Bilkent University

Department of Computer Engineering

CS 319  
Object Oriented Software Engineering   
Analysis Report

Survival in Bilkent

Group 2M

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1. **Introduction**

We decided to design a top to down 2D shooter type of game which is called ‘Survival in Bilkent’. In this game, player makes an effort to be alive in a restricted area. There are some kinds of enemies such as bugs, assignments, quizzes, labs, midterms and finals. These enemies tries to kill the player which is a CS student in Bilkent University by either shooting them, crashing onto him or spawning other enemy units that will attack the player. The aim of the student is to defeat these enemies by shooting codes and pieces of his/her will to study. The game has 4 levels which represent the 4 year major.  
The game will be a desktop application and will be controlled by a mouse and W-A-S-D keys on the keyboard.

This report contains an overview of the game, description of the basic gameplay. It also describes functional requirements, non-functional requirements, system models including use case model, dynamic models, object and class model, and user interface-navigational paths and screen mock-ups.

We impressed by a game which is the following url.

<http://diep.io/>

1. **Overview**

After launching the game player encounters game menu which has “Start Game”, “Options” and “Quit” buttons. The game commences when the player chooses “Start Game” option. “Options” will take the player to the Options menu where he will be able to modify sound settings. “Quit” option terminates the game.

When the game commences player will encounter various types of enemies that will try to kill him by shooting or crashing into it. The player’s objective is to survive the level without running out of time (player will only have time instead of health which will decrement as the time passes and additionally decrements when taken damage) by shooting the enemy units while collecting miscellaneous power-ups, keys, chests and coins. At the end of each level player will face stronger enemy units which are called “Finals”.Toplayer to proceed, player does not need to defeat every Final but a minimum number (depending on the level or circumstances) of Finals must be defeated. Yet, the undefeated Finals will come back again in the next levels Finals Phase in addition to that levels Finals. After the level is completed by the player game will enter an upgrade phase in which player will be able to upgrade his stats by spending coins on standard shop items or open chests by using a key and a chest which was collected in the previous level. Game will have a total of 4 levels and 4 upgrade phases.

* 1. **Controls**

The player can move around with W-A-S-D keys on the keyboard. W for going up, S for going down, A for left and D for right movement. Shooting and aiming will be done by using the mouse. Clicking with the left click shoots bullets around. Pointing the mouse on the screen will change the aim of shooting.

* 1. **Levels**

As mentioned before the game will contain 4 levels with increasing difficulty. (smarter enemy AI, higher enemy health, enemies that hit harder) Each level will bring at least one different enemy type to the game mechanism. The player will try to defeat standard enemy types without running out of time. If player does defeat the standard enemies the Finals will arrive, pushing game difficulty to higher. When required minimum number of Finals are defeated player will earn the right to proceed to next level. The level can be completed in two ways; first one being the defeating all the Final enemies which guarantees that there will be extra Final enemies in the next level, second one being defeating minimum required number of enemies which will result as undefeated Final enemies returning in the next levels Finals Phase.

* 1. **Enemy Types**

There will be various types of enemies that player will come across during the game. These enemies will be harmonious with our theme.

**Bug:** The most common and weak enemy type which will simply crash into player to damage him. Yet, this crash will damage it as well. It cannot shoot bullets, it is only capable of crashing.

**Assignments:** Basically, tougher versions of bugs that will hit harder and sustain more damage.

**Quiz:** Quizzes can spawn very close to the player. It has average damage, can move around and has low health. It can also shoot bullets.

**Lab:** A slow moving enemy type that will spawn bugs and assignments continuously unless it is destroyed. It has high health, it cannot shoot bullets.

**Midterm:** This enemy type is quite rare in comparison to others. It has more health than Labs and applies more damage by shooting bullets. It can move around. It is the most dangerous enemy type excluding Finals.

**Finals:** Finals come as a pack unlike Midterms. Yet, they spawn when there are no other enemies left for that level. They have more health and apply more damage by shooting. They will have a shield additional to their health, which will regenerate unless they are kept shot at.

## Requirement Specification

## 3.1 Functional Requirements

## Play Game

In the beginning of the game player enters his/her nick name which is his/her name during the game. Player can play the game by using the mouse and W-A-S-D keys on the keyboard. Enemies have limited amount of lives. Player kills the enemies by shooting bullets. Every bullet hits to the enemy decreases the enemy’s life. The durations of each level are limited. In order to be alive, player has to kill the certain amount of enemies until the end of the level. The player can use W for going up, S for going down, A for left and D for right movement. Shooting and aiming will be done by using the mouse. Clicking with the left click shoots bullets around. Pointing the mouse on the screen will change the aim of shooting. At the end of the game player can see his/her scores and enhancements.

## Voice Setting

Player can mute the voice of the game by using the setting bar.

## Pause the Game

During the game, player can pause the game whenever he/she wants and then he/she can continue the game where he/she leaves off.

## Help Bar

Player can get information about the game by clicking the help bar. Information that how is the game played, enemy types, rules of the game, power-ups and power-downs of the game can be reached.

## Non-Functional Requirements

**3.2.1 Usability**

The game can be used easily. In other words, the rules are such basic rules that seen in many shooting games. The game can be played by reading the explanations about the game which are stated in the help bar.

**3.2.2 Accessibility**

The game is accessible in everywhere in the world. There is no restriction about the accessibility of the game.

**3.2.3 Extensibility**

New features or rules can be added into the implementation of the game in every time.

* 1. **Pseudo Functional Requirements**

The Game will be implemented in java.