Project Proposal

Group Membership

Rishit Desai

- Skills: Java, Python, JavaScript, a little bit of SQL, HTML, CSS
- Tasks: Focus on ML Models, but will be contributing to other aspects as well

Varun Krishnaswamy

- Skills: Java, Python, JavaScript, Node, SQL (little), HTML
- Tasks: Front End React + ML, help with back end if needed, want to focus on React

Richard Zhang

- Skills: Javascript, Java, React, Node, Express, MongoDB, Python, Django
- Tasks: Work with the database and integration of model to database and back-end servers

Project Goals

Our focus is improving the IRS's prediction model and integrating it with real-time data. However, before beginning on any improvement, we must accomplish two things: 1) research alternate prediction models and 2) ensure the current version is working. The current version of the Intelligent Review System (IRS) does not work as the backend endpoints execute with errors when run through the console. To set up the IRS to be ready for improvements, we must ensure the project can be run without errors. This will be accomplished through debugging and fixing errors and unit testing on the original project.

After researching different prediction models and fixing the current repo, we will then work on the development and improvement of the linear regression model of the IRS. The model will produce real-time data about the user's input to certain questions to be sent to a live database. Different models may be employed to compare its prediction accuracy on questions to be rereviewed for the student to the current linear regression model. After experimenting on the best models, we will finally choose the best performing model and integrate it with the current backend and frontend servers.

Timeline

Project Timeline Checkpoints	
Week 4	• Proposal Drafting and Planning
Week 5-7	• Research on alternate prediction models • Getting the existing repo running • Understand original database structure
Week 7(8)-10	• Work on development of backend models + real time data updates - backend endpoint • Research testing methods
Week 11-15	• Test machine learning models for accuracy

	● Compare prediction models ● Ensure that new data is written into the database and utilized by our prediction models
Week 16	● Finish project presentation

Project Description

Problem and Ideas of Research:

We aim to improve the prediction model behind the IRS by first fixing the current version of the project and experimenting with alternate prediction models.

The current model utilizes a linear regression model with the duration as a feature, and such a model predicts the probability of getting a question correct. However, we think deploying a more complex model would make more accurate predictions.

Proposed Solution:

Through this project, we will be identifying which ML model will produce the most accurate result efficiently. We will research multiple models, such as linear and logistic regression, decision tree, cluster, and neural networks.

From there we will analyze the outputs to come to a conclusion. To best analyze the results of each model, we will use the existing ITS database and our own testing parameters to see which model works best.

Later, we will be connecting with a real-time SQL database through AWS Services to update our databases as students use the ITS system. The data that is produced through the user interactions will then populate the database. We can then use the update data to make our model more accurate.

Implementation and Tools:

- Collaboration: Github/Teams
- Front End: React
- Machine Learning + Back End: Python
- Data processing: Python + SQL server run through AWS services.