
Neo Si Hao - Project Portfolio for CS2103/T Revision Tool (RT)

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1. Introduction

This portfolio provides an overview of the CS2103/T Revision Tool and highlights my contribution in the project including a brief description of the key features that I implemented.

1.1. *The Team*

Our team of 5 consists of 2 Year 4 Engineering Science students, a Year 4 Industrial & Systems Engineering student, a Year 3 Communications & New Media student and a Year 2 Computer Science / Business student.

1.2. *About the Project*

This 7-week project was started as part of NUS' Software Engineering (CS2103/T) module. The team was required to to either morph or enhance an existing application ([Address Book - Level 3¹](#)). Our team decided to morph the project into the CS2103/T Revision Tool (RT) a desktop quiz application which allows users to create customised question banks and attempt the quizzes in an interactive manner. The user interacts with it using a CLI, and it has a GUI created with JavaFX. It is written in Java, and has about 14 kLoC.

UI of the Configuration Mode.



UI of the Quiz Mode.



¹ <https://github.com/nus-cs2103-AY1920S1/addressbook-level3/>

2. Summary of contributions

- **Major enhancement:** added **short answer questions functionality to the application**
 - What it does: allows the user to answer questions that are open ended in nature.
 - Justification: This feature improves the product significantly because a user can add and answer questions that cannot be formatted in MCQs or TrueFalse questions style.
 - Highlights: This enhancement required an in-depth analysis of external Natural Language Processing (NLP) libraries to analyse the user input to determine whether the user answered the SAQs correctly. The implementation was challenging as String processing is required and many edge cases had to be taken into account as user could input anything as the answer.
 - Credits: StanfordCoreNLP Library and FuzzyWuzzy Library
- **Minor enhancement:** helped with minor UI enhancements to display different types of questions correctly.
- **Code contributed:** view my code contributions [here](#)²
- **Other contributions:**
 - Documentation:
 - Added FAQs to user guide
 - Added all the user stories for the project to the developer guide.
 - Community:
 - Reviewed and merged PRs
 - Tools:
 - Integrated a third party library, StanfordCoreNLP and FuzzyWuzzy, to the project

²

<https://nus-cs2103-ay1920s1.github.io/tp-dashboard/#search=neoshh&sort=groupTitle&sortWithin=title&since=2019-09-06&timeframe=commit&mergegroup=false&groupSe>

3. Contributions to the User Guide

Given below are sections I contributed to the User Guide. They showcase my ability to write documentation targeting end-users.

3.1. Adding SAQ: *add*

Adds a SAQ to the question bank

Format: ``add type/saq q/QUESTION cat/CATEGORY diff/DIFFICULTY y/CORRECT_ANSWER ...``

The following are the valid answer formats for SAQ:

SAQ: Multiple correct answers, no wrong answers.

Examples:

- `add type/saq q/what does UML stands for? cat/cs2103 diff/1 y/unified modeling language`

NOTE:

Answer to the SAQ cannot be "exit".

Answer cannot appear in the question

(eg. `q/What is UML diagram? y/UML Diagram`).

3.2. Hints *[coming in v2.0]*

User will be able to get hints for MCQs and SAQs. Typing 'hint' for MCQs will eliminate two wrong answers from the options, leaving user with two options, one of which is correct. Typing 'hint' for SAQs will show the user random keywords from the correct answer list.

3.3. Pictures/Diagrams *[coming in v2.0]*

User will be able to upload pictures and diagrams as part of the questions when adding questions to the test bank.

3.4. FAQ

Q: How do I transfer my data to another Computer?

A: Install the app in the other computer and overwrite the empty data file it creates with the file that contains the data of your previous question bank folder.

Q: Why am I not able to click on the options to select the answers for MCQs and T/F questions?

A: The options are there as a way to show the users the options available. As this is a CLI application, the main input will be through keyboard inputs.

Q: Can I use this application for another module?

A: Yes you can. This application is designed to store any types of MCQs, T/F and SAQs.

Q: I want to challenge my friends using this application, how can I do it?

A: There is no online support for the application right now. One way you can challenge your friend is to prepare the same json files and load it up to your individual computers and do the quiz together.

4. Contributions to the Developer Guide

Given below are sections I contributed to the Developer Guide. They showcase my ability to write technical documentation and the technical depth of my contributions to the project.

4.1. Saq feature

How Saq works

The Saq input mechanism is facilitated by `SaqInputCommand`. It extends `Command` and execute the `CommandResult`. The input will be parse into `SaqInputCommandParser` to check for input validity. If the input String is not valid (i.e the String does not start with a letter of number), an invalid command parse exception will be thrown, indicating to user that the input String requires a letter or a number at the start of the String.

If the input is valid, `SaqInputCommand` object of type `Command` will be created. The `execute` command of the `SaqInputCommand` object will be executed. The `execute`

command will call the `isCorrect` method of `Saq` to check if the user input is correct or not.

The activity diagram below shows the steps the user takes to answer an SAQ.

