CS 467_400 Online Capstone Project
Winter 2018

Cassiopeia: UNT2 Project Plan

Cassiopeia: UNT2 Team Members

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Introduction

The Cassiopeia project team will be creating a 2D platformer that follows young Supergirl Mia Sojourner through a dream set in outer space as she fights various space monsters on Planet Gebolax in order to save her friend and pet dog Luke. Luke has been captured and enslaved by an evil alien colony called the Vortirons. In order to succeed, Mia must traverse two levels and overcome a final boss. The first level will cover her landing on the planet surface while the second encompasses her journey into the depths of the Vortiron's underground world. Finally, Mia will square off against the final boss known as the Vortolord.

The team has limited experience building games, however it will learn Unity and C# in order to accomplish its goal. Unity is a well-documented game development platform with many free guides, tutorials and assets. The team will also develop many of its own sprites using software such as Adobe After Effects. Group roles will be divided into three core areas of responsibility, including sprite and animation design, level design and scripting, as well as character and enemy scripting.

User Perspective

For the user, the program will be a 2D side-scrolling, platformer game similar to Super Mario or the Commander Keen series. The player will find the challenge of traversing each level entertaining and stimulating as they learn to coordinate movements such as jumping and flying in order to avoid enemies, while simultaneously launching their own attacks in order to survive. Additionally, users can compete with other players to achieve a high score by finding and accumulating the most "gems." Based on the story

set in a child's imagination, the game will likely appeal to children who are familiar with similar video games and can use this previous knowledge to quickly pick up the basic mechanics.

Client

Professor Ben Brewster will fulfill the role of client for this project. The requirements for this game were developed with consideration for similar projects that have previously been approved by the instructor.

Client Requirements

- The creation of a 2D side-scrolling Super Mario or Commander Keen-like game.
- It will be a single-player game set in a child's imagination.
- It must be created using the Unity Platform with C# as the scripting language.
- There must be 2 levels as well as a "boss room."
- The 2 levels will include a "space"-type and an "underground"-type level. The boss room will be at the end of the underground level.
- The "space" level will take place in space on a moon-like planet and will include enemies, ground and platforms to jump on, gems to collect and hidden items.
- The "underground" level will take place in a tunnel underground. It will feature enemies, uneven, downward sloping ground, moving platforms, lava pits, falling objects that can injure or kill the player and hidden items. The boss room will be at the end of this level.
- The count of gems collected by the player will be kept.
- High scores will be displayed at the end of the game.
- The players life status will be displayed.
- When an enemy damages the player the life status will decrease. Once the life status is empty the game is over
- When hearts are collected the life status will increase

Initial Plans

Scenes/Levels (in order):

- Story Screen
- Main Menu

    - High Scores
    - Start Game Option
        - Load Game (if game file exists)
        - New Game

    - Exit Game Option
      Confirm choice to exit

    - Other Options Button (available from any level)
        - Instructions
        - Mute
        - Save and Quit (with confirmation check)

- Space level
- Underground level
- Boss level
- Game over screen/End Credits
- Win screen/End Credits

Global / Reuse Game Objects

Supergirl

- Scripts
- Top, left, right or bottom collision with enemy removes one life point from player
- Has sound effect when shoots
- Has sound effect when injured (life point taken away)
- Actions/Animations:
    - Walk/run
    - Jump
    - Flying (if time)
    - Shoot
    - Injured
    - Die

Monster 1 (Walking)

- Left, right, bottom collision removes one life point from player
- Top collision kills monster 1
- Has sound effect when top collision occurs

- Has basic AI (follows player)
- Actions/Animations:
    - Walk
    - Die

Monster 2 (Flying)

- Left, right, bottom collision removes one life point from player
- Top collision with player kills monster 2
- Left or right collision with gun fire kills monster 2
- Has sound effect when top, left or right collision occurs
- Has basic AI (follows player)
- Actions/Animations:
    - Fly
    - Shoot (if time)
    - Die

Monster 3 (Snail)

- Walking state
    - Left, right, bottom collision removes one hit point from player
    - Top collision puts snail in hiding

- Hiding in shell
    - Resumes walking state if not touched for 5 seconds
    - Contact with the player sends the shell flying off in the opposite direction. If it hits something, then it bounces back.
    - Has sound effect when top collision occurs
    - Walks back and forth in a given patrol zone

