Team Cross-Over: Project 4 Documentation

Includes Documentation for Project 3 as part of Project 4's continuation of Project 3.

Team
- Chase Stump
- Marco Borth
- Jack McClure
- Rachel Elting
- Jarod Davis
- Haleigh Hunt

WORKS CITED
Battleship was developed in the Unity engine, utilizing provided libraries.

Libraries cited:
- All UI.Buttons, Dropdowns, and UI Panels set to GameObject variables derive from the UnityEngine.UI Library.
- UnityEngine.SceneManagement library was used for the Sceen Manager to reload the game scene.
- UnityEngine library uses the default Start and Update methods created in every .cs file.

Unity3D.com: Unity Documentation Web Page for Object properties and scripting examples.
- Unity User Manual: https://docs.unity3d.com/Manual/index.htmlls
- Unity Scripting Reference: https://docs.unity3d.com/ScriptReference/index.html

Documentation instructions and config files were provided by the official Doxygen website: http://www.doxygen.nl/manual/starting.html

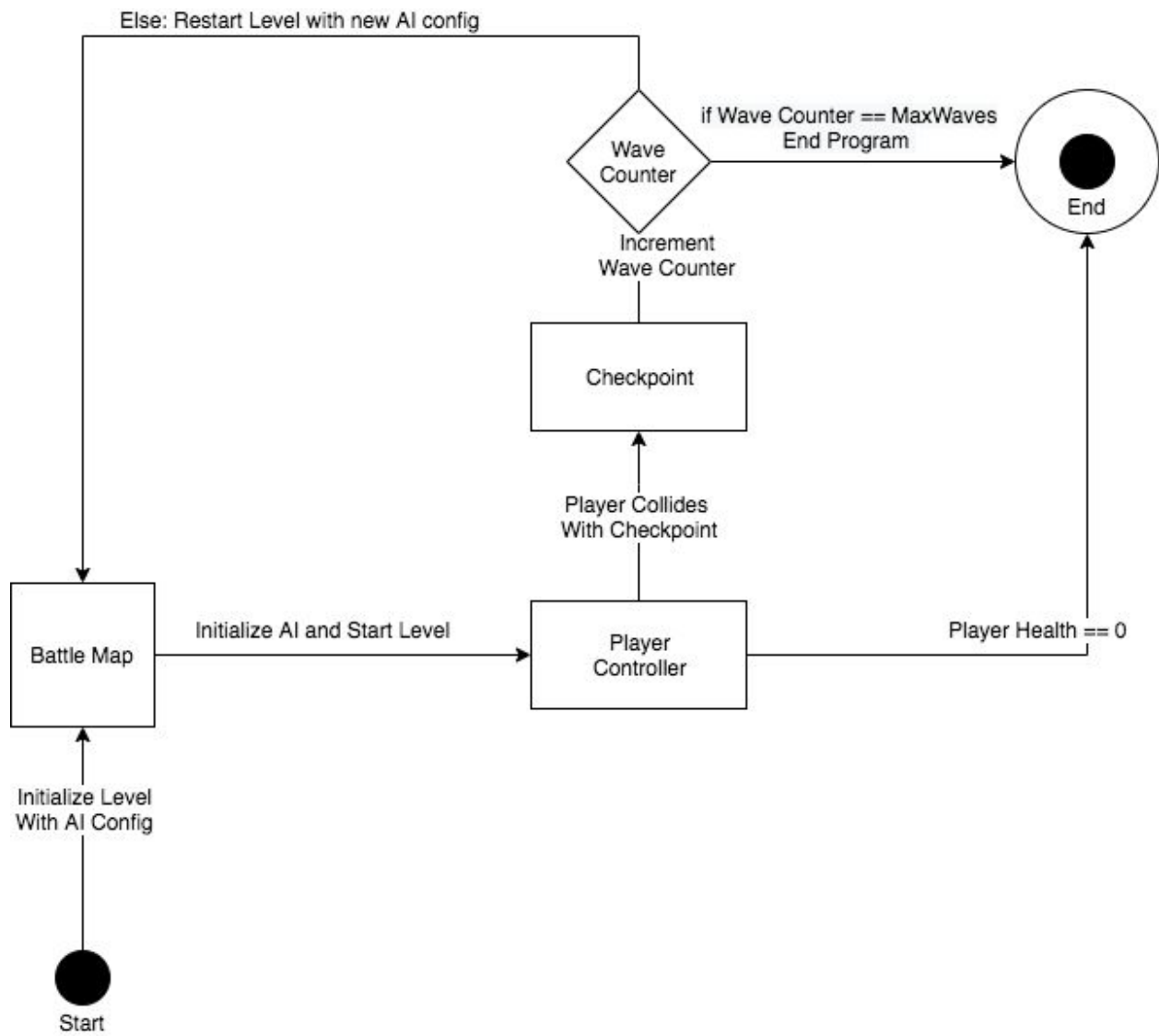Imported Assets:
- Simple Health Bar Free: https://www.tankandhealerstudio.com/simple-health-bar-free.html
- Free Download includes Sprites, Scripts, Etc., and an Asteroids Example to demo asset.
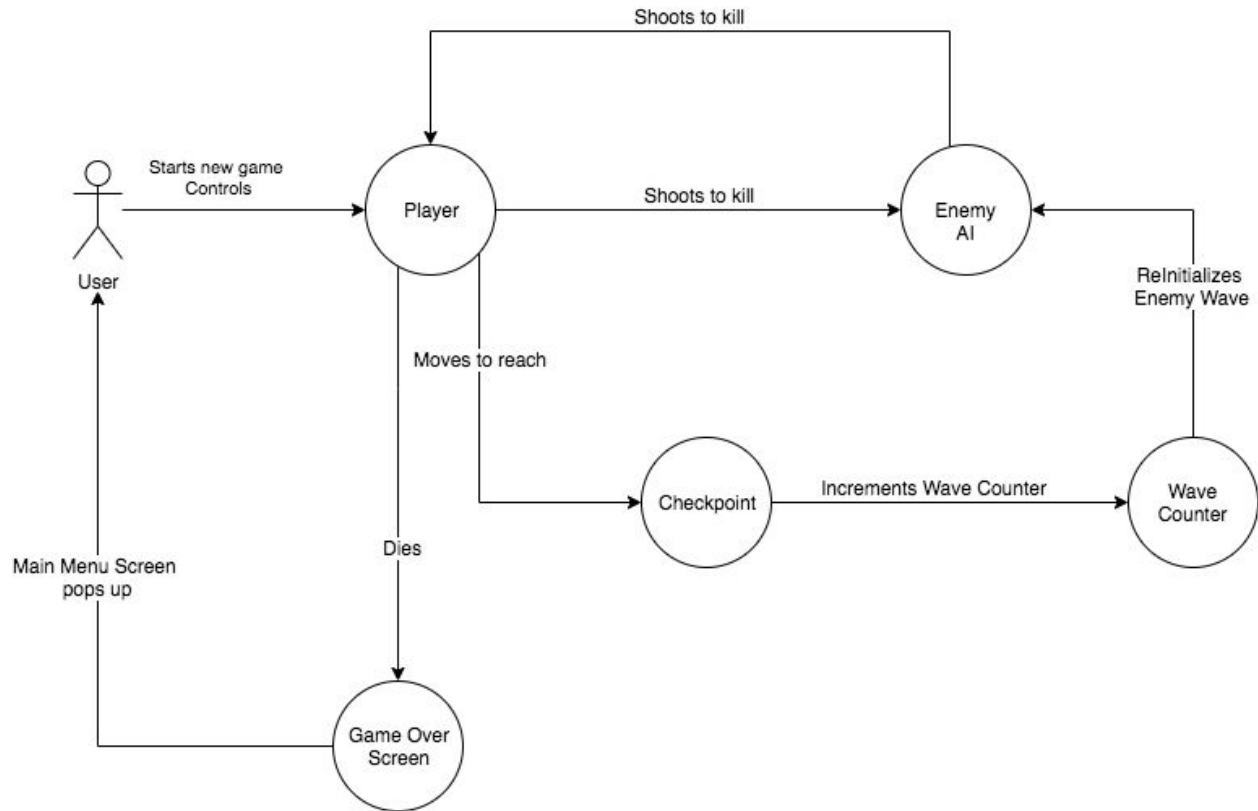
Sprites Imported as part of Simple Health Bar currently used for meters found in Player HUD.

UML
State Diagram

Use Case Diagram

Class Diagrams

Can be found within Doxygen Documentation.

