

# AlgoSenpai - Developer Guide

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## 1. User Profile

### 1.1. Target User Profile

- Wants to improve concepts in data structures and algorithms
- Wants to become faster at answering questions
- Dislikes learning concepts theoretically
- Prefers elements of fun in their learning
- Finds VisuAlgo boring, repetitive, and tedious to use

## 2. Value Proposition

Offer a more time efficient, and fun platform to learn and practice data structures and algorithms.

## Appendix A: Extras

### A.1. User Stories

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

Priority	As a ...	I want to ...	So that I can...
* * *	New User	See a summary of the commands available in the program	Have a brief idea of how to navigate through the program

Priority	As a ...	I want to ...	So that I can...
* * *	New User	Start the game	Start learning concepts immediately
* * *	New User	Pause the game	Pause the game and save the current quiz records
* * *	New User	End the game	See the results for the current quiz
* * *	New User	Go back to the previous question	Review the question and change my answer if necessary
* * *	New User	Skip to the next question of the game	Move on to other questions that I am more confident in to avoid spending too much time on a single question
* * *	New User	See the results of the previous games I have played	Can see a tangible improvement in my quiz scores
* * *	Weak User	Choose to attempt the game only on a certain chapter	Work on my weaker areas
* * *	New User	Continue the game which I have previously ended off with	Save time on trying to find out where I last ended off
* * *	User	Have an undo button	Reverse my actions if I typed the wrong command

Priority	As a ...	I want to ...	So that I can...
* *	User	Share and spread this game to my friends	Invite them to learn together
* *	Average User	Get feedback on my performance	Identify my common misconceptions and work on those areas
* *	User	Provide feedback to developers	Give them suggestions on what they can improve on
* *	User	Receive notifications and reminders to complete a few games a day	Be more consistent with my learning
* *	User	Experience a storyline	Learn in a less boring manner
* *	Weak User	Have visual aids for the questions	Understand the topic better
* *	Weak User	Have an explanation for any wrong answers	Learn faster from my mistakes
* *	Strong User	Have a time limit	Challenge myself to perform better
* *	Strong User	Have an arcade mode	Challenge myself to see how proficient I am in a topic
* *	Weak User	Have a multiple choice option rather than open-ended	Practice on my concepts before attempting harder questions

Priority	As a ...	I want to ...	So that I can...
* *	User	Have a reset option	Replay the game if I'm done with the storyline.
*	Weak User	Clarify certain concepts with a virtual agent/chatbot	Build a stronger foundation
*	User	be challenged every time I play the game	improve incrementally as I play it more
*	Advanced User	Get updates whenever the program has new levels	Keep up with the game and maintain my rank
*	User	enjoy playing the game	Have fun as I learn
* * *	Tutor	Track my students' progress	Cater my teaching style according to the weak chapters.
*	User	Customise my own questions [coming in v2.0]	Test myself on questions I know I'm weak at.
*	User	Choose which character to play in the game [coming in v2.0]	Vary the experience I have in every game
* *	Tutor	See which students are in dire need of help [coming in v2.0]	Focus more attention on weaker students

Priority	As a ...	I want to ...	So that I can...
*	Tutor	Set my own questions [coming in v2.0]	Test my students' understanding on the current topic
*	Tutor	Set my own storyline [coming in v2.0]	Make assignments more enjoyable.

## A.2. Use cases

(For all use cases below, the System is **AlgoSenpai** and the Actor is the **Student**, unless specified otherwise)

### Play through a story

1. User launches the game
2. System starts and displays a welcome message
3. User requests for the list of available stories
4. System displays the list of stories
5. User chooses a story to play
6. System starts displaying questions from the story
7. User enters an answer
8. System displays the next question
9. User enters an answer
10. Steps 8 - 9 repeats until the game is over
11. System shows the result and returns to the main menu

### Extensions

- User enters an invalid command/answer.
  1. System shows an error message and prompts the user to input a valid command
  2. User inputs a new command
  3. Steps 1 and 2 repeats till the user has entered a valid command

### UC01: Have a summary of commands

1. User enters the **menu** command
  - System displays a list of commands

Use case ends.

## **UC02: Start quiz**

1. User enters the **start** command
  - System displays the first question of the quiz

Use case ends.

## **UC03: Pause quiz**

1. User enters the **pause** command
  - System pauses the ongoing quiz

Use case ends.

## **UC04: End quiz**

1. User enters the **end** command
  - System exits user from the current quiz and shows him/her the results

Use case ends.

## **UC05: Revisit attempted questions**

1. User enters the **previous** command
  - System displays the previous question

Use case ends.

## **UC06: Move to the next question**

1. User enters the **next** command
  - System displays the next question

Use case ends.

## **UC07: View the history of the attempted quizzes**

1. User enters the **history** command
  - System displays the results of all the quizzes attempted by the user

Use case ends.

