
Assignment Part 1

OUA Building IT Systems (CPT111)
SP4, 2021

Code Name Bricks

by

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1. What?

1.1. Project Name

Trash Unit Response Droid (T.U.R.D).

1.2. Project Description

Our team, Code Name Bricks, is planning to create a 2D game in Java. We aim to create a side-scrolling, platformer that is based on a scrap yard wherein the scrap has come to life and must fight for its dominance against the other metallic creatures of the yard. The Player will control one of these said creatures and must collect other pieces of scrap as it moves throughout the levels to fight against its opponents and keep itself alive. The pieces of scrap that it finds will be used as its ammunition, and as the main contribution to its health, meaning that the Player must manage its scrap levels to not only defend itself but also to keep itself alive. We also intend to create a game function that causes the Player to slow down and become an easier target with the more scrap that it has on-hand so managing scrap levels and never holding too much is key to survival. This means the Player may never stock-pile ammunition or health, a potential issue with this style of game that may lead to "broken" game mechanics.

The fundamental features of this game are:

- That the player may move and gain or lose health.
- Enemies move and pursue the player to attack them.
- That the levels are in the format of side-scroller/platformer.
- The attack is a projectile.
- Pixelated graphics made by us.

If time permits, we would also like to include a few ancillary features that are not fundamental to the gameplay but would bolster and polish the overall experience. These include:

- Altering affects caused by picking up certain pieces of scrap. For example: scrap that makes the Player faster, slower, jump higher, lose health-over-time, or improve the effectiveness of its attacks.
- A soundtrack that will play in the background that hopefully changes as the Player moves through parts of the levels and sounds that respond to player input and actions that are performed in-game.
- A boss fight at the end of the level.

But more on these features further in our report.

Though our experience levels writing in Java differ dramatically, some much more advanced than others, it is something that we all have programmed in and feel we can gain something from. Some of us will be responsible for basic programming, possibly focusing on only a few classes, and others have the responsibility of overall game mechanics and planning the class structure of the program. Some of us will even focus on creating parts of the game that are not necessarily associated with the performance of the program itself i.e., graphics sprites, the soundtrack, project planning etc. This means that we all have something to gain from this project and can collectively improve our technical, and IT industry proficiency.

1.3. The Team

Connor Edmunds

Student Email Address: s3872028@student.rmit.edu.au

Your Locale: Canberra, Australia

Background & Passion in IT:

I studied Networking in the later years of high school, while doing an apprenticeship for Information Technology, I passed with high grades, but without proper education, it was hard to find an entry level job. After working in Hospitality for the last couple of years as a night worker, I decided to turn my life around by starting Uni.

What are you good at / What you are interested in?

I am generally good with technology and logical thinking, I am generally interested in most hardware, how open source some hardware can become through the hacking scene, even though I do not have quite enough knowledge to achieve those tasks, it is still very impressive. Like most 20 something year old's, my interests are video games, music and a general love for problem solving whether that be mirror cubes or IT problems.

What are your weak points in the context of the project?

My weak points for this project are mainly on the coding side, I somewhat understand how it all works, but I have not had enough exposure to all of it to wrap my head around it fully, and I generally have next to no experience in art for a game, but I am going to give it a go.

What role do you see yourself mainly playing in the team?

As having a design role for the group, I hope to help play a role in helping to move the team forward, trying to analyse what may be helpful for the team, I intend on keeping records of information for idea towards what could be done for the art direction of the game.

Corbin Peever

Student Email Address: s3855159@student.rmit.edu.au

Your Locale: Mornington Peninsula, Victoria, Australia

Background & Passion in IT:

My background is in Hospitality and Tourism management, which I have been doing for my lengthy career of 15 years and have been lucky enough to build entire venues and teams from the ground up several times. I now hope to move into the IT industry to do software development or data analysis. I enjoy management, so I hope to continue to do this one day after I have gained experience in an IT related role.

What are you good at / What you are interested in?