- Actions/Animations:
    - Walking
    - Hiding

Monster 4 (Spider or Bat)

- Left, right, bottom collision with player removes one life point from player
- Left or right collision with gun fire kills monster 4
- Has sound effect when left or right collision occurs
- Hide in ceiling until Supergirl enters trigger zone
- Return to hiding state after 4 seconds
- Actions/Animations:

    - Falling
    - Hanging

Boss Monster

- Monster starts with 10 life points
- Left, right, bottom collision with player removes one life point from player
- Top collision with player removes one life point from boss monster
- Left, right or bottom collision with gun fire removes one life point from boss monster
- Attacks player every 5 seconds
- Actions/Animations:
    - Attack
    - Idle
    - Jump/Move
    - Die

Gems (valuable object)

- Disappears on collide
- Adds one point to players gem count
- Sound effect
- Animation:
    - Spin

Heart (life-giving object)

- Disappears on collide
- Adds one point to players life count
- Sound effect
- Animation:
    - Bounce

Mystery block

- Bottom collide reveals content
- Sound effect
- Change appearance once item revealed
- Animation:
    - Shimmer
    - Collide

Platform blocks

- Bottom collide reveals content
- Disappears after collide
- Sound effect
- Animation:
    - Break

Folder Structure:

- Animation - animations and animation controllers
- Audio - sound files
- Font - text fonts
- Materials - templates to describe shading / color etc that can be added to an object.
- Physics Materials - physics description of an object e.g. friction, bounciness
- Prefabs - templates / groupings for layout items and game objects
- Scenes - different level / menu layouts
- Scripts - C# scripts for game
- Sprites - 2D images
- Textures - non sprite images

Level Testing:

- Individual Level Testing
- User testing
- Integration Testing

Software:

- The Unity game development engine
- C# for scripting
- After Effects for creating animations and sprites

Team Member Tasks

Andrew Bourret

Task	Time Estimate (Hours)

Week 4 - ● Level 1 planned with required elements conveyed to sprite designer. ● Level 1 rough structure implemented in Unity. ● Learn Unity level-design	20
Week 5 - ● Level 1 assets imported into Unity with components. ● Level 1 final structure 99% implemented in Unity. ● Level 2 planned with required elements conveyed to sprite designer.	20
Week 6 - ● Level 2 rough structure implemented in Unity. ● Boss level elements conveyed to sprite designer. ● Test character and enemy interaction with level 1 environment.	20
Week 7 - ● Level 2 assets imported into Unity with components. ● Level 2 final structure 99% implemented in Unity.	20
Week 8 - ● Boss level planned and implemented in Unity with components. ● Test character and enemy interaction with level 2 environment. ● User testing plan developed with survey.	20
Week 9 - ● Test character and enemy interaction with boss level. ● Gather user test feedback and uncover areas for improvement.	15
Week 10 - ● Implement final game improvements. ● Start on final report.	15
Week 11 - ● Final report ● Clean up ● Game file submission	15
Total Time	145

Jacqueline Francik

Task	Time Estimate (Hours)
Week 4 - ● Create player, level 1 enemies, point giving object, life giving object and mystery block sprites along with graphical assets for building the level (ie. platforms, blocks, scenery details) ● Assist with programming where needed for level 1 ● Submit video update	20
Week 5 - ● Create level 2 enemy sprites along with graphical assets for building the level (ie. platforms, blocks, scenery details) ● Assist with programming where needed for level 1	20
Week 6 - ● Create boss sprites along with graphical assets for building the boss level (ie. platforms, blocks, scenery details) ● Assist with programming where needed for level 2 ● Add block breaking audio and defeat audio to scripts	20
Week 7 - ● Create graphical assets for Main Menu ● Assist with programming where needed for level 2 ● Add player audio (shooting, defeat, injured and jumping to scripts)	20
Week 8 - ● Create graphical assets for the Win Screen, Game Over Screen and High Score Screen ● Assist with programming where needed for boss level ● Add background music	20
Week 9 - ● Assist with programming where needed for boss level/main menu	15
Week 10 - ● Assist with programming where needed for main menu, win screen, game over screen and high score screen	15
Week 11 - Final Report Input Demo File Submission	15

