# Project 5 Design Document

## Section 1 – Problem to be Solved.

* We will need to recreate the 1977 Zork Game in Java. It is supposed to be a “very simple adventure game,” but the size of **this** game (I’ve called it “The Sigian Conflict”) suggests otherwise.

## Section 2 – Inputs, Outputs, and Processing

### Inputs

* Main Menu (New Game, Continue, Options, End Game)
* Options (Difficulty, XP Multiplier, Exit Settings)
* Continue (File 1, File 2)

***New Game***

* (Plot Dialogue)
* Are you ready to begin? (Yes, No)

***Battlefield Navigation***

* Move Left, Move Up, Move Right, Move Down, Items, Stats, Escape.
  + Items (Medkits, Sodas)
    - Would you like to use Medkit/Soda? (Yes/No)
  + Escape (Yes/No)

***Battle***

* Attack
  + Use which weapon? (Primary Weapon/Secondary Weapon)
* Special Attack
  + Use which Special Attack? (Choices vary depending on level)
    - Use which Weapon? (Primary Weapon/Secondary Weapon)
* Examine (Shows data about the enemy)
* Use Item
  + Use which item? (Medkit / Soda)
    - Use Medkit/Soda? (Yes/No)
* Retreat
  + Would you like to retreat (Yes/No)

***Stage Select***

* Main Menu
* Tutorial
* Next Page (>>)
* Chapter 1
* Chapter 2
* Chapter 3
* Chapter 4
* Chapter 5

***Save/Load Game***

* Would you like to save your game? (Yes/No)
  + Save to which file? (File 1/File 2)
* Which file would you like to load from? (File 1/File 2)

***Preparations***

* Change Armor
  + Change which armor? (Choices vary depending on equipped armors)
    - Equip which armor? (Choice vary depending on level)
* Change Weapons
  + Change which Weapon? (Choices vary depending on equipped weapons)
    - Equip which armor? (Choice vary depending on level)
* View Attributes
* View Skills
* Ready!

### Outputs

* Background audio and click sounds are outputted throughout the game. They will vary depending on the chapter.
* **(Main Menu)**
* \* \* \* The Sigian Conflict \* \* \*
* (Options) Welcome to the Settings Menu! (Difficulty and Exp Multiplier) What would you like to change?
  + (Difficulty) The difficulty has been set to (Easy/Medium/Hard). Enemies have x(0.5/1/2) HP and ATK.
  + (Exp Multiplier) The experience multiplier has been set to: (1/2/3). You will receive (normal/double/triple) experience after battles.
* (End Game) Thank you for playing the Sigian Conflict!
* (Continue) Load from which save file?
* (New Game)
  + Hero Attributes and Equipment outputted.
  + (Are you ready to begin? (Yes)) Shows plot following the tutorial.

***Battlefield Navigation***

* Display the battlefield. The location of Enemies and Items will vary.
  + Items (Medkits, Sodas)
    - Would you like to use Medkit/Soda? (Yes/No)
  + Stats
    - Display the statistics of the hero.
  + Escape (Yes/No)
    - Goes back to stage select if yes, otherwise, returns to the battlefield.

***Battle***

* Choose an Option (Displays HP & SP for hero, HP for enemy)
* (Attack)
  + Use which weapon? (Primary Weapon/Secondary Weapon)
* (Special Attack)
  + Use which Special Attack? (Choices vary depending on level)
    - Use which Weapon? (Primary Weapon/Secondary Weapon)
* (Examine)
  + (Shows data about the enemy)
* (Use Item)
  + Use which item? (Medkit / Soda)
    - Use Medkit/Soda? (Yes/No)
* (Retreat)
  + Would you like to retreat? (Yes/No)

***Stage Select***

* Please choose a chapter.
* (Shows plot leading up to the chapter battle based on the chapter selected.)

