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Team Information and Technology Prototypes

Team Name and Team Photo

Team Name: Let's Go

Team Photo:

Team Membership

Duleesha Gunaratne

- Contact Details: dgun0024@student.monash.edu
- Strengths: Proficient in Python and Java. Experience with Agile methodology.
- Fun Fact: I was chess captain in high school.

John Vo

- Contact Details: jvoo0012@student.monash.edu
- Strengths: Experience with Java and Python. Good collaborator and team player.
- Fun Fact: I played the trumpet in high school.

Vincent Nguyen

- Contact Details: vngu0074@student.monash.edu
- Strengths: Experience in Python, Typescript and SQL. Organised and driven individual.
- Fun fact: Favourite food is chicken wings

Jeremia Yovinus (Sprint 1 Team Leader)

- Contact Details: jyov0001@student.monash.edu
- Strengths: Experience with Python, Java, HTML, CSS. Highly motivated and strong with communication
- Fun fact: Wants to learn to snowboard

Team Schedule

Meeting Schedule:

- Meeting 1: Friday 14/03 @9am-10:30am
- Next Meeting scheduled: Monday 17/3 @8:30pm-11pm recurrently weekly

Workload Distribution and Management:

A requirements document will be created to outline the project's scope, which can then be broken down into subtasks assigned to individuals based on an even or intuitive distribution. Workload distribution will be discussed during meetings to ensure fairness and efficiency. More complex tasks will be handled collaboratively as a group to leverage collective problem-solving. Additionally, deadlines for specific tasks will be set by the next meeting to maintain progress and accountability.

Technology Stack and Justification

Our group chose Java as our programming language due to its strong support for object-oriented programming (OOP), which we believe would sign well without approach to designing and structuring the game. Java's ability to have strong OOP features, such as encapsulation through enforced access modifiers, make it easier to manage the complex interactions between game components in a much more secure and organised manner. As well as its use of abstract classes and interfaces also allow us to define clear and flexible inheritance hierarchies, which is especially useful for modeling game logic and behaviour. While our team is proficient in both Python and Java, we found Java more intuitive and effective for building a scalable and maintainable game architecture. Furthermore, Java offers better performance and ability to add extensions, making it a more suitable choice.

User Stories

1. As a **player**, I want to be able to move my builder to any valid adjacent space so that I can position myself strategically for future moves. (Jeremia)
    a. Independent: Movement can be implemented separately from other mechanics.
    Negotiable: The exact movement rules (e.g., diagonal moves, restrictions) can be adjusted.
    b. Valuable: Players need movement to navigate and plan strategies.
    c. Estimable: The complexity of implementing movement can be estimated based on board size and constraints.
    d. Small: Moving a builder is a single action, making it manageable within a sprint.
    e. Testable: Can be verified by checking if a player can move to adjacent spaces and is restricted correctly.
2. As a **player**, I want to construct a building on a valid adjacent space after moving so that I can work towards reaching the third level. (Jeremia)
    a. Independent: Building can be implemented separately from movement mechanics.
    b. Negotiable: The rules (e.g., where to build, height limits) can be adjusted.
    c. Valuable: Essential to progression, as building is necessary to achieve victory.
    d. Estimable: The logic for adding a level to a structure can be estimated.
    e. Small: A single action (placing a level on an adjacent space), making it small enough for implementation.
    f. Testable: Can be verified by checking if a structure is properly built on an adjacent space.
3. As a **player**, I want to select between Classic mode (2 players on a 5x5 board) and Extension mode (4 players on a 7x7 board) so that I can play with different numbers of players and board sizes. (Jeremia)
    a. Independent: The selection of game mode only affects the initial setup and does not depend on movement, building, or victory mechanics.
    b. Negotiable: The exact board sizes and player limits can be adjusted based on playtesting and balance.
    c. Valuable: Adds variety to the game, making it more engaging and replayable.
    Estimable: Implementing game mode selection and modifying the board size and player count is straightforward.
    d. Small: Only requires setting initial game parameters (board size, player count) before the game starts.
    e. Testable: Can be verified by checking if selecting Classic results in a 5x5 board with 2 players and Extension results in a 7x7 board with 4 players.

4. As a **player**, I want to win the game by moving my builder onto a third-level structure so that I can achieve victory. (Jeremia)
    a. Independent: Winning conditions can be checked separately from movement and building mechanics.
    b. Negotiable: The victory condition (e.g., requiring a full turn on level 3) can be adjusted for balance.
    c. Valuable: Defines the main objective of the game, providing motivation for players.
    d. Estimable: The logic for checking win conditions (builder on level 3) can be determined.
    e. Small: The win condition is a straightforward check, making it a small feature.
    f. Testable: Can be tested by verifying if a player wins when stepping onto a third-level structure.
5. As a **player**, I want the game to enforce a structured turn sequence where I must move, then build, and optionally use my god power so that the game follows the intended rules of Santorini. (Jeremia)
    a. Independent: The turn system can be implemented separately from specific movement, building, or ability mechanics.
    b. Negotiable: The turn structure (e.g., allowing optional god power usage before or after moving) can be adjusted for balance.
    c. Valuable: Ensures fair and consistent gameplay by enforcing the official sequence of actions.
    d. Estimable: The logic for tracking turn order and enforcing move/build actions can be estimated.
    e. Small: Involves implementing a structured sequence of actions that players must follow.
    f. Testable: Can be verified by attempting to take actions out of order and ensuring the game enforces correct sequencing.
6. As a **player**, I want the game to highlight and restrict my movement and building actions based on the game rules so that I can only perform legal moves. (Jeremia)
    a. Independent: Movement and building restrictions can be applied separately from other mechanics like god powers.
    b. Negotiable: The method of restriction (e.g., visual highlights, error messages) can be adjusted for clarity.
    c. Valuable: Ensures players do not accidentally perform illegal moves, maintaining game integrity.
    d. Estimable: The effort to check valid moves and buildings based on adjacent spaces, height restrictions, and occupied tiles can be determined.
    e. Small: Requires checking available spaces for movement and building against game rules before allowing an action.