My personal strengths are sociability, organization, and a decent work ethic. My interests include playing and listening to music, gaming, anime, reading, politics, philosophy, and technology. In terms of IT, what I have enjoyed the most and see myself pursuing further is programming. Though I have only begun to learn Java, and a small amount of Python, I have developed a keen interest in it and legitimately enjoy coding.

What are your weak points in the context of the project?

My weak points are my inexperience in writing a program of this type, something that I will seek to improve throughout the project. I also lack any visually artistic talent as I can only draw on the level of most five-year-olds, so producing visual artefacts greater than something basic is beyond me.

What role do you see yourself playing in the team?

I have been selected as team leader, so breaking up tasks and allocating time will be a big part of my role. I can also see myself writing a portion of the code for the game with the assistance of other team members, as I have a large interest in programming, and I am interested in what creating a game involves.

Hamilton Hunter

Student Email Address: s3878833@student.mit.edu.au

Your Locale: Bunbury, Western Australia

Background & Passion in IT:

My work life has not had much to do with IT at all but outside of work I have always enjoyed playing around with various programs like game maker, unreal engine (world design), various 3D modelling tools, and I have also enjoyed building and upgrading computers. There are many things that keep me passionate about IT these include, AI, robotics, and 3D world design. All fields I would like to pursue later in life.

What are you good at / What you are interested in?

When it comes to IT, I would say I am good map design, I have for years enjoyed creating 3D worlds in many different programs, spending weeks perfecting the smaller details. Other than that, I do not have many IT skills yet (hence the study). Outside of IT, I work great in a team and understand the importance of teamwork (I spent some years as a store manager), this taught me the importance of team structure. I will also always pull my own weight and hold myself to that.

What are your weak points in the context of the project?

My weakness is the fact I have only done coding and IT work in general for about 6 months now so hopefully I can keep up with what the team expects. In saying that I know this project is about the individual pushing themselves to the next level and because of that I think I will be just fine. My goal is to improve my coding and learn how people get coding projects done in teams.

What role do you see yourself mainly playing in the team?

The role I see myself in is some kind of coding support role, it seems there are some people who know how to code already in this group so I think I can fit in lending some support to those. Other than that, I could see myself in some kind of map development role (if our project is going to be a game), making use of my artistic streak.

Leonard McDonald

Student Email Address: s3879586@student.rmit.edu.au

Your Locale: Melbourne, Australia

Background & Passion in IT:

When I was in primary school, I would go to my friend's house who was lucky enough to have internet, we would find flash games and small visual basic scripts that opened the PC's "cup holder" disk tray. Ever since then I have had an interest in IT, though I avoided learning more as I absolutely hated when family would ask me to help them with the same problem over and over, refusing to learn to fix it themselves. Now I am older and have found that this problem exists in everything, and the easiest way to make money is to fix problems for people who do not bother learning it themselves. Lately I have put my creativity and aptitude for learning IT systems into writing minigames and tools with commands/code in the game Minecraft.

What are you good at / What you are interested in?

Speaking for myself and my low experience in IT; the more I learn the more resourceful I become. Often there will be a problem that involves a lot of work or processing a lot of data into something new, I have found that I am good at finding methods outside the box to accomplish that goal, (e.g., lately I wrote a python script working with automation to batch join images, putting YuGiOh cards in Minecraft). When it comes to projects, at this point, I am interested in the end-user's experience; the project can look and feel amazing to use, even surprise the user, all while having a low workload behind the scenes.

What are your weak points in the context of the project?

My ability with learning specific areas in programming languages is somewhat random, I can get stuck on concepts for a long time (i.e., I have only recently properly learnt less than/greater than symbols without needing to look them up, it was a struggle). With my skill level, I am not entirely sure what the project will entail in terms of where to start researching, so another weak point is the need to rely on task delegation instead of volunteering to my strong points.

What role do you see yourself mainly playing in the team?

I am an eager level designer, I am interested in the direction we take the project and how we can achieve it, researching the best method. I think of the user experience, so I focus on mechanics and world building quite often in my personal projects (how it feels to the player) which might mean I engineer parts of the design together. As we all teamed up because of the project idea, I am available to learn different areas to fill in the gaps of skill and interest.

