CS48 Final Project:
HTML5 Canvas Game

Group G3

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1. Project Description:

Using HTML5, CSS, jQuery, and Javascript, our project aims to create a 2d side scroller game. The game should include unique features like a virtual environment that would not require the user to keep track of any quantities or values. The only concern of the user would be playing the game, using its functions and controlling the character. The user should be immersed in the game experience and challenged by different enemies and new levels. Finally the game should be accessible to the most people possible.

2. Vision

Problem Statement:

The goal of the project is to create a 2d side-scrolling game with a character who has certain attributes and abilities such as health, jump, attack, movement,etc. The character should interact with his environment. The environment should not be static, it should change. The objective of the game is to defeat enemies and complete levels. The objective of the game as a project is to entertain. For a game like this, a virtual environment would be the most effective medium for users. This is because of the need for unique features and graphics.

System Goals:

High-level:
The system will be an interface through which a user can manipulate and interact with the game environment. The system will have certain mechanics available to the user such as character movement, attack, jump, etc. that the user will be able to use in order to defeat enemies and complete levels. The system will show the side-scrolling game complete with level, character, and enemies. The value to be expected by the stakeholder

User:
The value to be expected of the user is entertainment. Interacting with all of these elements will provide the user with goals to achieve within the game, which will in turn entertain the user.

