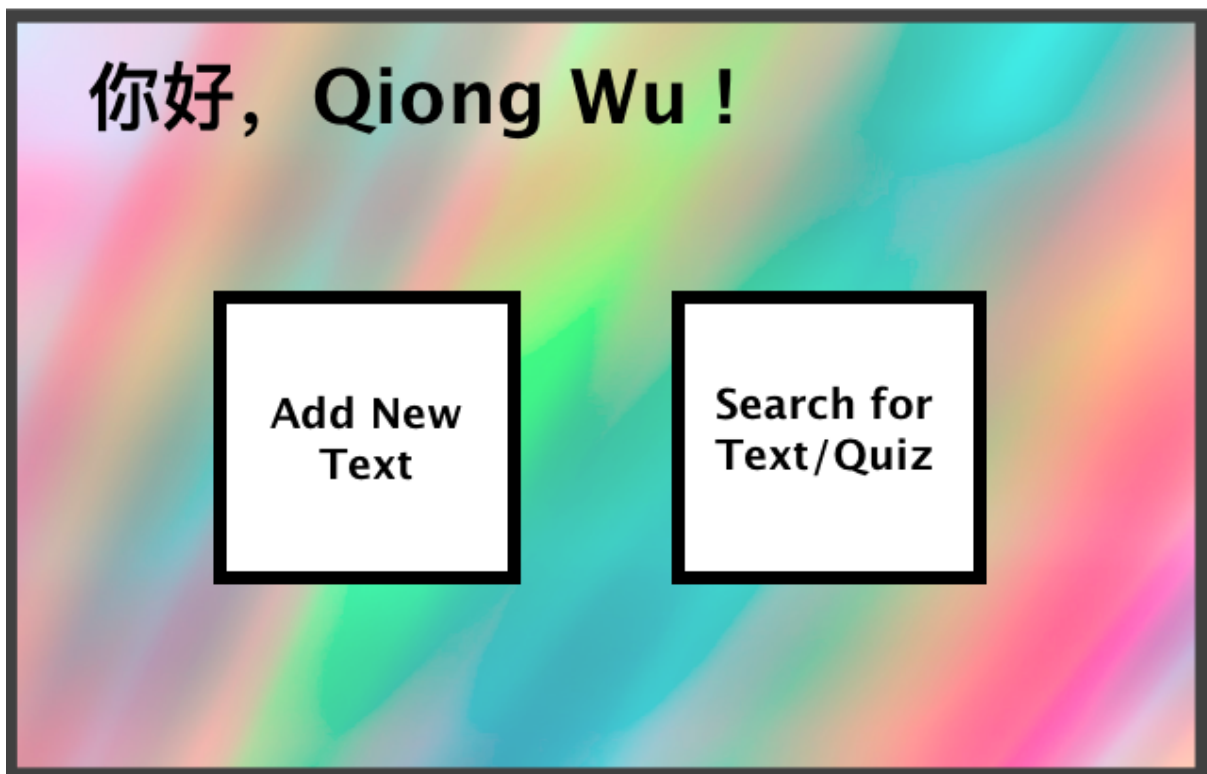


Criterion B: Design

Initial Screen Designs:

These are the screen designs that I put together to show how the screens will look like to my client and the events that occur if the user were to click certain buttons. Below are the screens in chronological order starting with the Home Screen.

Home Screen



This is the screen the user would see when they first run the application. There are 2 button options to choose from. If the user clicks 'Add New Text', below is what they would see on their screen.

FileUpload Screen

Upload a New File, 传一个文件:

Title of Text:

Browse:

Paste New Text:






Store Text


If user clicks 'Browse' to find a file to upload, below is what they would see on their screen.


Choose a File // 选你想用的文件


Look in :


Macintosh HD ▼



 Applications

 Downloads

 Desktop

 Chinese

File Name:

File Type:

Open

Cancel

After choosing a file, If User clicks the blue 'Open' button, their text would be shown in the text box underneath the 'Browse' button. Below is what would the user sees after uploading their file.

Upload a New File, 传一个文件:

Title of Text:

Browse:

Paste New Text:

这本书的男主人公叫李明，他是一名16岁的中学生。他的父母对他非常的严厉，要求他每门科目都考到班级的前三名。除此之外，李明还必须参加很多课外活动。他根本没有时间交朋友，也没有时间做他自己想做的事情，所以他觉得压力非常的大，心情十分的沮丧。

Store Text

If the user were to click 'store text' button, the text uploaded/pasted would be stored in the 'texts' database table. After that the text would be analyzed and they would be taken to the screen below.