Michael McQuarrie

Student Email Address: S3884359@student.rmit.edu.au

Your Locale: Sydney, Australia

Background & Passion in IT:

I have a background in game development and have acquired a Diploma in Interactive Gaming from the Media Design School in Auckland. I am trying to get a more diverse IT education so I can return to work in Japan and find new IT jobs rather than being constrained to game development. Currently I am very interested in Crypto-currency and how the technology behind the tokens is used for projects. Understanding how the technology and projects are used shows me more of how the future of decentralised technologies will look.

What are you good at / What you are interested in?

I have experience in the game development industry, and I have an understanding of how to keep projects progressing correctly to produce the final product. In workplace situations there can be major financial repercussions if a milestone is missed so I feel my experience in this area will make producing the final product easier. Smaller, seemingly insignificant details such as naming conventions and formatting of comments can also derail a project. I can work with the group in making sure these smaller things do not lead to the project being unfinished.

What are your weak points in the context of the project?

Due to the COVID-19 pandemic I have been stuck in Australia since the border closures. I had to take up a new job as front-line medical staff. Due to the pandemic and my job being in the medical industry my current scheduling is erratic. This can be solved with good communication, but it will be difficult as the pandemic is ongoing and my scheduling may change at any point due to new outbreaks or mutations.

What role do you see yourself mainly playing in the team?

With my background in game development, I see myself working more in designing and programming. Games are programmed differently to other IT projects. For example, a banking app needs to move money between accounts to pay people, but a game does not actually need to move the money, it just needs to look like it moved the money. I can help explain and design the project to give the illusion of a functioning world that is required in games.

Ross Rhodes

Student Email Address: s3706950@student.rmit.edu.au

Your Locale: Perth, Western Australia

Background & Passion in IT:

I have always had a passion for programming since I was young, starting with Java when I was 13 and throughout the years I have dabbled in just about every modern language. I became fluent with Java and expanded into PHP and web development, in my recent years I have become very comfortable with Node.js and explored some of the more modern web development trends which are built around Node.js. In the past 5 years I have found myself using C/C++ for my profession alongside Reverse Engineering assembly code.

What are you good at / What you are interested in?

C/C++, C#, PHP, Java, IDA (Disassembler and Debugger), many others, I can pick up new languages quickly from my years of experience.

I am interested in expanding my knowledge of modern-day information technology.

What are your weak points in the context of the project?

In the context of the project, not sure yet, however I am a quiet and reserved person and I have typically worked alone on projects or with people I have known for extended periods of time.

What role do you see yourself mainly playing in the team?

With my background and understanding of programming I see myself assisting others with understanding core concepts and laying a good working foundation when it comes to programming our project.

1.4. Demonstrable Outcomes

1.4.1. Minimum Viable Features

1.4.1.1. MVF1 - Player Movement.

Player movement using keyboard and mouse is a minimum viable feature for our team. To achieve this, we will need to be able to log input from mouse and keyboards and translate that to the screen. The graphics will then need to be updated to reflect the movement of the player in the game.

Validation:

- Depending on user input, player icon moves on screen.

1.4.1.2. MVF5 – Enemy Movement.

Enemies will need to move using basic artificial intelligence. Distinct types of enemies will have different AI. Enemies need to be able to target the player to shoot projectiles. Enemies will also need to be able to follow the player to attempt to stop progress in the game. As computers can react faster than humans testing will be required to offset the AI's movement and shooting accuracy to make the game possible to win.

Validation:

- Enemies move without user input.
- Enemies move towards player.
- Enemies track player and aim projectiles at their position.
- When moving off-screen, enemies “die”.

1.4.1.3. MVF2 - Side Scroller/Platformer.

The game will be a side scroller/platformer. This will require a movable background to create the illusion of the player moving through the world. Platforms will be made and will require physics and interactivity with the player. This will ensure the player does not fall through platforms that are trying to interact with. Platforms must also be distinct from the background and other non-player objects to show players what platforms are interactive and what is part of the scenery.

