# ECOJOZI

Environmental Sustainability in Johannesburg

# CSC2058 Peer Assessment 2: Group 22

This Assessment Document is intended to provide you and your assessor with an overview of each group member's involvement in delivering the final components of the CSC2058 Project.

Each group should complete one Peer Assessment 2 Document **and its content must be agreed by all group members**. The completed form should be included at the start of your group's PDF report. ***Don't forget to fill in the Group Number.***

There are three main parts to the Assessment Document – the Evaluation, the Declaration and the Personal Statements (**spaces for each team member's personal statement are provided at the end of this document**). All parts must be completed – otherwise your group's report will not be marked. Arrange a group meeting to discuss the evaluation and personal statements, **and please carefully read the note on the following page**!

**This evaluation concerns work that was undertaken and completed during the Second Semester.**

**Team members are expected to maintain a high level of engagement with the project across both semesters.**

| **Evaluation** | Group Number: 22 | | | |
|---|---|---|---|---|
| Name | Contribution to team-working and motivation[1] | Contribution to the Poster and the Poster Video, PDF Report 2, and the Final Game Demo Video and Game Demo Schedule [1,2] | Contribution to methodically developed and functioning game code [1,2] | **Peer Score** (Range 85 – 115) **You must fill this in as well as the other columns.** |
| *Muneer Alsahli* | *5* | *5* | *1* | *113* |
| *Adan Zeeshan Ullah Khan* | 5 | 2 | 5 | 113 |
| *Hassan Sakka* | 5 | 2 | 4 | 109 |
| *Ryan O'Neill-Quinn* | 5 | 1 | 5 | 111 |
| *Hein Htet Aung,* | 5 | 5 | 1 | 103 |
| *Joshua Dennison* | 5 | 5 | 1 | 107 |
| *Clive Nyamadzawo* | 5 | 1 | 5 | 110 |

[1]Values for contribution: 1 = Minimal Contribution; 2 = Reasonable Contribution; 3 = Good Contribution; 4 = Very Good Contribution; 5 = Excellent Contribution

[2]This value should consider contributions in the round – direct contributions this semester to required deliverables, and contributions this semester that have made the deliverables possible.

## Declaration

"I declare that I have read the Queen's University regulations on plagiarism, and that any contribution I have made to the attached submission is my own original work, except for any elements that I have clearly attributed to third parties. I understand that this submission will be subject to an electronic test for plagiarism and will also be subject to the University's regulations concerning late submission if it is received after the deadline."

| Name | Date | Confirmation *(use the words shown in the example below!)* |
|---|---|---|
| *Muneer Alsahli* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Adan Khan* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Hassan Sakka* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Ryan O'Neill-Quinn* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Hein Htet Aung,* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Joshua Dennison* | *20/03/2025* | *I agree to the terms of the declaration* |
| *Clive Nyamadzawo* | *20/03/2025* | *I agree to the terms of the declaration* |

***A note on the Evaluation:***

Complete all the columns in the Evaluation Table, **including the Peer Score column**. The Contribution columns are intended to help team members quantify each other's input to the project, before they award agreed **Peer Scores**. There will not necessarily be a precise correlation between the Peer Score and the Contribution values. However, high Contribution values, as an indicator of the importance of the team member's work to the success of the project, should normally result in a high Peer Score for a team member. Likewise a low Peer Score would be the expected outcome if Contribution values are low. Students who have made a high-value Contribution in all three contribution categories (e.g. 5,5,5) should expect to receive a higher Peer Score than students who have made a lower-value Contribution in one or more categories (e.g. 5,5,3).

If, having reviewed the Contribution values, the team agrees that Team Member 1 made an 'only just adequate' contribution overall, a Peer Score of 85 would be appropriate for Team Member 1. If Team Member 1's contribution was excellent (critical to the success of the project in all areas of engagement), consider a peer score of 115. If Team Member 1 made a generally good contribution, doing what was expected of them, they could expect to receive a Peer Score of 100. It may be that a team member (for whatever reason) has disengaged from the project entirely, and in such circumstances **a Peer Score of 0** may be acceptable. ***Please inform the Module Lecturer if a team member has left your group or has ceased to play an active role in the group.***

**P.T.O.**

Each team member's overall score for the Semester 2 deliverable will be calculated according to the following formula, where $S_i$ is Team Member *i*'s overall score, $P_i$ is the Peer Score received by Team Member *i*, N is the number of members in the team, and M is the raw mark awarded to the Semester 2 deliverable by the assessor.

$$S_i = \frac{P_i}{\frac{1}{N}\sum_{j=1}^{N} P_j} \times M$$

**Except for a Peer Score of 0, a Peer Score must not be awarded to a Team Member who has not made any clearly identified contribution to the Semester 2 deliverable.** Peer Scores **outside** the range 85 – 115 should be discussed with the Module Lecturer. Provided there are appropriate and clearly identified contributions by the Team Member, a Peer Score within the range 85 – 115 will normally be accepted by the Module Lecturer. **However, students are expected to award a range of Peer Scores within a team: it is very unusual in a project for everyone to display exactly the same level of ability and commitment, and the Peer Scores should reflect this. (See the following paragraph also!)** Be fair: be prepared to recognise someone who has adopted a leading role in the project, and acknowledge the fact that some contributions will be weaker than others. Uniform scores may require that the Team discuss its decision with the Module Lecturer, in order to agree a fair distribution of scores. Throughout the project, team members should use appropriately named folders in GitLab to help them co-ordinate their work and maintain a record of their contributions.

**Where team members cannot agree a distribution of Peer Scores, or the distribution is unreasonable, the Module Lecturer's judgement will be final.** In such circumstances the Lecturer will normally consider: individual contributions to the module, as evidenced by uploads to GitLab; minutes of meetings that name attendees and document the progress of their work; sections of the PDF report that clearly identify lead and secondary contributors; the personal statements in this document; other relevant evidence. **If your team is unable to agree a distribution of Peer Scores, please inform the Module Lecturer before you make your final submissions.**

**All team members should ensure that their contributions are clearly identifiable in the Git record and in the content of the PDF report** (e.g. – in the PDF report – [heading:] 'Class Diagram: Principal: A.B; C.D; Support: E.F.; G.H.; I.J.; K.L.)'.

**Each team member is expected to be actively involved in all aspects of the development process, even if they take a primary or leading role for some components and a secondary or supporting role for others.** A leading role might mean that you identify candidate classes, attributes and operations for the class diagram, complete the first draft of the class diagram, and approve the final version; a supporting role might mean that you review the class diagram and prepare corrections and additions, or that you provide the written commentary on the diagram, having consulted with the lead designer.

**Taking the agreed Contribution values and Peer Scores into account, each team member must enter a personal statement in one of the boxes on the following pages.**

# Personal Statements

| *Personal statement of (enter name):* | *Muneer Alsahli* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| I worked with the team from the start making sure that we are all up to date with everything, I started the work on the poster and completed the design of it, I worked on the JUnit testing and helped my team to complete the pdf report, which included working on the team minutes and organising meetings, I have also worked on the research of Johannesburg waste problem to ensure our solution is going to help as many people as possible and I have always been working on solving problems and coming up with the best solutions for our team. | |

| *Personal statement of (enter name):* | *Adan Zeeshan Ullah Khan* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| - I started programming with Clive's skeleton code and programmed the entire GUI from scratch, with Java Swing. All Menus, Buttons, Panels, the Game board, the Player Movement Menu, Character Selection, and Implementing all the core and value-added functionalities of the Game.<br><br>- I have also implemented value-added features like Colourblind features and tweaked "Form Alliance" functionality along with heavy debugging of the Bad_Events class towards the end.<br><br>- I have worked on the UI Design Documentation for the PDF Report with Hein and polished the entire PDF Report for submission with Muneer. | |

| *Personal statement of (enter name):* | *Hassan Sakka* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| At my time working on the project, I helped in important areas like Task Class, Alliance Class, GUI features and bug fixes, I played a important role in creating the new class diagram. I always tried to help the team be positive in a team environment, boosting co operation and collaboration. My problem solving skills and commitment to teamwork helped the the project come to life making our project user friendly and working. | |

| *Personal statement of (enter name):* | *Ryan O'Neill-Quinn* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| While working on the EcoJozi project this semester, I was a major contributor to the planning, writing and development of the codebase. Most of my time was spent figuring out the best way to write core functions such as claim task, allocate resources, form alliance and more. After the rest of the team and I had implemented these features, I spent countless hours refactoring and debugging the code, finding incorrect behaviour, and fixing it, as well as adding new features and tweaking the way existing features worked, such as the allocation of resources and form alliance, which I majorly reworked. | |

# Personal Statements (continued)

| *Personal statement of (enter name):* | *Hein Htet Aung* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| I made significant contributions to the EcoJozi project during my tenure, such as producing the User Interface Design Documentation for the PDF report, designing the poster material, and creating the EcoJozi logo. I also had a major part in revising and updating the class diagram to make sure it matched the code structure of the project. In addition to my technical contributions, I worked well with my team to improve documentation clarity and preserve a productive workflow. My efforts ensured clarity in the project's technical design and documentation by assisting in the effective visual and structural presentation of EcoJozi. | |

| *Personal statement of (enter name):* | *Joshua Dennison* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| Throughout the semester, I played a key role in showcasing EcoJozi by crafting and refining its visual and presentation materials. I wrote the script for the poster video, delivered the presentation, and meticulously edited the final video. Additionally, I took the lead on the game demo video, creating the script, visuals, and editing, as well as organising the game demo schedule. To ensure a polished user experience, I conducted acceptance user testing, gathering valuable feedback for improvements. My contributions were instrumental in effectively communicating the project's vision and delivering a seamless, engaging user experience. | |

| *Personal statement of (enter name):* | *Clive Nyamadzawo* |
|---|---|
| The following were my most significant contributions to the Semester 2 Deliverable (100 words or less): | |
| The project started with my development of initial skeleton code for all classes to create a structured foundation. The Bad_Events and Good_Events classes were developed to store random events that are assigned to specific squares within the board game. I improved the Board class by adding a few new methods while fixing known bugs. I worked on other classes during the project but concentrated primarily on these specific ones. During the project duration I communicated regularly with team members while persistently enhancing required classes. | |

## Design Documentation

### User Interface Design:

Our game is designed for efficient and engaging gameplay. The interactive GUI elements like player mechanics, along with the strategic team-based decision-making nature of the game, maintain balance and fairness, making it fun and engaging for players.