***Save/Load Game***

* Would you like to save your game? (Yes/No)
  + Save to which file? (File 1/File 2)
* Which file would you like to load from? (File 1/File 2)

***Preparations***

* Prepare for the upcoming battle! (Display the hero’s attributes)
* (Change Armor)
  + Change which piece of armor?
    - Which \_ should be equipped?
      * \_ was successfully equipped.
* (Change Weapons)
  + Which weapon should be swapped?
    - Swap with which \_?
    - Your (Primary/Secondary) weapon was successfully swapped with the \_.
* (View Attributes)
  + Display the current attributes of the hero and what each of them do.
* (View Skills)
  + Display a description of the hero’s current skills.
* (Ready!)
  + Go into the chapter battle.

### Processing

* Some processing takes place in the battle class, where the damage total is calculated through (damageDealt – (damageDealt \* enemyArmor)).
* Major processing is required for the WavePlayer class, as it is believed to be the primary source of “lag.” Plays, stops, pauses, swaps, and continues audio clips.
* Processing may also be required for the hero’s equipment. Equipping new armors/weapons requires the Equipment class to set the old equipment equal to the new equipment. New Armors, Weapons, and skills may also be added upon level up(s).

## Section 3 – Responsibilities for each Class

* (Note: There are different packages for the Game, Weapon, and Armor class. This is done to separate the game from miscellaneous classes.)

### Armor Package

### Armor.java

* The class used to create and get attributes of an Armor object.

### AllArmors.java

* This class only acts as a reference to (most) Armor objects that can be used in-game.

### BodyPart.java

* An Enum class that accompanies Armor. Contains all the body parts that the Armors will fit to.

### Weapon Package

### Weapon.java

* This class is used to create and get attributes of a Weapon object.

### AllWeapons.java

* This class only acts as a reference to (most) Weapon objects that can be used in-game.

### Game Package

### Driver.java

* This class runs and coordinates the game by creating and managing objects of other classes.

### Enemy.java

* This class is responsible for keeping track of enemy stats and attributes when they are created.

### Equipment.java

* This class keeps track of the Participant’s stats and attributes.

### HeroAttributes.java

* This class keeps track of the Hero’s attributes and their equipment. (Extends Participant)

### Map.java

* This class keeps track of the player’s location in the battlefield and the game.

### Participant.java

* The base class for the HeroAttributes and Enemy classes. Provides their name and Equipment.

### WavePlayer.java

* This class is responsible for the audio in-game.

Diagram

Description automatically generated

Section 4 below…

## Section 4 – UML Diagram and Relationships

* (Note: a .png file will be included in the submission because the picture may not be seen clearly here.)
* The BodyPart enum class is used in the Armor class.
* The Equipment class relies on the Armor and Weapon to function.
* Participant relies on the Equipment class to function.
* HeroAttributes and Enemy are derived (inherit) from the Participant class.
* The Driver relies on the HeroAttributes, Enemy, WavePlayer, and Map class to function.

## Section 5 – Major Algorithms

### Driver.java

#### Operation: main()

START

* + CHOOSE options (New Game, Continue, Options, End Game)
* **When choosing “New Game”:**
  + INPUT name.
  + DISPLAY Attributes and Equipment
  + (Are you ready to begin?) CHOOSE options (Yes/No)
  + Show menu. CHOOSE options (button input for “Creating a Member”, “Display Members”, “Find a Member”, “Edit Members”, “About [clubName]”, “End the Program”).
* **When choosing “Continue”:**
  + CHOOSE file to load: (File 1, File 2)
* **When choosing “Options”:**
  + CHOOSE options (Difficulty, EXP Multiplier, Exit Settings)
  + (Difficulty) Changes Difficulty.
  + (EXP Multiplier) Changes XP Multiplier.
* **When choosing “End Game”:**
  + DISPLAY Thank you Message.