Validation:

- Game is 2D.
- Game is side scrolling.
- Window moves to track player.
- Game involves platforms or “height”.

1.4.1.4. MVF3 - Projectile Weapons.

To create projectile weapons the team will need to learn how to use vectors and translate those vectors into movable objects. The vector will show where the player or AI is aiming the weapon when the fire button is pressed. Once the fire button is pressed the program will use mathematics to detect if another player would have been hit. If hit the player will lose health points and parts of their robot. Projectiles will also need to be able to detect if it hit a platform or other tangible object to react with that instead of the player object.

Validation:

- Player performs “projectile” attacks that can be aimed at enemies.
- Player aims using mouse input.
- Projectile's damage and destroy enemies.

1.4.1.5. MVF4 - Pixelated Graphics.

The team will use pixel graphics to visually represent the world we have tried to create. The graphics engine will need to be able to draw and represent objects using image file created by the team. These images should be able to show transparency when needed and update themselves when necessary.

Validation:

- All in game entities are rendered with team-member-designed, pixelated graphics.
- Graphics are pixelated, or “16-bit” in style.
- Entities move between multiple graphics state to create a sense of “motion” or animation.

1.4.2. Extended Features

1.4.2.1. EVF1 - Character Speed Alters Based on Ammo/Health.

A feature we would like to implement is for health and ammo to be based on the amount of scrap a player has collected. As players collect more scrap their robot will start to slow down but have more health points due to the added armour from more scrap. As the player throws scrap at opponents their health will diminish, and their speed will increase. Players with less scrap will be faster but have less health when taking hits. This leads to a risk versus reward system for players to choose to either slow themselves down to be more protected or risk having less health but more manoeuvrability.

Validation:

- When player picks up scrap, speed lowers.
- When player loses scrap, through damage or attacks, speed increases.

1.4.2.2. EVF2 - Ammo/Amour Adds Effects.

Ammo and armour would be able to be changed depending on what type of scrap was picked up by the player. These could be combined into different armours or ammo types for more creativity from the player. As an example, a player could combine a fire type scrap with an explosive type of scrap to make explosive fire-based ammo.

Validation:

- When player picks up scrap with special qualities, the player is granted special effects.
- Special effects lay temporary graphics/animations over player.
- Special effects are lost after a brief period.

1.4.2.3. EVF3 – Soundtrack and SFX.

The team would like to implement a synth backing track for the game to improve immersion for the players. This will also include sound effects for actions of the player and AI enemies in the game. This will have to interact with the physics managers in the game to decided what sounds are being played to make sure immersion is not broken. The sounds will try to be atmospheric for the game world of a robotic scrap yard.

Validation:

- When player, or enemies interact with the environment, each action is met with a sound effect i.e., jump, attack, take damage.
- During gameplay, a soundtrack is always played.
- Soundtrack is in a “synth”, “16-bit” style.

1.5. Project Motivation

The motivation for undertaking a 2D game was mostly because we all have a similar interest in video games. Some of us have worked on games previously so choosing to undertake this project only made sense to us. This project is relatable to all of us in one way or another, Ross and Michael have extensive backgrounds in IT and coding while Leo enjoys coding Minecraft functionalities in his pass time, the rest of us enjoy playing video games as a hobby.

1.6. Project Justification

1.6.1. Justified Workload

The way we will justify our workload is by giving each person a main task to focus on and then a sub-task to complete, the sub-task can be shortened or extended depending on what the team needs to achieve the desired outcome, doing this ensures each person has their own goals and deadlines to reach while some of us will also be working on the same sections of the project, for example as of writing this there are 3 developers and 1 lead developer but each of those people also have their own sub-task to focus on like testing, animation and level design. Splitting the work this way holds individuals accountable for their own section of the assignment while also making sure there is solid progress towards the main development. We are also splitting the work load up based on skill level. There are 2 members of the group who have a much more advanced understanding of Java than the rest of us so allocating lead developer roles to those team members seems to make the most sense to us.