System features:
Display character, and enemies to user
Display level as a background with ever changing enemies.
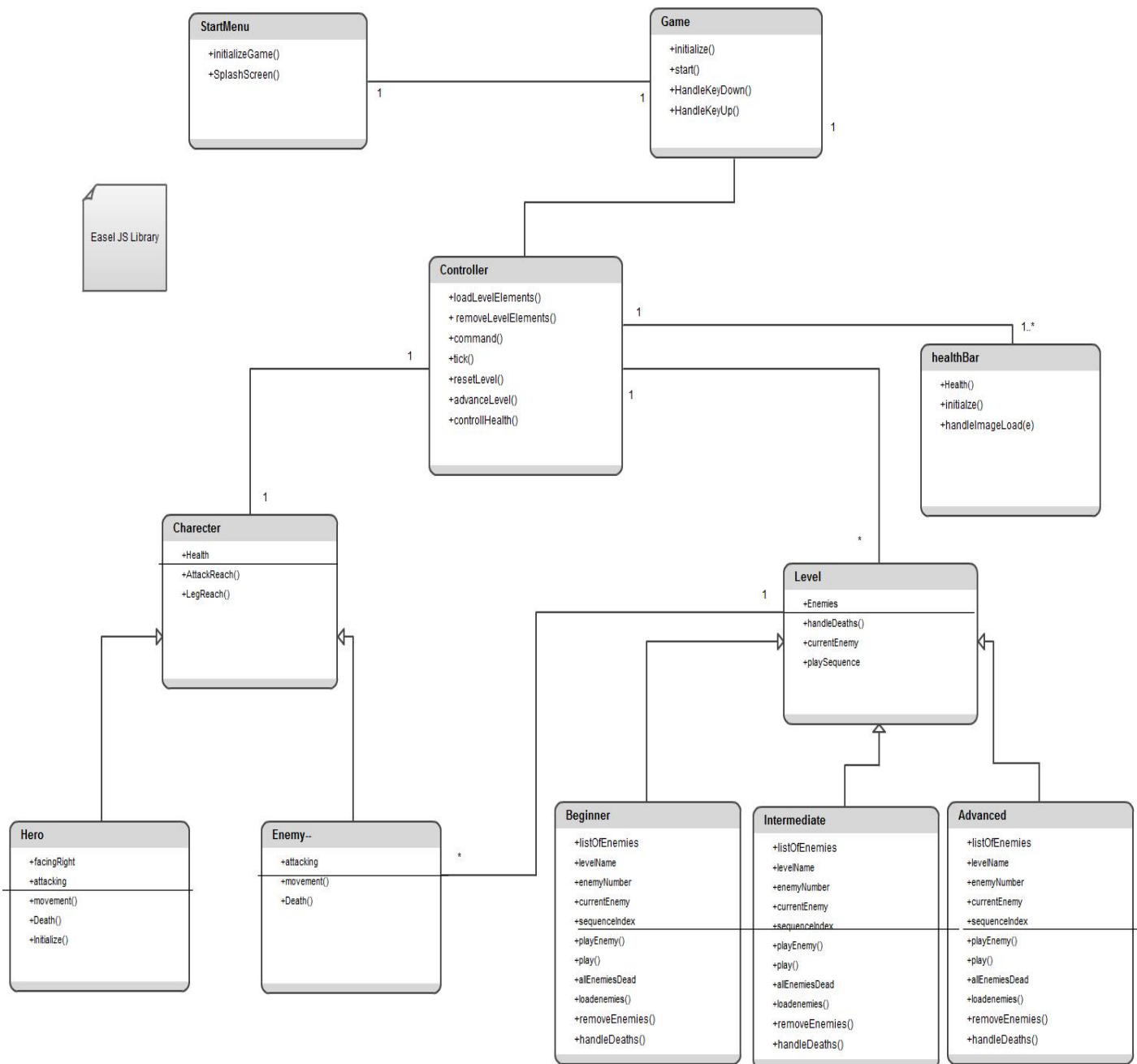Keep the character and enemies on the boundaries of the canvas.
Allow player to move, attack and interact with the environment with this character
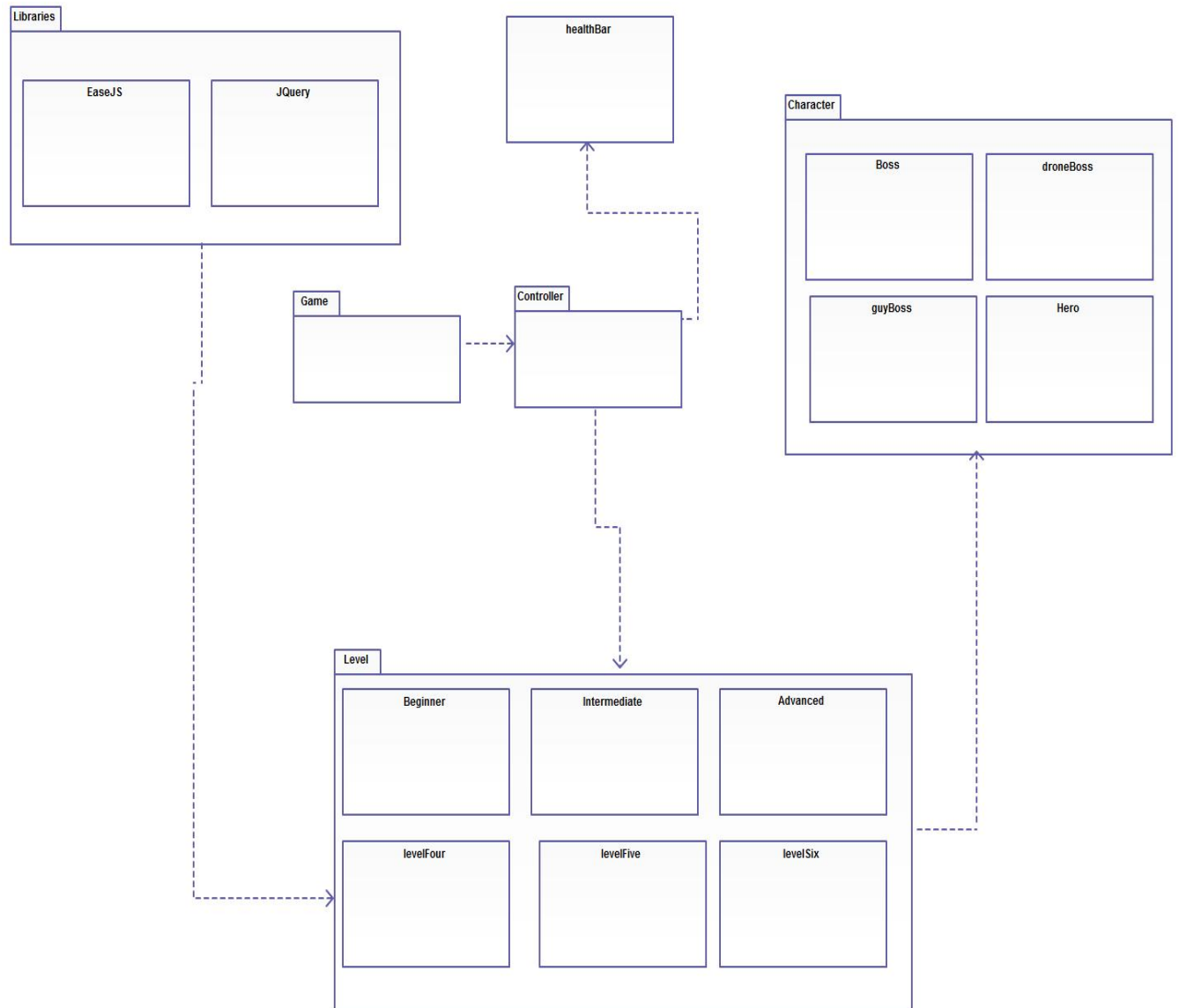Provide the user with opportunities to complete levels
Some events will include starting a level, death, and completion of a level