END

#### Operation: loadGame()

START

* + VALIDATE Files
  + LOAD File Information
  + CHOOSE file to load: (File 1, File 2)
  + Scanner - READ Line 1. INTAKE Name, Stages Completed, Level, Exp, Exp to Level Up.
  + Scanner – READ Line 2. INTAKE Primary Weapon Name, Secondary Weapon Name.
  + Scanner – READ Line 3. INTAKE [All Owned Weapon Names]
  + Scanner – READ Line 4. INTAKE [All Owned Armor Names]

END

#### Operation: stageSelect()

START (Assume Tutorial and Chapter 1 have been completed)

* CHOOSE options (Main Menu, Tutorial, >>) - >>
* CHOOSE options (<<, Chapter 1, >>) - >>
* CHOOSE options (<<, Chapter 2)

END

#### Operation: preparations()

START

* CHOOSE options (Change Armor, Change Weapons, View Attributes, View Skills, Ready!)
  + (Change Armor) CHOOSE (Helmet, Chestplate, Hand, Leg, Feet, Accessories, Back)
    - (Helmet) Change to which? [Varies]
      * SET Helmet = Chosen Helmet. //It’s a bit more complicated that this.
  + (Change Weapons) CHOOSE (Primary Weapon, Secondary Weapon)
    - (Primary Weapon) CHOOSE (Weapon Category)
      * (Pistol) CHOOSE (Weapon)
        + SET Primary = chosen Pistol.

END

#### Operation: mapNavigation()

START

* CHOOSE options (Move Left, Move Up, Move Right, Move Down, Items, Stats, Escape)
  + Move Left
    - CHECK for Enemy. If Not an Enemy Square, Move Left. //Uses the map class.
    - If Enemy, CHOOSE (Yes/No) //To attack the enemy
      * (Yes) BEGIN Battle.
  + Items
    - CHOOSE (Medkit, Soda)
      * (Soda) Use Soda? (Yes/No)
        + (Yes) Set Hero’s SP to (Hero SP + (Hero Max SP / 2))

END

#### Operation: Battle()

START

* CHOOSE options (Attack, Special Attack, Examine, Use Item, Retreat)
  + (Attack) CHOOSE (Primary Weapon/Secondary Weapon)
  + While I < RPS, fire.
    - Chance Hit = Random Num (0 – 99) < (accuracy\*100) – weight
    - Crit Hit = Random Num (0 – 99) < luck
    - IF chance Hit = TRUE, SUBTRACT 1 Ammo, ADD 1 Shot Connected, ADD Damage.
    - IF Crit Hit = TRUE, ADD 1 Luck Shot, ADD Damage.
    - SUBTRACT Enemy HP BY Damage. //It’s a bit more complicated.

END

#### Operation: saveGame()

START (Assume Tutorial and Chapter 1 have been completed)

* CHOOSE options (File 1, File 2) //Save Game to which file?
* (File 1)
  + USE PrintWriter – Print Name, Stages Completed, Level, Exp, Exp to Level Up on Line 1
  + USE PrintWriter – Print Primary Weapon Name & Secondary Weapon Name on Line 2.
  + USE PrintWriter – Print [All Owned Weapon Names] on Line 3.
  + USE PrintWriter – Print [All Owned Armor Names] on Line 4.

END

### WavePlayer.java

#### Operation: swap(String filePath1, String filePath2)

START (Assume FodlanWindsR is filePath1, FodlanWindsT is filePath2)

* SET Clip Microsecond Position = Clip - Get MicroSecond Position;
* IF Swap = 0, filePath = FodlanWindsR, Swap = 1;
* ELSE filePath = FodlanWindsT, Swap = 0;
* RESET AudioInputStream.
* PLAY filePath.

END

### Map.java

#### Operation: initiateBattleField(int length, int width, int enemies)

START (Assume length, width, and enemies are 5.)