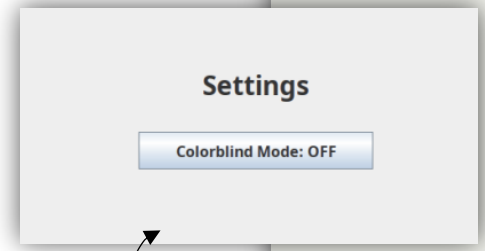
We have implemented a GUI for our game using Java Swing to allow players to have a fun and immersive experience while also educating themselves on development projects for helping a community in need.

### Key Features of the GUI:

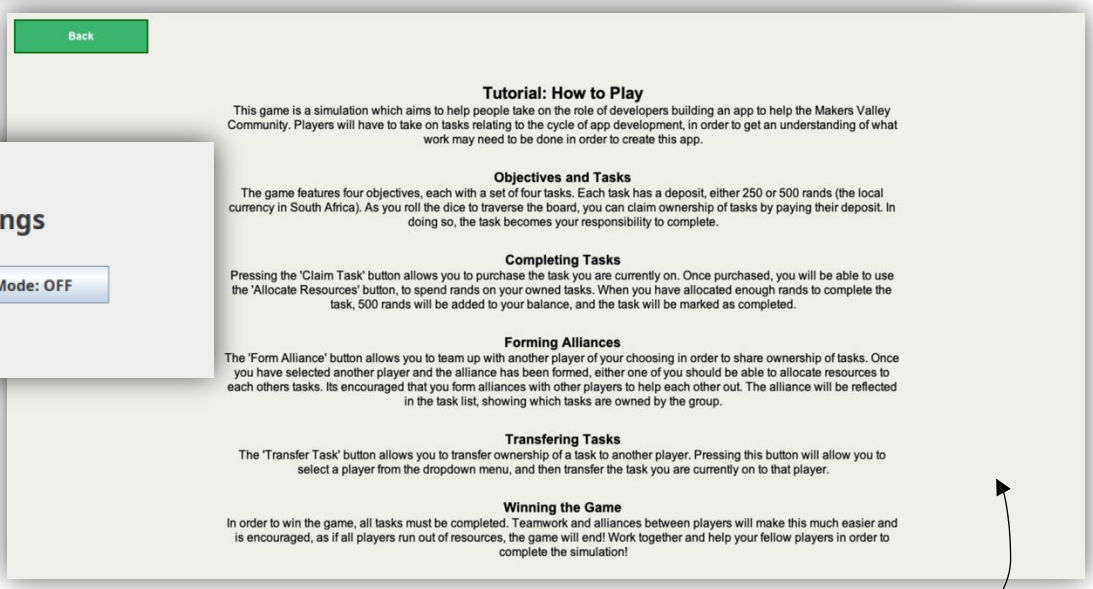
### 1. Main Menu:


- ⇒ This is the Main Menu, it hosts buttons like: Start Game, Settings, Tutorial and About.
- ⇒ **Start Game button:** It initiates the game, which leads to setting up players.
- ⇒ **Settings:** Players can adjust colourblind settings by clicking this button, which takes you to the Settings page.
- ⇒ **Tutorial:** Users can access the tutorial page, which describes how the game operates.
- ⇒ **About:** This button takes you to our mission page, explaining our mission and what the game is about.


About




Settings




Tutorial

### 2. Player Setup Menu:


⇒ This sub-menu prompts the player to input the number participants with a **minimum of 2 and a maximum of 4**.


⇒ Each player can **customise their desired names and select a unique character**.
⇒ Start Game: Launches the Game Board and starts the game.

### 3. Main Game Screen:

⇒ All of the key components for the gameplay, including the game board, player action buttons, game log, and objective panels, are all gathered on the screen.

The Objectives Panel shows each task's progress

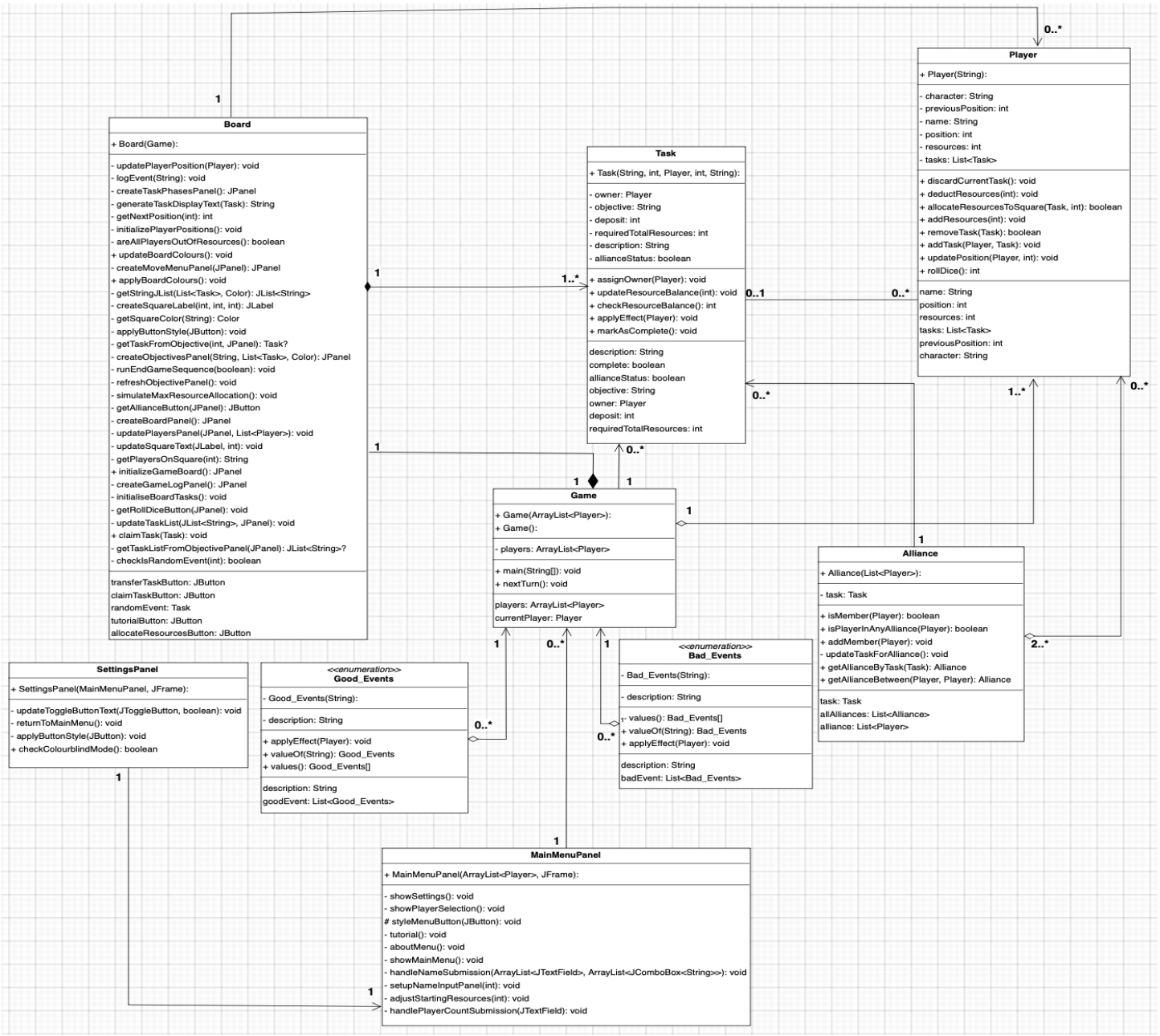
The main stages of project development such as planning, design, development, testing, and deployment are represented at the centre of the board. Furthermore, Random Event squares helps keep the gameplay dynamic.


On the left, player details display names, unique characters, and available resources for easy tracking

Key operations like rolling dice, claiming tasks, forming alliances, allocation resources, and transferring tasks are all available through the Player Menu. In addition, for a seamless gameplay experience, the Tutorial button offers instructions on game mechanics.

The Game Log on the right helps the players keep a track of their turns and key events,

## Class Diagram:




## Class Diagram Commentary:

### Design Considerations included

- **A modular structure** with classes such as Player and Game. Additionally, each board member has a distinct responsibility, which enhances maintainability.
- **Flexibility:** Players can be managed dynamically and games can scale by using collections like ArrayList in classes like Game.
- **Encapsulation:** Classes such as Player maintain data integrity by keeping private information accessible through public methods.