1.6.2. Beyond Current Capabilities

Hamilton wants to improve his coding capabilities in general, setting him up for his desired career path. This project is a terrific opportunity to learn from others who have coding capabilities. Corbin enjoys coding but has not done much outside of his studies in IT, his goal during this assignment is to expand his knowledge using Java and become better at coding, he is also wanting to expand his knowledge in leadership and team management. Leo would like to expand his knowledge in game development in general but for this project focus on a few specific things like, how to read and write files and how to link the frontend to the back end. Connor has no experience in game art and design but is willing to learn, he will oversee graphics and animation, creating the character textures etc. Michael wants to expand his knowledge of how he communicates concepts, design principles and designs for projects he is working on, getting better at communication will help him explain concepts and ideas to his clients and producers. Ross has extensive knowledge in coding but has not done much in the way of gaming, for this assignment Ross would like to become familiar with writing code for games in Java and learn more about team dynamics and group work.

1.7. Project Risks

1.7.1. Project Risks

Risk: *Proper planning.*

Without a proper timeline scheduled for each week, with appropriate time to complete the weeks objectives, and help the team by pulling one's own weight.

A timeline has been misinterpreted, thus leading to things for the project being late or end up using more members and costing more time when it is critical.

Mitigation:

Proper Communication for what needs to be done, where someone is up to by having the proper time to complete objectives, it can allow for people to finish ahead of time and helping with other work that could be done.

1.7.2. Project Risks

Risk: *Miscommunication.*

One of the risks towards the project, could come from miscommunication between the group members. It could happen at any time, and only takes split seconds to instruct the wrong thing or convey the wrong meaning.

Mitigation:

There should be a set schedule for meetings with at least once a day to check in on Microsoft Teams to confirm where the project is up to. To prevent further miscommunication between the group, Leonard has created a weekly Availability planner, that I had touched up for people to set out their schedules for the week so team members can see when is appropriate to contact people.

1.7.3. Project Risks

Risk: *Clearly stated objectives.*

If one member of the team must search for individual specific pieces of information from a timeline like Trello, finding a way to layout weekly objectives in a neat manner as for members of the group to find information faster.

Mitigation:

Having clearly identifiable information needs a sure-fire way to find that information every time, adding some semblance of structure helps to get a message across to the group with information being lost in the crossfire.

1.7.4. Team dynamics related risks.

Risk: *Personality clashes.*

While having a group of six members, there may come a time when there are personality clashes within the group between members.

Mitigation:

A way of mitigation for this risk would be to talk to the team and try to find alternate means to satisfy each group member.

1.7.5. Team dynamics related risks.

Risk: *Conflict between opposing parties.*

A Risk while doing a group project such as this one, where everyone has their designated roles, this may lead to checking in with the team unprepared for the meeting.

Mitigation:

A way to mitigate against this problem would be preparing notes for what has been achieved and what needs help on completing, or if a team member needs help.

1.7.6. Team dynamics related risks.

Risk: *Uncooperative members.*

with a project of this scope, every week is important, having each member contribute to the project, when members fall behind or are unresponsive to messages, it could lead to the other members having to work harder to pick up the slack.

Mitigation:

To help combat this problem, we have a general rule to check Teams at least once per day, with the weekly Team Meeting for all member that can attend, members that are not present are still counted in duties relative to their area, the team meeting is also the chance for members to mention difficulties that the group can work on before the Mentor meeting usual on Wednesday nights for our group.

2. How?

2.1. Resources & Tools

Programming Resources:

LWJGL (Lightweight Java Game Library)

- NanoVG
 - A simple to use vectorized anti-aliasing rendering library for OpenGL. Allows for quick and easy creation of 2D geometry.
- NanoSVG
 - A remarkably simple albeit stupid SVG (file format) parser with plots out paths in the form of cubic bezier shapes.
- OpenGL
 - A popular and dead simple 2D and 3D vectorized rendering API.

OpenGL is cross-platform.
- GLFW
 - A utility library that extends on the functionality of OpenGL and exposes the ability for programmers to quickly create windows and process mouse and keyboard input directly from the operating system.