Scrum

Product Backlog: an ordered list of the work to be done in order to create, maintain and sustain a product. Managed by the Product Owner. From most to least difficult, the tasks are:

Weapon System: More or less the weapons will be a collection of parts objects for various things such as stocks. I am the one doing this and will gladly take another hand. For testing all we will attempt to do is produce a gun which then will roll for each of its slots and be usable by the player. Nothing fancy just getting the gun to roll different objects and use the stats from them. Done by Chase

Enemies with AI. The AI will be at best some sort of very basic navigation like moving to a fixed location. Maybe have HP that is displayed and can be deducted. Jack will handle AI.

Map: Likely a large room made of 6 boxes, one each for the walls, ceiling and floor. Each will have a collider and not interact with gravity. Done by Jarod.

Character Controller: What it sounds like. Lets us control a character's actions either through automated scripts or user input. Likely will use one abstract class which then will have child classes. We only need one for the player.

Loot spawn: Loot can be spawned with random stats. This will be any of the nine gun parts, that will be sent to the inventory once the player walks on top of it. Rachel and Chase will work on this.

UI: UI will be done by Marco. Ammo counter and health objects drawn on canvas and updating as we change variables. These changes can be done via editor

Asset Modeling: 3D models of players, enemies, and objects used in game with textures and animations. Haleigh will be working on this feature.

Audio: supplemental to gameplay: bullet sounds, music, etc. Done by Haleigh

Project 3 Sprint Backlog: an overview of the development work to realize a Sprint's goal, typically a forecast of functionality and the work needed to deliver that functionality. Managed by the Development Team.

- Preliminary Research: Research needed to be made to plan out core features and core systems for this project.
- Player and Gun Controller: Controllers needed to allow player to move and use gun during gameplay
- BattleMap level Prototype: Prototype Level to demo Project 3
- Asset Design:
  - Chest Object Design: 3D Object Model design of chest object to use for Lootbox Prototype
- Lootbox Prototype: Prototype of an interactable object for player to interact with. Will be used to collect items such as health and guns for Player to use.
- Player HUD prototype: Prototype of the Player HUD, including player health bar, aim cursor, and ammo counter.

Project 4 Sprint Backlog: an overview of the development work to realize a Sprint's goal, typically a forecast of functionality and the work needed to deliver that functionality. Managed by the Development Team.

- Player and Gun Controller: Controllers needed to allow player to move and use gun during gameplay. Additions will be added to integrate Player and Gun Controllers with User Interactions and UI Controllers.
- BattleMap levels: Restrooms for Player to travel in and out of between combat levels containing AI spawn points to demo Project 4
- Character Modeling and Design: Gun player, AI enemies, Crafting tables, Pre-built guns
- Loot: Loot that has randomly rolled stats. Will be used to collect items such as gun parts for Player to use. Will disappear from the game and be placed in inventory when the player walks over them.
- User Interactions: Start Menu, Pause Menu, Player Death Screen, Game Over Screen, and UI controller to determine program end state.
- Crafting Table User Interactions: In game screens and panels to allow players to build and customize their weapons and weapon parts.
- Player HUD: includes player health bar, aim cursor, ammo counter.
- Graphics: enemies models, items, etc.
- Audio: supplemental to gameplay: bullet sounds, music, etc.

Retrospective

Sprint Meetings:

Scrum 1 - 10/23/2019 - Spahr Classroom

Project Ideas:
- Borderlands style shooter
- Galaga

Agreed project:
- Borderlands style shooter

Features:
- Maze/Gauntlet style map with combat rooms and "rest" rooms
- 3D/FPS
- Static maps, NOT random generation.
- No hit scan - projectiles only, requring platforms and upward mobility
- Jump mechanics

- Doom style mechanics
- QWERTY support (input manager)
- Mapping to controller if time allows with (input manager)
- Safe rooms / "rest" rooms for outfitting and equipment
- Weapon generation and customization within the restrooms - heavy customizability with weapons
- General shapes for characters for simplicity - modeling and artwork later.
- Inventory system
- Random enemy spawns
- Player health/shield
- Dumb AI

Stretch goals:
- Multi-player (adversarial & coop) support
- multiple maps
- Multi characters

Scrum 2 - 10/23/2019 - Spahr Classroom

Plans for week 10/28
-Discussed schedules for the week.