AnalyzeText Screen

Text Difficulty:

Words from text that match Chinese word database (User will be able to add, delete or edit words)

Add Word here

Easy

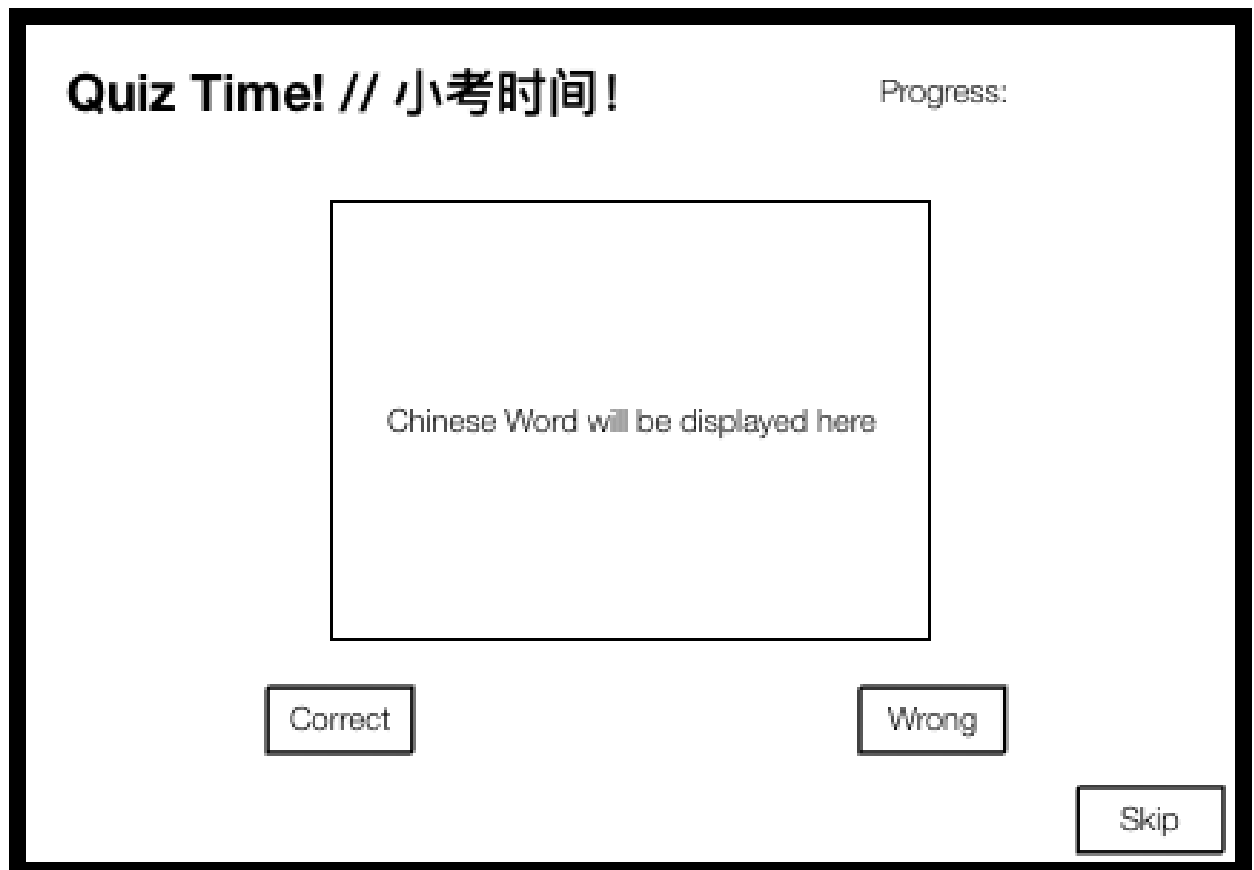
+

-

Play Quiz

On the left-hand side of the screen, the difficulty of the text would be displayed (easy, medium, or hard). On the right-hand side of the screen, in the large box, the words from the uploaded file that match the HSK Chinese word database will be printed. The box in the bottom right corner with the text ‘*Add Word here*’ is for the user to type in a Chinese word of their preference to the table for it to be tested in the quiz. The box next to it which has the text ‘easy’ in it, is for the user to select the difficulty of the word between easy, medium, and hard. The ‘+’ and ‘-’ buttons are for the user to either add or delete words from the table, respectively. If the user then clicks the ‘Play Quiz’ they would be taken to the screen below.