3.Analysis And Design

System Class Diagram

StartMenu

+initializeGame()

+SplashScreen()

Game

+initialize()

+start()

+HandleKeyDown()

+HandleKeyUp()

Easel JS Library

Controller

+loadLevelElements()

+ removeLevelElements()

+command()

+tick()

+resetLevel()

+advanceLevel()

+controllHealth()

healthBar

+Health()

+initialze()

+handleImageLoad(e)

Charecter

+Health

+AttackReach()

+LegReach()

Level

+Enemies

+handleDeaths()

+currentEnemy

+playSequence

Hero

+facingRight

attacking

+movement()

+Death()

+Initialize()

Enemy--

+attacking

+movement()

+Death()

Beginner

+listOfEnemies

+levelName

+enemyNumber

+currentEnemy

+sequenceIndex

+playEnemy()

+play()

+allEnemiesDead

+loadenemies()

+removeEnemies()

+handleDeaths()

Intermediate

+listOfEnemies

+levelName

+enemyNumber

+currentEnemy

+sequenceIndex

+playEnemy()

+play()

+allEnemiesDead

+loadenemies()

+removeEnemies()

+handleDeaths()

Advanced

+listOfEnemies

+levelName

+enemyNumber

+currentEnemy

+sequenceIndex

+playEnemy()

+play()

+allEnemiesDead

+loadenemies()

+removeEnemies()

+handleDeaths()

Package Diagram

Libraries

EaseJS	JQuery

healthBar

Character

Boss	droneBoss
guyBoss	Hero

Game

Controller

Level

Beginner	Intermediate	Advanced
levelFour	levelFive	levelSix

SSD: Move Hero Charecter

Human User

: Hero Character

:Game

:Controller

:Level

:Charecter

HandleKeyDown()

HandleKeyUp()

Command(Charecter, Action, IsStarted)

moveLeft()

