LetsEat Technical Summary

Technical Innovation

The main technologies that will be used in our project are React, FastAPI, MySQL, and Scikit Learn. React library will be used to develop the frontend, FastAPI will be used to host the web server and send data to React frontend, MySQL for the storage of user information and answer choices to questionnaires, and finally Scikit Learn for the machine learning portion. The novel part of our restaurant recommender is that it provides a <u>single</u>, <u>personalized</u> recommendation instead of a long list of restaurants based on basic filters. Our competitors Yelp and OpenTable don't suggest restaurants based on atmospheric characteristics and don't provide single recommendations based on a machine learning algorithm. LetsEat will take out the time consuming searching part and suggest the best restaurant based on the user's preferences and the occasion through the machine learning algorithm.

Key Objectives

The key objectives for this project would be to deliver a fully functioning full-stack application with a working frontend web application along with a backend with all the key components including a database for storage of user information, a machine learning model trained and able to give predictions on restaurant data, and security set up to prevent any potential attacks exposing the website and/or user information.
Questions that must be answered include:
  - How secure will the user forms and user data be?
  - Will the machine learning model be able to give accurate and quick suggestions?
  - How can we integrate the React frontend with the Fast Api backend to send and receive data of the user forms?
  - How do we plan on improving the model as we gather more data?
  - How will the user-base be built and how will retention of users be accomplished?

Technical Feasibility

React and Fast API have a lot of online documentation and YouTube tutorials that will help us in cases where we are technically blocked. Team members of our group also have experience with the tools in case any of us need help.

Costs, Risk and Risk Mitigation

The development cost in terms of hardware is none, as our project and the backend component specifically are entirely software-based. For the machine learning side, the expectation is that there will be a working machine learning model to deliver suggestions with relatively-low confidence scores by the end of December (first semester). After that, it may take an additional semester to fully refine the machine learning and web server code so that it is optimized and running as quickly as possible. For lines of code, the estimation for the entire project would likely be about 1,000 - 1,500 lines of code on the frontend, while the web server and machine learning side would be closer to 300 - 400 lines of code because that code is more concise.