-Nav mesh and all level rooms needs to be completed.
-Hidden Walls that look glitchy
-Trigger colliders and spawning

-Basic AI needs to be set up

-Begin graphic/art and modeling for synthwave bathroom and enemy characters
-Animation

Scrum 3 - 10/30/2019 - Spahr Classroom

-Deciding on enemy character shapes - possibly skeletons. Easier animation. 3D modelling.
-Add physics to dem bones
-Neon horror theme. SPECIAL characters designed by Haleigh
-Trigger colliders for rooms still need to be implemented.
-Enemy spawner needed

-Scripts with timers, spawn enemy
-Use flags for rooms
-Modify timers based on areas
-Multiple spawn points for enemies
-Enemies spawning from cracks in the ground - can be hit when facing player, invisible when angled perpendicular
-Bullet animations for different ammo

Scrum 4 - 11/8/2019 - Spahr Classroom

Vertical maps
teleportation
wall jumping
obstacles for rooms
hidden rooms for collectible
destructible walls
timers for hidden collectibles
for secrets - make it so that there are small holes in the walls that require certain weapons to shoot through to teleport through/activate
possible different game modes

Stagger enemies with hit, stagger player when hit
stun rounds

crafting table menu
        player locks up
        camera pans to the three screens
        three screens displayed
        interact with each screen
        perspective camera - makes FOV easy to scale with aspect ratio changes

Before loading the game, different color themes
COLOR PALLATE = SYNTH WAVE, NEON, REDS, GREENS, BLUES, DARK PURPLES, CREATIVE LIGHTING

TABLE WITH BOOK FOR MANUAL

TEST SCENE FOR TEST SUITE

Load screen
　　　　press start, level rises up and loads, player selects options, hits doorbell, game
begins

gameplay - objective room for the player to get to, each restroom allows the player to
see hor far left to go.
　　　　　　　　player can fall through floors and end up having to replay levels.

Art
　　　　gun models,
　　　　enemy models,
　　　　control panels
　　　　objects for the settings (tv's for display, stereo for audio, etc.)

Scrum 5 - 11/13/2019 - Spahr Classroom
Priorities discussed:
-Get requirements done

Progress with Thanksgiving approaching
-Most of the project will need to be completed before break.
-UI and start/stop/menu need to be implemented.

Scrum 6 - 11/15/2019 - Spahr Classroom
-Health bar system being developed
-Basic map layout in the works
-AI plans being developed

Scrum 7 - 11/18/2019 - Spahr Classroom
Maps
　　　　-Redesigned color scheme
　　　　-New process for map generation
　　　　-Maps will be created standalone and portals will be used to allow player access
when levels are complete
　　　　-This boosts performance while not having to load an entire game at once, but
load maps when needed.
Player
　　　　-Still functioning as before.
　　　　-TODO: modified wall jump capabilities

-TODO: modified gun and inventory system
-TODO: More user friendly controls.

AI

-With new levels being built AI can be created accordingly.
-AI with mix of attack and patrol features.

Sound and Art

-Modeling created using Maya
-Sounds possibly created using LMMS
-Modeling to be imported into Unity soon for use in game testing

UI

-Player HUD in process of being built and added to the player.

Scrum 8 - 11/20/2019 - Spahr Classroom
Members Discussing Schedules for Thanksgiving Break
-We will all be spending time with families, yet will try to make progress after thanksgiving remotely as usual.

AI

-Need to create enemies that patrol and attack player
-Exploding enemies to be created.
-Possible sniper and flying enemies to be created
Level Design
-Level 2 Needs work, more room refining, adding in structures and obstacles.
-Portals need to be made connecting Levels 1 and 2.
-Possibility of new rooms.
Player
-Need to create inventory system.
-More functionality with gun mods and construction.
-More user controls, including interacting/interactables.

Models/Sound

-Need to import from Maya to unity to use models in game.
-Soundtrack created using online software to be added to the game.

UI

-User menus for start, stop, win, and pause need to be created.

Challenges

- Project 3:
    - A New Challenger has joined the team, with Projects 3 and 4 our project would need to ensure that 6 members have a sufficient amount of work split between them for these projects. With the current project as is, our project was able to include more work for new members.
    - With only one week to complete this current, our goals for this project had to be scaled down to just developing a working prototype rather than complete a finished project. Prototype should be ready for Demos.
- Project 4:
    - Canvas and Panels for User Interactions had trouble being interactive for 3D games. With some work needed to be done to raycasting, User Interactable elements can now be interacted with.
    - Numerous commitments piled up over the course of this sprint, but with communication between team members, we did the best we could to keep everyone in the loop and up to speed with the project.

Features that didn't make it

- Player HUD feature to view inventory system separate from crafting table not developed.
- Initially planned to develop 5 to 6 combat levels, that number had to be scaled down to two combat levels ready for demo.
- Although the random spawning scripts for each loot item was successfully implemented, the interactable box for the loot was having some issues and could not be implemented in time.