moveRight()
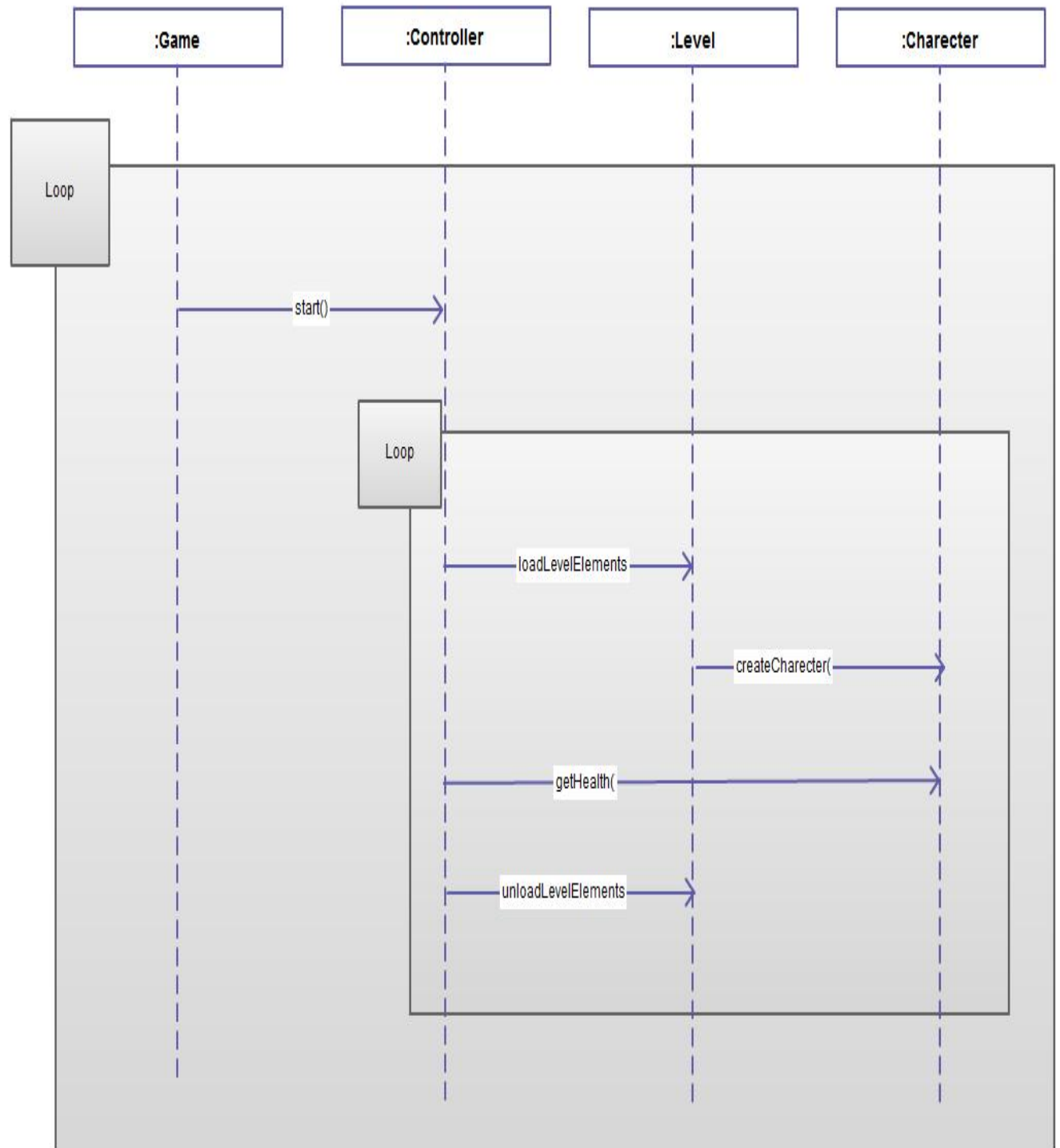
jump()

attack()
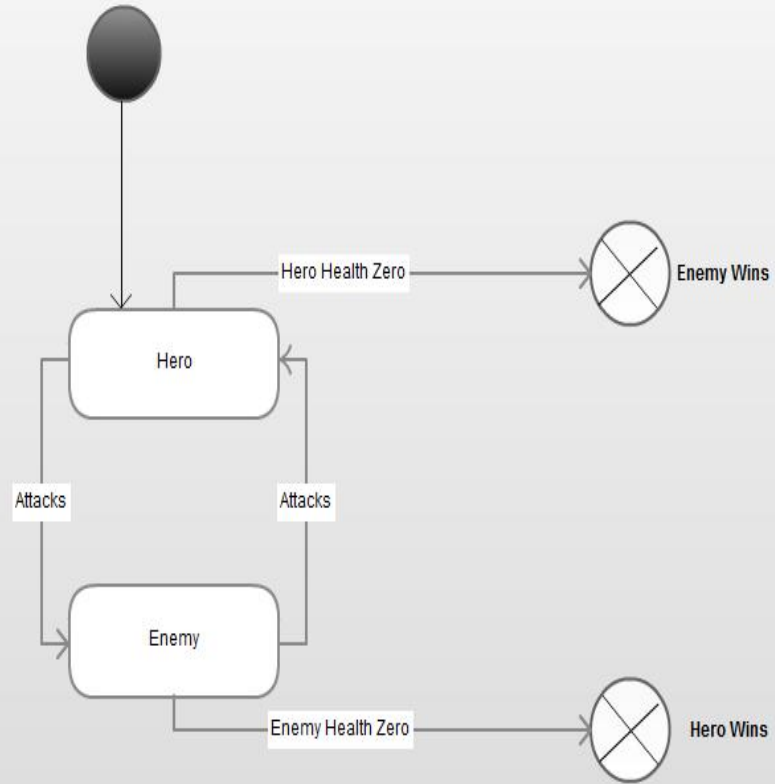
LOOP

playSequence()