GLFW is cross-platform much like OpenGL.
- OpenAL
 - Provides an API for sound playback in 2D and 3D space. OpenAL follows the same basic API foundation as OpenGL making it easy to grasp and keeping code neat and organized.
- STB (single-file public domain)
 - This contains libraries for text rendering, images (bitmaps, png, etc)
- SSE (Streaming SIMD Extensions)
 - Adds the capability for programmers to compact more data into single instructions for better optimizations and execution time (CPU cycles)

It is unlikely we will take advantage of this in our game, but the option is there if we need it.

All the resources included in our custom configuration of LWJGL have public documentation readily available and has been configured to include javadocs binaries for IDE hinting.

Alternatives to LWJGL for graphics rendering would be Java Swing (or Swingx) though we would be extremely limited in our creative design. Swing is more commonly used to change the look and feel of user-interface components such as the colour of a slider, while you can utilize the library to render basic graphics such as images, shapes, etc... you do not have any control over the underlying code that exposes such functionality, and you are reduced to what is exposed by the API.

Other project resources:

Adobe Photoshop will be used for creating the textures used in the game, the formats we will use should be PNG, JPG/JPEG and SVG.

Adobe Photoshop is a paid product that offers a free trial period and alternatives to this would be programs like [GIMP](#) which offers a lot of the same functionality that Photoshop has.

Ableton Live 10 Lite will be used for audio mixing to create the soundtracks that will be used in the game. The Lite version of the Ableton Live software is free and comes with the essential workflows that the paid version provides.

There are many alternatives for audio mixing however most are only available on macOS and the ones that are not exclusive to macOS are often simple in comparison and lack a lot of essential features that music professionals need, Ableton Live supports Windows and macOS with the same feature set across the platforms.

All the resources used are completely free and unless specified elsewhere.
All the resources used are the latest available versions unless specified elsewhere.

2.2. Collaborative Workspaces

Using a combination of Microsoft Teams and Trello, we have been collaborating towards fully forming the idea of the project we want to create. We want to provide an equal learning opportunity for all members to learn the coding side of making a game by members sharing their screens while going through some of the work.

As we are working on a game the main tool we will use for sharing code is git and we will use the repository hosting website: github.com.

Ross Rhodes (s3706950) will host and maintain the repository and help other group members with using git tools such as git bash and git GUI to commit to the repository.

GitHub Repository:
https://github.com/RossRRMIT/BITS_SP1_Group10_2DGame

Access to the repository is open to the public, thus anyone with the URL can view the source code.

To edit the source code and build/run our game we will use the [Eclipse IDE for Java](#) and to import the code from the repository we will use git to clone the repository to a local folder which we will open in Eclipse IDE.

To collaborate with team members we will have regular meetings and discussions in our Microsoft Teams group.

To track progress and assign tasks to members we will use Trello, we will break down tasks into weeks and aim to complete our individual tasks each week to track our progress.

The three main tools of collaboration will be:

Microsoft Teams:

<https://teams.microsoft.com/ #/school/conversations/SP1-Group10?threadId=19:ad1743313798459786eee4765b18fceb@thread.tacv2&ctx=channel>

- The team can access the Teams group through the web or desktop application.

Trello:

<https://trello.com/b/KF9c1Bey/sp1-group10>

- The team can access Trello through the web application.

GitHub:

https://github.com/RossRRMIT/BITS_SP1_Group10_2DGame/tree/master

- The team can access the GitHub web page through the website and can push/pull files being updated to and from GitHub using GitBash, GitGUI, or the command line.

Other tools include:

Canvas:

<https://rmit.instructure.com/groups/319243>

- The team can access Canvas through the online portal, under groups, in the Building IT Systems course page, using their student access details.

Google Drive:

<https://docs.google.com/spreadsheets/d/1MmvenRipj9DTtu2wvHPXRCWVIfcuxKlyiu6HH8eZ-aY/edit#gid=0>

- The team can access their Google Drive folder through the web app.

