Math Warrior

Software Requirements Specification

*CxTemp\_SoftwareRequirementsSpecification.doc*

**Draft 1.0.0**

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**[ Software Development ]**

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**Revisions**

|  |  |  |  |
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| **Version** | **Primary Author(s)** | **Description of Version** | **Date Completed** |
| Draft Type and Number  1.0 version | Everton Gardiner  Jahmal Newton  Jon-Julius Lindsay  Thaonguyen Nguyen | Version 1.0 of the Adventure Count Game. | 09/15/14 |
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# Introduction

## Purpose

The purpose of this game is to enhance the mathematical skills of elementary school students. Students are often uninterested and intimidated while learning in a lecture environment, However, when math is presented in a fun way it has been proven that students often learn and retain more of the information. The Math Warrior is a hands on game that exposes middle school students to mathematics in an entertaining way. It will promote learning in an engaging way in order to lay a positive foundation for further understanding in math.

## Scope

The Math Warrior game is a Java based text game that will be designed for students for students ages 9 -12. All the ages listed should be able to have a minimal understanding of addition, subtraction, division, and multiplication.

## Definitions, Acronyms, and Abbreviations

DBMS - it is a software system that uses a standard method of cataloging, retrieving, and running queries on data.

JAVA - An object-oriented programming language from Oracle that is platform independent. Developed by Sun in the early 1990s (Oracle acquired Sun in 2010), and modeled after C++, Java was originally designed for embedded applications in set-top boxes and other consumer electronics.

MYSQL - relational database management system.

Interface - a point where two systems, subjects, organizations meet and interact.

## References

Example of

text-based game:

<http://www.gameshed.com/Puzzle-Games/You-Find-Yourself-In-A-Room/>

## Overview

The rest of this document will outline the necessary requirements to build the Adventure Count Game. It will include the Product Perspective such as system interfaces, user interfaces and hardware interfaces. We will also list all the specific requirements in this game such as performance requirements, design constraints and necessary reliability of the software.

# Overall Description

## Product Perspective

### System Interfaces

Database interface (MySQL) to go from database to JAVA. Database will provide the rooms, the monsters, puzzles, and items.

### User Interfaces

The user will interact with JAVA in this game. When users first open the game, they should see a login page. User should be able to login with user name and password and if they don’t have a user name and password, prompt user to create one. Once finished, the user should see a “how to play”. There also should be a help command that prints a hint so users can use it if they don’t know what they should do next. When the users type in a command that is not in the commands list, show an error message, and also print a list of possible commands.

There should be a user inventory for all item collected.

### Hardware Interfaces

* keyboard
* Windows or Apple OS computers

Users should be able to use the software with Windows or Apple OS computers. Other hardware required is a keyboard, and the software should be able to get the input from the users.

### Software Interfaces

* MySQL 5.6.20
* Windows 7 or higher
* Eclipse 4.3.2 or higher

MySQL is used to store data, MySQL 5.6.20. Inventory database should allow items going in when the users collect items, and allow item going out when the users use the item. Monsters database should allow the system to draw monster out if it is called. Puzzles database should allow the system to draw puzzles out if it is called. Rooms database stores rooms. Items database stores items.

### Communications Interfaces

The password going to the server should be encrypted.

HTTP?

data transfer rate?

*.*

### Memory Constraints

*minimum:*

*4GB RAM*

*6GB HDD*

### Operations

*The user can save their progress with the save command.*

*The user can also load a previous save.*

Users will need to:

Left click to select within the area they need to type.

Command List Action

|  |  |
| --- | --- |
| ↑ | Move Up |
| ↓ | Move Down |
| ← | Move Left |
| → | Move Right |
| Save | Save game to a file |
| Load | Loads a saved game file |
| Restart | Restarts game |
| Quit | Will end game |
| Describe | Will show command list |
| Score | Will display score |
| Health | Displays Health |
| C | Display calculator |
| M | Map |
| I | Inventory |

### Site Adaptation Requirements

In order to play the Adventure Count Game all sites are required to have an device that is able to run JAVA.

All users are required to have an operating system that is JAVA compatible.

## Product Functions

This software will be able to help kids age 9 to 12 practice mathematics while having fun using puzzles, items, monsters, and different rooms. The math puzzles level should be in the range of grade 5 to 9 including addition, subtraction, multiplication, and division.

When the users face a monster, there should be a puzzle pop up. To kill/pass the monster, users have to type in the correct answer for the puzzle.

## User Characteristics

Users are between the age of 9 to 12. No technical expertise is required. The math puzzles level should be in the range of grade 5 to 9 including addition, subtraction, multiplication, and division.