    f. Testable: Can be verified by trying to move or build in invalid spaces and confirming that the game prevents these actions.
7. As a **player**, I want to know the other players' god powers so that I can make a strategy around them. (John)
    a. Independent: Only requires the ability to display other players' god powers
    b. Negotiable: How it's presented can be negotiated
    c. Valuable: Players can plan around other players' god powers
    d. Estimable: We can estimate how to add the god power data and how to display it to the players
    e. Small: Only requires the ability to read others' god cards
    f. Testable: We can see if we see the god powers while in play
8. As a **player**, I want to be able to set the game mode so that I can have a new experience with the same game. (John) (Extension)
    a. Independent: While this may change the setup of the game initially, once players start playing the game, they play otherwise as normal
    b. Negotiable: How the mode card is chosen is negotiable
    c. Valuable: This allows gives the game replayability
    d. Estimable: Adjusting the settings of games depending on the mode card and the ability to select them can be estimated
    e. Small: This primarily deals with altering attributes of the game rather than fundamentally altering how Santorini is player
    f. Testable: We can test if a mode card is appropriately changing the game
9. As a **player**, I want to be able to use my god power so that I can have an advantage and win the game. (John)
    a. Independent: This only depends on the god power itself
    b. Negotiable: How the player activates their god power (if needed) is negotiable
    c. Valuable: Players can use their god power to attempt victory
    d. Estimable: Implementing the god power interacting with the current game state can be estimated.
    e. Small: Adding each god power can be done within a sprint (though adding all of them is outside of the scope of Sprint 2)
    f. Testable: We can test if activating a god power actually works
10. As a **player**, I want to see a clear visual representation of the board with different building heights and worker positions, so I can make informed decisions during gameplay. (Vinnie)
    a. Independent: The visual representation of the board can be implemented separately from game logic and mechanics.
    b. Negotiable: The visual representation can be negotiated based on feedback
    c. Valuable: Clear visualisation for the game is important for players to understand the current situation and plan their strategy.

    d. Estimable: Creating visual assets and implementing the board display is a well-defined task with clear scope.
    e. Small: The board visualization can be broken down into smaller components (tiles, levels, workers) and implemented incrementally.
    f. Testable: Can be verified by checking if players can easily distinguish different building heights and worker positions on the board.
11. As a **player**, I want the game to highlight valid movement spaces for my selected builder, so I can easily see my available options.
    a. Independent: Highlighting valid moves can be implemented separately from the actual movement mechanics.
    b. Negotiable: The method of highlighting the available movement space can be adjusted.
    c. Valuable: Helps players quickly understand their options without having to manually check each space.
    d. Estimable: The logic for calculating valid moves and the UI implementation for highlighting them are clearly defined tasks.
    e. Small: This feature focuses on a single aspect of the UI that can be implemented within a sprint.
    f. Testable: Can be verified by selecting a builder in various positions and confirming that only valid movement spaces are highlighted.
12. As a **player**, I want a simple scoreboard that tracks wins between players across multiple games, so we can keep track of our overall performance.
    a. Independent: The scoreboard functionality is separate from the core gameplay mechanics.
    b. Negotiable: The display format, persistence method, and statistics tracked can be adjusted based on requirements.
    c. Valuable: Adds a competitive element that enhances player engagement across multiple game sessions.
    d. Estimable: Implementing win tracking and a scoreboard display is a straightforward procedure.
    e. Small: This feature is focused on a single UI element and data tracking mechanism that can be completed within a sprint.
    f. Testable: Can be verified by playing multiple games and confirming that wins are correctly recorded and displayed on the scoreboard.
13. As a **player**, I want an end-game screen that displays a victory message and the option to play again or return to the main menu so that I can smoothly transition to my next action. (Dul)
    a. Independent: The end-game screen can be implemented separately from other game mechanics.
    b. Negotiable: The details of the victory message and options can be adjusted based on feedback.
    c. Valuable: It provides a smooth user experience by ensuring a clear transition after the game ends.
    d. Estimable: Involves UI changes and event logic.