2.3. Communication Expectations.

Team Support.

A psychological tool was unintentionally established as part of the initial meeting, as team members with higher levels of expertise in specific areas have willingly made themselves available to assist when another team member has hit a large roadblock in their weekly and overall project work and research, this encourages team members to continue their individual work without becoming overwhelmed, while giving more opportunity for open communication.

Mentor Support.

MS Teams also allows the teams mentor to view communications and the progress of the project from the beginning until the end of the project presentation. The team mentor joins a weekly meeting to make sure the team is progressing and provide assistance and advice.

Every team member has different schedules, lifestyles and expertise that effect the way they work, though there is an expectation when working with a team that each member of the team communicates frequently enough for the team to function. Consistent communication and uploading of individual project progress are expected from all team members (e.g., uploading to GitHub any sizeable progress made in JAVA code, rather than working on it primarily offline and uploading in one heap). It is assumed that team members who are not contributing or communicating are not fulfilling the tasks in their role, as such they will be followed up on in the weekly team meeting, or if needed, an active team member will seek further action through the mentor or course coordinator when this unresponsive team member has been unresponsive for around two weeks.

In the unexpected occurrence of a team member becoming unresponsive to communication. After the team leader has communicated the situation to the mentor or course coordinator, the remaining team members will re-evaluate the workload of the project to make the necessary changes: The unresponsive team members work will be split up and reassigned to different team members, with an aim on completing the MVP and optimising the workflow to make room for the additional tasks with a focus on keeping the team members on the same expected weekly work load (an individual team member should not be expected to work more than 10 hours a week on this project).

The team will continue working with the MVP goal and new tasks reassigned with Trello, awaiting any information or further instruction from the mentor or course coordinator. If the unresponsive team member is suddenly available, then the workload will once again be re-evaluated and split up among the team, potentially organising the aforementioned team member to work in a pair with another team member to ensure the project work is ongoing.

2.4. Decision Making Processes.

Most decisions that influence the entire project are brought up through the main weekly team video meeting and communicated clearly to start a discussion. A team member will bring a problem or task to discussion (in the initial stages this is usually the team leader) and explain why the problem is a problem to be solved. It is important that the problem is clearly understood by each team member so that they understand the purpose and can focus on a path to finding the solution with the problem-solving discussion. This problem could be as simple as deciding whether using the same software as each other to work on the JAVA code is necessary, while some team members may not think it is important, it is the job of the team member who brought the problem into discussion to clearly establish the reason it is important.

With the clear goal in mind, each team member can now bring their work, research, and expertise into the discussion to narrow down the practical solutions and to then move into brainstorming solutions for the problem at hand. The team leader will write down all ideas brainstormed into a shared document during the meeting, team members are encouraged to join in and ask questions and provide ideas for a solution as all different methods of thinking are valuable for finding the best possible solution and keeping everyone on track.

Once all or most team members are happy with a decision, the team leader will make the appropriate changes to the Trello task cards (if necessary), and the decision made will be put into effect into the team workflow, to be monitored thereafter to ensure the decision is kept by the team and solves the original problem.

Decisions on a smaller scale can be made by individuals working within their role or discussed within smaller groups that pertain to a particular role, making sure to communicate to the team leader and other team members about the decision made and what other changes may occur from this decision (e.g., .png graphics are required for the JAVA code written, therefore the graphics designer should be informed of the format decision made by the developer writing the graphics class).