### Key Elements:

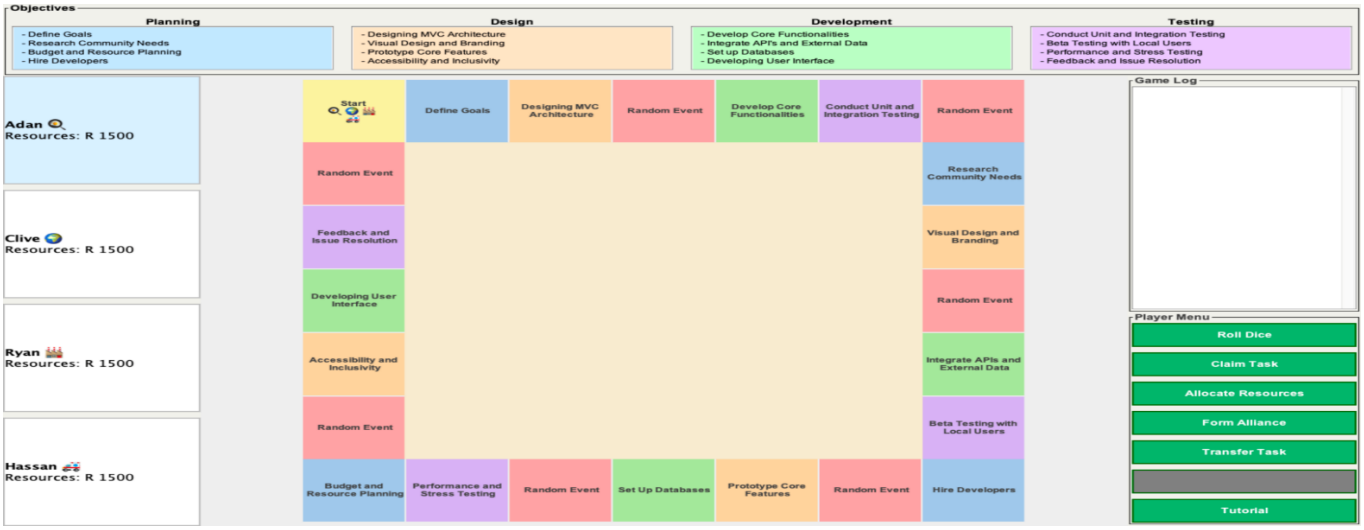
- **Game Class:** Essential for controlling the game, it starts processes with open methods and maintains data integrity.
- **Player class:** essential to gameplay dynamics, it stores each player's qualities and actions.
- **Alliance class:** Enhances strategic gaming elements by facilitating player participation.

### Arrow style:

- **Association:** demonstrates use or interaction, such as "Game to Player," which shows that the player is a part of the game.
- **Composition:** High ownership, such as "Game contains a Board," which indicates that the board is a component of the game's lifespan.
- **Multiplicity Notation:** Improves comprehension of class interactions by describing the possible quantity of links.

### Design Considerations includes:

### Final Game Layout:




## The Game: Implementation related documentation:

### Acceptance Testing

| Basic Reqs. | Description of Test | Test Initialisation | Test Inputs | Test Procedure | Expected Results | Passed ? |
|---|---|---|---|---|---|---|
| 2.1 | Validate that a valid player count is accepted | Click start game on main menu | 3 | Input 3 into the player count field and click the start game button | The game proceeds to the player set up screen with three player selections displayed | Yes |
| 2.2 | Test the validation for the amount of players in the game is lower than 2 | Click start game on main menu | 1 | Input 1 into the player count field and click start game button | A validation message comes up saying please enter a number between 2 and 4 | Yes |
| 2.3 | Test the validation for the amount of players in the game is higher than 4 | Click start game on main menu | 5 | Input 5 into the player count field and click start game button | A validation message comes up saying please enter a number between 2 and 4 | Yes |
| 3.1 | All player enter unique names and characters | Go to player setup by selecting start game and then a valid player count | Input unique names and select different characters . | 1.Fill in valid names and select unique characters.<br>2. Click "Start Game." | Game starts with correct player names and characters displayed. | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.2 | Validate that player names are not duplicated | Go to player setup by selecting start game and then a valid player count | Enter the same name for multiple players | 1. Input duplicate names for two players.<br>2. Click "Start Game." | A validation error appears indicating that there cannot be duplicate player names | Yes |
| 3.3 | Validate that player names are not left empty during setup | Go to player setup by selecting start game and then a valid player count | For one of the players leave the player name field blank and select a character | 1. Fill in player details for all players except one, leaving the name field blank for one player.<br>2. Click the **Start Game** button. | A validation error appears indicating that player names cannot be empty | Yes |
| 3.4 | Validate that player characters are not duplicated | Go to player setup by selecting start game and then a valid player count | Select the same character for multiple players | 1. Choose the same character for two players.<br>2. Click "Start Game." | A validation error appears saying that there are duplicate characters | Yes |
| 4.1 | Tasks are displayed correctly on the board | Start a game and reach the main board screen by inputting valid information | None | 1. Check that all tasks are sorted into Planning, Design, Development, and Testing categories.<br>2. Verify that tasks are displayed as squares on the board. | Tasks are correctly categorised and represented visually | Yes |
| 5.1 | A dice roll moves the player correctly | Start a game and reach the main board screen by inputting valid information | Use the roll dice button | 1.Click Roll dice | The game log displays the dice roll result between 1 and 6 and moves the character accordingly on the board | Yes |
| 6.1 | A Player can claim an unclaimed task | Start a game and roll the dice to land on a task | Use the claim task button | 1. Land on an unclaimed task.<br>2. Click "Claim Task." | The task is marked as claimed by the player that claimed it and the resources are deducted from their balance | Yes |
| 6.2 | A Player cannot claim an already claimed task | Start a game and roll the dice to land on a task | Use the claim task button on a task already owned by another player | 1. One player claims a task.<br>2. Another player lands on the same task and tries to claim it. | A validation message appears saying that the task is already claimed by another player | Yes |
| 6.3 | Player can transfer tasks to others | Start a game and claim a task | Use the transfer task button | 1.Click the transfer task button<br>2.Choose the task from the dropdown menu | The game log reflects the transfer, and task ownership updates correctly. | Yes |

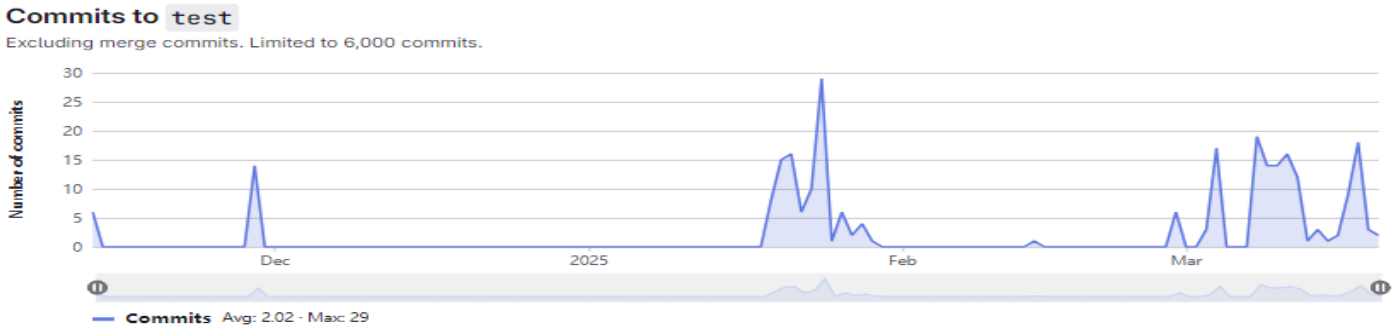
| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | 3.Choose the player to transfer the task to | | |
| 7.1 | Completing a task gives resources to the task owner | Start a game and complete a task | Use the allocate resources button | 1.Allocate enough resources to complete the task | The game presents a message that the correct number of resources are allocated and that the task has been completed which will then update beside the task along the top of the screen | Yes |
| 7.2 | Players can allocate resources to any of their tasks no matter where they are on the board | Start a game and claim a task | Use the allocate resources button | 1.The same player rolls dice to another square on the board<br>2.The player uses the allocate resources and selects the task they have previously claimed and allocates resources to it | Resources are correctly allocated and task progress updates and balance correctly updates | Yes |
| 8.1 | Player receives 1000 Rands upon passing start square | Start a game | Use the roll dice button | 1.Continue to roll the dice until one player has reached or has moved past the start square again<br>2. Check balance | Player's balance increases by 1000 rands | Yes |
| 9.1 | Game ends when all objectives are completed | Start a game | Complete all objectives | 1.Players completes all the tasks | The game ends with a successful message | Yes |
| 9.2 | Game ends when all the players run out of money | Start a game | Spend all resources available | 1.Players spend all their resources | The game ends with a failure message | Yes |
| va1.1 | Congratulations screen appears when all objectives are complete | Start a game | Complete all objectives | 1.Complete all objectives<br>2.Click end turn | Congratulations message should appear on screen | Yes |
| Va2.1 | Tutorial is accessible from main menu and in game | Launch the application | Click the tutorial button in game or on the main menu | 1.Click the tutorial button | The tutorial should appear on screen | Yes |
| Va3.1 | GUI is engaging to the user | Launch the Application | Show the user the different interfaces within the game | 1.Show main menu<br>2.Show board screen | Survey questions<br>Visual Appeal (1-5)<br>Ease of use (1-5)<br>Responsiveness (1-5)<br>Enjoyability (1-5) | |
| Va4.1 | Colourblind mode works | Launch the application | Change the colourblin | 1.Click on settings<br>2.Click on colourblind mode | Colourblind mode works and the game elements are distinguishable | Yes |