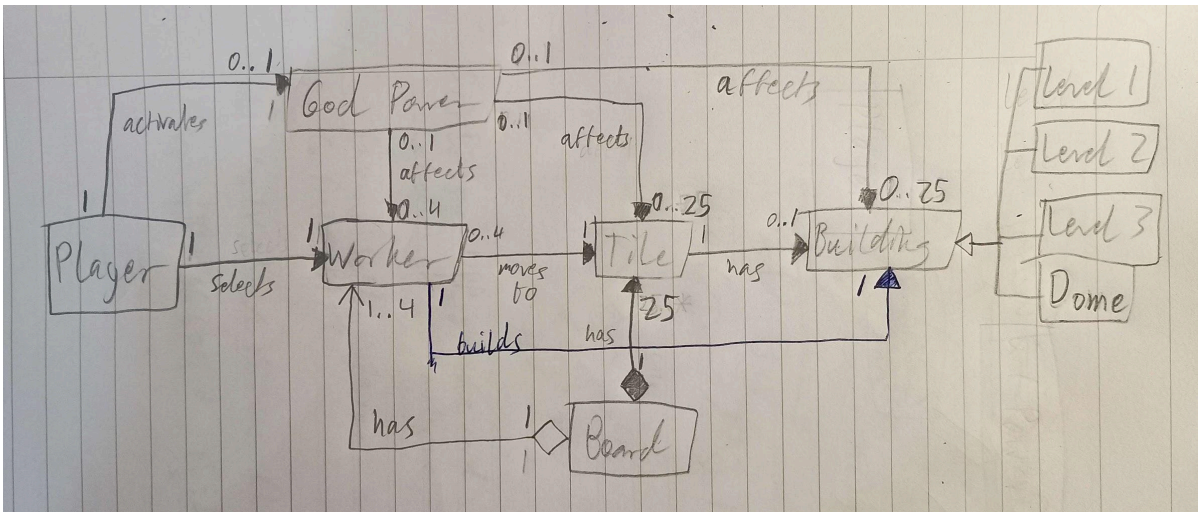
    e. Small: The end-game screen is a single feature that can be completed within a sprint.
    f. Testable: Can be verified by checking if the victory message appears and if the options function correctly.
14. As a **player**, I want a information page that explains how to play the game so I can understand all the rules. (Dul)
    a. Independent: This page is a standalone feature and does not affect gameplay mechanics.
    b. Negotiable: The format and level of detail in the explanation can be adjusted.
    c. Valuable: Players need clear instructions to understand the game.
    d. Estimable: Requires text content and a simple UI.
    e. Small: Creating a single information page is manageable within a sprint.
    f. Testable: Can be verified by checking if the page appears correctly and contains the necessary information.
15. As a **player**, I want to have a confirmation step when selecting my god so that I don't accidentally pick the wrong one. (Dul)
    a. Independent: The confirmation step is separate from other game mechanics.
    b. Negotiable: The method of confirmation (button, dialog box, etc.) can be adjusted.
    c. Valuable: Prevents accidental selections, improving user experience.
    d. Estimable: It is limited to UI modifications and event handling.
    e. Small: A confirmation dialog or step is a small addition that fits within a sprint.
    f. Testable: Can be verified by checking if confirmation is required before finalizing the selection.
16. As a **player**, I want the option to concede the game when I feel it's unwinnable so that I can end the game and let my opponent win, avoiding unnecessary frustration. (Dul)
    a. Independent: Conceding the game is separate from other mechanics like movement or building.
    b. Negotiable: The conditions for conceding and how it's displayed can be adjusted.
    c. Valuable: Gives players control over ending unwinnable games, improving user experience.
    d. Estimable: Involves adding a UI option and handling game state updates.
    e. Small: Implementing a concede option is a single, straightforward feature.
    f. Testable: Can be verified by checking if the game ends correctly when a player concedes.

17. As a **player** (with Atlas god/power card), I want to place a dome on any space instead of building a normal level so that I can block key positions. (DUL - This one might already exist, its just a specific one. Can delete it later.)
    a. Independent: Dome placement affects building but does not require modifying movement or other mechanics.
    b. Negotiable: Whether domes can be placed anywhere or only on empty spaces can be adjusted.
    c. Valuable: Allows blocking level-three victories, adding a layer of defensive strategy.
    d. Estimable: Implementing an option to place a dome instead of a normal build is simple.
    e. Small: Only modifies the build function without affecting turn structure.
    f. Testable: Can be verified by attempting to place a dome and ensuring level-three spaces cannot be occupied afterward.
18. As a **player** with a worker on the board, I want to be unable to move onto a space with a dome so that I cannot step onto an inaccessible structure. (Dul)
    a. Independent: This rule applies to movement logic and does not depend on other mechanics.
    b. Negotiable: Whether some god powers (e.g., Pegasus allowing flight) bypass this can be adjusted.
    Valuable: Ensures players follow the intended game rules and cannot move illegally.
    c. Estimable: Checking if a space contains a dome before allowing movement is straightforward.
    d. Small: Only modifies movement validation logic.
    e. Testable: Can be verified by attempting to move onto a domed space and ensuring it is blocked.
19. As a **player**, I want the option to place my workers manually at the start of the game instead of having a fixed setup so that I can customize my opening strategy. (Dul)
    a. Independent: Affects game setup but not movement, building, or turn rules.
    b. Negotiable: Whether workers must be placed within a certain area or can be anywhere can be adjusted.
    c. Valuable: Adds variety to the game and increases strategic depth.
    d. Estimable: Allowing players to select starting spots before play begins is straightforward.
    e. Small: Only modifies initial placement mechanics.
    f. Testable: Can be verified by ensuring players can place their workers before the first turn.
20. As a **worker**, I want to be unable to move to spaces occupied by other workers or topped with domes so that I respect the physical limitations of Santorini

    a. Independent: Collision detection with other workers and domes can be implemented separately
    b. Negotiable: How blocked spaces are indicated to the player can be adjusted
    c. Valuable: Enforces core game rules that create strategic depth and challenges.
    d. Estimable: The logic for checking occupied spaces is clearly defined.
    e. Small: This rule focuses on a single aspect of movement validation.
    f. Testable: Can be verified by attempting to move to occupied spaces or domes and confirming these moves are prevented.
21. As a **worker**, I want to be able to move to any adjacent space that is not more than one level higher than my current position so that I can navigate the game effectively.
    a. Independent: Worker movement can be implemented separately from building mechanics.
    b. Negotiable: The visual indication of valid move spaces can be adjusted.
    c. Valuable: The core functionality of worker movement is essential to gameplay.
    d. Estimable: Programming movement rules for workers is a clearly defined task.
    e. Small: This covers just the movement aspect and can be completed within a sprint.
    f. Testable: Can be verified by placing workers in various positions and confirming they can only move to valid spaces.
22. As a **player**, I want to lose when all of my workers are unable to move, so that I follow the rules of the Santorini board game. (John)
    a. Independent: Determining if the player loses is separate to other mechanics.
    b. Negotiable: The implementation of this losing condition is negotiable.
    c. Valuable: It is important to follow the rules.
    d. Estimable: The time it takes to implement this condition check is estimable.
    e. Small: It is independent of other mechanisms and is likely to fit in one sprint.
    f. Testable: We can test if a player actually loses when appropriate.