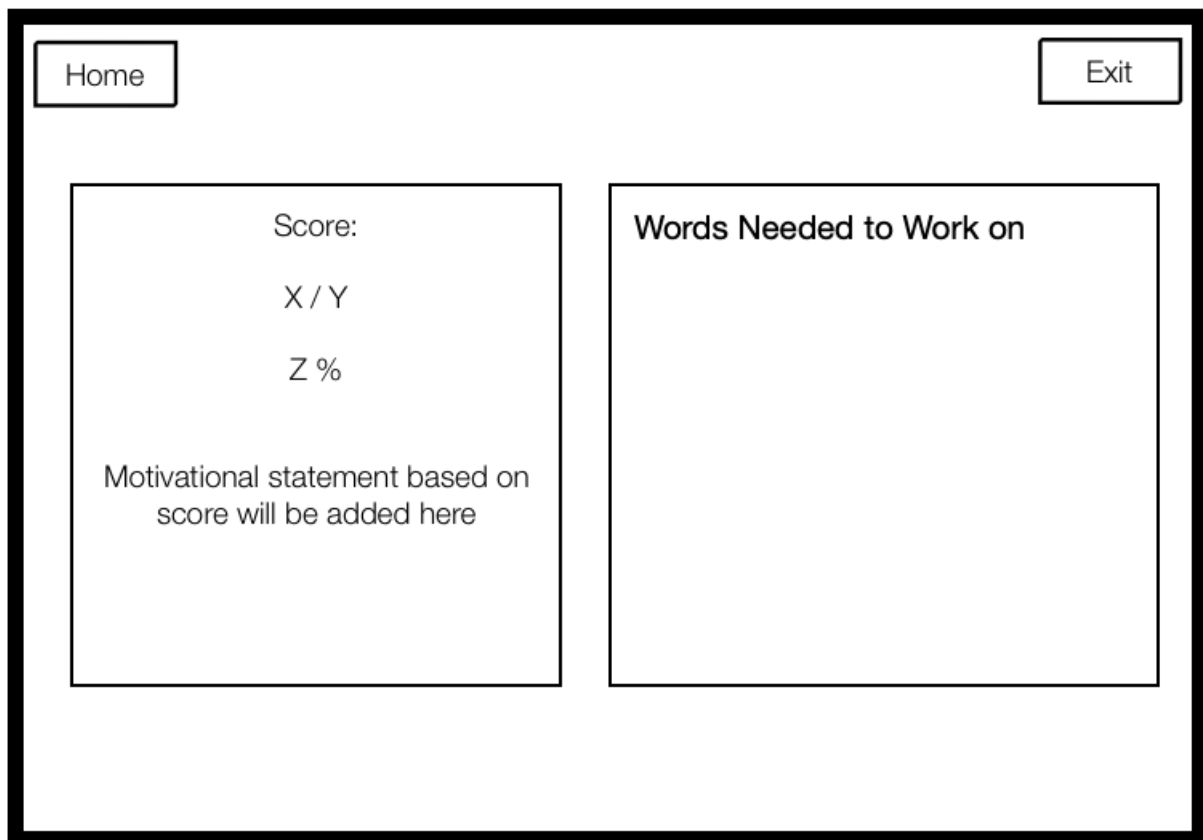
Quiz Screen



The Quiz Screen interface is enclosed in a thick black border. At the top left, the text "Quiz Time! // 小考试时间!" is displayed in a bold, black font. At the top right, the text "Progress:" is shown in a smaller, grey font. In the center of the screen is a large, empty rectangular box with a black border. Below this box, the text "Chinese Word will be displayed here" is written in a grey font. At the bottom of the screen, there are three buttons: "Correct" on the left, "Wrong" in the middle, and "Skip" on the right. All buttons have a black border and a light grey background.

Once the user finishes the quiz, the screen below will appear where the user would see their score, percentage of the score, as well as a motivational statement that is based on their score percentage. They would also see a list of words that they would need to work on.