3. When?

Title	Planned Start	Planned Due	Lead by
https://trello.com/c/EuUvIUv2/152-personal-research	8/3	14/3	Everyone
Week 3			
https://trello.com/c/ZDucuvjP/151-assessment-1	22/3	31/3	Everyone
Week 4			
https://trello.com/c/kvh2nmW/34-week-4	22/4	28/4	Hamilton Hunter
https://trello.com/c/FB4Dq3bG/45-week-4	22/4	28/4	Corbin Peever
https://trello.com/c/HIXU5r8D/61-week-4	22/4	28/4	Leonard McDonald
https://trello.com/c/vt7q9SVd/70-week-4	22/4	28/4	Connor Edmunds
https://trello.com/c/4Rjr9lvt/90-week-4	22/4	28/4	Michael McQuarrie
https://trello.com/c/RwXreQPW/100-week-4	22/4	28/4	Ross Rhodes
Week 5			
https://trello.com/c/ceV7odfu/115-class-platform	29/4	9/5	Hamilton Hunter
https://trello.com/c/jlCjWfxr/121-class-sound	29/4	16/5	Corbin Peever
https://trello.com/c/RwS4mTa0/125-class-graphics	29/4	16/5	Leo McDonald
https://trello.com/c/ekOVvQrw/129-graphics	29/4	16/5	Connor Edmunds
https://trello.com/c/CelhoPnF/130-class-game	29/4	2/5	Michael McQuarrie
https://trello.com/c/1Ensbsnj/131-class-physics	29/4	2/5	Michael McQuarrie
https://trello.com/c/lyilJXNJ/137-class-gameobject	29/4	9/5	Ross Rhodes
Week 6.			
https://trello.com/c/ilDs5mo3/116-sandbox-level-design	5/4	25/4	Hamilton Hunter
https://trello.com/c/s5xQirbU/132-class-scrap	5/4	16/5	Leonard McDonald
https://trello.com/c/pDbdsSch/127-class-health	5/4	16/5	Leonard McDonald
https://trello.com/c/x1JaGbNn/133-class-projectile	4/4	2/5	Michael McQuarrie
https://trello.com/c/8niOZDZI/138-class-player	4/4	9/5	Ross Rhodes
https://trello.com/c/QQXKEz2p/139-class-enemy	4/4	9/5	Ross Rhodes

Week 7			
https://trello.com/c/a8Cc0Mia/122-assessment-2	12/4	25/4	Corbin Peever
https://trello.com/c/GIEKHALA/146-sandbox	12/4	22/4	Michael McQuarrie
Week 8			
https://trello.com/c/6Y9hPeaP/117-final-level-design	19/4	9/5	Hamilton Hunter
https://trello.com/c/PI1AXXnO/150-artifact-game	19/4	25/4	Michael McQuarrie
https://trello.com/c/YPmDNwqv/149-artifact-sound	19/4	25/4	Corbin Peever
https://trello.com/c/RUGuJoTOq/134-artifact-sandbox	19/4	25/4	Hamilton Hunter
https://trello.com/c/yCBsU9Vp/142-artifact-level-design	19/4	25/4	Hamilton Hunter
https://trello.com/c/dwGHsSwy/141-artifact-graphics	19/4	25/4	Leonard McDonald
Week 9			
https://trello.com/c/3eIVU4Fr/123-soundtrack	26/4	16/5	Corbin Peever
https://trello.com/c/k54i65iU/135-testing-document	26/4	2/5	Michael McQuarrie
Week 10			
https://trello.com/c/PpLMosWs/140-class-boss	3/5	20/5	Ross Rhodes
Week 11			
https://trello.com/c/ucaUEiul/118-assessment-3-part-1-project-background	10/5	16/5	Hamilton Hunter
https://trello.com/c/Dx4EpaMQ/136-additional-effects	10/5	20/5	Michael McQuarrie
https://trello.com/c/dXX2CoAA/148-additional-graphics	10/5	20/5	Connor Edmunds
Week 12			
https://trello.com/c/oqeudHE3/119-assessment-3-part-1-marketing-pitch	17/5	23/5	Hamilton Hunter
https://trello.com/c/CCrZ5tuG/120-assessment-3-part-1-skills-and-jobs	17/5	23/5	Hamilton Hunter
https://trello.com/c/bA4Z7QrT/124-assessment-3-part-1-project-progress	17/5	23/5	Corbin Peever
https://trello.com/c/a7z7kVeP/128-assessment-3-part-1-section-challenges-and-learning	17/5	23/5	Leonard McDonald
Week 13			
https://trello.com/c/7IbjWML/143-assessment-3-part-2-final-presentation	24/5	30/5	Everyone