Domain Model & Justification

Domain Model



Domain Model Justification

Assumptions

- The domain model captures a single turn of standard 1 v 1 gameplay.
- The board is a standard 5 x 5 board and thus has 25 tiles (and 25 maximum buildings). The extension for different sized boards is not included, but can be by changing the size of 25 to 1..* (for God power -> Tile and God power -> Building, it will change from 0..25 to 0..*)
- The God power the player is using has no passive effects, and the player is allowed to not activate it.
- Building is interpreted to be 1 entity, regardless of the multiple levels. (For example: A level 2 building entity is still considered as one entity)

Entity Justifications

Entity	Justification
Player	Represents the player who interacts with the game. It is responsible for controlling the workers and using their god power.
Worker	Represents a game piece controlled by a player. Its responsibility is to be able to move across the board, build on structures on adjacent tiles, be affected by god powers and fulfill victory conditions.
God Power	Represents a special ability assigned to a player. It has a special effect on the game based on the specific God's power.
Tile	Represents a single cell on the board. Its responsibility is to contain a worker and allow them to move and build on itself.
Board	Represents the grid where the game will take place. It establishes how all the tiles are connected to each other in the game.
Building	Represents a buildable structure on the board. Its responsibility is to be stackable and allow the player to progress through different levels in the game.
Level 1	Represents the first level of a building. Its responsibility is to allow players to step onto them.
Level 2	Represents the second level of a building. Its responsibility is to allow workers to step onto them unless they are on the ground.
Level 3	Represents the third level of a building. Its responsibilities are to indicate victory when a worker is on it. It also allows workers to step onto them unless they are on a Level 1 structure or on the ground.
Dome	Represents the cap placed on a cell. Its responsibilities are to prevent workers from moving onto the tile it is built on.

Relationship Justifications

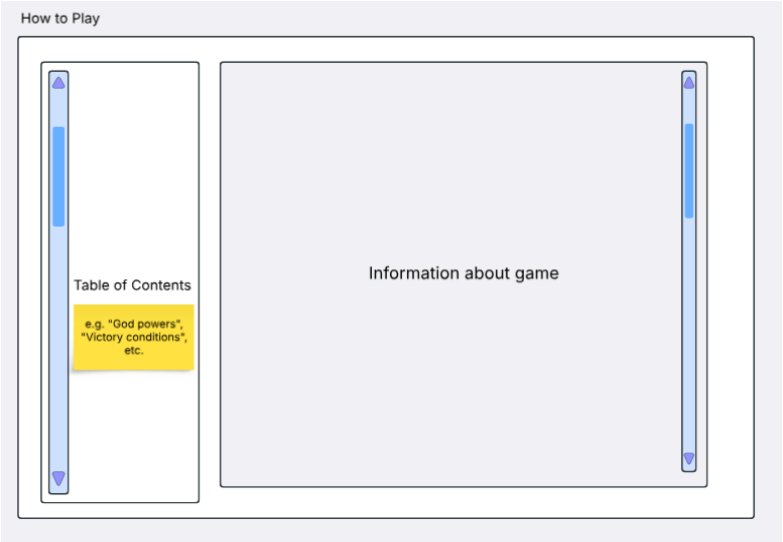
Entity A	Entity B	Relationship Type	Justification
Player	Worker	Association (1 to 1)	One player selects 1 of their 2 workers (if the other is still alive) on the board to move.
Player	God	Association (1 to 0..1)	A player can optionally activate their God power during the game. A player only has one god card (for different modes it's still one) to activate.
God Power	Worker	Association (0..1 to 0...4)	An activated God power may affect workers on the board. However, they do not affect the worker every turn, only when their ability is able to or the player calls on it.
God Power	Tile	Association (0..1 to 0...25)	An activated God power may affect any of the tiles on the board depending on the power. A tile can be affected by 0 or 1 player-activated God power (since at most 1 God power is activated per turn).
God Power	Building	Association (0..1 to 0...25)	An activated God power may affect any of the buildings on the board depending on the power. A building can be affected by 0 or 1 player-activated God power (since at most 1 God power is activated per turn).
Worker	Tile	Association (0..4 to 1)	If a worker can move at all, they can move only to 1 of the spaces they can move to. They may have 1 to 8 possible tiles to move to under normal circumstances since they can move only 1 space. For any given tile, it can be moved on to by 0 to 4 workers.
Tile	Building	Association (1 to 0..1)	A building can only ever be placed upon a tile however a tile may not necessarily have a building placed on it.

Level 1, Level 2, Level 3, Dome	Building	Generalisation	Each level is a type of building that has different purposes, yet each has the same general meaning of being constructed by players and placed on tiles.
Worker	Building	Association (1 to 1)	A Worker, at least normally, must build after they move. Given that a worker can always build on the tile they moved out of, workers can always build if they've moved. They can only build 1 building, and a given building level can only have ever been built by one worker.
Board	Tile	Composition (1 to 25)	A tile cannot exist without the existence of a board. A board has tiles that make it up. A tile belongs to a single board. A board in the standard game consists of 25 tiles.
Board	Worker	Aggregation (1 to 1..4)	All workers are placed on the board. However, it is up to the players to place them on the board, so workers do exist outside of the board. There is always at least 1 worker on the board since a game must have a winner by default.