What we would have done differently

- Project 3:
    - Clarify with Scrum Master the requirements needed for this project, and if we have met those requirements with the progress made thus far.
- Project 4:
    - Work on artifacts, such as deployment plan and bug list, early on at the beginning of the sprint, or dedicate a meeting specifically for those

artifacts, to complete those projects early to free more time to code project later in the sprint.

SLCR Bug List

- ○ Ammo Counter does not update when the ammo on the equipped gun is updated.
- ○ Inventory Display like that seen in Doom / Minecraft not successfully implemented.
- ○ Health Bar does not change colors when Player health is low (yellow) or critically low (green).
- ○ Interactable loot crate was not functioning properly, so spawns were generated around it instead.
- ○ Landing in lava does not kill the player.
- ○ Patrol enemies won't inflict melee damage
- ○ Exploding enemies explosions sometimes won't do full value
- ○ Large mobs of enemies can push the player through walls
- ○ Restart game button refreshes the test s

Work Split for Project 4

- ● **Documentation** - Setup completed by Haleigh Hunt, all members contributed to documentation
- ● Refer to Gantt Chart for detailed Work Split for Projects 3 and 4

Gantt

Timeline

dates/team	Chase	Jack	Jarod	Haleigh	Marco	Rachel
10/25	**Preliminary Research**					
10/26						

10/27	**Done**					
10/28	**Player Controller**	**AI Prototype**	**BattleMap Level Prototype**	**Asset Design**	**Player HUD Prototype**	**210 Project**
10/29	**Done**	**Moving AI**		**Chest Object Design**		**210 Project**
10/30	**Gun Controller**	**Moving AI**		**Chest Object Design<-Done**		**563 Project**
10/31	**Done**	**Moving AI**				**563 Project**
11/1		**Moving AI<-Done**	**Done**		**Done**	**Lootbox Prototype**
11/2			**Project Finalization**			**Lootbox Prototype**
11/3						**Lootbox Prototype <- Done Doxygen Documentation<-Done**
11/4	**368 Projects/ Labs 5 and 6/ Project 3 Demo**					
11/5						
11/6						
11/7						
11/8						
11/9	**Weapons System**	**AI Design**	**Level Design**	**Character Design**	**User Interactio**	**Level Design**

					ns	
11/10		**AI Firing**	**Level Design, Textures**	**Player Model Design Textures**	**Player HUD Scripting**	**Level Design, Textures**
11/11		**AI Firing**	**Level Design, Textures**	**Player Model Design Textures**	**Player HUD Scripting**	**Level Design, Textures**
11/12		**AI Firing**<-Done	**Level Design, Textures**	**Player Model Design**<-Done **Textures**	**Player HUD Scripting** <- Done	**Level Design, Textures**
11/13		**AI Variants: Turrets, Melee, etc.**	**Level Design, Textures**	**Enemy AI Model Design Textures**	**Pause Menu** **Start Menu** **Game Over Menu**	**Level Design, Textures**
11/14		**AI Variants**	**Level Design, Textures**	**Enemy AI Model Design music**	**Pause Menu** **Start Menu** **Game Over Menu**	**Level Design, Textures**
11/15		**AI Variants**<- Done	**Level Design**<-Done, **Textures**	**Enemy AI Model Design music**	**Pause Menu**<-Done **Start Menu**<-	**Level Design**<-Done, **Textures**

					Done Game Over Menu<- Done	
11/16	Project Midpoint					
11/17						
11/18	510 Midterm	AI Wave Configurations	510 Midterm			563 Project
11/19		AI Wave Configurations				
11/20		AI Wave Configurations				
11/21		AI Wave Configurations				
11/22	Weapons System	AI Wave Configurations	Textures	Character Design	User Interactions	Textures
11/23		AI Wave Configurations	645 Midterm	Enemy AI Model Design music	645 Midterm	Textures
11/24		AI Wave Configurations		Enemy AI Model Design music		Textures
11/25		AI Wave Configurations		Enemy AI Model Design music		Textures

11/26	<- Done	AI Wave Configurations<- Done	Textures Done	Enemy AI Model Design<- Done music	User Interactions Done	Textures Done
11/27	Happy Thanksgiving					
11/28						
11/29						
11/30			Project Finalization	music<- Done		
12/1						Doxygen Documentation<- Done