* SET amountEnemies = 0 and amountItems = 0.
* WHILE AmountEnemies != enemies
  + FOR(int x = 0; x < length; x++) //Unsure how to Simplify this.
    - FOR(int y = 0; y < width; y++)
      * IF battlefield[x][y] = null
        + IF Random Number (1-100) <= 10 AND AmountEnemies != enemies

Battlefield[x][y] = [ -E- ];

ADD 1 TO amountEnemies

* + - * + IF Random Number (1-100) <= 20 AND amountItems < Length AND battlefield[x][y] = null

Battlefield[x][y] = [ -I- ];

ADD 1 TO amountItems

END

#### Operation: getBattleFieldString()

START (Assume Tutorial and Chapter 1 have been completed)

* SET message = “”;
* FOR(int x = battlefield.length-1; x >= 0; j--)
  + FOR(int y = 0; y < battlefield.length; y++)
    - IF battlefield[x][y] = null
      * Battlefield[x][y] = [ - - ]
    - ADD TO message: battlefield[x][y];
  + ADD TO message: “\n”; //Move to next line.
* ADD to message: [Map Legend – [ -I- ] is an item tile, etc.]

END

## Section 6 – Test Cases

* Tests here are done chronologically. No changes to the file have been made before running.

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Input | Result/Output | Notes |
| Hey, VSauce! Michael here. Today, we’ll be playing this new game called “The Sigian Conflict.” It’s a recreation of the 1977 game *Zork*,a text-based adventure game, but with more gameplay elements and better UI than a storyline. Let’s start! | | | |
|  |  | \* \* \* The Sigian Conflict \* \* \* | This is the main menu. Let’s start off by changing some options. |
|  | (Options) | Welcome to the Settings Menu!  Difficulty: Medium, EXP Multiplier 1  What would you like to change? | We want to stretch the game to the limits. Let’s do Hard difficulty with x3 XP Multiplier. |
| Difficulty / XP Multiplier | Difficulty, EXP Multiplier x2, X | \* \* \* The Sigian Conflict \* \* \* | With that done, let’s see what continuing does. |
|  |  | While file would you like to load? (File 1 and File 2 data) | The developer of this game left us this completed save file so we can test every chapter. But let’s not do that yet. I’m more interested in loading File 2 since it says it’s empty. |
|  | (File 2) | Sorry, this save file has no data associated with it. Please begin a new game. | Pity. Looks like our first attempt to break the game didn’t work. Let’s start a new game now. |
| Name | (New Game) | What is the name of your soldier? | Usually, very long names can break certain games. Let’s try it here. |
|  | Hey,VsauceMichaelHereToday | Sorry, this name is too long. Please input a shorter name. | Looks like it didn’t work. Oh well. Let’s stick to the default James E. Clipse. |
|  | OK 🡪 James E. Clipse | Beginning Attributes | Whoa! This is so much information! Allow me to break it down. |
| Our HP is 100HP. It stands for the hero’s life force.  SP is 50SP. We’ll need this to perform “Special Attacks”.  The SBR 1100 is our Primary Weapon. It does 120HP Damage with a clip size of 8, 95% accuracy, and 1 Rounds Per Second.  Likewise with our Secondary Weapon, the Amber M7.  Luck is our chance of performing Critical Hits. The developer of this game calls them “Lucky Hits.”  Armor is self-explanatory. Enemies will be attacking us as we attack them, so Armor will help reduce the damage we take.  Weight is not so self-explanatory. It reduces accuracy by 1% every 5 pounds. The heaviest loadout may only reduce accuracy by 7%, so no need to worry.  Level + EXP to Level Up: James E. Clipse here will be levelling up as he defeats enemies on the field. He’ll gain EXP from battles and unlock new gear, weapons, and skills at certain thresholds. Great!  There are even weapons below the hero description, but they should make sense now.  Similarly, Armor has Defense. Defense reduces damage on a scale of (Defense/100). | | | |