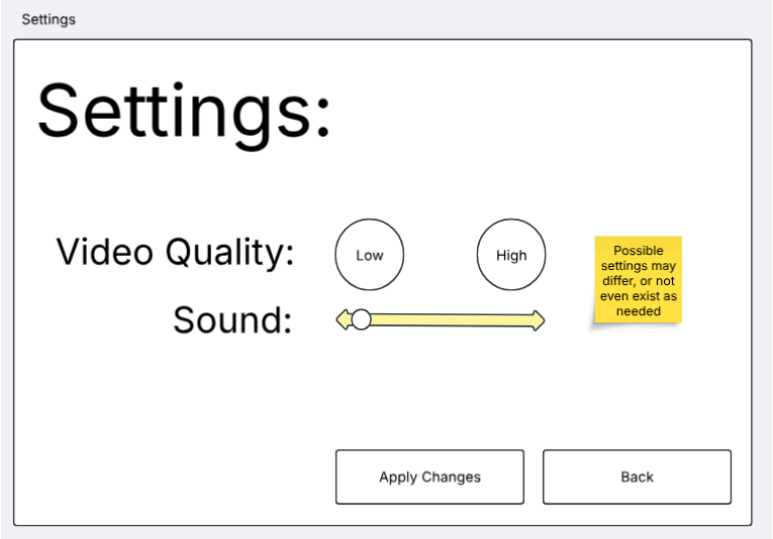
Basic UI Design

Main Menu Screen

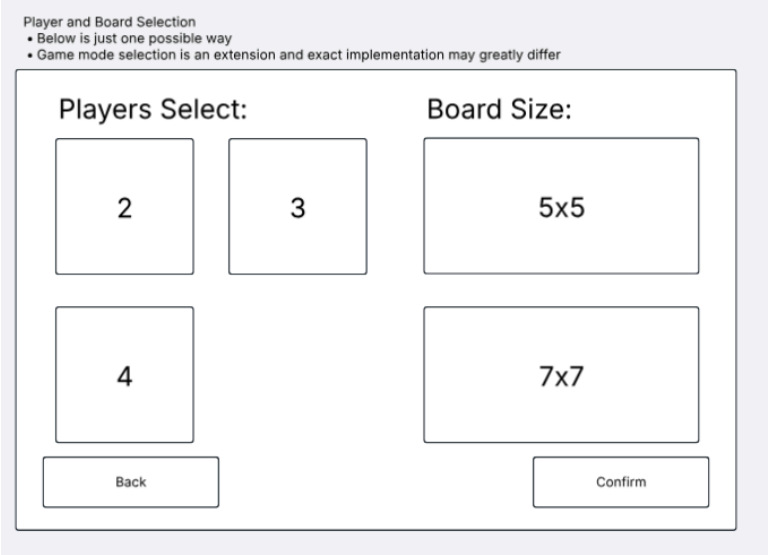
How to Play Screen



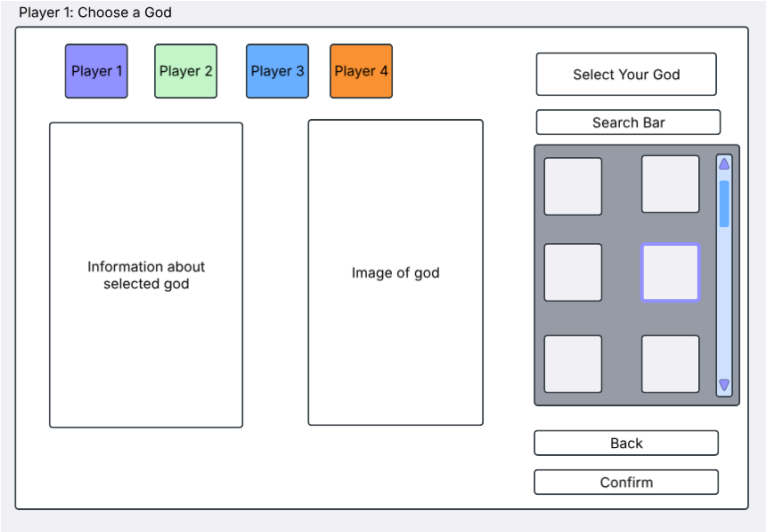
Settings Screen



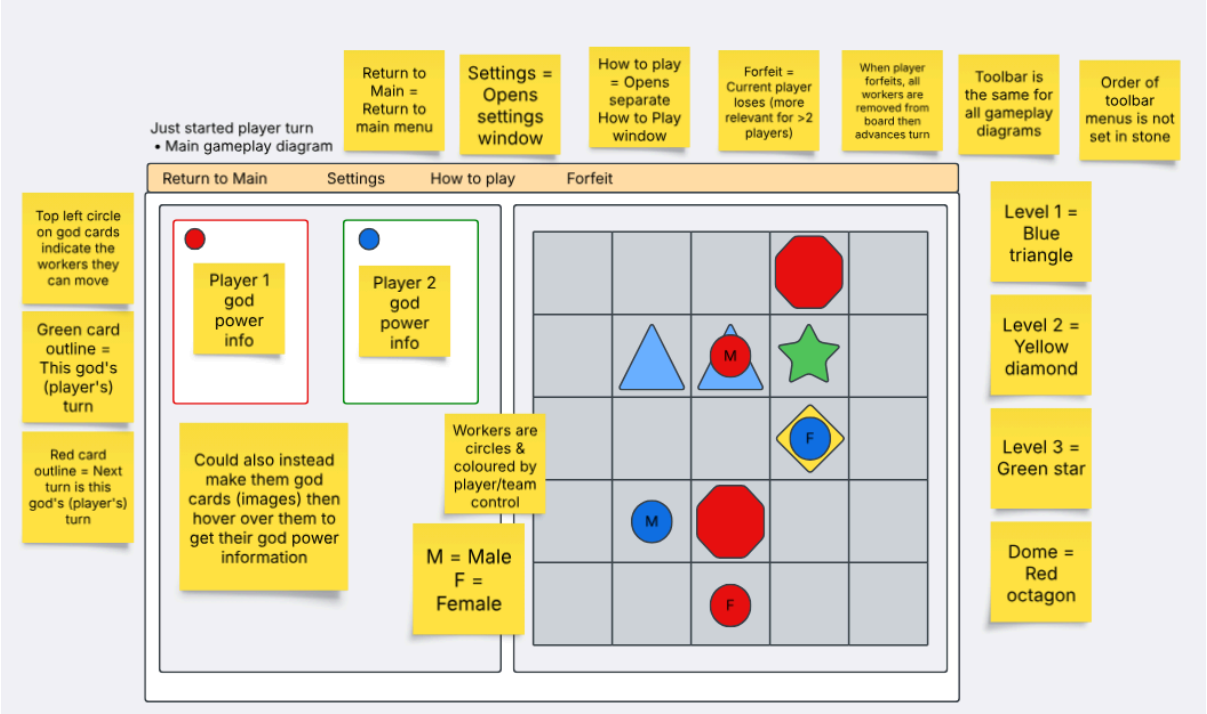
Player and Board Selection



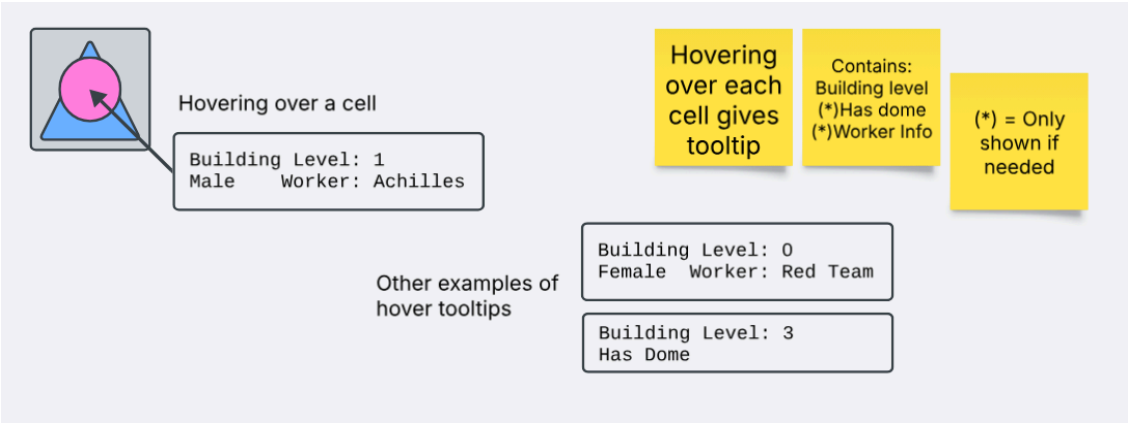
Player selecting God Screen



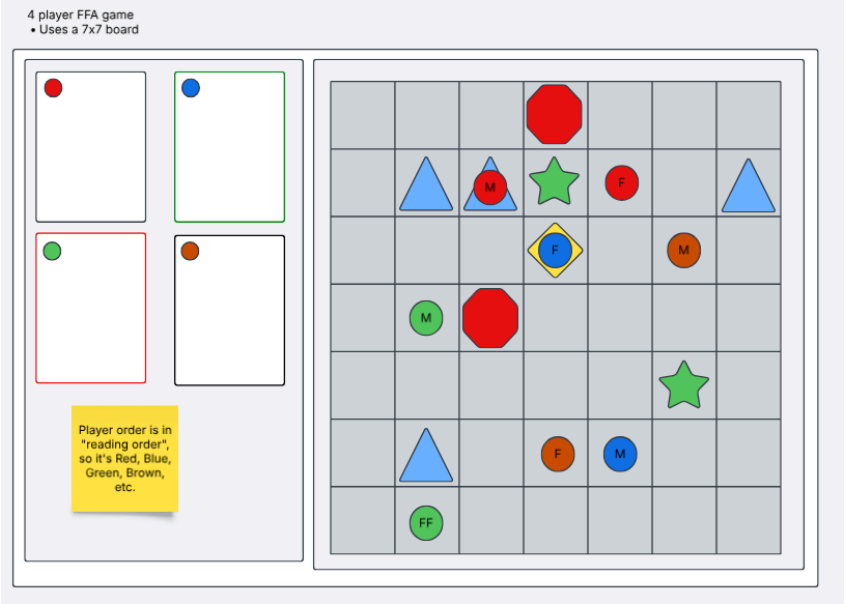