moveLeft()
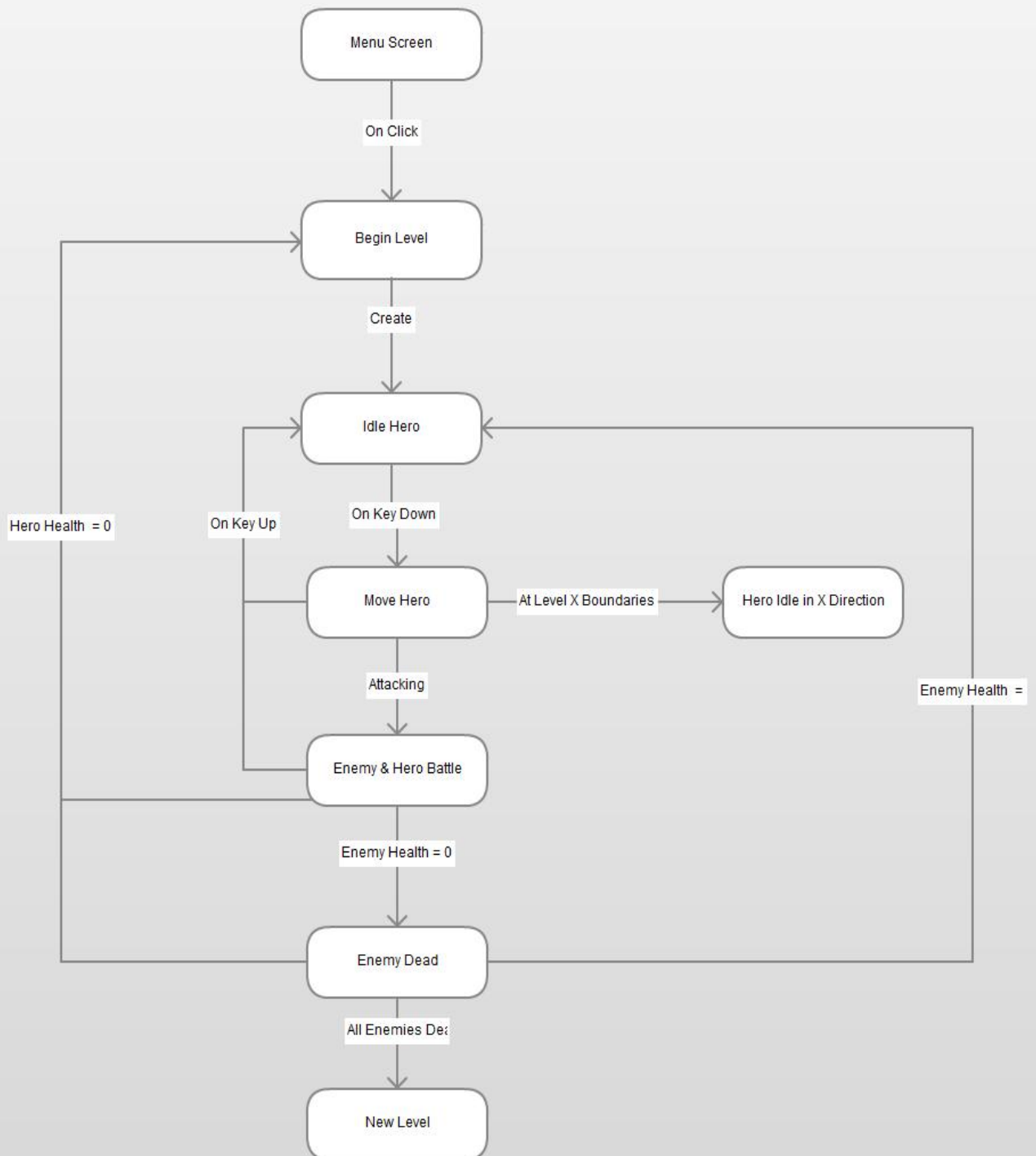
moveRight()

jump()

attack()