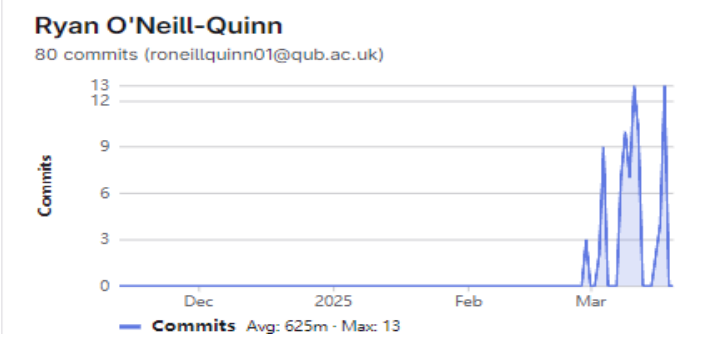
| | | | | | | |
|---|---|---|---|---|---|---|
| | | | d mode to yes | 3.Make sure colourblind is set to yes<br>4.Start a game | | |
| Va5.1 | Players can form an alliance when on a claimed task and cannot form another alliance | Start a game and claim the task you land on | Click the form alliance button | 1.Click the form alliance button whilst on the task that you claimed<br>2.Choose another player to form an alliance with<br>3.Other player accepts the request<br>4. Click on the form alliance button again | Message comes up saying that an alliance has been formed between two players. When the player tries to form alliance again an error message comes up saying that you can't form another alliance | Yes |
| Va.6.1 | Special squares trigger an event when landed on | Start a game | Click the roll dice button | 1.Roll the dice<br>2. Land on a random event square | The event will be displayed upon landing. | Yes |

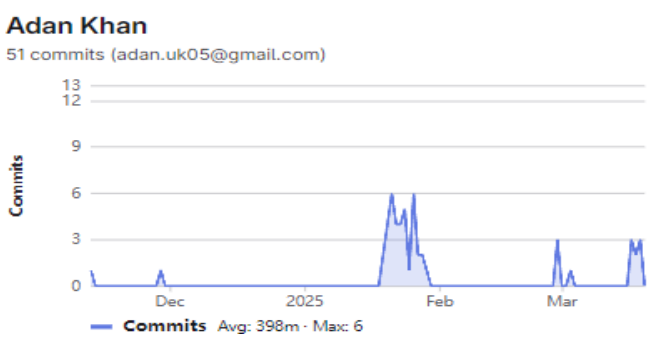
Survey link and results: https://forms.office.com/e/AXpHwgKRi0


## Adherence to process:

## GitLab usage:

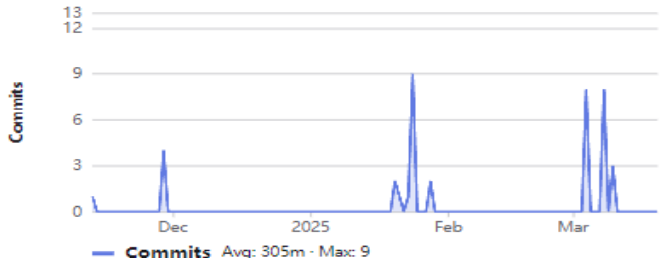


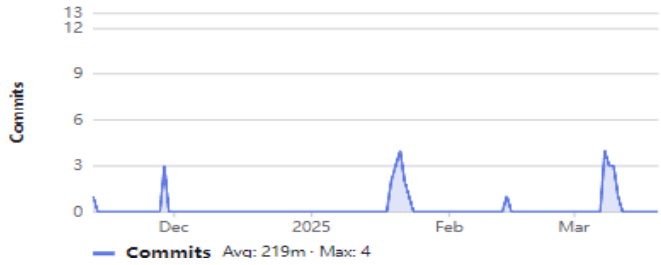
## Hassan Sakka

39 commits (geaster742@gmail.com)



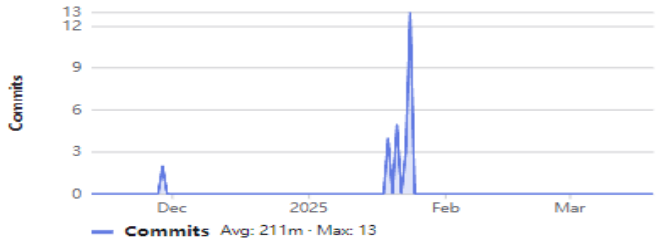

## Clive

28 commits (cnyamadzawo01@qub.ac.uk)



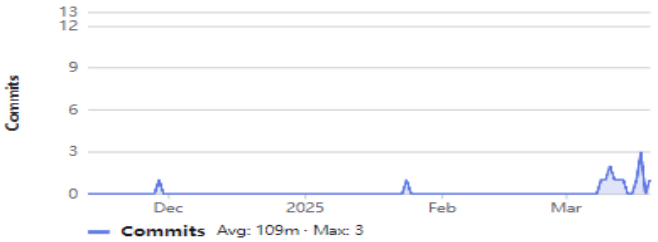

## Ryan

27 commits (158093720+ryanonq@users.noreply.github.com)



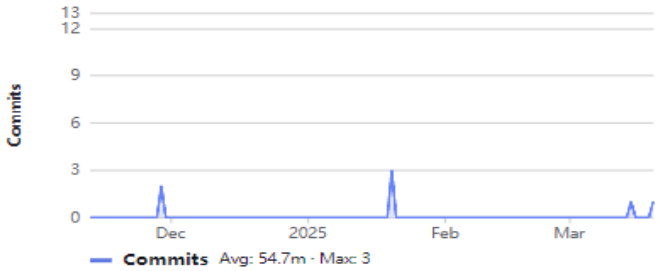

## Muneer455

14 commits (muneeralsahli455@gmail.com)




## Joshua Dennison

7 commits (jdennison07@qub.ac.uk)

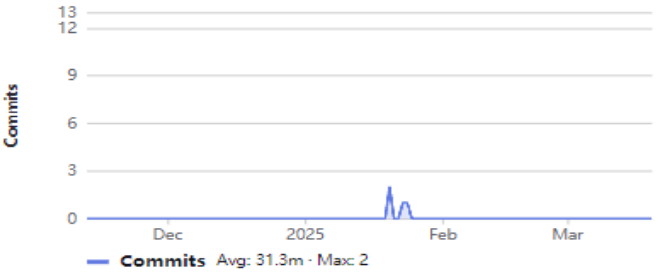



## 40409760

4 commits (malsahli01@qub.ac.uk)

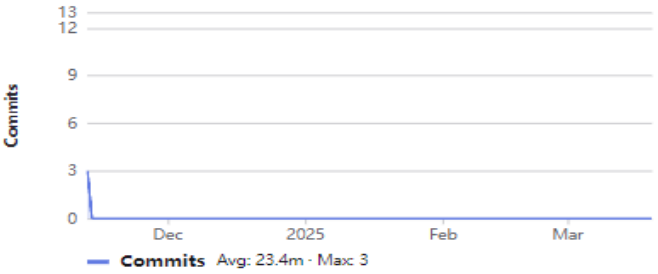

## Hein Htet Aung

4 commits (heinhtetaung@leon-2.local)



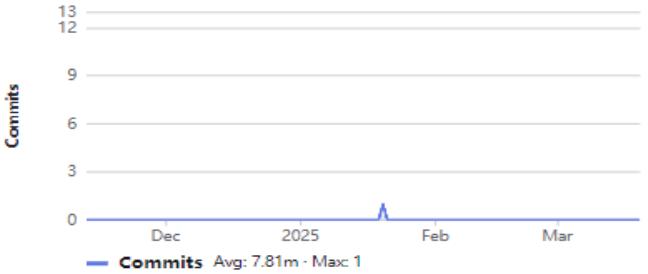

## Muneer Alsahli

3 commits (40409760@eeecs.qub.ac.uk)




## muneer

1 commit (muneer@muneers-macbook-air.local)




## Hein Htet Aung

1 commit (40425970@eeecs.qub.ac.uk)

**40404050** @40404050
Pushed to branch test
89382d52 · Changes to structure

**40404050** @40404050
Pushed to branch test
dea6d315 · minor changes

**40336250** @40336250
Pushed to branch main
cd70ff59 · Backing up our work to main
... and 92 more commits. Compare 7367713c...cd70ff59

**40336250** @40336250
Pushed to branch test
cd70ff59 · Backing up our work to main

**40336250** @40336250
Pushed to branch test
fa26304d · Merge branch 'test' of https://gitlab.eeecs.qub.ac.uk/CSC2058-2425/...
... and 1 more commit. Compare 8cd858d4...fa26304d

**40409760** @40409760
Pushed to branch test
8cd858d4 · Team minutes 17-01-2025

**40336250** @40336250
Pushed to branch test
3dacb5b0 · Merge branch 'test' of https://gitlab.eeecs.qub.ac.uk/CSC2058-2425/...
... and 22 more commits. Compare 4b7566b4...3dacb5b0

