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Final Project Proposal

We intend to create a program that visualizes exercise data and suggests new routes for the future. The program will be multifaceted, allowing users to input data from completed runs in order to obtain an interesting visual of their runs, bike rides, or other exercises on the one hand, while simultaneously allowing them to input a starting point and desired distance in order to obtain a new route to take in the future. In this project, we will broadly explore topics including mapping, data visualization, graphical user interfaces, and optimization problems. We may also tackle areas of interest such as machine learning, but have yet to decide how or whether to include these in our project. Currently, we will acquire and parse gps data from users in order to construct maps of routes, build a database of routes by scraping websites such as Strava, and create a visual of those routes, which may not necessarily be a simple map, for our minimum viable product. We have set one of our stretch goals at the ability to suggest a non-overlapping route that starts and stops at the same point and is unlike the last route taken by a given user.

Our learning goals for this project are as follows:

Daniel Connolly→ I hope to gain greater experience working on data visualization and optimization problems. I would like to continue to work on my ability to work with a team on programming projects.

Raquel Dunoff → Make a cool app that is fun to interact with and easy to use.

Lydia Hodges → Learn more about what machine learning entails and how to do it, and develop more skills in team programming.

Implementation Plan:

At the moment, we plan to utilize GMPlot, the Google Maps API, and Strava in order to create a map and visuals of our routes. As we continue to look into the libraries and modules that could be used to implement this project, however, our plans have been consistently evolving in terms of which to utilize. To begin, we will work on data collection and analysis before moving onto the more intensive problems of visualizing the data and optimizing route suggestions.

Project Schedule:

- Week 1: Install necessary libraries, complete research about how to implement and accomplish this project.
- Week 2: Create database of routes and have basic mapping of routes up and running.
- Week 3: Refine maps, tackle visualizing the routes in other ways, begin working on suggesting routes.
- Week 4: Refine visualizations and emphasize optimizing route suggestions
- Week 5: Finish route suggestions, add to and refine the program and user interface.
- Week 6: Clean up the code, complete documentation for the project, and present.

Collaboration Plan:

Currently, we intend to utilize a group chat to communicate when we are unable to meet in person. As we proceed into the project, we will break the project up into components in order for each team member to contribute to different parts of the project based on their interests and may meet to try pair programming at times. In terms of the actual code, we will work to improve our git skills by utilizing GitHub branches to divide up different elements of the project and learning to better deal with merging files.

Risks:

The greatest risks we face include our interest levels in the project, our ability to motivate ourselves to work on the project regularly, and our ability to effectively schedule times to work on the project individually and to meet as a team. We have all run into problems with the scoping of our projects in the past, and thus we hope that we have adequately scoped this project. We believe our minimum viable product is quite achievable and expect to have a significant amount of time to add more interesting and exacting details to the program.

Additional Course Content:

We believe that we could benefit from the class covering optimization problems and data visualization strategies and libraries in greater detail.