QuizEnd Screen

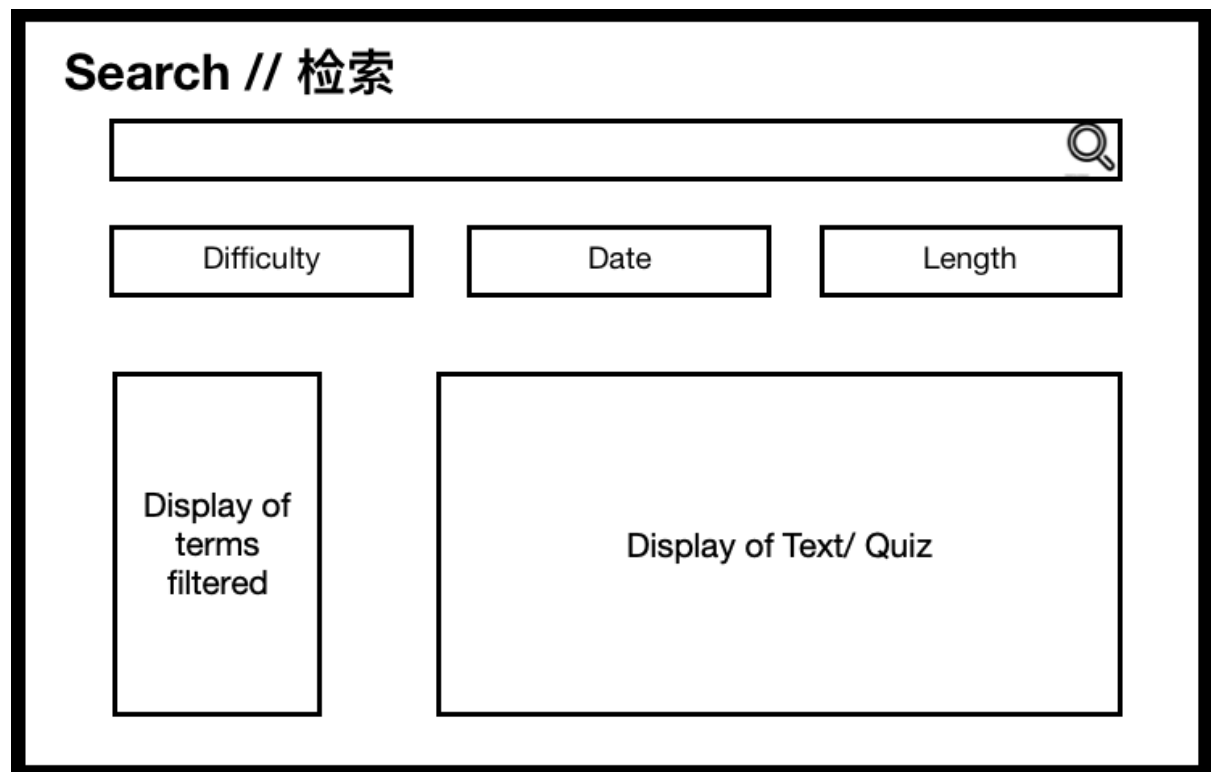


The QuizEnd Screen is a rectangular interface with a thick black border. At the top left is a button labeled 'Home' and at the top right is a button labeled 'Exit'. Below these buttons are two large rectangular boxes. The left box contains the text 'Score:', followed by 'X / Y', then 'Z %', and finally 'Motivational statement based on score will be added here'. The right box contains the text 'Words Needed to Work on'.

| | |
|---|--------------------------------|
| Home | Exit |
| <p>Score:</p> <p>X / Y</p> <p>Z %</p> <p>Motivational statement based on score will be added here</p> | <p>Words Needed to Work on</p> |

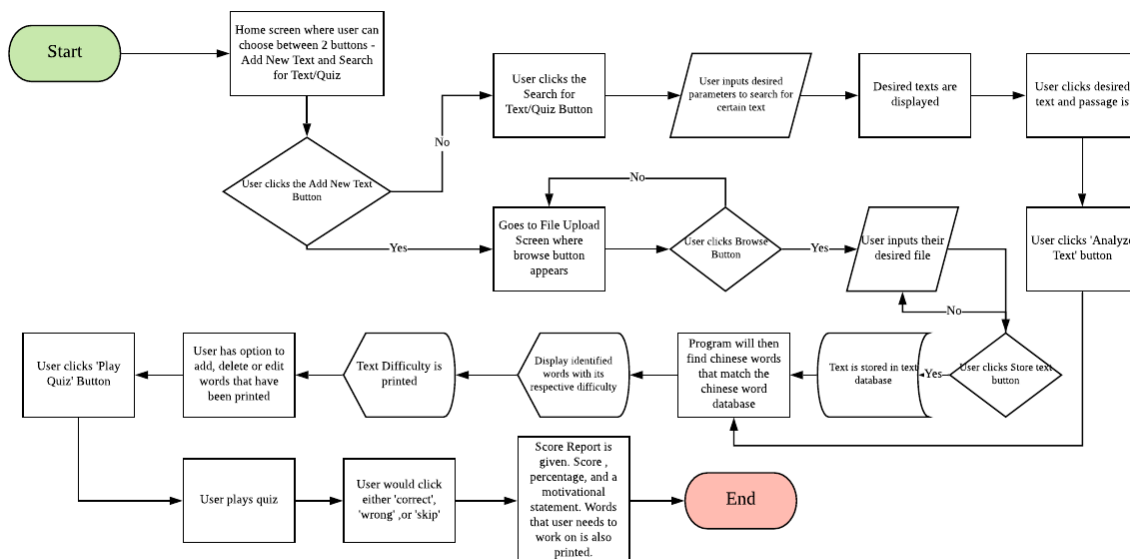
If the user presses either the 'Home' or 'Exit' button, it would return them back to the Home Screen. On the home screen, if the user this time were to click 'Search for Text/Quiz' the screen below will appear.

SearchFor Screen

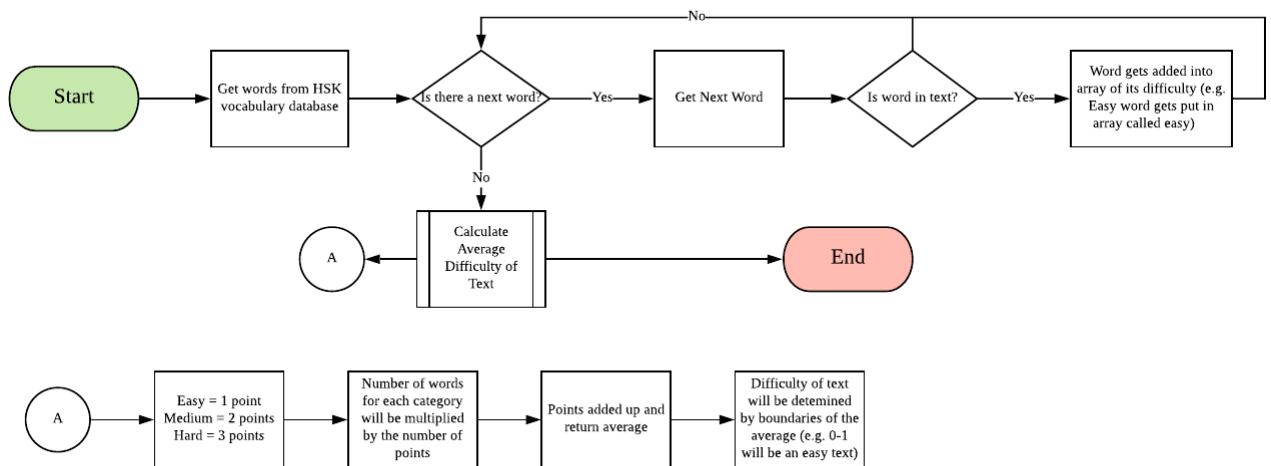


Data flow diagrams:

