
Requirements and Analysis Document for Chalmersforce

Mystery Inc.

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1 Introduction

The aim of the project is to create a 2D Run-and-gun platform game called 'Chalmersforce'. In the game, there is a Player, who has to defeat enemies in order to get the highest score possible.

1.1 General characteristics and functionality

When you start a new game, you can choose a name, a character for your player and the difficulty of your game. The game will start of with relatively few enemies, but the number will increase as the game goes on. The enemies in the game have different difficulties, which also affects the number of points a player receives when defeating them. The harder they are to defeat, the more points the player gets. The points are added to a score which is visible on the screen during the whole gameplay, giving the player the opportunity to see how close they are to beating their previous score.

The player can find different types of food in the game, which can both increase or decrease the player's HP, strength or defence. There are no time constraints, but the length of the game-play is controlled by the number of lives the player has left, which can decrease by for example eating a bad fruit or taking damage from enemies.

After the player has been defeated the score is saved on a local high score list. This can be accessed from the start page which also showcases the 10 current highest scores.

1.2 Definitions, acronyms, and abbreviations

HP

Health Points, the player's life. When the points are down to 0, the player is defeated. In the game, it is represented in the form of hearts in the bottom center of the screen, which are red and "full" when the player has the highest possible number of health points and slowly lose colour when a player's health decreases, for example during a fight.

Boost

A boost comes in form of a hat or a weapon. The items boost either the player's strength, defence or its health points depending on what player character the user has chosen in the beginning of the game.

Food

Food can be found at random in the game and will give the player some form of increase or decrease in its HP, defence or strength.

Hat

A Hat gives the player a Boost. Each player character is assigned their own Hat, all with different benefits.

Weapon

A weapon is an item a player can use to fight enemies in the game. A player is given a weapon at the beginning of the game.

GUI

'GUI' stands for Graphical User Interface

2 Requirements

2.1 Finished User Stories

User Story

Story ID: 0

Story name: Application start

Description

As a user I want to have a start page, so that I am able to access the different options provided in the game.

Confirmation

There is a start screen visible when the application is opened

Can I access the different options in the game from the start page, like the actual game or a page for the high scores?

User Story

Story ID: 1

Story name: Game Area

Description

As a user I want to see the area where my player can move around, so that I have the opportunity to explore the game.

Confirmation

Platforms on which the player can jump and move around

Background and other aesthetics which imply a playable game area

User Story

Story ID: 2

Story name: Player in the Game

Description

As a user I want to see a character in the game, which I can control, so that I can play the game.

Confirmation

Does a character appear on the screen?

Is it clear that the character is for the player to use?

User Story

Story ID: 3

Story name: Movement of player

Description

As a user I want to be able to move sideways, so I can proceed and explore the game.

Confirmation

Is the character in the game moving right when I use the right arrow key?

Is the character in the game moving left when I use the left arrow key?

User Story

Story ID: 4

Story name: Player's ability to jump

Description

As a user I want to be able to jump while playing the game, in order to access otherwise remote locations.

Confirmation

Can I see the character performing a jumping motion if I pressed the up arrow key?

User Story

Story ID: 5

Story name: Enemies

Description

As a user I want enemies in the game, so I feel like there's a goal when playing.

Confirmation

Are there other characters, besides the player's character apparent on the screen?

Does the character act unfriendly, for example, do they attack the player?

User Story

Story ID: 6

Story name: Fight enemies

Description

As a user I want to be able to fight my enemies, in order to feel like I have a chance of winning.

Confirmation

Do I have a weapon or other means to use against enemies?

Does the enemy take damage when I use my weapon against them?

User Story

Story ID: 7

Story name: Reward for defeat

Description

As a user I want to be rewarded for defeating my enemies, in order to have a purpose of doing so.

Confirmation

Do I gain points from defeating an enemy?

Are the points collected in a total score?

User Story

Story ID: 8

Story name: Visible score

Description

As a user I want my score to be visible throughout the whole game, to know how close I am to beating my previous highscores.

Confirmation

Is the score visible in the game screen?

Does the score update when I advance in the game?

User Story

Story ID: 9

Story name: Visible HP

Description

As a user I want to see how many lives I have left, to know how much longer I can play the game.

Confirmation

Is the HP visible on the gameplay screen?

Does the HP update if I take damage?

User Story

Story ID: 10

Story name: Items in the game

Description

As a user I want items in the game which can give my character different boosts, so that there is variety and I have more fun playing the game.