## **UC08: Attempt quiz of a topic**

1. User enters the **chapters** command

- System displays the list of chapters
- User enters the number corresponding to the topic he/she would like to attempt
- System displays the first question of the selected chapter

Use case ends.

### **UC09: Resume quiz**

1. User enters the **resume** command
  - System displays the next question from the uncompleted quiz

Use case ends.

### **UC10: Undo my answers**

1. User enters the **undo** command
  - System the previous action done by the user

Use case ends.

### **UC11: Share this game with my friends**

1. User enters the **share** command
  - System displays the social media platforms for the user to choose from
  - User selects one
  - System displays a pop up message "This will be opened in a separate window, do you wish to continue? Y/N"
  - User enters "Y" (If user accidentally entered "N", he/she will be redirected to the menu)
  - User then selects the contact he/she wishes to send the invite to

Use case ends.

### **UC12: Get review on my performance**

1. User enters the **review** command
  - System displays the review generated by a virtual agent

Use case ends.

### **UC13: Provide feedback to developers**

1. User enters the **feedback** command
  - System displays "A separate window will be opened, do you wish to continue? Y/N"
  - User enters "Y" (If the user accidentally enters "N", he/she will be redirected to the menu)

- A google form window is opened for the user to fill up

Use case ends.

## **UC14: Receive remainders for quizzes**

1. User enters the **settings** command
  - System displays the settings menu
  - User enters the timing(s) he/she would like to receive the reminders under the "reminder" window
  - System will display a pop-up reminding the user to complete the quizzes at the specified timings

Use case ends.

## **UC15: Get help**

1. User enters the **help** command
  - System displays the help menu

Use case ends.

## **UC16: Learn through animations**

1. User enters the **settings** command
  - System displays the settings menu
  - User clicks on for the animation section
  - System turns on animations and returns to the quiz

Use case ends

## **UC17: View explanations for wrong answers**

1. User enters **help** command
  - System displays the help menu
  - User clicks on "explanation" and enters the question number he requires explanation for
  - System displays the explanation for the selected question

Use case ends

## **UC18: Set time limit**

1. User enters **settings** command
  - System displays the settings menu
  - User inputs a number under the time limit section



Use case ends

### **UC19: Have a quest to complete**

1. User enters **quest** command
  - System displays the list of quests available

Use case ends

### **UC20: Have MCQ instead of open-ended ones**

1. User enters **mode** command
  - System displays the mode menu
  - User clicks on "MCQ"

Use case ends

### **UC21: Have a reset option**

1. User enters **reset** command
  - System clears all existing answers
  - System displays the first question of the current quiz

Use case ends

### **UC22: Clarify concepts with an agent 24/7**

1. User enters **help** command
  - System displays the help menu
  - User opts for a live agent
  - System starts a live chat with a live agent

Use case ends

### **UC23: Share my highest score with my friends**

1. User enters **history** command
  - User enters **share** command
  - System displays the social media platforms for the user to choose from
  - User selects one
  - System displays a pop up message "This will be opened in a separate window, do you wish to continue? Y/N"
  - User enters "Y" (If user accidentally entered "N", he/she will be redirected to the menu)
  - System displays a default post on the selected social media platform

- User can type his/her own caption and proceed to upload it

Use case ends

## **UC24: Print the quiz to pdf**

1. User enters **print** command
  - System converts file to pdf and proceeds with the command

Use case ends

## **UC25: Listen to music during the quiz**

1. User enters **settings** command
  - System displays settings menu
  - User selects a playlist
  - System starts to play the playlist and returns back to the menu/quiz

Use case ends

## **UC26: Archive difficult questions**

1. User enters **help** command
  - System displays the help menu
  - User clicks on "archive"
  - System automatically archives the question the user is on

## **UC27: Take screenshots of the students' results**

Actor: Tutor

1. User enters **screenshot** command
  - System automatically saves the screenshot into the user's hard disk

Use case ends

## **UC28: Interact with characters in the game**

1. User enters **interact** command
  - System displays the list of users who are online
  - User selects another user and a chat page pops up

Use case ends

## **UC29: Refer to the algorithms**

1. User enters **settings** command
  - System displays the settings menu
  - User selects "algorithm" option

Use case ends

### **UC30: Choose an answer verbally**

1. User enters **settings** command
  - System displays the settings menu
  - User selects "microphone" option

Use case ends

## **Non-Functional Requirements**

- The application should work on any mainstream OS with Java 11 installed to run the game.
- The computer should have a minimum of 320 by 300 screen resolution for the game to display.
- The computer should have soundcards and audio speakers for the game music to play.
- The computer should have a minimum of Intel I3 dual core processors for the game to run without notable sluggish.
- The user should be able to read, understand, and write English to complete the storyline in the game.
- The computer should have minimum 4GB of RAM to load the game.
- The user should be at least 16 years of age due to mature content.