Total Time	145

Thomas McIntosh

Task	Time Estimate (Hours)
Week 4 - Create the physics for the main character, and start work on level one enemies.	20
Week 5 - Work on the scripting for level one enemies, start level two enemies if time is permitting.	20
Week 6 - Continue any scripting for the characters in level 1 or 2	20
Week 7 - Continue any scripting for the characters in level 2	20
Week 8 - Create scripts for interactable items.	20
Week 9 - Continue working on scrips.	15
Week 10 - Finalize any scripts.	15
Week 11 - Final report. Editing the game.	15
Total Time	145

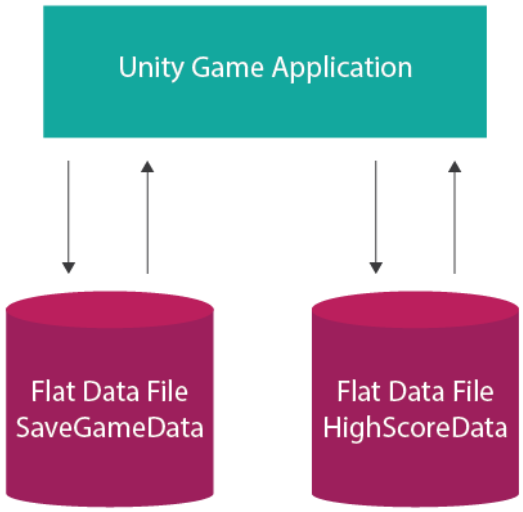
Task Delegation

Report	Due	Format	Assignee to Submit
Project Plan	Sunday, January 21	PDF	[All]
Update Week 4	Monday, January 29	Video	[All]
Update Week 5	Monday, February 5	Video	[All]
Update Week 6	Monday, February 12	Video	[All]
Mid-Point Check	Monday, February	All files +	Andrew

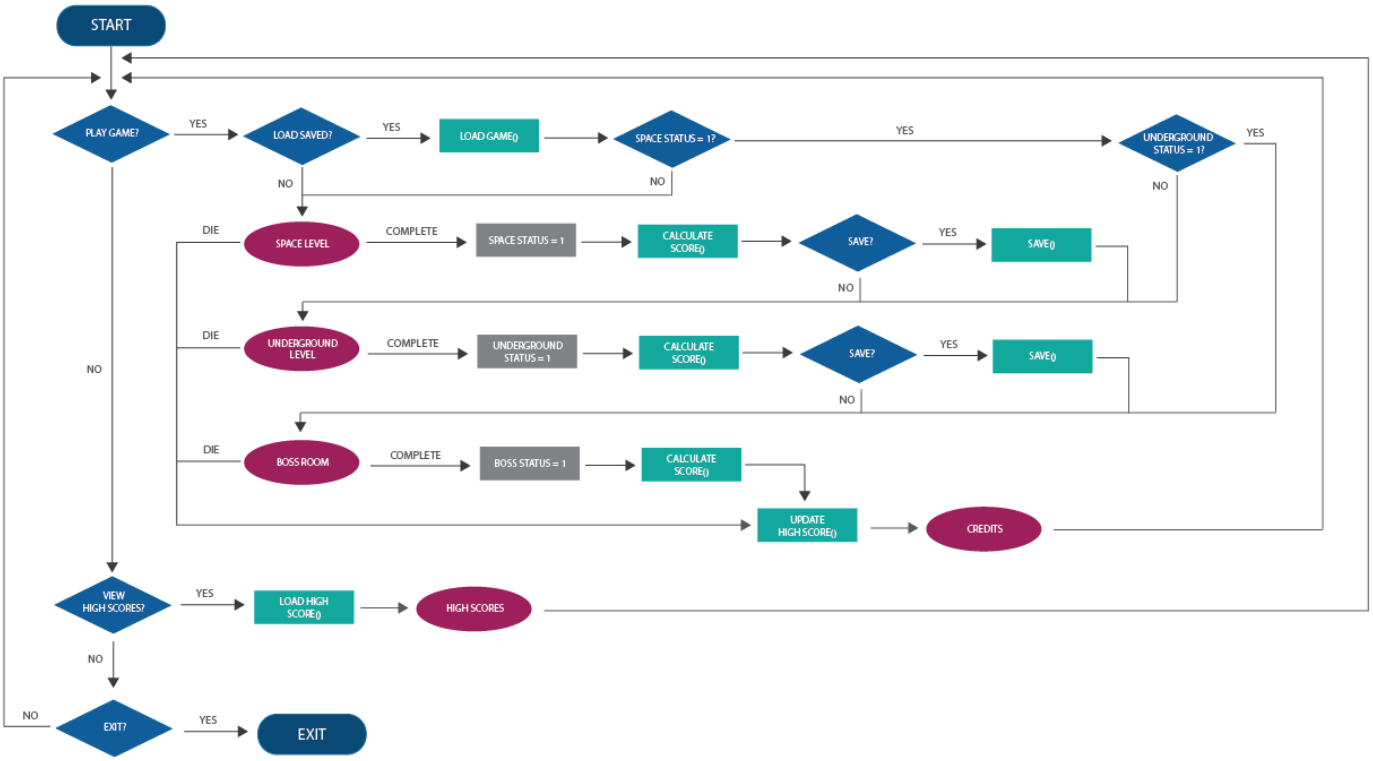
	19	written report	
Update Week 8	Monday, February 26	Video	[All]
Update Week 9	Monday, March 5	Video	[All]
Final Report	Friday, March 16	Written (including instructions to run)	Jackie
Demonstration	Friday, March 16	All files zipped	Thomas