Confirmation

Can I see items?

Can I interact with the items?

Is there a visible difference when I have obtained an item?

User Story

Story ID: 11

Story name: Aesthetics in the game area

Description

As a user, I want the levels to have a background and other aesthetics to make my experience more fulfilling.

Confirmation

Is there a background in the game which matches the overall theme of the current game area?

Do platforms match the overall theme of the current area and the background?

Are there animations which make the game feel more immersive?

User Story

Story ID: 12

Story name: High score

Description

As a user I want to be able to look at my high scores, to reflect on my past achievements.

Confirmation

Is the high score from each game saved?

Is there a page with the high scores which I can access?

Are there instructions which guide me to the high score page?

User Story

Story ID: 13

Story name: Pause the game

Description

As a user I want to be able to pause the game, so that I can take a short break from the game.

Confirmation

Is there a button with which I can pause the game?

Does the game continue were I left it when I resume the game?

User Story

Story ID: 14

Story name: Physics

Description

As a user, I want world-like physics applied to the game, such as gravity and collision, in order to make the world feel more natural while moving around.

Confirmation

Is gravity applied to the player and enemies?

Do neither players nor enemies fall through the platforms?

2.2 Incomplete User Stories

User Story

Story ID: 0

Story name: Multiplayer Mode

Description

As a user, I want to be able to play the game with multiple players, so that we can have fun together at the same time.

Confirmation

Is there the option to choose a multiplayer mode?

The number of registered players is visible on the screen

User Story

Story ID: 1

Story name: Save interrupted game

Description

As a user I want to be able to save interrupted games, so that I can return and continue playing the same game at another time and not get frustrated at my lost efforts.

Confirmation

Can I leave the game knowing the current game play is saved?

Can I access my interrupted games from the main menu?

Does the saved game continue from the same place I left the game at?

User Story

Story ID: 2

Story name: Player Character

Description

As a user I want to be able to choose a character I identify with, which I can use in the game, in order to make the game immersive.

Confirmation

Can I choose my character among different ones?

Is the character customisable?

User Story

Story ID: 3

Story name: Difficulty Levels

Description

As a user, I want the game to have different difficulty levels, so that I can test my skills and stay interested in the game for longer time.

Confirmation

Are there options provided to the player which lets them choose what difficulty they want to play at?

Is there a visible difference between the different levels, in term of aesthetics and gameplay?

