Sequence Recall: Chimp Test Adventure

Project Proposal Team Cyborg

Section: EQ8

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I. Introduction

Professor Tetsuro Matsuzawa of Kyoto University's Primate Research Institute, as part of a lecture, touched upon the test where chimpanzees would be shown numbers in random locations of a screen, which would then be replaced by squares for the monkey to press in order. Studies showed that young chimpanzees were able to perform better than human adults in performing this task (Kasprak, 2016).

The proposed Chimp Test Game would be a Java-based cognitive skills assessment tool inspired by the classic psychology experiment. It challenges users' short-term memory and attention span by presenting them with sequences of items and asking them to recall the order. This program allows the evaluation of people's cognitive skills in specific fields, such as education or psychology. The necessary skills are able to be assessed and improved, as they enhance cognitive skills while also providing valuable information that researchers can use.

The importance of this project is that understanding and evaluating cognitive skills is crucial in various fields such as education, psychology, and neuroscience. The Chimp Test Game provides a user-friendly and accessible platform to assess and improve these skills in an interactive and engaging manner. It offers a fun way for individuals to challenge and enhance their cognitive abilities while providing valuable data for research and assessment purposes.

The primary goals of this project are:

1. Create an engaging and user-friendly digital platform for assessing cognitive skills.
2. Develop a tool that progressively challenges users' short-term memory and attention span.
3. Implement a timer and scoring system to measure and track users' performance.

The traditional methods of assessing cognitive skills can be time-consuming, labor-intensive, and may not always provide real-time feedback. Additionally, existing digital assessment tools may lack user-friendliness and engaging interfaces. The Chimp Test Game addresses these issues by offering an interactive, accessible, and fun way to evaluate and improve cognitive abilities.

The scope of this project will encompass:

- Main game interface with instructions and level selection
- Progressive difficulty levels.
- Timer and scoring system integration
- Random sequence generation.
- Basic analytics for research and assessment purposes

Some constraints of this project will be the compatibility of common web browsers and adherence to accessibility standards for inclusivity.

II. Methodology

The approach to developing the sequence recall training application involves several key phases. Firstly, an in-depth analysis of project requirements will be conducted, encompassing user stories and functionalities, along with the definition of necessary technical specifications and technologies. Following this, the design and architecture phases will commence, focusing on creating an intuitive user interface and establishing a database schema. Additionally, plans for random sequence generation algorithms and a system for tracking user progress and performance will be outlined.

Moving on to the development phase, the front-end interface will be constructed using Scene Builder or JavaFX, with interactive elements implemented through JavaFX for sequence presentation and recall. Simultaneously, the back-end logic will be developed to handle user input, scoring, and difficulty progression. A timer and scoring system will also be integrated for accurate measurement of user performance. Subsequently, extensive testing will be conducted, including unit testing to ensure individual components function as expected, integration testing to verify interactions between modules, and user testing for usability and to identify potential issues.

In the deployment phase, basic analytics may be integrated to collect data for research and assessment purposes, with careful consideration of privacy and data protection regulations. Visual aids, including IPO diagrams, flowcharts, and UML diagrams, will serve as valuable references throughout the development and testing phases, ensuring a smooth and functional implementation. The project will progress through major milestones, starting with the requirements and design phase, followed by the development, testing, deployment, and user testing phases, and optionally culminating in the implementation of user accounts and analytics components. The proposed architecture encompasses SceneBuilder and JavaFX for the front-end, Java for the back-end, and algorithms for random sequence generation. The timer and scoring system will be seamlessly integrated into the back-end logic to provide accurate performance metrics.