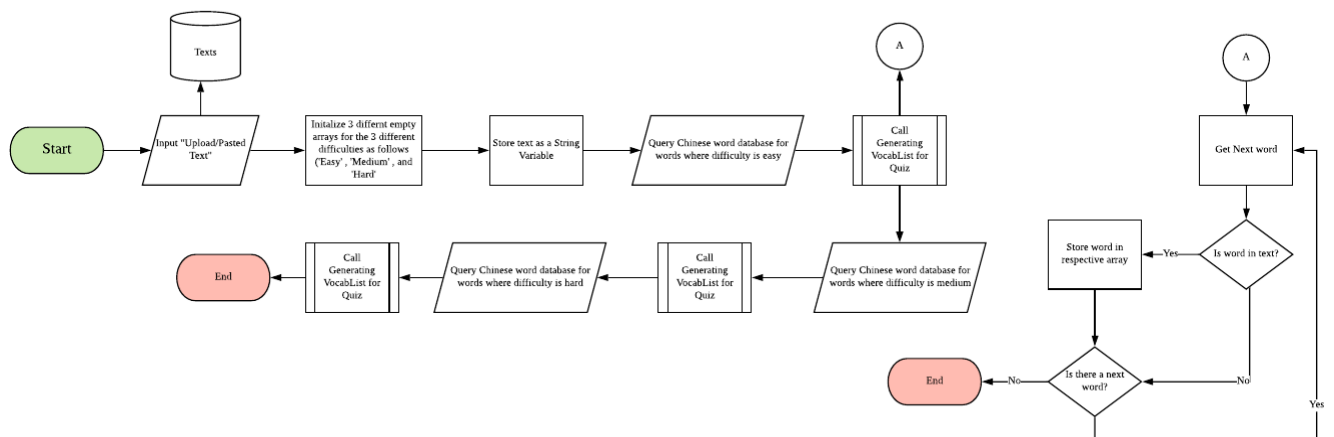
Systems Flowchart for Application



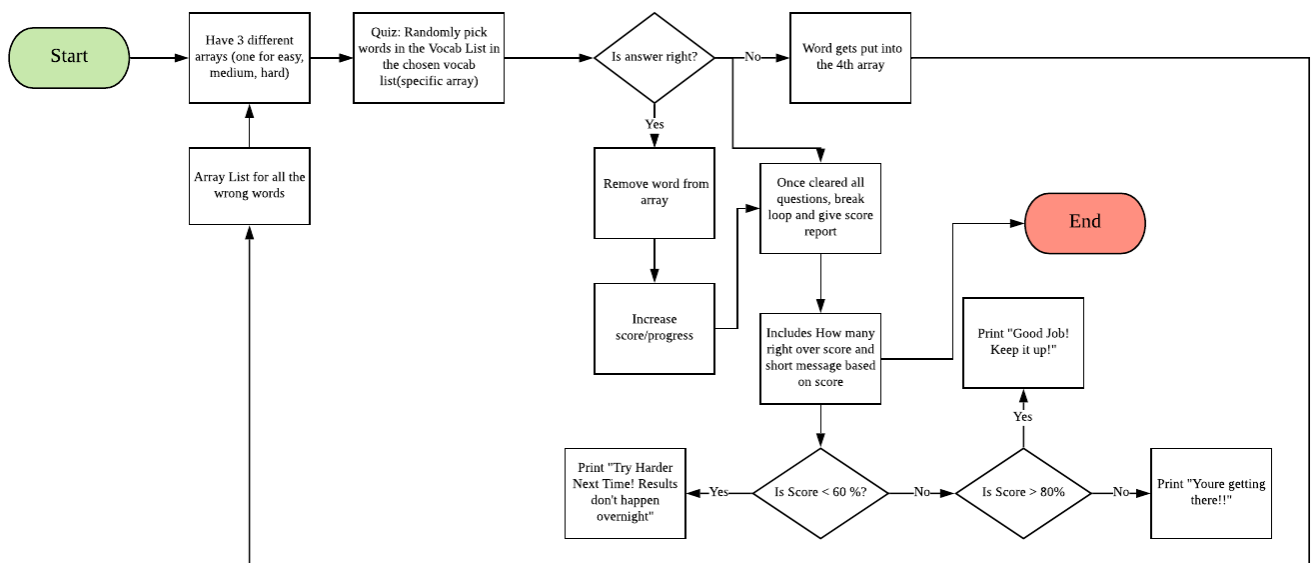
Algorithm Flowchart for Analyzing Text



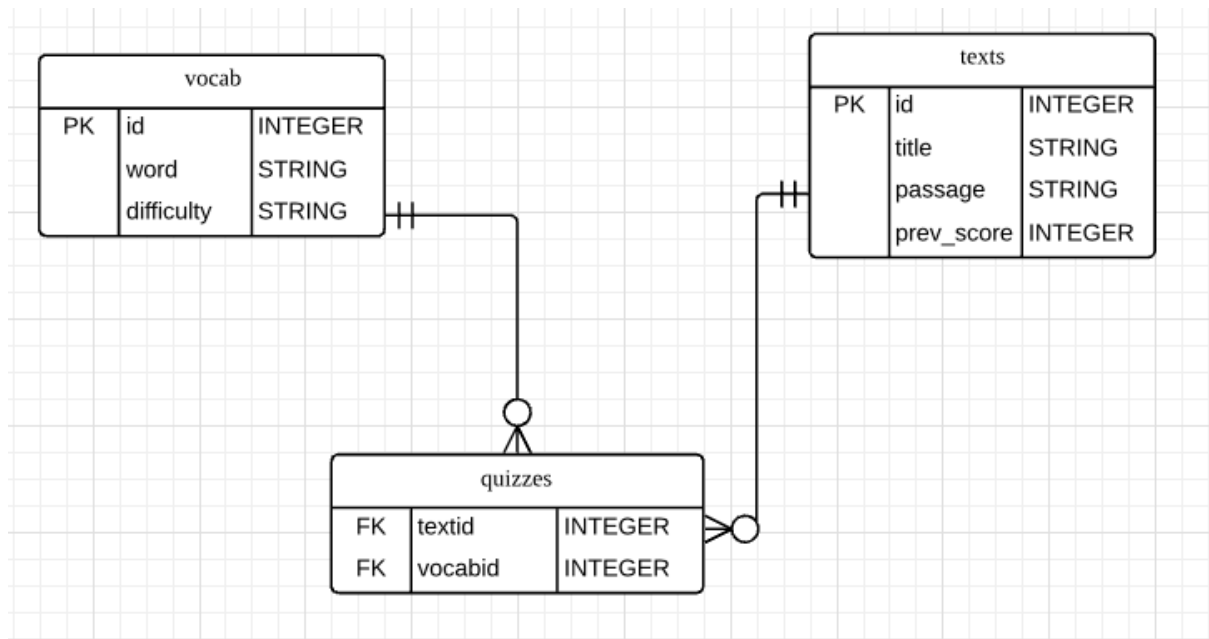
Algorithm Flowchart for Creating Quiz and Storing Text



