BEAT THE LOGIC: APPLICATION AND GAMIFICATION OF BOOLEAN ALGEBRA THROUGH A SIDE SCROLLING ROLE PLAYING GAME WITH LEARNING PROGRESS ANALYTICS

THESIS

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ABSTRACT

ARCA, JOSHUA MIGUEL Q., FALGUI, ALEXANDER B., AND GUZMAN, RYLE HARVEY P., **Beat The Logic: Application and Gamification of Boolean Algebra Through A Side Scrolling Role Playing Game with Learning Progress Analytics.** Undergraduate Thesis. Bachelor of Science in Computer Science. Cavite State University, Indang, Cavite. May 2019. Adviser: Ms. Ezra Marie F. Ramos.

The study was conducted to develop an endless side-scrolling role playing game for application and gamification of Boolean Algebra.The software is a unique learning tool which is combined with the concept of RPG that has an easier approach in understanding Boolean Algebra. The game provides a progress report analytics which serves as the evidence learning. In order to improve the AI enemy behaviour and to have much complex movement and response on the game, Moore machine was implemented.

The game limits the topics to cover only the fundamentals of course subject being taken by the student of Cavite State University – Main Campus.

Iterative method was used in the development of the software which consists of the planning, requirements, analysis and design, implementation, testing, and evaluation. The tools used to create were Unity as the game engine, monoDevelop as the external Integrated Development Environment (IDE), C# as the programming language, and editing tools for creating game sprites and assets.

The software was evaluated based on the given criteria such as functionality, reliability, usability, portability, efficiency, user-friendliness, and relativeness. Evaluators were composed of College Students and IT professionals. The software passed all the given criteria in the evaluation and met all the requirements of the software. The results were collected through an evaluation form based on ISO 9126.

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INTRODUCTION

Role playing game abbreviated to RPG is a type of game in which the player presume his/her role as a fictional character. Also the player is responsible for the actions being made by his/her character. It is either by acting or a step of decision making in order to accomplish a specific goal. A side scrolling game, side-scroller, or 2D is a type of RPG where the gameplay and the camera view of action is from the side angle. Specifically the onscreen character moves from left side of the screen to right and vice versa in order to meet and acquire the objective.

Computer implementations are significant in applying ideas from discrete mathematics to a real-world problems such as encountering logic that can use the basics of discrete mathematics resulting to an output of true or false. Discrete algebras includes Boolean algebra which is used in logic gates and programming. It is a method of