**40404050** @40404050
Pushed to branch test
4b7566b4 · fixing up broken files

**40404050** @40404050
Pushed to branch test
512c0201 · fixing some errors

**40404050** @40404050
Pushed to branch test
b8d24c5d · renaming package

**40404050** @40404050
Pushed to branch test
3c403cf7 · Resolved merge conflicts and removed .DS_Store
... and 2 more commits. Compare 63da9ffe...3c403cf7

**40336250** @40336250
Pushed to branch test
63da9ffe · Removed old player code, added new code and removed test file for p...
... and 1 more commit. Compare 1580acca...6a1180b1

**40418429** @40418429
Pushed to branch test
1580acca · Additions

**40418429** @40418429
Pushed to branch test
a3cfbe67 · Resolve conflicts

**40403135** @40403135
Pushed to branch test
3d5ba84c · fixed the Windows problem

**40336250** @40336250
Pushed to branch test
0b3f2073 · Undid code refactoring from earlier due to unforeseen errors

**40336250** @40336250
Pushed to branch test
56f09aba · tidied GameBoardUI a bit

**40336250** @40336250
Pushed to branch test
3811e5a0 · implemented allocate resources feature, still buggy

**40336250** @40336250
Pushed to branch test
55c7524a · implemented allocate resources feature, still buggy

**40336250** @40336250
Pushed to branch test
d30e4805 · Syncing repository

**40336250** @40336250
Pushed to branch test
89992749 · Merge remote-tracking branch 'origin/test' into test
... and 1 more commit. Compare 52128aa1...89992749

**40403135** @40403135
Pushed to branch test
52128aa1 · alliance update

**40403135** @40403135
Pushed to branch test
6cc22cb0 · form alliance updated

**40336250** @40336250
Pushed to branch test
5b064679 · Removed old code from Game

**40336250** @40336250
Pushed to branch test
48a21300 · Removed old code from Game

**40403135** @40403135
Pushed to branch test
cf9841ef · form alliance - incorprated some features

**40403135** @40403135
Pushed to branch test
98585b5b · claimTask-stopped dual claims on same task
... and 1 more commit. Compare d273d5ed...98585b5b

**40336250** @40336250
Pushed to branch test
cc74a13a · Disabling JUnit dependency for now

**40409760** @40409760
Pushed to branch test
5b53ba40 · This is the QR code in the poster

**40409760** @40409760
Pushed to branch test
9b44213c · This is a web page for the poster

**40404735** @40404735
Pushed to branch test
6676be2e ·

**40404735** @40404735
Pushed to branch test
7fc86971 · Added the two videos

**40409760** @40409760
Pushed to branch test
3dbaf7bb · JUnit Testing for core classes

## JUnit test and run:

java (20 Mar 2025 23:10:27)

| Element | Coverage | Covered Instructions | Missed Instructions | Total Instructions |
|---|---|---|---|---|
| EcoJozi | 80.1 % | 11,874 | 2,943 | 14,817 |
| src | 63.8 % | 4,979 | 2,821 | 7,800 |
| main | 63.8 % | 4,979 | 2,821 | 7,800 |
| Board.java | 58.4 % | 2,600 | 1,851 | 4,451 |
| MainMenuPanel.java | 52.8 % | 488 | 437 | 925 |
| BadEndingPanel.java | 0.0 % | 0 | 201 | 201 |
| GoodEndingPanel.java | 0.0 % | 0 | 201 | 201 |
| SettingsPanel.java | 82.1 % | 285 | 62 | 347 |
| Game.java | 47.1 % | 41 | 46 | 87 |
| TutorialPanel.java | 96.2 % | 504 | 20 | 524 |
| AboutPanel.java | 99.0 % | 312 | 3 | 315 |
| Alliance.java | 100.0 % | 175 | 0 | 175 |
| Bad_Events.java | 100.0 % | 120 | 0 | 120 |
| Good_Events.java | 100.0 % | 116 | 0 | 116 |
| Player.java | 100.0 % | 222 | 0 | 222 |
| Task.java | 100.0 % | 116 | 0 | 116 |
| src/test/java | 98.3 % | 6,895 | 122 | 7,017 |
| main | 98.3 % | 6,895 | 122 | 7,017 |
| AllianceTest.java | 96.5 % | 988 | 36 | 1,024 |
| PlayerTest.java | 96.8 % | 973 | 32 | 1,005 |
| AboutPanelTest.java | 97.5 % | 636 | 16 | 652 |
| BoardTest.java | 99.2 % | 1,782 | 14 | 1,796 |
| MainMenuPanelTest.java | 98.3 % | 745 | 13 | 758 |
| TutorialPanelTest.java | 98.5 % | 678 | 10 | 688 |
| GameTest.java | 99.7 % | 362 | 1 | 363 |
| EventsTest.java | 100.0 % | 502 | 0 | 502 |
| TaskTest.java | 100.0 % | 229 | 0 | 229 |

## Security Considerations:

Security concerns overview for our EcoJozi game:
Some of the key risks that our solution might potentially have in the future include Data Breach, preventable through encryption and secure storage. Other examples are Unauthorized access which can be avoided by implementing multi factor authentication and a strict access control roles to keep the users safe.

Furthermore there are other attacks such as Denial of Service(DoS) threats require rate limiting and web application firewalls for prevention.

- **Data Breach:** Potential theft or leakage of user data
  - Solution is to implement data encryption, secure data storage solutions and regular security audits.
- **Data integrity attack:** which is a risk on the data where it can be altered or corrupted intentionally by unauthorized users.
  - Solution is to implement a hashes, and data validation techniques to ensure data security and integrity.
- **Injection Attacks:** SQL injection, which is a script injection that insert malicious code into a program leading to unauthorized command execution or data access
  - Solution is using validation and sanitizing user inputs.

## Commentary on Development processes:

We started working on the project by creating a Trello project/tasks tracker to have an idea of what are the tasks we are required to complete, we set up deadlines and weekly meetings as well as discord group chat to stay in touch with any updates regarding the project.

**GitLab for Version control:** We have used GitLab as instructed by the lecturer, to maintain the availability of our project work and to ensure that a fair tracking of the activities is available. The GitLab was provided by the Queen's EEECS which track all the contributions of the team.

**Java Swing for GUI Development:** We prioritized the core functionality over aesthetics, and ensured that in the end the game is both fully functional and aesthetically pleasing.

**Junit for automated testing:** We ensured consistent validation of core mechanics such as Board, and Player and reduced regression testing time.

**Lessons Learned:** We found that using GitLab help keeping a fair record of the work of each team member, and that using Trello helped us stay organised and on track.

**Improvements:** Use more UML diagrams in initial design phases, and keep in mind the potential of sudden changes.

## Appendix 1: Team Minutes

**Minutes for CSC2058 17-01**

Group 22 Date of this minute 17/01/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | Absent | Absent |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- 

Name (2): Adan Khan

- 

Name (3): Hassan Sakka

- 

Name (4): Joshua Dennison

- 

Name (5): Clive Nyamadzawo

- 

Name (6): Ryan O’Neill-Quinn

- 

Name (7): Hein Aung Htet

- 

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Identifying the requiremnts of the A1 poster and brainstorming ideas.
- Organising team minutes
-

Name (2): Adan Khan

- Identify the core functionalities, work on it with Hassan and Ryan
- Learn about Java Swing

Name (3): Hassan Sakka

- Identify the core functionalities and work on it with Adan and Ryan

Name (4): Joshua Dennison

- Understanding the requirements of the poster.

Name (5): Clive Nyamadzawo

- Finalising the creation of the skeleton code
-

Name (6): Ryan O'Neill-Quinn

- Identify the core functionalities and work on it with Adan and Hassan

Name (7): Hein Aung Htet

- Understanding the requirements of the poster and work with Muneer on it.

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- O.K.

Name (3): Adan Khan

- O.K

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

**Date of next minutes meeting: 28/01/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

**Minutes for CSC2058 28-01**

**Group 22** **Date of this minute 28/01/2025** **Location (Room No. and/or Teams): Teams**

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | T | HHA |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Initiated the poster design using the Problem and Solution document from semester one.
- Reviewed and reconfirmed the existing documentation of the problem and solution document

Name (2): Adan Khan

- Refactored core functionality classes.
- Redefined classes such as Game.java, Board.java, and Player.java, to implement functional GUI prototype using Java Swing.

Name (3): Hassan Sakka

- Finalising task Alliance and endGame classes

Name (4): Joshua Dennison

-

Name (5): Clive Nyamadzawo

- Refactored core functionality classes with Adan.

Name (6): Ryan O'Neill-Quinn

- Programmed and developed on Clive's skeleton for the game.java and the main.java and the player.java.
- Refactored Clive skeleton for Game.java, Player.java and Main.java

Name (7): Hein Aung Htet

- Helped with the poster design and the content with Muneer.

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Start designing the A1 poster.

Name (2): Adan Khan

- Focusing on improving GUI and adding minor changes on Task class

Name (3): Hassan Sakka

- Work on form Allience functionality

Name (4): Joshua Dennison

-

Name (5): Clive Nyamadzawo

- Introducing the concept of Events and Event class
-

Name (6): Ryan O'Neill-Quinn

- Work on Claim task functionlaity

Name (7): Hein Aung Htet

- Start writing the content of the A1 poster.

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- O.K.

