Competitive Programming Primer: Milestone 4 Report

Members:

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Advisor and Client: Dr. Raghuveer Mohan (rmohan@fit.edu)

Task matrix:

Task	Completion %	Pedro	Jon	Ivan	To do
Problem Cataloguer	70%	70%	0%	0%	-Update DB -To and from -Add categorization
Database and Website Connection	100%	50%	50%	0%	None
Rework Website UI	70%	0%	100%	0%	Create “World Map”
Visualization of Graphs and Nodes	90%	0%	0%	100%	Better graph algorithm better documentation

- Discussion (at least a paragraph) of each accomplished task (and obstacles) for the current Milestone:
    - Problem Cataloguer:

The cataloguer now has a fully working scraper for Kattis URLs. It can create, save, and update information about a problem, which is stored as a JSON file. The task was greater than initially expected, requiring a variety of new libraries to be implemented as well as a build automation and project management tool. Maven is currently being used as the project management tool, JSOUP handles HTML information (for the scraper), Jackson for JSON translation, and JavaFX for the GUI elements. Given that so many tools were needed for the project, ChatGPT was used to quickly understand how to

implement and use them, but all code was generated and managed by us. We had hoped to also have a connection directly to the database ready for testing at this stage, but unfortunately, just understanding the new libraries and tools took too much time to get to that point.

- Visualization of Graphs and Nodes

  The visualizer can now visualize graphs in such a way that there are not too many overlapping lines and all nodes are non overlapping and on screen that being said sometimes the tool can result in graphs with nodes so far apart the graph gets extremely zoomed out. Also we now have a better form of interacting with the tool where people can input code into a separate file instead of in the middle of the tools code. Lastly we now have a simple reminder file to help give basic instructions for using the tool

- Database and Website connection

  Due to migrating website deployment to Netlify, the website connection just involved installing an extension on Netlify to use the database which we have on Supabase. Once integration was done, I followed the steps required to use the client in the website. Once the website was able to access information on the database, I was able to print out a rough table of all the problems.

- Rework Website UI

  I changed the strategy of creating the website's UI. Instead of doing it the hard way from scratch, I instead opted to use Jekyll themes to make the website look more professional. The new challenge, however, is to integrate the world map cleanly with the new UI.

- Discussion (at least a paragraph) of contribution of each team member to the current Milestone:
  - Pedro Marcet: I spent the entire milestone working solely on the Problem Cataloguer side of the project. The GUI, the Kattis scaper, the JSON files, and all the tools required to get the cataloguer working were implemented and managed by me. I also helped slightly with the database management, but that was mainly given to Jon.
  - Jon Ayuco: I spent the entire milestone working on the website and the database. Since I was granted authorization to the database, I was able to spend time getting

accustomed to the schema of the database, as well as the contents within. Then putting that information onto a new version of the website.
    - Ivan Marriott: I spent the entire milestone working solely on the visualization tool and the documentation for that tool. Now the tool is more user friendly, has documentation, and now it has documentation to help explain how to use it.

- Plan for next milestone

Task	Pedro	Jon	Ivan
Problem Cataloguer	100%	0%	0%
Improved Visualization of Graphs and Documentation	0%	0%	100%
Integrate World Map	0%	100%	0%

- Discussion (at least a paragraph) of each planned task for the next Milestone
    - Problem Cataloguer

The cataloguer is still missing a few key features. Most importantly is the connection to the database. The cataloguer needs to be able to update information on the database (adding new problems, competitions, sample inputs/outputs) from what the cataloguer was locally fed. The connection should also allow for the cataloguer to be updated. If Dr. Mohan were to get a new computer and download a fresh version of the cataloguer, all the problems currently in the database should be downloaded in the correct format for the cataloguer to fully display and be able to edit them. We also need a way for categorization to be implemented. Ideally we would like to have one full competition added and categorized to serve as a sample for Dr. Mohan. Dr. Mohan will also be testing the Problem Cataloguer for feedback.

    - Improved Visualization of Graphs and Documentation

The plan is to implement a better graph visualization algorithm and also provide some examples for using the tool to go in the user guide. Specifically the plan is to use a gradient descent algorithm that treats graph edges like physics

springs and attempts to minimize the overlap of edges. Also we will start the gathering of example visualizations to show as examples for how to use the tool base.

- Integrate World Map:

  Doing the world map integration is two fold. Supporting the front end to have the map of North America be movable and the elements within the map to be viewable, then working on the back end to filter and grab the problems on the database that correlate to the portion of North America being viewed.

- Date(s) of meeting(s) with Client during the current milestone:
  - See faculty advisor meetings below
- Client feedback on the current milestone
  - See Faculty Advisor Feedback below
- Date(s) of meeting(s) with Faculty Advisor during the current milestone:
  - February 20th, 12pm
  - February 23rd, 12pm
- Faculty Advisor feedback on each task for the current Milestone
  - Task 1:
  - Task 2:
  - Task 3:
  - Task 4:
- Faculty Advisor Signature: _____ Date: _____

- Evaluation by Faculty Advisor
    - Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Pedro	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Jon	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Ivan	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

    - Faculty Advisor Signature: _____

    - Date: _____