SSD: Cycle Through Levels

:Game	:Controller	:Level	:Charecter

Loop

start()

Loop

loadLevelElements

createCharecter(

getHealth(

unloadLevelElements

Enemy Battle

Hero

Enemy

Hero Health Zero → Enemy Wins

Enemy Health Zero → Hero Wins

Attacks   Attacks

Game Sequence

Menu Screen

On Click

Begin Level

Create

Idle Hero

Hero Health = 0

On Key Up

On Key Down

Move Hero → At Level X Boundaries → Hero Idle in X Direction

Attacking

Enemy Health =

Enemy & Hero Battle

Enemy Health = 0

Enemy Dead

All Enemies Dead

New Level

Use Cases
Key Interactions **Name of the Use Case: Start Game**
Primary Actor: Human user.
Main Success Scenario:
>   1. User begins to play the game.
>   2. User plays the level with the main character.
>   3. User completes the level with the main character

Extensions:
>   1a)   User decides not to play the game.
>   User quits the game.
>   4a)   User fails to complete the level (Character controlled by user dies)
>   Game is over

2. Use Case: Move Character
Primary Actor: Human User controlling character, Character
Main Success Scenario:
>   1. User presses button, and character moves right.
>   2. User presses button, and character moves left.
>   3. User presses button, and character jumps.
>   4. User presses button, and character ducks down.

Extension:
>   1a)   System detects no input
>   Character stands idle until input is received to move left/right/jump

3. Use Case: Attack Sequence
Primary Actor: Human User controlling character
Main Success Scenario:
>   1. User moves character towards enemy
>   2. User presses button, and character attacks
>   3. Character attacks enemy by pressing button.
>   4. If he hits enemy then enemies health goes down.
>   5. Character kills enemy.

Extension:
>   1a)   Characters health is low and moves away from enemy.
>   4a)   Enemy attacks character and characters health goes down.
>   Character dies.
>   User fails to complete the level