Name (3): Adan Khan

- Trying to learn Java swing and implement java swing at the same time

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

**Date of next minutes meeting: 14/02/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

Minutes for CSC2058 14-02

Group 22 Date of this minute 14/02/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | T | HHA |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Created initial design drafts of the poster and got feedback from the team.
-

Name (2): Adan Khan

- Added changes to the Task.java class and improved GUI
-

Name (3): Hassan Sakka

- Still working on the Allience functionality
-

Name (4): Joshua Dennison

-

Name (5): Clive Nyamadzawo

- Finished refactoring core functionality classes with Adan.

Name (6): Ryan O'Neill-Quinn

- Finished working on Claim task functionlaity
-

Name (7): Hein Aung Htet

- Drafted the first content for the poster and sent it to the team for feedback
-

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Continue working on the poster and work with Leon on the content of the poster to finalise it.
-

Name (2): Adan Khan

- Polishing GUI
-

Name (3): Hassan Sakka

- Continue working on Allience and + manager updates.
-

Name (4): Joshua Dennison

- Start the PowerPoint using the poster and poster content he got from Muneer and Leon

Name (5): Clive Nyamadzawo

- Work on Character icons
-

Name (6): Ryan O'Neill-Quinn

- Work on Claim task
-

Name (7): Hein Aung Htet

- Edit the content of the A1 poster
-

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- Difficulty in achieving a balance aesthetic appeal and clarity in the poster design.

Name (3): Adan Khan

- O.K

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

**Date of next minutes meeting: 21/02/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

Minutes for CSC2058 21-02

Group 22 Date of this minute 21/02/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |

| | | |
|---|---|---|
| Hein Htet Aung | T | HHA |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Reviewed and revised the poster based on the feedback, focusing on improving the visual elements
-

Name (2): Adan Khan

- Continuing polishing the GUI
-

Name (3): Hassan Sakka

- Continue working on Allience and + manager updates.
-

Name (4): Joshua Dennison

- Sill working on the PowerPoint using the poster and poster content he got from Muneer and Leon
-

Name (5): Clive Nyamadzawo

- Still working on Character icons
-

Name (6): Ryan O'Neill-Quinn

- Finished working on the Claim task
-

Name (7): Hein Aung Htet

- Still working on the poster content

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Finalised the poster design and get more feedback from lecturer and others.
-

Name (2): Adan Khan

-

Name (3): Hassan Sakka

- Resolving issues for allocate resources

Name (4): Joshua Dennison

-

Name (5): Clive Nyamadzawo

-

Name (6): Ryan O'Neill-Quinn

- Tidying up the code

Name (7): Hein Aung Htet

-

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- Busy with assignments,and exam couldn't do much

Name (2): Muneer Alsahli

- Busy with assignments, and test

Name (3): Adan Khan

- Busy with assignments.

Name (4): Hassan Sakka

- Busy with assignments.

Name (5): Joshua Dennison

- Busy with assignments.

Name (6): Clive Nyamadzawo

- Busy with assignments.

Name (7): Hein Htet Aung

- Busy with assignments.

**Date of next minutes meeting: 28/02/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

Minutes for CSC2058 28-02

Group 22 Date of this minute 28/02/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | T | HHA |

| | | |
|---|---|---|
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Made final adjesments to the design and content based on comprehensive feedback from a wider audience.
- Got feedback regarding the poster from Ian and from Tj regarding the poster.

Name (2): Adan Khan

-
-

Name (3): Hassan Sakka

- Finished resolving the issues for allocating resources.
-

Name (4): Joshua Dennison

-

Name (5): Clive Nyamadzawo

-
-

Name (6): Ryan O'Neill-Quinn

- Finished tidying up the code.
-

Name (7): Hein Aung Htet

-
-

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Implement the feedback I got from Ian and Tj for the poster.
- Get the poster ready for the poster video

Name (2): Adan Khan

- Fixing broken GUI
- Adding extra fetures to GUI
- Making sure all buttons work
- Fixing the game board

Name (3): Hassan Sakka

- Fixing icons
- Fixing Allience logic

Name (4): Joshua Dennison

- Do the script for the poster video
- Finish the video recording and start the editing process for the poster video

Name (5): Clive Nyamadzawo

- Fixing the board game for the players when they are on red
- Working on Transer tasks
- Fix the character change
- Assigning the amount each player gets when they start the game
- Fix the random events when player land on it

Name (6): Ryan O'Neill-Quinn

- Make changes to when random events are triggered
- Clean up some of the colourblind mode errors
- Clean up unused code
- Removing redundant classes
- Change the amount of random events
- Fix emojies for linux
- Fixed Allience formation

Name (7): Hein Aung Htet

- Finish the content of the poster and finilase the logo of the poster

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- O.K.

Name (3): Adan Khan

- O.K

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

**Date of next minutes meeting: 07/03/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

Minutes for CSC2058 07-03

Group 22 Date of this minute 28/02/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | T | HHA |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Finished the poster and implemented all the required changes.
- Started working on the JUnit testing.

Name (2): Adan Khan

- Fixed the broken GUI
- Added the extra fetures to GUI
- Checked that all buttons are working
- Fixed the game board

Name (3): Hassan Sakka

- Fixed icons in the game
- Fixed Allience logic
-

Name (4): Joshua Dennison

- Done the script for the poster video
- finshed the video recording and the editing of the poster video

Name (5): Clive Nyamadzawo

- Fixed the board game for the players when they are on red
- Finished the work on Transer tasks
- Fixed the character change
- Finished the assigning of the amount each player gets when they start the game
- Fixed the random events when player land on it

Name (6): Ryan O'Neill-Quinn

- Made the changes to when random events are triggered
- Changed the amount of random events
- Fixed emojies for linux

Name (7): Hein Aung Htet

- Finished the content of the poster and finilase the logo of the poster
- Started working on the pdf report

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Finalise the JUnit and push to gitlab
- Work on the pdf report for the Adherance to the process section

Name (2): Adan Khan

- Work on the pdf report, for the Design documentation section

Name (3): Hassan Sakka

- Work on the pdf for the class diagram section

Name (4): Joshua Dennison

- Finish the scrip for the game video and record and edit the video
- Finish the acceptance testing

Name (5): Clive Nyamadzawo

-

Name (6): Ryan O'Neill-Quinn

-

-

Name (7): Hein Aung Htet

- Finish the work on the pdf report for the Design documentation section with Adan

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- O.K.

Name (3): Adan Khan

- O.K

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

**Date of next minutes meeting: 13/03/2025**
**Location of next minutes meeting: (Room No. and/or Teams): Teams**

Minutes for CSC2058 13-03

Group 22 Date of this minute 28/02/2025 Location (Room No. and/or Teams): Teams

The following team members were present (in the same meeting room or on Teams) when these minutes were discussed:

| Name (printed/typed) | In room (R); On teams (T). | Signature (agreed bitmap or initials) |
|---|---|---|
| Muneer Alsahli | T | MA |

| | | |
|---|---|---|
| Ryan O'Neill-Quinn | T | RO |
| Adan Khan | T | AK |
| Hassan Sakka | T | HS |
| Hein Htet Aung | T | HHA |
| Clive Nyamadzawo | T | CN |
| Joshua Dennison | T | JD |

Task Reporting (Briefly list what each team member did in the last week/since the last meeting if < 1 week.*)

Name (1): Muneer Alsahli

- Finished the Junit and push to gitlab
- Completed my part for the pdf report

Name (2): Adan Khan

- Finished working on the pdf report for the Design documentation section

Name (3): Hassan Sakka

- Finished working on the pdf for the class diagram section
- Done the peer assessment

Name (4): Joshua Dennison

- Finished the scrip for the game video and recorded and edited the video
- Done the peer assessment
- Finished the acceptance testing

Name (5): Clive Nyamadzawo

- Done the peer assessment

Name (6): Ryan O'Neill-Quinn

- Done the peer assessment

Name (7): Hein Aung Htet

- Finished the work on the pdf report for the Design documentation section with Adan
- Done the peer assessment

*Printouts giving an overview of interim deliverables may be added as a supplement to these minutes.

Actions Planned (Briefly list what each team member will do this week/until the next meeting if < 1week.)

Name (1): Muneer Alsahli

- Check the work and make sure its ready for submission

Name (2): Adan Khan

- Check the work and make sure its ready for submission

Name (3): Hassan Sakka

- Check the work and make sure its ready for submission

Name (4): Joshua Dennison

- Check the work and make sure its ready for submission

Name (5): Clive Nyamadzawo

- Check the work and make sure its ready for submission

Name (6): Ryan O'Neill-Quinn

- Check the work and make sure its ready for submission

Name (7): Hein Aung Htet

- Check the work and make sure its ready for submission

Obstacles (List briefly anything that may be blocking your progress and the possible solutions you need to investigate. Indicate 'O.K.' if there are no obstacles you are aware of.)

Name (1): Ryan O'Neill-Quinn

- O.K.

Name (2): Muneer Alsahli

- O.K.

Name (3): Adan Khan

- O.K

Name (4): Hassan Sakka

- O.K

Name (5): Joshua Dennison

- O.K.

Name (6): Clive Nyamadzawo

- O.K.

Name (7): Hein Htet Aung

- O.K.