## Constraints

Timing and response time of database.

Software must be completed by October 25th.

The theme must be suitable for children between the ages of 9 and 12.

## Assumptions and Dependencies

we assume that this game will be primarily played on computers that meet the system requirements. If the game is opened on a computer that does not meet the minimum system requirements, the game may not function as intended (limited access) or it may not function at all. Another dependency will depend on the web browser being used to launch the game. The properties of the browsers must be compatible with that of the game. Which means if a browsers support behind java or specific requirements listed changes we must upgrade our system to be compatible.

## Apportioning of Requirements

In the event the project may be delayed the range of items/weapons available to the character will be pushed out during the following updates to the game.

# Specific Requirements

* 1. **External Interface Requirements -**
* DBMS
* The DBMS is designed to store and retrieve user data as well as track where the user has reached in the game.
* Input will be received from Java and data will be returned from the DBMS
* valid range, accuracy, and/or tolerance
* timing
* relationships to other inputs/outputs
* Java Screen/GUI Option
* Most of game will be ran through the Java Console
* Strings, Integers and other Java/ DBMS data types

### User Interfaces

* Java Scanner

The user of the game should be shown the home screen upon loading the application. From there the user should be able to log in or create an account. If the user is a first time user they should be prompted to create an account and choose between whether they are a male or female. The user should then be prompted to select a starter weapon:

* Math gloobler (range) (Launches math symbols at monsters to make them overload)
* Substra-libur (melee) (subtracts power from monsters to make them faint)

Existing users should be prompted to log in from which they can choose to load a game from a save or start a new game.

Every user should have a section where they can enter the user id and password

### Hardware Interfaces

Since this is a web based game there is no hardware interface that the user will need. The game will be managed b y their computer which will load using java

* computer keyboard.

### Software Interfaces

* Java
* DBMS

The game application will react with the information within the database to function. The games interactions with the database is to pull the data for the monsters, items, and rooms that the user will interact with.

### Communications Interfaces

Communication between the different interfaces is crucial to the game since they depend on one another to pull the information needed for the game. The way the communication is achieved is not important and can be handled with the database.

## Software Product Features

### Feature 1

None

#### Purpose

#### Stimulus/Response Sequence

#### Associated Functional Requirements

*● validity checks on inputs*

*Look for key words such up, down, up arrow key, down arrow key, open, etc.*

*· Title and welcome screen that remains until the user signs in or creates an account.*

*o After creating an account the game auto logs-in for that game session.*

*· Inventory command*

*o Allows the user to see what weapons and key items they have acquired.*

*· Map command*

*o Tells the user where the exists are.*

*· How to play/help command*

*o At any time the user can see the how to play instructions*

*· Save command*

*o At any time the user can save their progress*

*· Interact with… command*

*o Allows the user to interact with an item saving it to inventory or opening something like a drawer, closet, chest, etc.*

*· Notification pop up*

*o Tells the user they have entered an incorrect command.*

###### 

## Performance Requirements

* Static Numerical Requirements:
* · 1 terminal per user.
* · There are no time critical tasks.
* · The target latency should be <1 sec response time for each command the user enters and the system response.
* · The worse accepted latency is 1.5seconds for an entered response.
* · unlimited users but they are not connected.
* · For comparable systems the data store is <1MB.

## Design Constraints

* ·All related software associated with Math Warrior must be written using JAVA.
* If an outside DBMS (ex MS ACCESS) is used, that system may use whatever language is deemed appropriate.

## Software System Attributes

### Reliability

The time to failure is 2 minutes. At that point the program should end.

### Availability

The program should be in an all-inclusive project folder title “Math Warrior” that is easily accessible within Eclipse or Intellij.

### Security

To play the game the user must register with a user name and password.

If the user does not have a user name and password or they have forgotten their user name and/or password they must create a new user name and password.

USER NAME:

· It must be unique in the database.

· It must be at least 5 characters long.

· It must start with a letter but the remaining characters can be any combination of letters and numbers only.

· It is not case sensitive.

PASSWORD:

· It must be at least 6 characters long.

· It is case sensitive.

· It must begin with a letter and the remaining characters may be any combination of letters and numbers only.

· It does not need to be unique to the database.

### Maintainability

The system should be well commented:

· Thorough comments must precede all classes and any methods that contain 5 or more lines of code (excluding spaces and brackets).

· Where possible, like variables should be grouped together.

· Where possible like instances should be grouped together.

## Logical Database Requirements

* Monsters (Frequency of use: Random)
* Items (Frequency of use: Random)
* Inventory (Frequency of use: high)
* User’s save (Frequency of use: low)
* User password/name (Frequency of use: low)

## Other Requirements