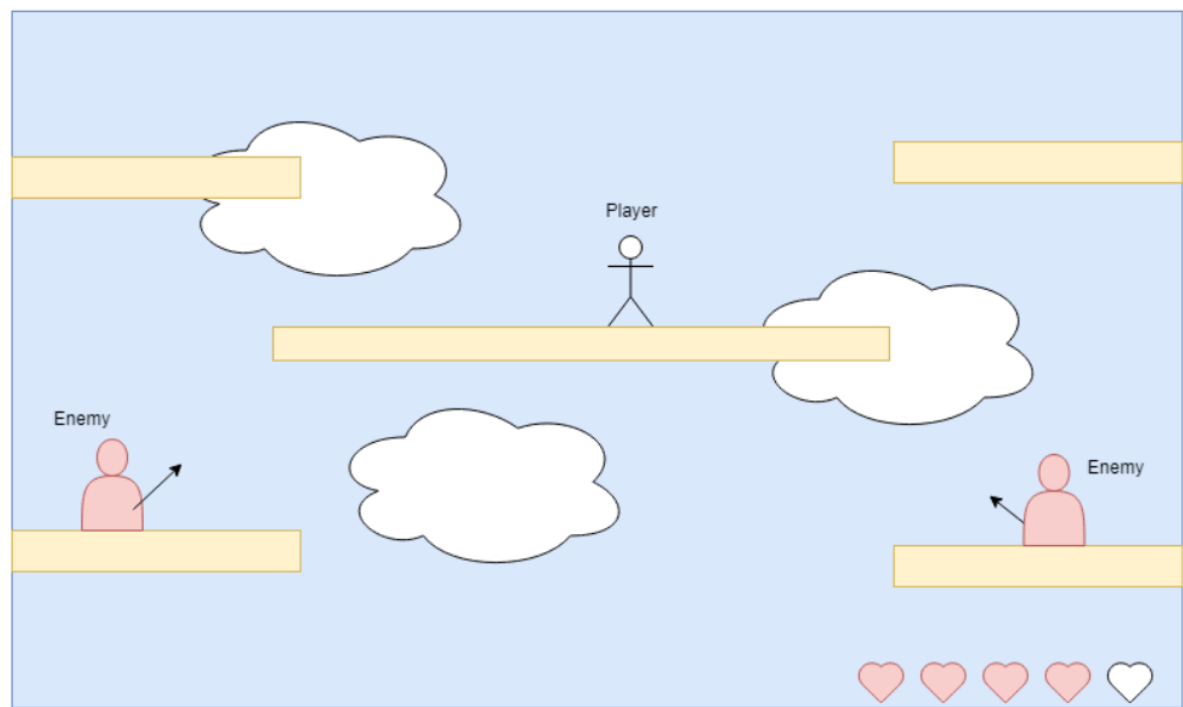
2.3 Definition of Done

For a User Story to be defined as **done**, the following should be true for the code:

- It should have been looked over and refactored if necessary
- It should be well documented with JavaDoc, and additional comments if necessary
 - Public classes should have a description, a list of @authors, and the current @version
 - Public methods should have a description, a list with explanations for @parameters, and @return values
- All public methods should be well tested using JUnit

2.4 User interface

The image below illustrates the first sketch of the user interface, when the overall look of the game had been decided on. It features a player, platforms and hearts in the bottom right of the screen, which indicate a player's health (HP). Background and platforms are supposed to match in appearance and in the overall theme of the current level to give the player a more immersive experience.



This later turned into a more detailed image of the game, also consistent with the Java 2D graphics, which is also the first background you see when you start playing the game, as shown below.



The title screen is the first page the user sees when they open the application. This screen has different options available for the user to select: view the high scores, play the game, or exit the application.



The screen for the high scores in the game is accessed from the title screen (or the defeat screen) and consists of a table of the highest scores from the game. The user interface fits into the overall theme of the game. It also gives the user the option to go back to the title screen.



When you press the play button, the player is first introduced to a help-page which displays the controls used in the game. From there the player can continue on to the selection screen.

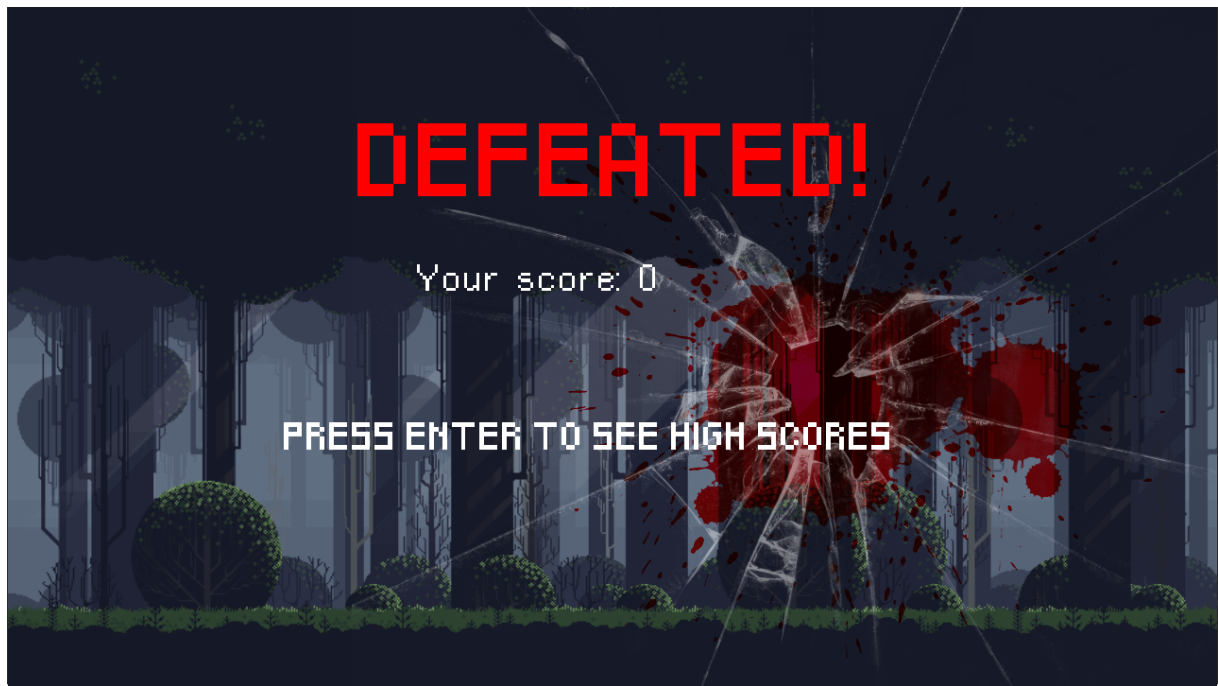


The Selection screen consists of 3 different views. The player is prompted for their name, then asked to choose a character and a difficulty level. After this, the game begins.