## Appendix 2: Credits for the Poster

Credits (principal and supporting contributors) for the Poster
**Principal:** M.A
**Support:** H.H.A

## Appendix 3: Credits for the Poster Video

Credits (principal and supporting contributors) for the Poster Video
**Principal:** J.D
**Support:** M.A, H.H.A,R.O,A.K,H.S,C.N

## Appendix 4: Credits for the Final Game Demo Video

Credits (principal and supporting contributors) for the Final Game Demo Video
**Principal:** J.D
**Support:** M.A, H.H.A,R.O,A.K,H.S,C.N

## Appendix 5: Comments on the development processes

We started working on the project by creating a Trello project/tasks tracker to have an idea of what are the tasks we are required to complete, we set up deadlines and weekly meetings as well as discord group chat to stay in touch with any updates regarding the project.

**GitLab for Version control:** We have used GitLab as instructed by the lecturer, to maintain the availability of our project work and to ensure that a fair tracking of the activities is available. The GitLab was provided by the Queen's EEECS which track all the contributions of the team.

**Java Swing for GUI Development:** We prioritized the core functionality over aesthetics, and ensured that in the end the game is both fully functional and aesthetically pleasing.

**Junit for automated testing:** We ensured consistent validation of core mechanics such as Board, and Player and reduced regression testing time.

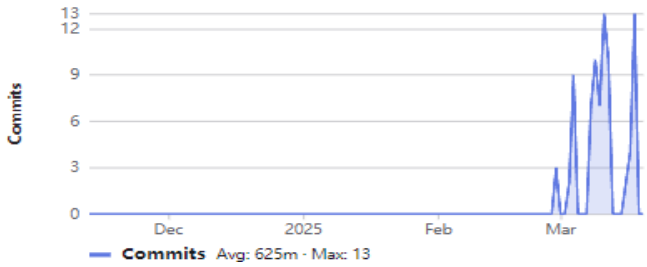
**Lessons Learned:** We found that using GitLab help keeping a fair record of the work of each team member, and that using Trello helped us stay organised and on track.

**Improvements:** Use more UML diagrams in initial design phases, and keep in mind the potential of sudden changes.

## Appendix 6: GitLab Evidence

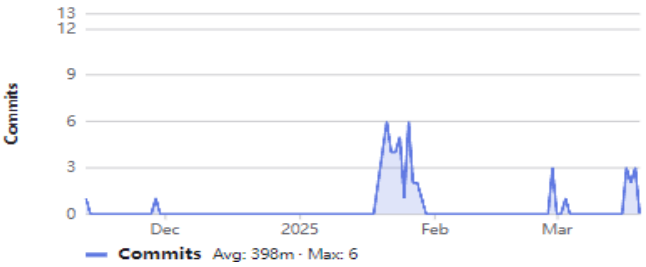
## Ryan O'Neill-Quinn

80 commits (roneillquinn01@qub.ac.uk)



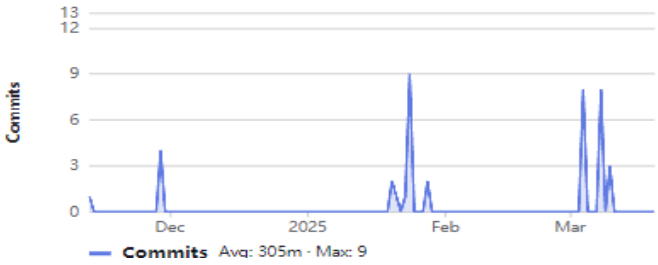

## Adan Khan

51 commits (adan.uk05@gmail.com)



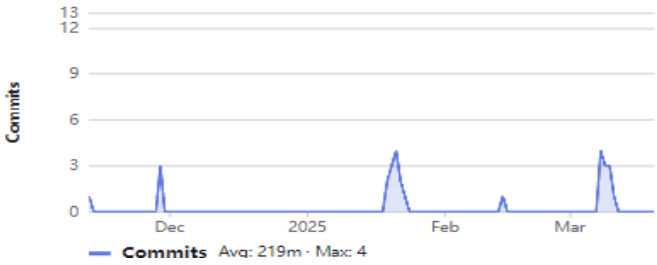

## Hassan Sakka

39 commits (geaster742@gmail.com)



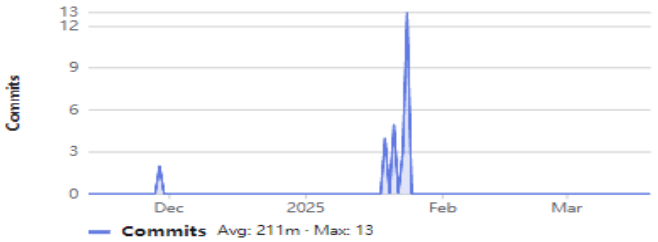

## Clive

28 commits (cnyamadzawo01@qub.ac.uk)



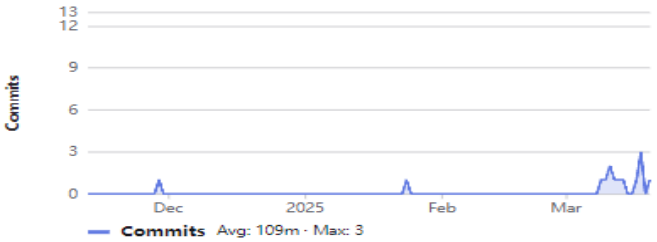

## Ryan

27 commits (158093720+ryanonq@users.noreply.github.com)



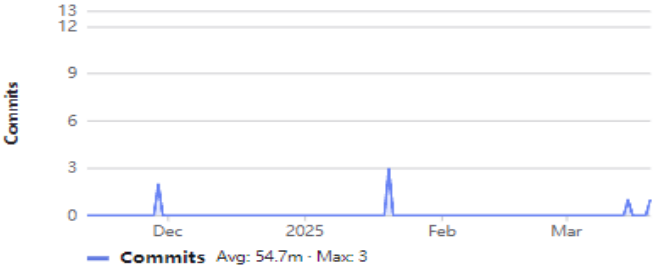

## Muneer455

14 commits (muneeralsahli455@gmail.com)



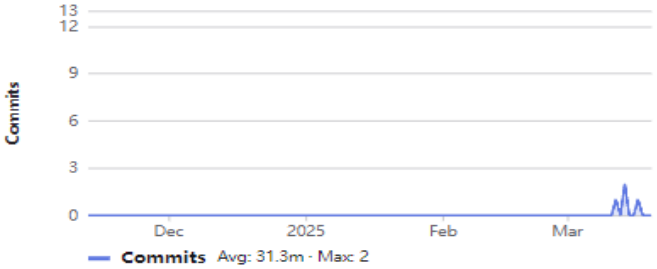

## Joshua Dennison

7 commits (jdennison07@qub.ac.uk)



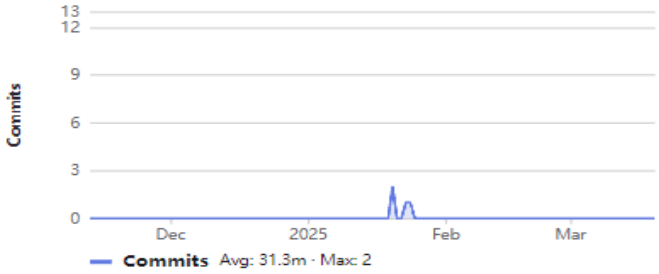

## 40409760

4 commits (malsahli01@qub.ac.uk)



## Hein Htet Aung

4 commits (heinhtetaung@leon-2.local)




## Muneer Alsahli

3 commits (40409760@eeecs.qub.ac.uk)


## muneer

1 commit (muneer@muneers-macbook-air.local)


## Hein Htet Aung

1 commit (40425970@eeecs.qub.ac.uk)

**40404050** @40404050
Pushed to branch test
89382d52 · Changes to structure

**40404050** @40404050
Pushed to branch test
dea6d315 · minor changes

**40336250** @40336250
Pushed to branch main
cd70ff59 · Backing up our work to main
... and 92 more commits. Compare 7367713c...cd70ff59

**40336250** @40336250
Pushed to branch test
cd70ff59 · Backing up our work to main

**40336250** @40336250
Pushed to branch test
fa26304d · Merge branch 'test' of https://gitlab.eeecs.qub.ac.uk/CSC2058-2425/...
... and 1 more commit. Compare 8cd858d4...fa26304d

**40409760** @40409760
Pushed to branch test
8cd858d4 · Team minutes 17-01-2025

**40336250** @40336250
Pushed to branch test
3dacb5b0 · Merge branch 'test' of https://gitlab.eeecs.qub.ac.uk/CSC2058-2425/...
... and 22 more commits. Compare 4b7566b4...3dacb5b0

**40404050** @40404050
Pushed to branch test
4b7566b4 · fixing up broken files

**40404050** @40404050
Pushed to branch test
512c0201 · fixing some errors

**40404050** @40404050
Pushed to branch test
b8d24c5d · renaming package

**40404050** @40404050
Pushed to branch test
3c403cf7 · Resolved merge conflicts and removed .DS_Store
... and 2 more commits. Compare 63da9ffe...3c403cf7

**40336250** @40336250
Pushed to branch test
63da9ffe · Removed old player code, added new code and removed test file for p...
... and 1 more commit. Compare 1580acca...6a1180b1