Player Turn* Screen



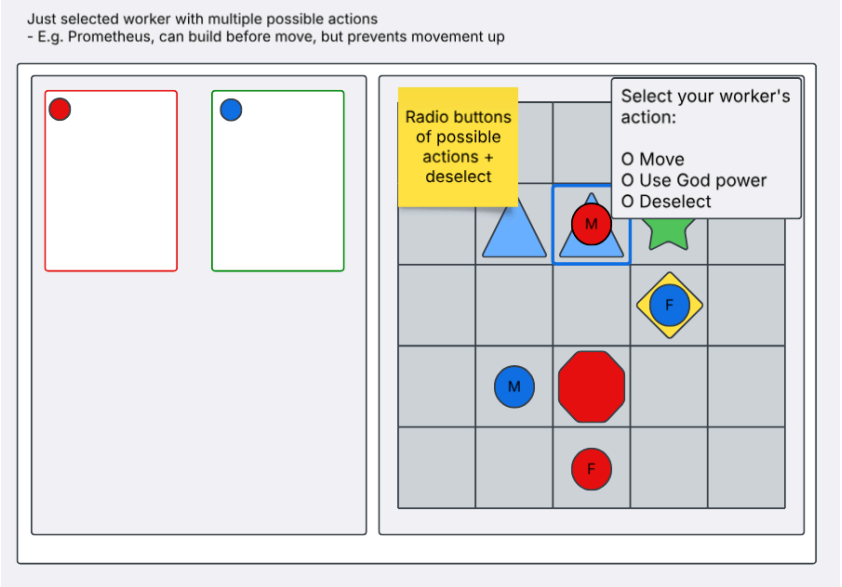
Hovering over tiles*



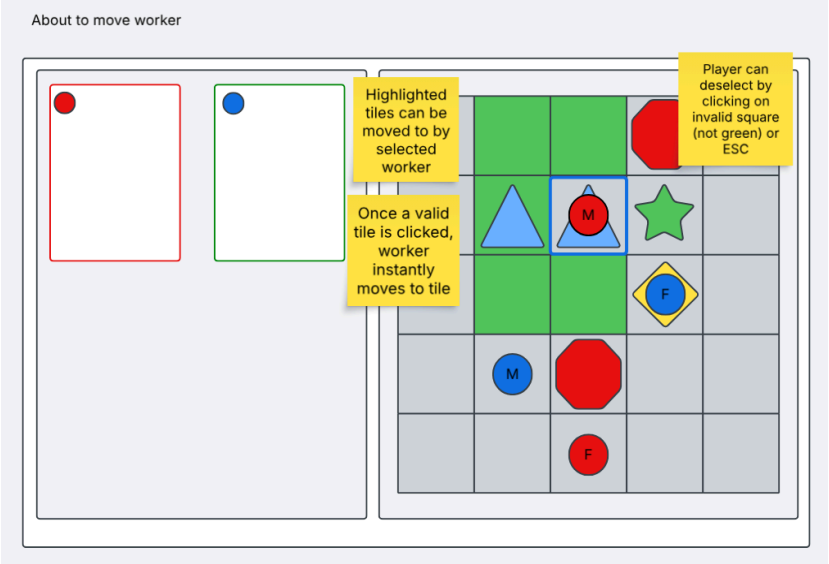
Player Turn Screen w/ 4 Players



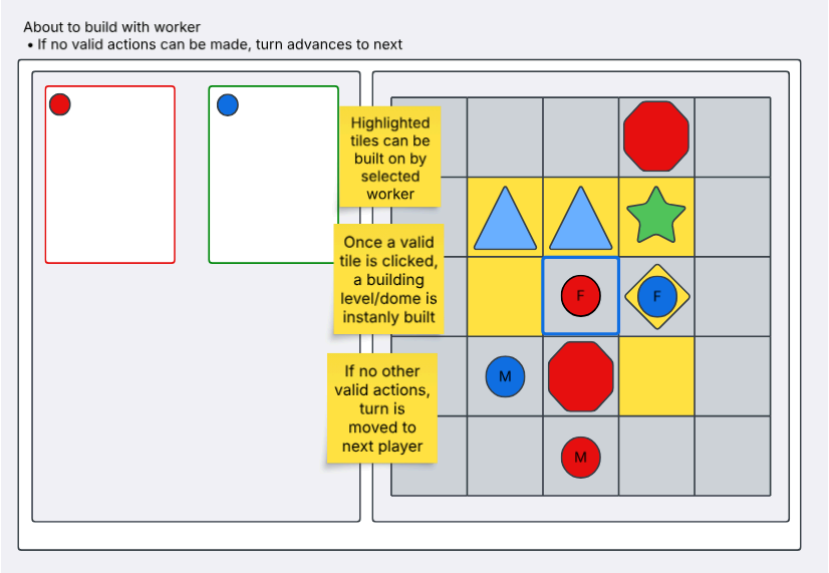
Worker Selected*



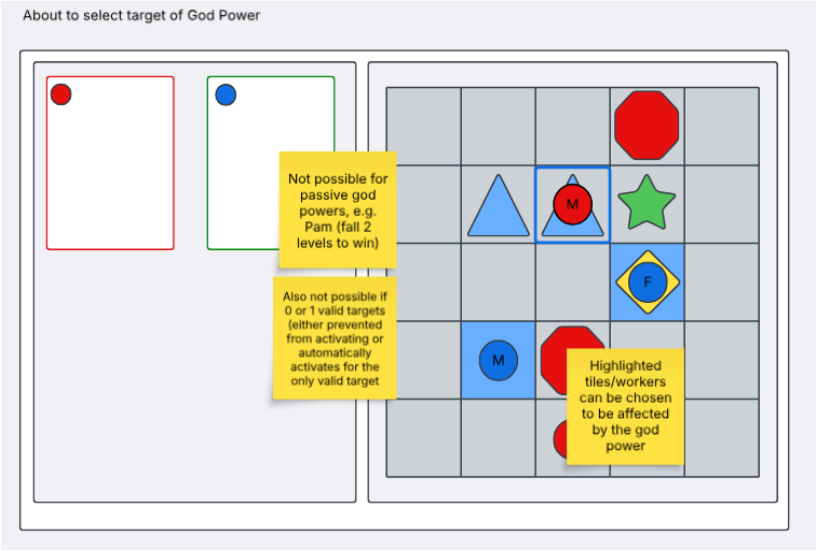
Worker moving*



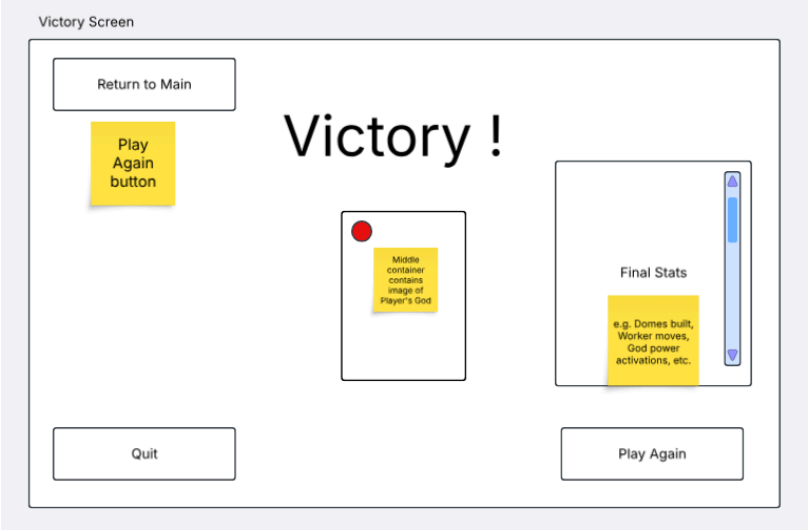
Worker building *



Player using God ability*