Key Interaction Diagram

Level

Start Game

Move Charecter

Attack Enemy
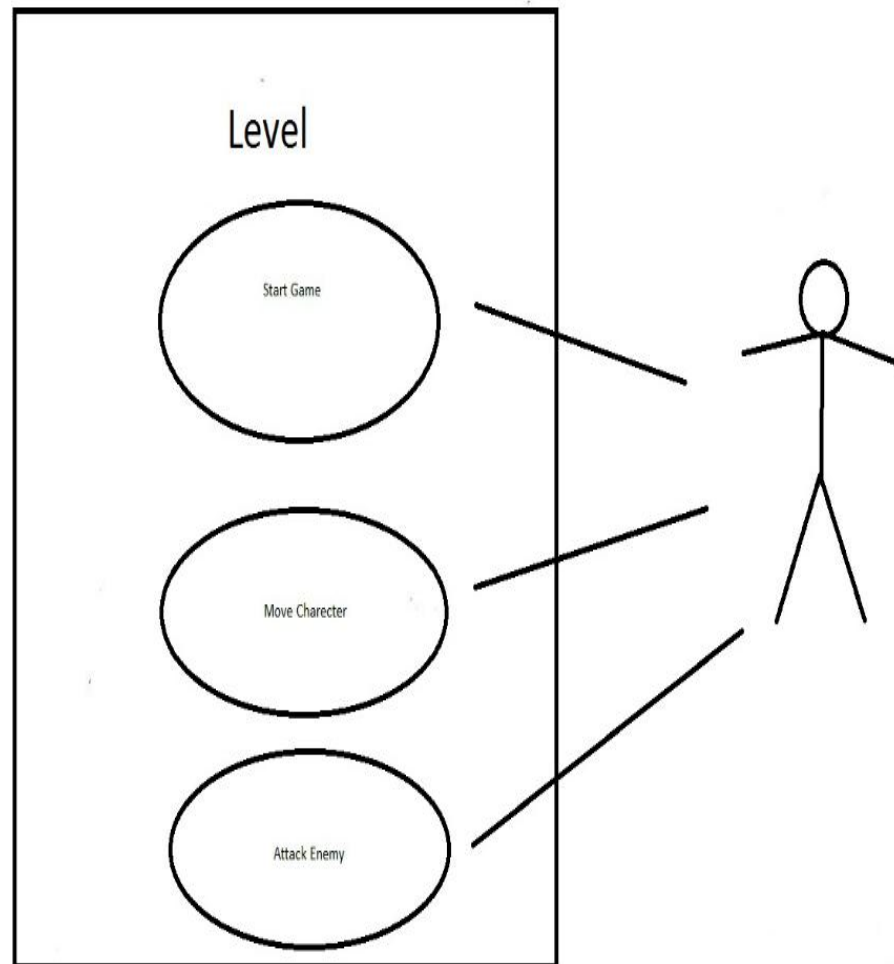
Glossary

Human user - The person controlling and interacting with the game.

Movement - The ability of the character to move within the level. Left, right, jump, and duck.

Attack - The ability of the character to perform a move that damages enemies.

Enemy - AI that interacts with the main character. Has the ability to damage and be damaged by the main character.

Health points - A number having to do with the amount of times the main character can be hit before death is reached.

Death - When the health points of the character reach zero, the character will be unable to progress in the level and be presented with the game over screen.

Level - The background and platforms with which the character interacts by progressing through the level.

Menu - The interface that the user interacts with in order to start the game.

Plays-to do something physical such as sound is played in the level

Choose from-Human Chooses from Menu to select new game TakesYouTo- Menu Takes you new level.

Causes- Main Character Causes

Name- string given to different characters, and the user.

userLevel Music- Boolean knows if level mus

SoundOn- checks if sound is on.

SoundOff- checks if sound is off.

DisplayLevel- displays level may be as simple as getting an image file.

Display Character- gets sprite and displays character.

Display Enemy: gets sprite of enemy and displays it.

DisplayGraphics- Displays HUD Graphics.SSD

Start Game- Game Initialization starting with human.

Start Menu- menu that is displayed to user with options.

InitializeLevel- level initialized and created by system upon user request by clicking start game.

Exit Game- when user quits game and process is terminated. SSD Level Sequence- how to complete a level

Main Character Description - This notes the changes between characters for different users.Maincharacters will have different powers, names, ranking (compared to other human users), etc.

Enemy Description - This notes the difference between enemies like their type, damage, attack pattern, etc.

MoveAroundLevel: use keys to move character

Attack enemy: use buttons to attack enemy.

HumanUserKillEnemy: death of enemy
occurs.

MainCharecterDies: enemy kills main charecter.

HumanUserCompleteLevel: user finished level. Possibly sound or animation.

Human user - The human user is you.

Menu - The interface allowing you to select from the start game option.

HUD - The Head's-Up Display. The HUD sits on top of the level and provides human users knowledge and information about the main character such as health.

Sound - These are the noises you hear in the game.

Level - The stage or area you are currently playing on.

Main Character - This is who the human user controls.

Enemy - The "bad guys." These are the things preventing you from completing levels. Stop them. Menu Music – The sound you hear at the start menu.

Drone – These are the machines that prevent you from advancing to the next levels.

Drone Boss – This is the final enemy you must defeat to complete the game.

EaselJS – Javascript library to work with bitmap sequences.

jQuery- Javascript library to work with the menu and starting the game.

HealthBar – This is represented in the HUD and is visible as a bar in the top left corner of the game screen.

Beginner – This is the first level you play. There is one drone you must defeat.

Intermediate – This is the second level you play. There are 3 drones you must defeat.

Advanced – This is the third level you play. There is a boss you must defeat.

LevelFour--This is the fourth level you play. There is another boss, a human boss you must defeat.

Level Five-- This is the Fifth level you play. There is a boss you must defeat and a drone.

Level Six--This is the sixth level you play. There are tow of each enemy that you have previously faced that you must defeat. Good luck.

Boss – This defines the types of enemies you face.

Character – This is the parent class of boss and hero.

Controller – This defines how elements are loaded onto a level.

Game – This controls the start of the game.

Hero – This defines how to control your player character.