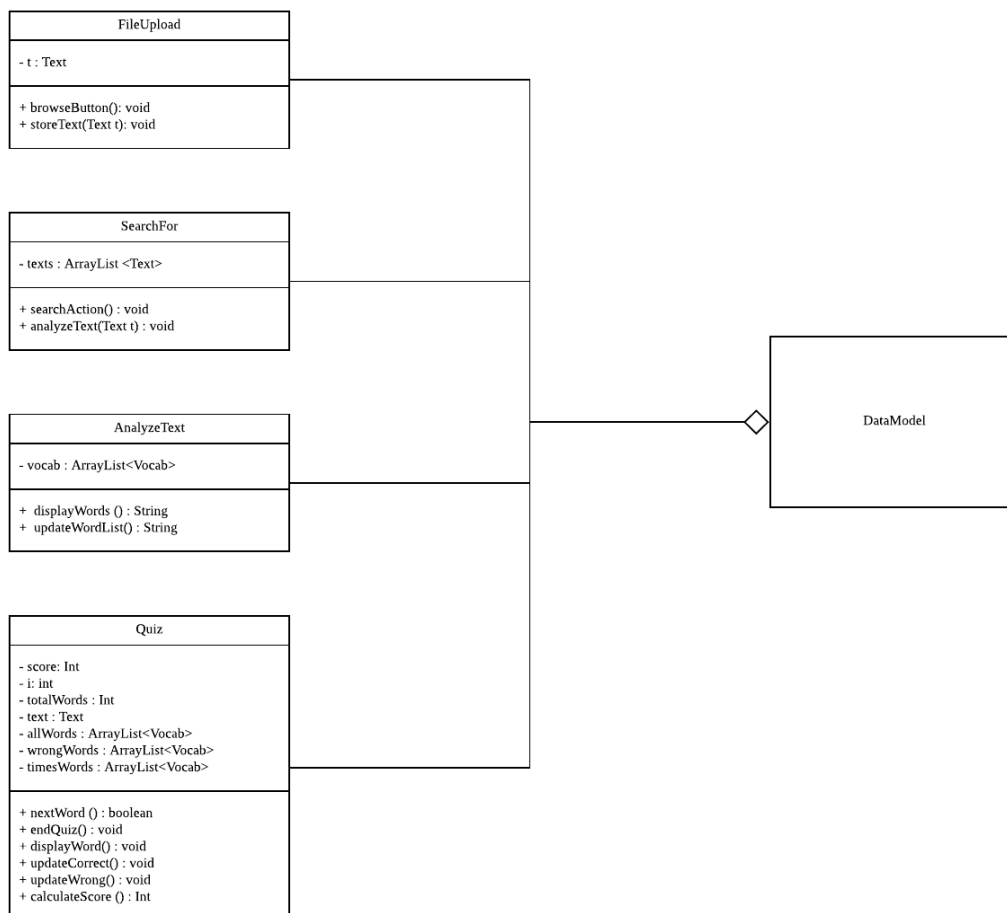
Algorithm Flowchart for Quiz



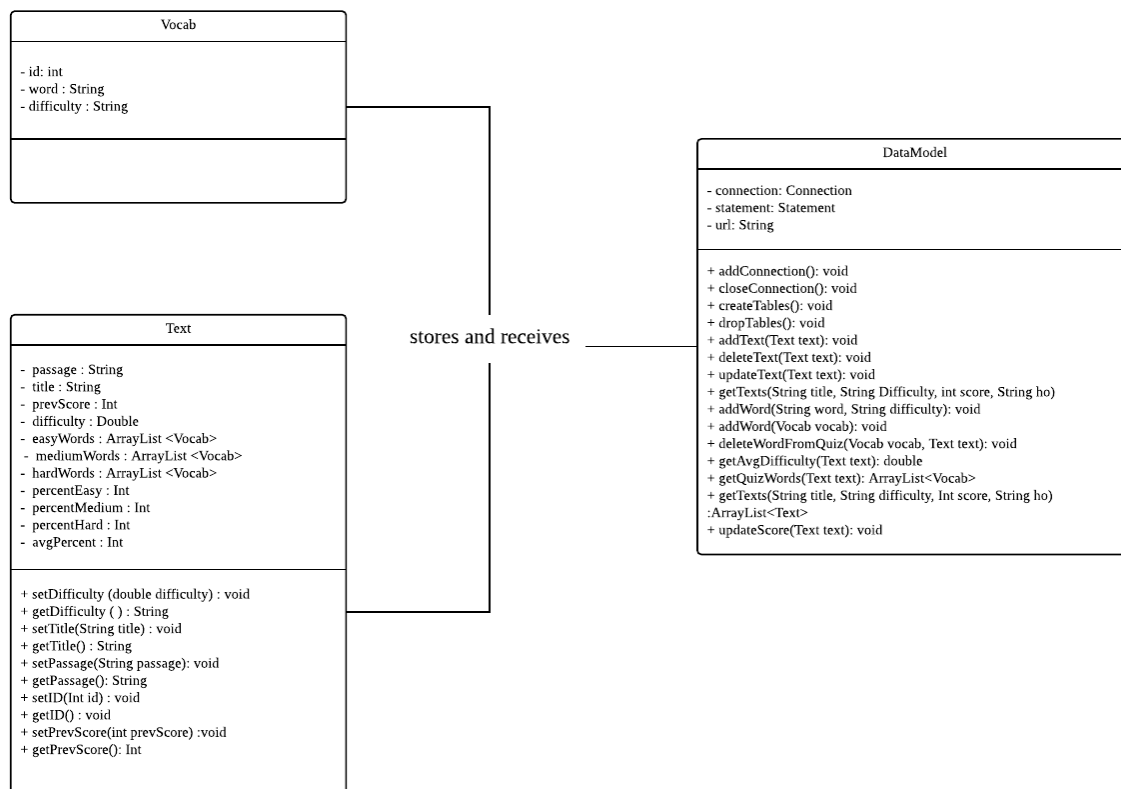
Entity Relationship Diagram



Front-End UML Diagram



Back-End UML Diagram



Class Functionality:

1. **DataModel** - This class establishes connection with database and contains methods to carry out SQL commands that interact with database tables.
2. **FileUpload** - This class takes in the text object and interacts with certain methods from the DataModel class.
3. **SearchFor** - This class interacts with certain methods from the DataModel class to search for Text objects.
4. **AnalyzeText** - This class takes in text and vocab objects and interacts with certain methods from the DataModel class.
5. **Quiz** - This class represents the quiz object class and contains the states and behaviors for each respective quiz object.
6. **Text** - This class represents the text object class and contains the states and behaviors for each respective text object.
7. **Vocab** - This class represents the quiz object class and contains information for each respective vocab object.

Data Validation:

| Input | Requirement | Validation |
|------------------------|-----------------------------------|--|
| Passage in Texts table | Needs to be a Chinese word | If user uploads a text that has english words, program would show a pop up message saying, 'please put a Chinese text'. |
| Title in Texts table | Has to be unique | If user names their uploaded text the exact same name as another text that has been stored in the 'texts' database table, pop up message will appear saying, "There already is a text with that name. Please input another name." |
| Word in Vocab Table | Needs to be a unique Chinese word | <ul style="list-style-type: none">- If user puts english word in text field for the 'addWord' button, pop up message will appear saying, 'Please input a unique Chinese word in the text field'.- If user puts a Chinese word that is exactly the same as one in the 'matched' words list, pop up message will appear saying, 'Please input a unique Chinese word in the text field'. |

Data Structures :

ArrayLists:

ArrayLists are data structures that store a collection of data of the same data type. They do not have a fixed size unlike Arrays but are useful for programs whereby data is manipulated. With that being said, I plan to use Array Lists for various classes. In the Text class, I plan to have 3 separate Array Lists for each difficulty - easy, medium, and hard. These Array Lists would interact with the Array List 'vocab' in the AnalyzeText class. The 'vocab' Array List in the AnalyzeText class would be stored in the 'allWords' Array List in the Quiz class. Words that are wrong in the quiz would be put in the 'wrongWords' Array List and depending how many times the word gets wrong, the number of times the word has been gotten wrong, the number would be stored in the 'timesWrong' Array List.