|  |  | Are you ready to begin? | VSauce is always ready. Actually, I am in control. |
|  | Yes | (Plot Line… Skip to Battle) | This is pretty much the plot. We’ll be skipping ahead to the Battle. |
|  | READY | (Hero HP, SP, Enemies Remaining)  (Battlefield)  (Legend) | This is some good music, despite being compressed. Let’s see what we can do. |
|  | Move Left | (Battlefield) | Looks like Attempt #3 to break the game didn’t work. How about down? |
|  | Move Down | (Battlefield) | Nope. Our player is still on the bottom-left corner. Let’s just go ahead and play the game. |
|  | (Move into an [ -E- ] Tile) | It appears that there is an enemy in the room. Enter? | Yes. Onto Battle. |
|  | Yes | You confronted the enemy! |  |
|  | OK | Choose an option. (Hero HP/SP, Enemy HP) | It’s our first battle! Immediately, press X and catch the program off guard! |
|  | X | Choose an option. (Hero HP/SP, Enemy HP) | It’s as if the X was never pressed. Well, let’s just play the game normally and see what happens. |
|  | (Win Battle) | Congratulations! You have defeated the \_. You have been awarded \_\_ experience. | We’ve defeated the enemy! Once we press OK, we return to the battlefield. |
|  | OK | (Battlefield) |  |
|  | (Move onto an [ -I- ] Tile) | Pvt. James E. Clipse finds useful items as they are looking around the room. These will proves useful later on! | Let’s see what we get. |
|  | OK | You found (1-2) Medkits/Sodas! You now have \_ Medkits/Sodas. | Because the program generates a random number here (2, actually), we may not share the same result. |
| To test our Items out, we’ll need to take some serious damage and see what happens. Get the hero to 100 HP or lower, and make sure there is one enemy remaining afterwards. Retreat from the battle if necessary, as it replaces the old enemy with a new one. | | | |
|  |  | (Battlefield) [HeroHP is less than 100HP] | Let’s go ahead and use an item to heal the hero. You should be Level 3, with 300 HP, if XP Multiplier is 3. |
|  | Items > Medkit | Heal for 50% of your HP? | In theory, because we have 300HP, we will heal for 150HP. In my run, I have 93HP, so let’s test. |
|  | Yes | The Hero has been healed. Hero HP: 243HP/300HP (This will vary depending on hp.) | Looks like we recovered 150HP! Let’s go ahead and complete the chapter. |
|  |  | … |  |
|  |  | Would you like to save your game?  (Hero Attributes) | Since File 2 is empty, we’ll be saving to there and going to the main menu. |
|  | Yes > File 2 | Your game has successfully been saved! | After this, we will be taken to the stage select. |
|  | OK | Please choose a chapter.  (Main Menu) (Tutorial) (>>) | To get a sense of what levels we’ve got, press >>. |
|  |  | Please choose a chapter.  (<<) (Chapter 1) | Looks like we must do Chapter 1 next. Let’s validate that File 2 works as intended. |
|  | X | \* \* \* The Sigian Conflict \* \* \* | And continue using File 2. |
|  | Load Game > File 2 | Please choose a chapter.  (Main Menu) (Tutorial) (>>) | Have we got our data? |
|  | >> | Please choose a chapter.  (<<) (Chapter 1) | Yes. We’ve got our data. |
|  | X | \* \* \* The Sigian Conflict \* \* \* |  |
| This concludes the test gameplay run of The Sigian Conflict. As always, thank you for joining me today. Feel free to test or play it even more! We haven’t gone over many aspects, like Special Attacks, what happens when our weapon reaches 0 ammo, what happens when the enemy’s weapon reaches 0 ammo, Sodas, and testing out the preparations menu (seen in Chapter 1 and above). We will conclude by ending the game. Thanks again for sticking with me! | | | |
|  | End Game | Thank you for playing the Sigian Conflict! |  |
|  | OK | [End] |  |
|  |  |  |  |
|  |  |  |  |