VIP-ITS-Spaced Repetition System

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What is ITS for VIP?

- ITS is a web-based Q+A system which provides problem-centered exercises and enhances student's conceptual understanding.

- ITS system looks like a course textbook and it can track student's problem solving proficiency in terms of concepts. For example, there are math courses example in the ITS system.

- There are former projects for ITS: ChatGPT, GPT Chatbot, textbook summarization, spaced repetition system

What is Spaced Repetition System for ITS?

- The spaced repetition system was implemented spaced repetition algorithm which works on leveraging spacing effect that optimizes and strengthens
- The spaced repetion algorithm works on four key components: retrievability, stability, difficulty, grade
- The spaced repetition algorithm is used to want next review to be when retrievability is at 90%. We can have 90% chance of succesfully recalling a card
- Used with virtual flashcard system. It's used to have cabilities to track card, can create ordering of cards, and can schedule optimal future review session

The existing code on Github for Spaced Repetition System

- The whole program is mostly developed in Java code
- The code includes spaced repetition algorithm which can work on flashcard's review for retrievability, stability, difficulty, grade
- The code includes HashMap which can store cards as an ordered collection.

Current Project's Goal for Spaced Repetition System

- need to tune up spaced repetition algorithm to predict optimal study time
- Create a flashcard program with basic spaced repetition
- Create a database which stores multiple sets of cards
- Formulate a plan of action for data collection to improve spaced repetition algorithm

How it works for Current project?

- Need to research methods for spaced repetition algorithm using Java code

- Need to implement flashcard program using React code

- Need to create a SQL database to store data of cards

- After creating the database and then tuning up the algorithm as we merge everything together.

- Need to use Github for group sharing code

Ideas for Creating a Database

- For the SQL database, we need to make SQL server connect directly to React App through JavaScript
- Make Java code read in the json file, create insert statements, and then append sql file which contains insert statements
- For the database, not need to pick data from the textbook

Idea for improving Algorithm

- The weightage Points:

(a)we can make each question begin with a set weightage points which change when the user gets right question or wrong question

(b)the wrong question increases weightage point

(c) the right question loses weightage point

- We can assume a user gets the wrong question and then the algorithm predicts an exponential growth

Idea for Flashcards

- Need to primarily focus on refining the difficult selection of the flashcards and the repetition to users based on difficulties generated

- We can group flashcards by difficulty topic:

(a)since the flashcard's difficult level can be adjusted with each topic, the less data should be gathered

(b)the users can track progress with their areas of study

(c)we can add a "topic" attribute to each card object

(d)the creation of flashcard should include topic for each card

- We need to update difficulty for flashcard:

(a)we need to update difficulty of a card's topic based on user's performance

(b)we need to calculate performance with user's performance provides a more stable estimate of user's proficiency in that topic

- we need to update code about difficult topics which will be included in flashcard program, need to figure difficult topic

- Then we can create database which store difficult card's information from falshcard program

Current Work for Project

- Haved used React code to create an inital web page
- Haved installed Node.js on local computer and tested React code and then run web page using Node.js command prompt
- The React code also includes CSS and JSX. CSS is a code which is used to style and layout web page. JSX is a syntax extension to JavaScript. It can be used with React to describe what UI looks like.
- Haved installed XAMPP on local computer and we can access MySQL and phpMyAdmin using XAMPP, then it can work with React code

Next Step for Project

- We need to complete flashcard program which can go with algorithm code

- we need to create SQL database that creates tables to store user's and flashcard's information, like user ID, last name, first name, card topic ID, and card topic.

- We need to research how to import database from sql file into React code