ABSTRACT

Digital puzzle games have evolved into useful tools for enhancing a person's critical thinking skills while also providing a competitive environment through features that show who is leading.

The objective of this research is to create and implement an HTTP protocol-based leaderboard system for the 8-Puzzle game using the Linear Congruential Generator (LCG) algorithm, which will produce varied and random puzzle arrangements.

Back-end system is built using the PHP programming language for processing CRUD operations of real-time player scores and data. To ensure responsive and secure data transfer for leaderboards, HTTP methods; GET, POST, PUT, and DELETE are used to communicate and send data between the client and server. To measure the ease and satisfaction of users in using the system, the System Usability Scale (SUS) method is used.

The results of the implementation and testing show that the system can perform various important functions. This includes shuffling puzzles using LCG, storing and displaying scores in real-time, and creating an interactive leaderboard.

Black box testing shows that the system features function as desired in all tested scenarios. The average score of the SUS questionnaire is 81.5 or grade A, indicating that the system's usability level is very good. It can be concluded that the development of the HTTP-based leaderboard system for the 8-puzzle game successfully increased competition, provided a higher level of game difficulty, and improved user satisfaction during the game.

Keywords: *Leaderboard, 8-Puzzle, HTTP, Linear Congruential Generator, System Usability Scale*