Graphical Examples

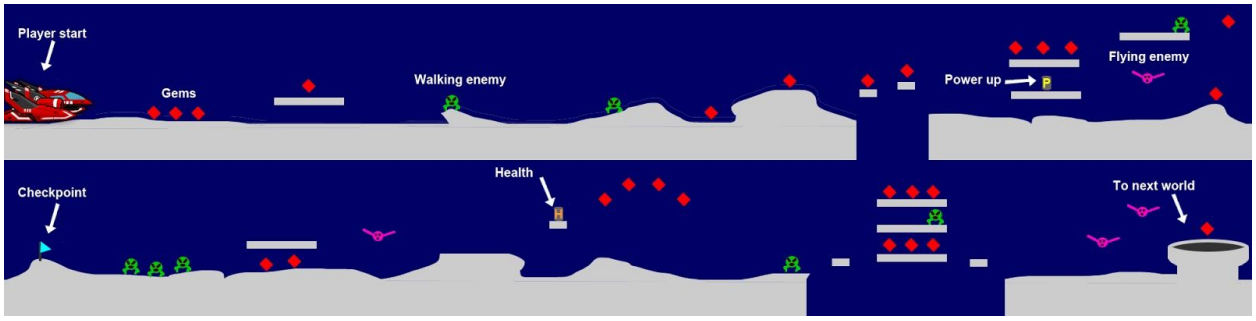
Game Architecture



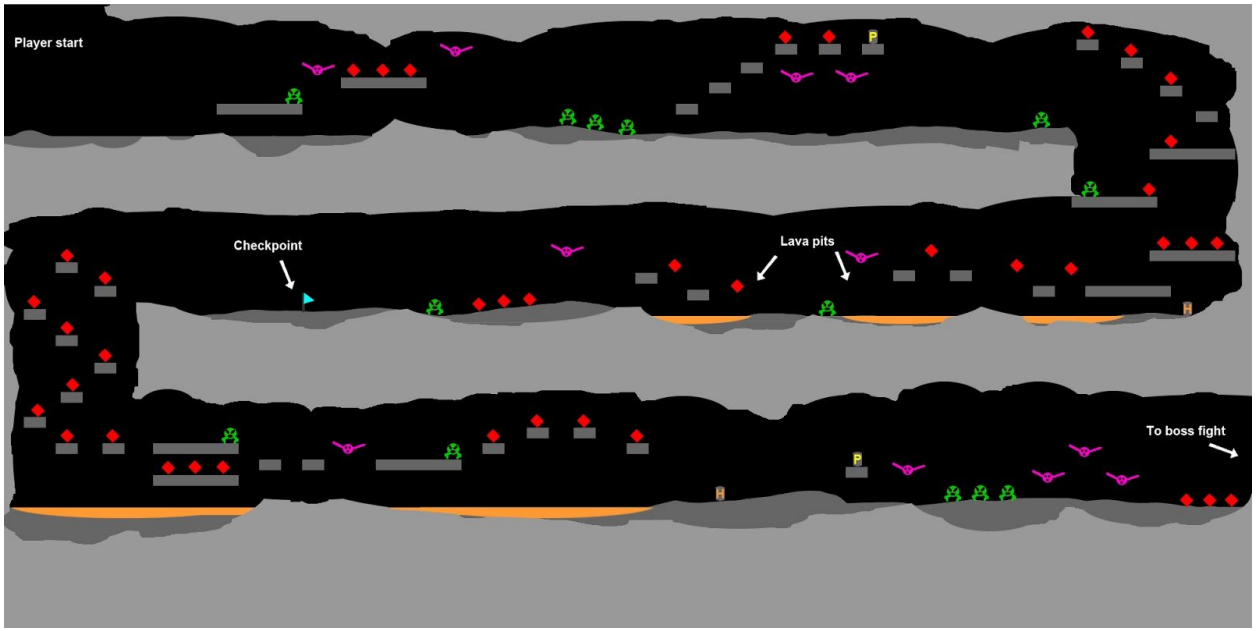
Game Flow



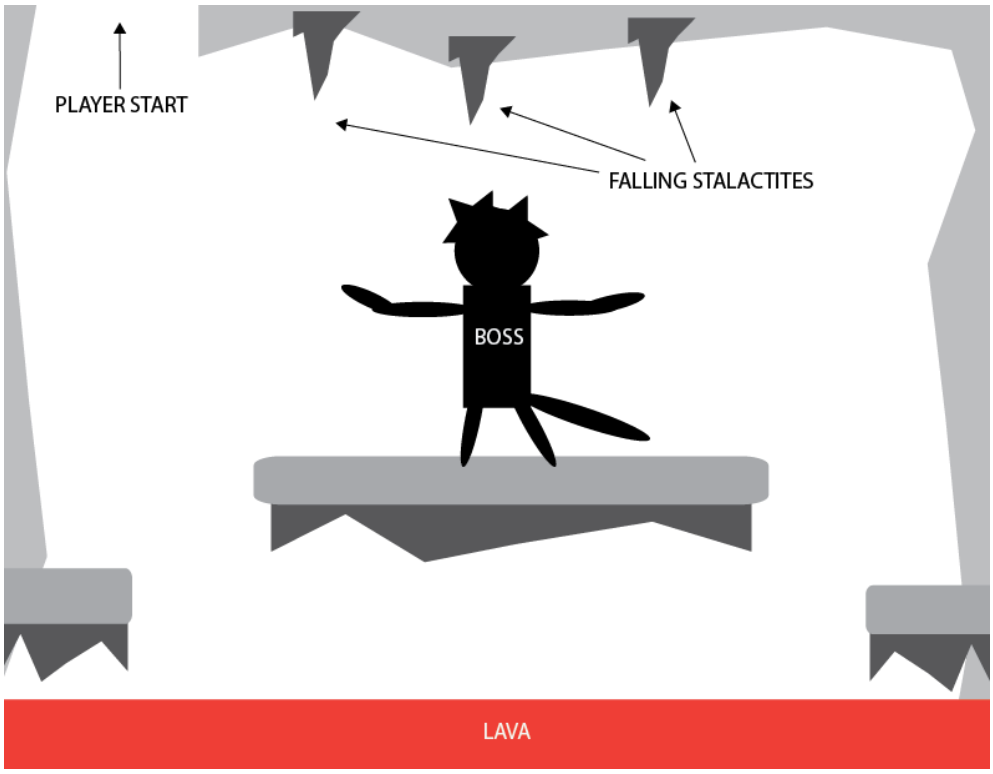
Space Level Mock Up



Underground Level Mock Up

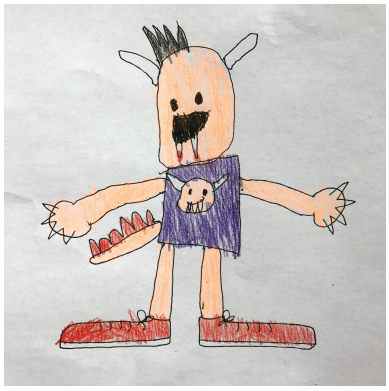


Boss Room Mock up



Player

Enemy Examples



Conclusion

The Cassiopeia team hopes to create a 2D side-scrolling game using the Unity game engine along with scripting in C#. The graphics will be custom made using Adobe Illustrator and the animation will be done using Adobe After Effects. The project should take at least 435 hours to complete and should be completed on schedule.