration fees, etc. if the paper is accepted.

Use of Research Questions in the Term Project Paper

Your project objectives can be written in the form of research questions. For example, if your case study was on daily (diurnal) performance variation of serverless functions on Amazon Cloud across multiple regions, then in your term project, you might propose the following research question:

RQ-1: What are the performance implications (e.g. runtime, latency) of executing the TLQ pipeline continuously and sequentially across different cloud regions? How does runtime and latency vary over a 24-hour period?

If your case study was on alternative programming languages for the TLQ pipeline use case, then your research question may be:

RQ-1: What are the performance implications (e.g. runtime, latency, throughput) of implementing an identical TLQ pipeline in different programming languages (e.g. Java, Python, and node.js) ? How does the programming language impact runtime and data processing throughput for processing large datasets?

After stating your project's research goals/objectives as a research question, the term project should then refer to the research question throughout the paper with the designation of RQ-1 or RQ-2. The experimental approach section (II.C) should describe the experimental design used to evaluate the research question(s). The experimental results section (III) should provide detailed results for each of the research questions. The analysis section (III.C) should answer and discuss the results of the research questions. The conclusion section (IV) should summarize in short-form the key conclusions for the research questions, but it should not repeat all of the discussion in (III.C). The conclusion should be the short summary of the results (III).

Students can reach out to the instructor for help in writing (formulating) the research questions relative to the case study objectives provided in the earlier project proposal.

2023 Workshop Opportunity

The timing of TCSS 562 works well to submit papers to a cloud computing workshop focused on performance evaluation/engineering. These papers are due around ~ January 24, 2023. Interested students should contact the instructor for additional information. These papers are either 4 pages (short) or 8 pages (full).

Hot Cloud Performance Workshop 2023: <https://hotcloudperf.spec.org/>

Questions

Please contact the instructor for questions and advice on how to approach writing the term paper. The approach to writing the term paper is a common approach which allows students to practice writing research papers. These skills are applicable to writing *any* research paper.

Submission Deadline

Project term papers should be submitted in PDF format on Canvas no later than 11:59pm on Saturday December 17th.

Change History

Version	Date	Change
0.1	12/6/2022	Original Version