III. Deliverables

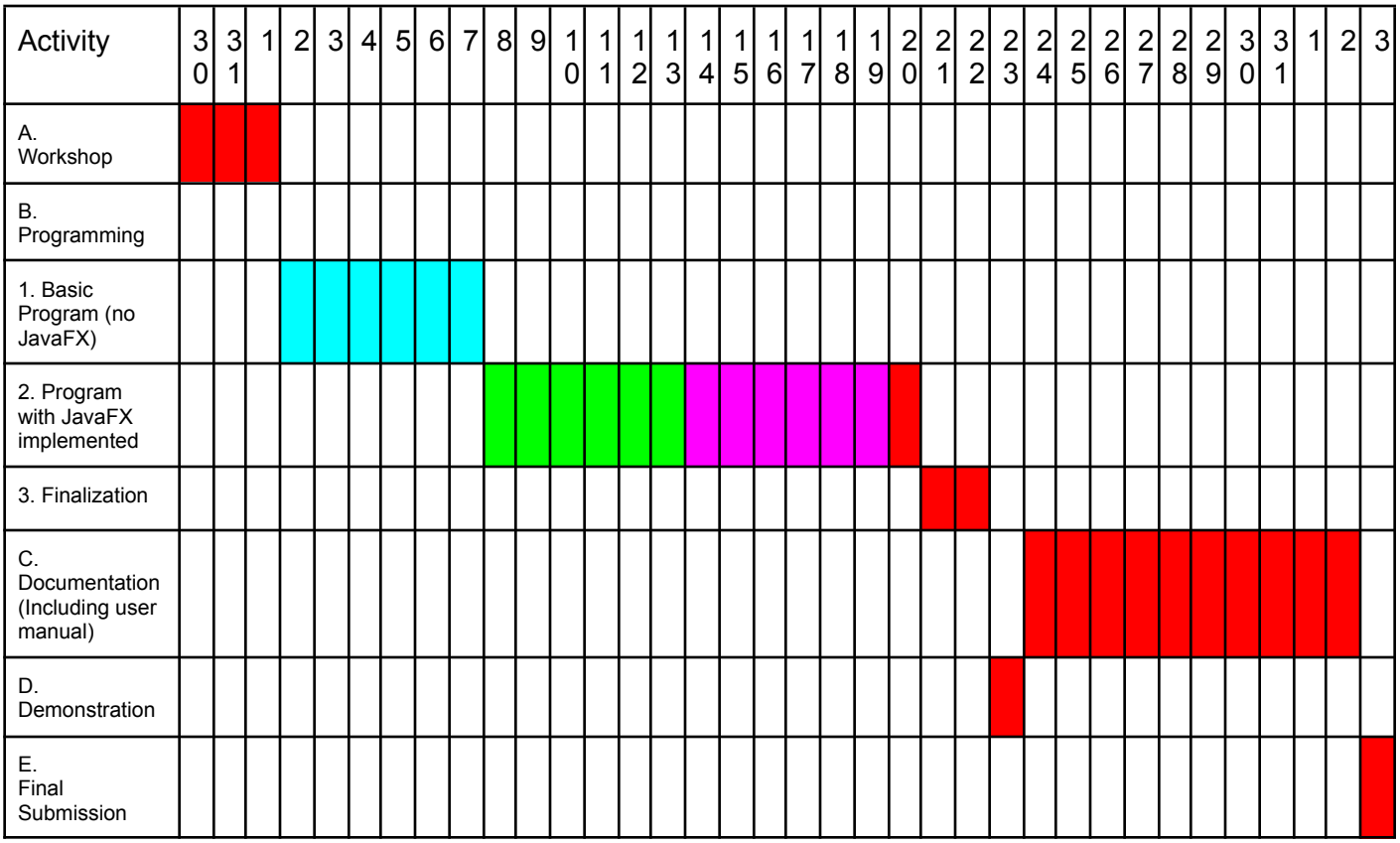
A. Program
The JavaFX project would be compressed into and submitted as a zip file.

B. User Manual
Along with the java program of the game, a user manual would be provided. Said manual would contain instructions on how to navigate the program as well as how to play the game. It would also contain descriptions of each part of the game in order for the user to have a better understanding.

C. Documentation
After the completion of the program, a paper on it and how it came into fruition would be prepared and turned in as well.

Below is a gantt chart that serves as a timetable for the activities that would be accomplished throughout October 30, 2023 to December 3, 2023.

Gantt Chart



RED = ALL BLUE = ELLAR GREEN/PURPLE = LIM and ROLDAN

IV. Evaluation

To effectively assess and enhance user engagement with the cognitive assessment game, a multifaceted approach is recommended. Key metrics include tracking the average session duration and number of sessions per user, as they serve as indicators of sustained interest and involvement. Evaluating the accuracy and recall rate of sequences aids in gauging cognitive performance. Monitoring the progression of difficulty levels is crucial to ensuring that users are appropriately challenged, reflecting the value they derive from the game. Gathering user feedback through ratings and comments provides valuable insights into satisfaction levels

and the game's effectiveness as an assessment tool. Furthermore, retention rate is pivotal in determining if users find the game engaging over time. If user accounts are implemented, the completion rate becomes an important metric, measuring user commitment to finishing the assessment. Performance analytics, if integrated, offer invaluable research insights in cognitive psychology. Ensuring accessibility across various devices and browsers, as well as adhering to accessibility standards, is vital for broad user reach. Regularly addressing reported bugs and errors maintains a seamless user experience. In instances involving user accounts, privacy and data protection measures must align with regulatory standards to foster trust. Finally, optimizing load times and overall performance is paramount for an optimal user experience.

V. Conclusion

The cognitive assessment field has significantly benefited from The Chimp Test Game. It provides an interactive and engaging platform to assess users' short-term memory and attention span by taking inspiration from the well-known psychology experiment. In order to evaluate cognitive abilities, which are critical in a variety of fields including education, psychology, and neuroscience, it is necessary to have readily available tools that are also simple to use. Traditional cognitive assessment techniques may take a long time, require a lot of work, and do not always provide immediate feedback. The Chimp Test Game fills this gap by providing a digital solution that is intuitive, progressive in difficulty, and incorporates a timer and scoring system for accurate performance measurement. Its randomized sequences prevent pattern memorization, ensuring a fair and accurate assessment. Overall, this project serves as a valuable tool for evaluating cognitive skills in an engaging and accessible manner, making it relevant and impactful in educational, clinical, and research settings.

VI. References

Kasprak, A. (2016, September 4). Chimpanzee rapidly memorizes, locates numbers on a Screen. Snopes. https://www.snopes.com/fact-check/chimpanzee-rapidly-memorizes-locates-numbers-on-a-screen/?fbclid=IwAR3Gw3nT9UV9YXK7kdYbI6J1fgKgqqdv6HTEQ424e-miw5D0GTmtf3CsZg4