**40418429** @40418429
Pushed to branch test
1580acca · Additions

**40418429** @40418429
Pushed to branch test
a3cfbe67 · Resolve conflicts

**40403135** @40403135
Pushed to branch test
3d5ba84c · fixed the Windows problem

**40336250** @40336250
Pushed to branch test
0b3f2073 · Undid code refactoring from earlier due to unforeseen errors

**40336250** @40336250
Pushed to branch test
56f09aba · tidied GameBoardUI a bit

**40336250** @40336250
Pushed to branch test
3811e5a0 · implemented allocate resources feature, still buggy

**40336250** @40336250
Pushed to branch test
55c7524a · implemented allocate resources feature, still buggy

**40336250** @40336250
Pushed to branch test
d30e4805 · Syncing repository

**40336250** @40336250
Pushed to branch test
89992749 · Merge remote-tracking branch 'origin/test' into test
... and 1 more commit. Compare 52128aa1...89992749

**40403135** @40403135
Pushed to branch test
52128aa1 · alliance update

**40403135** @40403135
Pushed to branch test
6cc22cb0 · form alliance updated

**40336250** @40336250
Pushed to branch test
5b064679 · Removed old code from Game

**40336250** @40336250
Pushed to branch test
48a21300 · Removed old code from Game

**40403135** @40403135
Pushed to branch test
cf9841ef · form alliance - incorprated some features

**40403135** @40403135
Pushed to branch test
98585b5b · claimTask-stopped dual claims on same task
... and 1 more commit. Compare d273d5ed...98585b5b

**40336250** @40336250
Pushed to branch test
cc74a13a · Disabling JUnit dependency for now

**40409760** @40409760
Pushed to branch test
5b53ba40 · This is the QR code in the poster

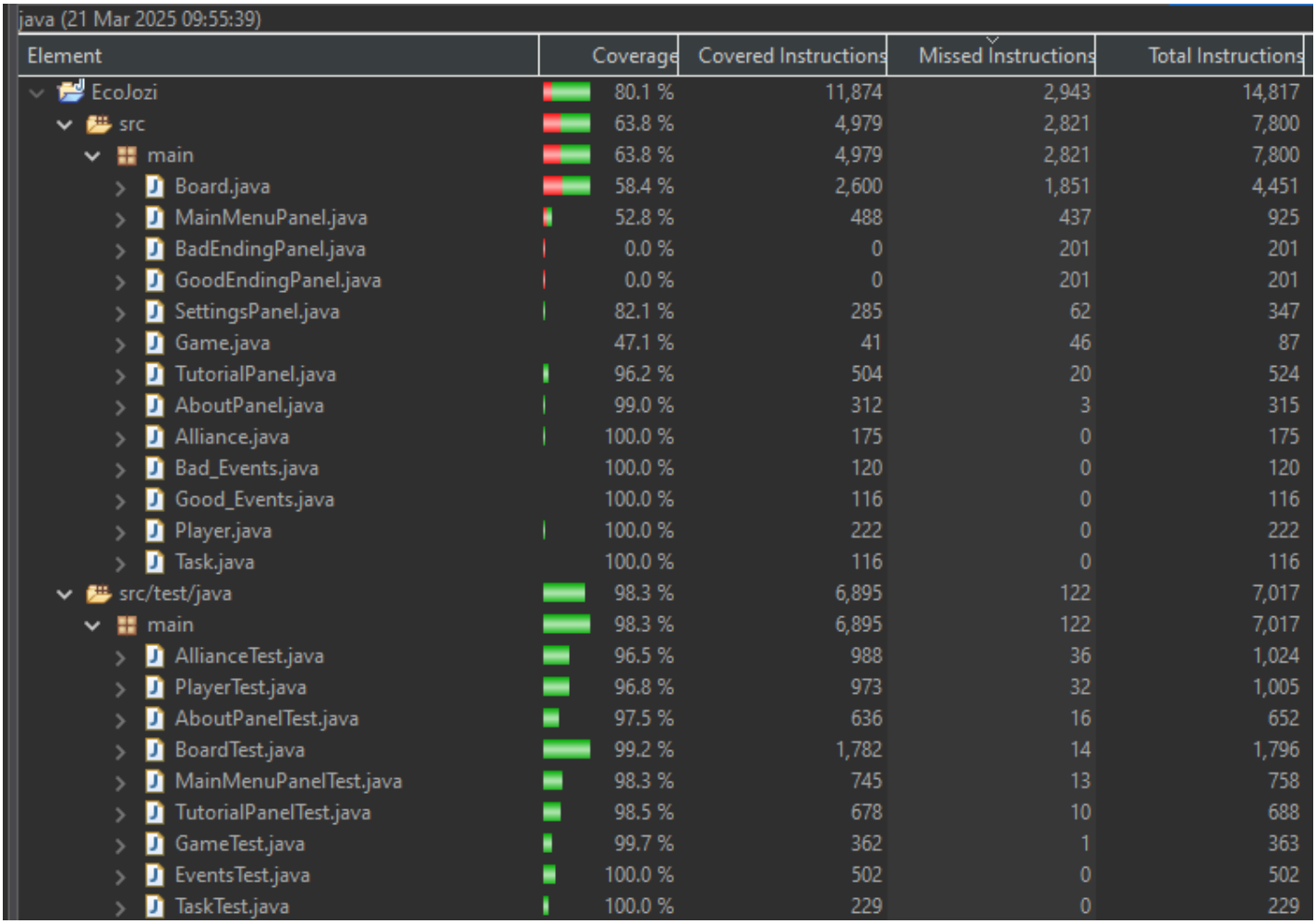
**40409760** @40409760
Pushed to branch test
9b44213c · This is a web page for the poster

**40404735** @40404735
Pushed to branch test
6676be2e ·

**40404735** @40404735
Pushed to branch test
7fc86971 · Added the two videos

**40409760** @40409760
Pushed to branch test
3dbaf7bb · JUnit Testing for core classes

## Appendix 7: Screen dump of key JUnit



java (21 Mar 2025 09:55:39)

| Element | Coverage | Covered Instructions | Missed Instructions | Total Instructions |
|---|---|---|---|---|
| EcoJozi | 80.1 % | 11,874 | 2,943 | 14,817 |
| src | 63.8 % | 4,979 | 2,821 | 7,800 |
| main | 63.8 % | 4,979 | 2,821 | 7,800 |
| Board.java | 58.4 % | 2,600 | 1,851 | 4,451 |
| MainMenuPanel.java | 52.8 % | 488 | 437 | 925 |
| BadEndingPanel.java | 0.0 % | 0 | 201 | 201 |
| GoodEndingPanel.java | 0.0 % | 0 | 201 | 201 |
| SettingsPanel.java | 82.1 % | 285 | 62 | 347 |
| Game.java | 47.1 % | 41 | 46 | 87 |
| TutorialPanel.java | 96.2 % | 504 | 20 | 524 |
| AboutPanel.java | 99.0 % | 312 | 3 | 315 |
| Alliance.java | 100.0 % | 175 | 0 | 175 |
| Bad_Events.java | 100.0 % | 120 | 0 | 120 |
| Good_Events.java | 100.0 % | 116 | 0 | 116 |
| Player.java | 100.0 % | 222 | 0 | 222 |
| Task.java | 100.0 % | 116 | 0 | 116 |
| src/test/java | 98.3 % | 6,895 | 122 | 7,017 |
| main | 98.3 % | 6,895 | 122 | 7,017 |
| AllianceTest.java | 96.5 % | 988 | 36 | 1,024 |
| PlayerTest.java | 96.8 % | 973 | 32 | 1,005 |
| AboutPanelTest.java | 97.5 % | 636 | 16 | 652 |
| BoardTest.java | 99.2 % | 1,782 | 14 | 1,796 |
| MainMenuPanelTest.java | 98.3 % | 745 | 13 | 758 |
| TutorialPanelTest.java | 98.5 % | 678 | 10 | 688 |
| GameTest.java | 99.7 % | 362 | 1 | 363 |
| EventsTest.java | 100.0 % | 502 | 0 | 502 |
| TaskTest.java | 100.0 % | 229 | 0 | 229 |

## Appendix 8: Security and assurance considerations

Security concerns overview for our EcoJozi game:
Some of the key risks that our solution might potentially have in the future include Data Breach, preventable through encryption and secure storage. Other examples are Unauthorized access which can be avoided by implementing multi factor authentication and a strict access control roles to keep the users safe.

Furthermore there are other attacks such as Denial of Service(DoS) threats require rate limiting and web application firewalls for prevention.

- **Data Breach:** Potential theft or leakage of user data
  - Solution is to implement data encryption, secure data storage solutions and regular security audits.
- **Data integrity attack:** which is a risk on the data where it can be altered or corrupted intentionally by unauthorized users.
  - Solution is to implement a hashes, and data validation techniques to ensure data security and integrity.
- **Injection Attacks:** SQL injection, which is a script injection that insert malicious code into a program leading to unauthorized command execution or data access
  - Solution is using validation and sanitizing user inputs.

## Appendix 9: Third party software toolkit

We used **Java Swing** which is GUI widget toolkit for java that is used to create a window based application with a user interface components.

**Eclipse:** we used eclipse IDE JDK 17 and higher for all team member, we used it for coding, debugging and testing tools that enhanced our productivity and facilitate efficient code management throughout the project.

**IntelliJ IDEA:** Some of the team members used this IDE for java programming, this IDE is known for its advanced code navigation and refactoring capability.

**Canva:** A web based graphic design tool, which we used to work on the poster and the graphic designs used for the Poster and app graphic designs.

**Draw.io:** we used this tool to help with the class diagram to make the necessary changes.