With these behaviours occurring in the program, the use of Array Lists are the best data structure due to it not having a fixed size. Every text that is uploaded will have different amount of words, and therefore a different amount of 'matched' words (words from the uploaded text that match with the HSK Chinese word database) that can be tested in the quiz. This means that after a text is analyzed, the number of 'matched' words that will be stored in the respective difficulty Array Lists (easy, medium, hard) in the Text class would be different. Therefore, an Array List is needed to be used as it does not have a fixed size unlike an Array. In addition, the total number of 'matched' words will also differ from each text. When playing the quiz, students will also get a different amount and number of words wrong.

The amount of data that would be stored in these Array Lists will not be the same every time, and will not be static. If I were to use arrays, I would be unsure of a certain number that the amount of data could reach to set the size of the arrays so that I could store all the data in the respective arrays. Furthermore, if an Array were to be used, some 'matched' words may not be able to be stored in the Array and thereby will not be tested in the Quiz. This may lead to not only hindrance of the program but also to the students learning as they are being tested on fewer words.

Data structures (with base tables):

Vocab Table

| ID (Integer) | Word (String) | Difficulty (String) |
|--------------|---------------|---------------------|
| 1 | 爱 | Easy |
| 2 | 报纸 | Easy |
| 3 | 兴奋 | Medium |
| . | . | . |
| . | . | . |
| . | . | . |
| . | . | . |
| . | . | . |
| . | . | . |
| 2525 | 骄傲 | Hard |
| 2526 | 自觉 | Hard |
| 2527 | 作品 | Hard |

Texts Table

| ID (integer) | Title (String) | Passage (String) | Prev_Score (Integer) |
|--------------|----------------|---|----------------------|
| 1 | Health 1 | 无意间，他发现了一款很好玩的电脑游戏。他觉得只有在打游戏的时候才能释放他全部的压力。渐渐的，他离不开电脑游戏了，成绩一落千丈，父母对他非常的失望。 | 80 |
| 2 | Travel 2 | 患上了很严重的抑郁症，他甚至想过自杀。班主任老师发现了这个秘密，于是建议他的父母带他去专业机构找专家来帮助他调节他的情。我要与你分享这个故事是因为我们和李明的情况非常像，我们都是中学生，面临很多的压力和父母的期望。 | 94 |

| | | | |
|-----|------------|---|----|
| | | 如果无法处理这些负面情绪，我们也很容易出现问题。所以我希望我们引以为戒，调整好自己的情绪，学会与压力共处。 | |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| 223 | Pressure 4 | 这部电影的男主角是一名才学兼优的男孩，名叫明华。明华与一名脾气很不好的女孩子谈恋爱，这个女孩子叫丽丽。大家都不明白为什么那么聪明的男孩会跟那么没礼貌的女孩子在一起。但是，明华觉得丽丽很可爱，对他也很温柔。每天放学后，他们会一起去附近的图书馆学习。 | 93 |

Quizzes Table

| TextID (Integer) | VocabID (Integer) |
|------------------|-------------------|
| 1 | 3 |
| 1 | 663 |
| 1 | 224 |
| . | . |
| . | . |
| 7 | 34 |
| 7 | 23 |
| 7 | 53 |

Test Plan for Application:

| Test Criteria | Test Criteria Description | Test Method |
|---------------|--|---|
| A | <ul style="list-style-type: none"> - User is able to click 'browse' button and therefore is able to either paste a text or browse computer's files for a document | Test is successful if user is able to see desired text in the text box. |
| B | <ul style="list-style-type: none"> - User is able to click 'store text' button | Test is successful if text is stored in 'texts' database and words from text that match database are printed in list. |
| C | <ul style="list-style-type: none"> - User is able to click add or remove button as well as type out desired word and select its difficulty | Test is successful if user is able to add or delete words from the list. |
| D | <ul style="list-style-type: none"> - User is able to click 'Search for Text' button and Search for a text or quiz. | Test is successful if user can type in the name of the text or selecting different parameters given such as difficulty, date and length and their desired result is printed. Also, if user were to click on a filtered result, it would be displayed for user to read before confirming that they want to use that specific result. |
| E | <ul style="list-style-type: none"> - User is able to click 'Play Quiz' button and program brings user to quiz | Test is successful if program brings user to 'Quiz Time' Screen and word from the quiz is shown. |
| F | <ul style="list-style-type: none"> - User is able to progress through quiz and click 'correct', 'wrong', or 'skip' buttons | Test is successful if progress bar increases slightly every time user clicks the 'correct', 'wrong', or 'skip' button. |
| G | <ul style="list-style-type: none"> - User should get tested on every wrong word again | Test is successful if when user gets a word wrong, after another 2-3 different words, that wrong word appears again and this cycle repeats until that word is 'correct'. |

| | | |
|----------|--|--|
| H | <ul style="list-style-type: none">- User should get a score report after completing the quiz | Test is successful if score report includes the score out of the number of questions attempted, percentage and a motivational statement based on the score. User should also have a list of words that they need to work on. |
|----------|--|--|

Words: 0