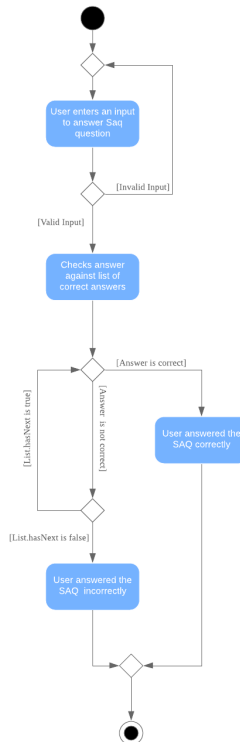


Figure 1. Activity Diagram of checking answer for SAQ

NLP Libraries

External libraries were used to determine if the user input is correct or not. `stanfordCoreNLP` library was used to check for sentimental value of user input and the list of correct answers. This helps to check for negative sentence against a neutral or positive sentence (eg. "not a uml diagram" and "it's a uml diagram"). The `Fuzzywuzzy` library was also used to determine the similarity percentage of the user input to the correct answer using fuzzy string matching technique.

The class diagram below shows the relationship between the classes that are used to validate the correctness of the user input.

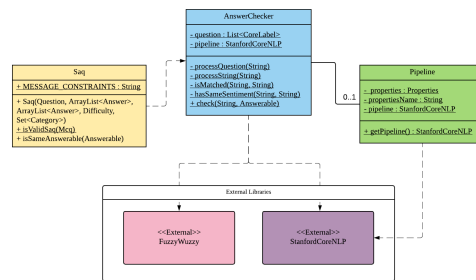


Figure 2. Class Diagram of SAQ Answer Checker

Validating the answer

The execute method will return the CommandResult, correct or wrong. The currentAnswerable of type saq will call its isCorrect method and return a boolean value, true for correct answer and false for wrong answer. The sequence diagram below shows the steps taken by the isCorrect method to determine if the user input is correct or wrong.

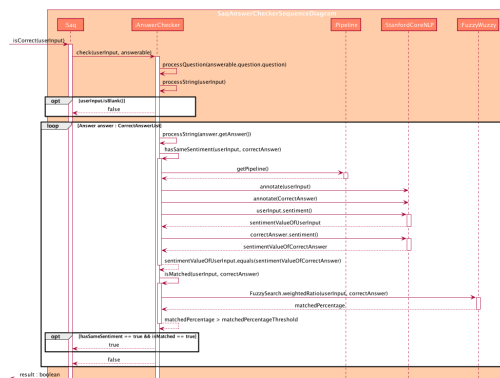


Figure 3. Sequence Diagram of SAQ isCorrect Method

4.2. User Stories

Priorities: High (must have) - * * *, Medium (nice to have) - * *, Low (unlikely to have) - *

Priority	As a ...	I want to ...	So that I can...
* * *	lazy CS2103 student	refer to the revision tool solely for my consolidated module revision	do not have to refer to Luminus
* * *	CS2103 student	have a personalised application to store all my questions and answers in one place	refer to it conveniently for revision.
* * *	CS2103 student	have a revision tool to test my coding skills and concepts through writing short codes	test myself on coding proficiency too.
* * *	CS2103 student	keep track and see how	gauge my level of progress in

Priority	As a ...	I want to ...	So that I can...
		much progress I have made in completing the questions	completing the syllabus.
* * *	vim-using CS2103/T student	use the keyboard-based commands	further increase my efficiency
* * *	busy CS2103/T	use quick revision tools	learn using spaced-retrieval
* * *	busy CS2103 student	mark certain concepts as easy	will not have to spend as much time studying the easy concepts.
* * *	CS2103 student with a lot of things on my mind	mark certain questions that I am unsure of	refer back to the question when I am free.
* * *	CS2103 student	import questions from my peers	study on my own.

Priority	As a ...	I want to ...	So that I can...
* * *	conscientious CS2103 student	ask the questions I am unsure of	raise them up during tutorials.
* * *	indecisive student	be recommended questions instead of me having to plan my own study plan	go directly to studying
* *	competitive CS2103 student	at least know where I stand among my cohort	look at who is the next person I can beat.
* *	gamer CS2103/T student	accomplish tasks that give me a sense of achievement, preferably through in application rewards	I feel good.

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Priority	As a ...	I want to ...	So that I can...
* *	A+ CS2103 student	review and give suggestions to improve the application	benefit more CS2103 students.
* *	CS2103 student	port this application over to my other modules	revise for my other modules using this application as well.
* *	unorganized CS2103 student	get reminders about my quiz deadlines	complete my quizzes on time
* *	organized CS2103 student	schedule reminders to remind me when I should use the application to do revision	will not forget to do revision.
* *	user of the application	get an estimate of my final grade for CS2103	know what to expect on result release day.

Priority	As a ...	I want to ...	So that I can...
* *	CS2103 peer tutor	use this as a form of teaching tool	teach better
* *	CAP 5.0 CS2103 student	show off my IQ by perfecting my test scores	motivate other students.
* *	CS2103 student	view the questions/ topics that most students answered wrongly	revise for those topics.
* *	visual oriented student	the app to have different colours as compared to the regular black and white	learn better
* *	non-motivated CS2103 student	use the application to remind me to study	I will study

Priority	As a ...	I want to ...	So that I can...
* *	student that wants shortcuts	type a partial command and have it be auto-completed	I can save time.
* *	CS2103 student new to Git	have a help function which lists all the commonly used Git commands	become more proficient with Git.
* *	master software engineer taking CS2103	be able to access the source code	to make the application better and customise it for myself.
* *	CS2103 student	get recommended a list of questions that I frequently get wrong	learn from my mistakes
*	lonely CS2103 student	have someone to talk to, even	I won't feel lonely

Priority	As a ...	I want to ...	So that I can...
		if it's a computer	
*	CS2103 student who keeps having stomach ache	the application to tell me where the nearest toilet is	go and shit

