

ECpE 492 – Bi-weekly Report #6

Nov 08 – Nov 22

Project Title	Interactive evaluation of shortest path methods
Client & Advisor	Goce Trajcevski
Team	sddec23-14
Team Members	Alex Blomquist, Samuel Caldwell, Selma Saric, Yadiel Johnson

1 Report

1.1 Abstract

This period, a testing overhaul was performed to achieve greater and more effective code coverage on the backend. Additionally, adjustments to the frontend logic and its deployment on the virtual machine were made.

1.2 Work Breakdown

A few noteworthy items were addressed this period on the backend.

- The first one is the test rewrite that was mentioned in the last report. Now, a suite of end-to-end tests are featured that evaluate various aspects of the application. With them, the code base achieves 85%+ method and 80% line coverage, so it is expected that most scenarios are covered and accounted for. The tests focused primarily on simulating realistic MVC scenarios such as adding, removing, modifying, and retrieving information and executing business logic.
- Finished implementation for the Floyd-Warshall wrapper class that was unfinished (see: [issue #16](#))
- Corrected some logic for the Algorithm Execution Driver that produced broken or undesirable results.
- Frontend code was migrated to the appropriate location such that Spring Web would serve it.

For the frontend, a new dropdown was implemented that uses GET requests to populate it with all the different algorithms. A checkbox was also added and implemented, so that users can select whether they want the graph to be directed or undirected. The file parser code and visualizations are also now attached to the home page and a POST request is now made when a user adds a file containing their dataset that sends the dataset information to the backend.

The team has also begun work on the Final Report and Final Poster, which are almost done.

1.2.1 Major accomplishments

- Implementation
 - Floyd-Warshall's algorithm wrapper implemented.
 - Spring frontend logic implemented.
 - Sigma.js improvements (a visualization library).
 - Graph parsing from text files.
 - Began connecting elements in the backend to the frontend.
 - Fixed Backend docker CI/CD pipeline issues.
 - Finished implementation of MySQL database and began integration of Spring Boot data storage.
- Additions
 - Revamped testing suite and methodology for the backend.

1.2.2 Pending issues

- Due to the lack of a real-time language, operating system, or supporting hardware, it becomes inevitable that run-to-run variance affects the execution results for the Algorithm Execution Driver due to preemption, context switching, and interrupts. There seem to be no "simple" solutions to this problem, but it can be mitigated by performing an average over X number of runs. However, this implementation can prove to have other problems associated with it.

1.2.3 Individual contributions

Name	Individual Contributions	Worked Hours	
		This Period	Cumulative
Alex Blomquist	<ul style="list-style-type: none">• Finished setup of the MySQL Database springboot server storage/connection• Assisted filling in some sections of the Final Poster• Filled in my portion of the Final Report	12	100
Samuel Caldwell	<ul style="list-style-type: none">• Continued implementation of Mapbox visualizer• Continued implementation of fetching results to the results page• Refactored graph storage code• Updated home page to accommodate mapbox	15	103

Selma Saric	<ul style="list-style-type: none"> • Created multi-select dropdown that allows users to select one or two algorithms to run, populating dropdown using GET request • Implemented checkbox for user to select whether they want the graph to be directed or undirected • Merged Sam’s visualization and file parser code into the home page • Implemented POST request to send dataset information to the backend • Designed and filled in Final Poster • Created and filled in my portion of the Final Report • Lead discussion and helped team members get tasks assigned to them for the next couple of weeks • Filled out meeting minutes document and Gitlab for project management 	30	116
Yadiel Johnson	<ul style="list-style-type: none"> • Major testing rework and updates, alongside logic improvements for the entire backend. • Merge request for completed changes on GitLab (issue, issue). • Portions of Section 1: Report and overall development for this weekly report. 	27	136

2 Comments and extended discussion

2.1 Work Planned for Next Week

2.1.1 Collective

The next major step for our project is to continue working on completing the end-to-end process of the website. For the frontend, we need to send the algorithm and source point for the user’s dataset to the backend and we need to integrate the MapBox visualization in as well. On the backend, improvements need to be made to the Algorithm Execution Driver to reduce run-to-run variance that results from JVM- or OS-level scheduling and context switching. Currently, this involves taking the average over n runs, but it will require changes across the stack.

2.1.2 Individual

- Alex Blomquist
 - Continue working on the final report and poster
 - Assist in overall integration of the system and integration testing
 - Begin work on final presentation slides and notes
- Samuel Caldwell
 - Finish implementation of mapbox visualization

- Finish implementation of the results page
- Continue working on the final report and final poster
- Selma Saric
 - Continue updating the meeting minutes document when we meet with our client
 - Update the Gitlab issue board as new tasks come up
 - Create POST request to send user's requested algorithm(s) to the backend and their source point for their dataset as well.
 - Create button within home page to send users to MapBox visualization.
 - Integrate results page into the rest of the website.
- Yadiel Johnson
 - Devise a solution for run-to-run variance using queues for the AED.
 - Complete the Implementation, Testing, and general backend Revisions sections of the Final Report.

2.2 Summary of weekly advisor meeting

In the past two weeks, we have met with our client once and discussed our individual progress on the project. He advised us to create a to-do list and schedule for ourselves to ensure we get our entire project done on time.