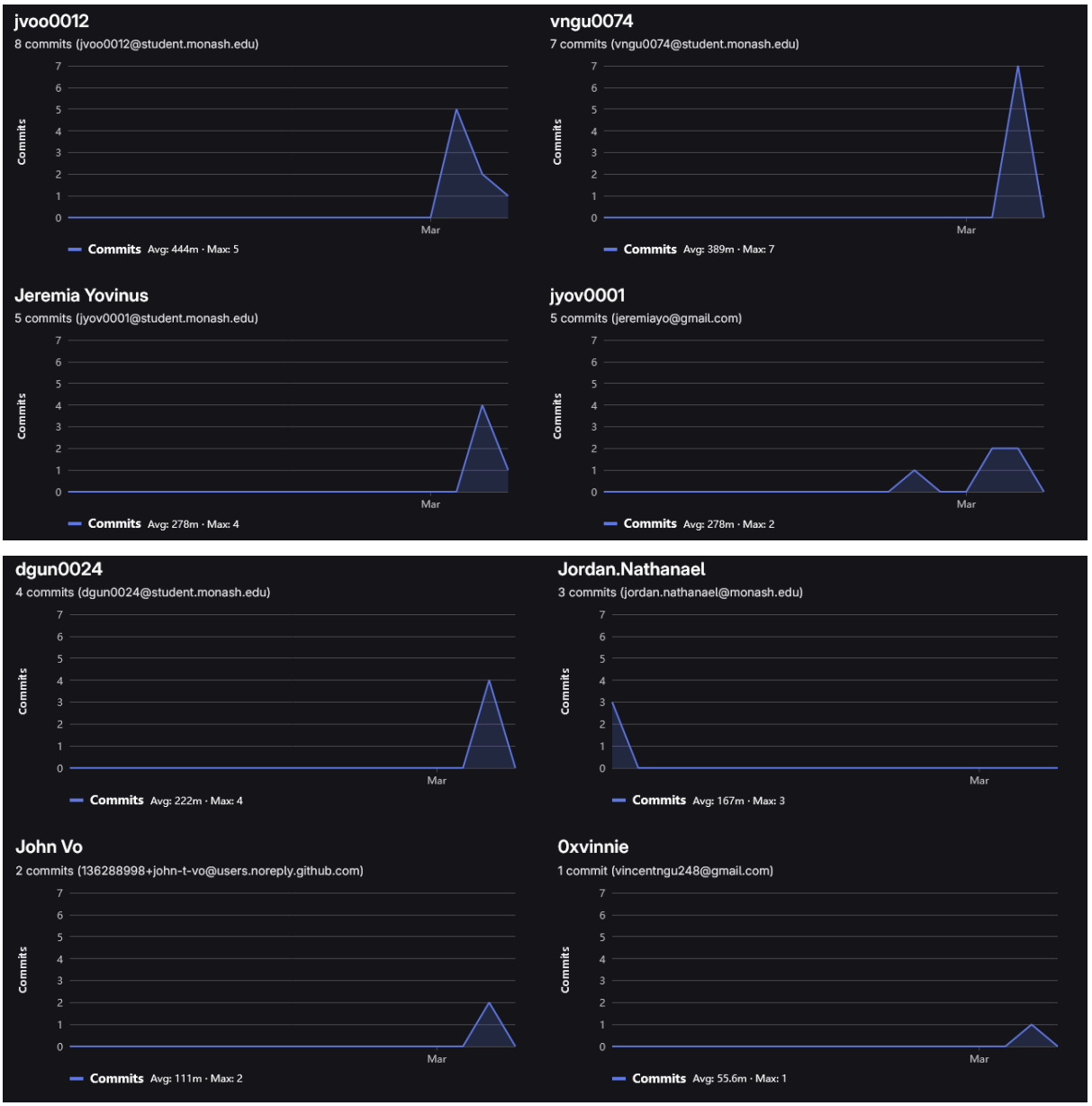


Victory Screen



Team Contribution

Contributor Analytics



Note: Jeremia Yovinus and jyov0001, 0xvinnie and vngu0074, and John Vo and jvoo0012 are each the same person. There were some mistakes with Git authoring.

Disclosure

Our group acknowledges that several commits were missed as much of the work was done collaboratively during frequent meetings. Moving forward, we will ensure more consistent and iterative commits to accurately reflect individual contributions. In the meantime, the following link leads to our Google Docs document, which has a version

history that outlines our work for this sprint and can be used for assessment purposes:
https://docs.google.com/document/d/1Zivchf8OgmFTVEAlV7ry3ScWTpiJGETPH1h4UfGEQRk/edit?usp=sharing