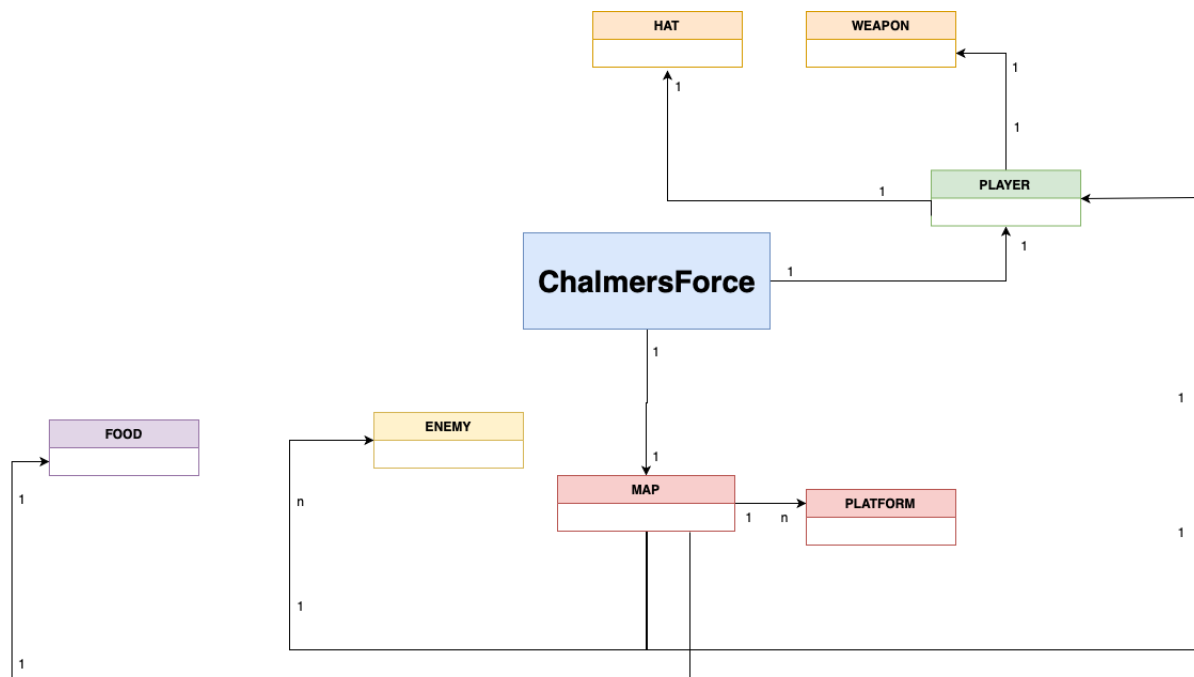
The pause screen is accessed from the game by clicking the pause button (P). The game screen

will be out of focus, so that the different options presented to the user are clearly visible such as return to the game or exit.



When the player is defeated their achieved score will be displayed on a new screen. From there the players only option is to navigate to the high score list, to see if they have managed to get on it. Lastly the player will bring themselves back to the menu page where it is possible to start a new game again.

3 Domain model



The figure above shows the domain model of this application. It represents the overall game model, which was designed in the beginning of the design process and further developed as the project progressed.

3.1 Class responsibilities

ChalmersForce

The overall representation of the game.

Player

The Player class contains the attributes of the player.

Enemy

This class is responsible for the enemies in the game.

Food

A class that represents the food found in the game.

Weapon

The class that represents a player's weapon.

Hat

The class that represents a player's hat.

Map

This class represents the game world in which the player moves around.

Platform

The Platform class handles the platforms displayed in the game, on which the player can move around.

4 References

In order to run our game, a external game engine with corresponding library was used in the Controllers and Views. This external game engine was LITlengine, a Java based game engine which specializes in 2D platformer games.

This game engine can be found at <https://litiengine.com/>.