Software Engineering Group Project
Final Report

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CONTENTS

1. INTRODUCTION

1.1 Purpose of this Document

This document summarises and describes the accomplishments, final state of the project and performances of group members. The purpose of this document is to aid markers in evaluating the success of the group project.

1.2 Scope

The document has been created in line with the General Documentation Standards [1] and covers all sections described in SE.QA.10 [2].

This document describes the how well the project went, provides a historical account of the project, features a report on the performances of each team member and discusses improvements that could be made.

1.3 Objectives

The objectives of this document are:

- To summarise what the project achieved
- To provide a historical summary of major events
- To summarise the final state of the project
- To summarise the performances of each team member
- To evaluate the team and project

2. MANAGEMENT SUMMARY

2.1 Project Achievements

The software engineering group projects tasked us with producing a chess tutor program along with all appropriate documentation. The project involved, designing a UI, producing a test specification, designing the structure of the program, programming and testing the chess tutor and producing a final report. As a group we managed to achieve all these goals.

2.2 Documentation Produced

The project team produced all required documentation. The team:

- Produced a comprehensive user interface document where we identified typical users, produced a set of use cases, and identified error conditions.
- Produced a user interface presentation to accompany the user interface document. This provided an interactive demonstration on how the program would react to the use cases.
- Produced a design specification. The specification provides a detailed decomposition description, dependency descriptions, interface descriptions and an overview of the design of the program.
- Produced a maintenance manual. The manual outlines known bugs and acts as an aid to future developers.

All documents are complete, and feature all required sections.

2.3 Chess Tutor Program

The project team managed to implement most product functions and specific requirements [3]. The chess tutor allows two players to play a game of chess on the same computer screen. The tutor keeps track of players' pieces and board positions, enforces all rules of chess including movement and capture, uses a GUI to output the status of the game to users, assigns the white pieces to the bottom of the board and black to the top at the start of the game, indicates valid piece selection, shows all valid moves, detects check and checkmate, allows the user to save and replay games. However, we did not fully implement the ability to resume saved games. In addition, we identified several bugs (see maintenance manual [4]).

Implementing replay functionality in general was a major challenge faced by the group. The first problem encountered was saving the JSON save file in the correct file format. Initially, the resulting file was missing the corresponding key, specifically the arrayList. However, after a researching other JSON implementation online, we managed to save game data in the correct format.

2.4 Team Performance

The team worked well together. In addition to our weekly meetings with our project manager, we decided to meet at the Hugh Owen Library every Tuesday. During this extra meeting, we worked together on the project, discussed development, and conducted review meetings. In addition, we created a Discord server. This further improved communication and notified us of commits. The extra meetings and Discord server improved group communication. These measures reduced errors that would usually occur from poor communication, thus improving team performance.

Furthermore, during integration week, all members attended each day. This improved work output and allowed us to finish the project in time.

3. HISTORICAL ACCOUNT OF THE PROJECT

3.1 Designing the System

To make sure all design documentation was delivered in time, we split up tasks between members. The progress of each task was reported back at the start of each week during the weekly tutorial meeting. All major tasks were recorded in total_hrs spreadsheet in config. This allowed the group to identify which documents still needed to be completed. In addition, we conducted numerous review meetings identify improvements needed. This resulted in more complete documentation and allowed the team to identify how much work was left to do for each document. This allowed us to complete all design for the system on time.

3.1.1 User Interface Specification [5]

The user interface specification was worked on by Tate Moore (TAM41), Adrian Enache (ADE12), Finley Aubin (FIA5), James Owen (JCO3) and Dustin Baker (DUB4). Moore and Enache produced a comprehensive document. The document identifies typical users, discusses use cases, and analyses potential errors that could occur from each use case. Aubin, Owen, and Baker produced a PowerPoint presentation to accompany the document. The presentation acts as a visual aid to demonstrate how the program responds to the use cases.

Work commenced on 21/02/23. Following feedback, we fixed formatting errors highlighted and updated error conditions to improve the specification.

3.1.2 Design Specification [6]

The design specification was worked on by George Cooper (GWC1), Kieran Foy (KIF11), James Owen (JCO3) and Tate Moore (TAM41).

Work commenced on 7/02/23. Following feedback, Moore and Owen updated the document by completing section 5 and adding missing diagrams.

3.2 Writing Code

Similarly, to the documentation. All programming tasks were assigned via actions in meeting minutes in the config folder. This allowed us to hold each member to account. The status of all progress was reported on during the following weekly meeting, and code was demonstrated. This allowed other team members to offer feedback and suggest improvements.

3.2.1 Spike Work

Finley Aubin (FIA5) and Kieran Foy (KIF11) conducted initial spike work. Spike work commenced on 27/02/23. Aubin worked on a UI prototype while Foy worked on the structure of the project and outline each method.

3.2.2 Developing the Chess Program

All team members contributed to the development of the project. George Cooper, Dustin Baker, Kieran Foy, James Owen worked implemented piece functionality, board management and logic. Tate Moore, Adrian Enache and Finley Aubin worked on implementing loading, saving and replay functionality. George Cooper and Finley Aubin implemented the UI using JavaFX.

Work commenced on 13/03/23 and concluded at the end of integration week (week beginning 01/05/23).

3.3 Testing

Do ensure delivery of the product in time, we produced a template table for test in advance. This allowed us to begin testing straight away during integration week.

3.3.1 Testing Specification [7]

George Cooper (GWC1), Kieran Foy (KIF11), Dustin Baker (Dub4) and Adrian Enache (ADE12) worked on the test specification. Work commenced on 26/02/23 and concluded on 2/05/23.

3.4 Testing Chess Tutor

Tate Moore (TAM41) and Kieran Foy (KIF11) produced a number of Junit tests. These tests allowed the team to test the program as it was developed. This led to a more robust program with fewer bugs and after every change the tests were ran to identify any section of the code broken by the recent changes. Dustin Baker (DUB4) conducted regression testing. Testing commenced on 28/04/23 and concluded at the end of integration week (week beginning 1/05/23).

3.5 Producing maintenance information

Kieran Foy (FIA5), Dustin Baker (DUB4) and Adrian Enache (ADE12) worked on the maintenance manual. Work commenced on 01/05/23 and concluded 10/05/23.

3.6 Producing the end-of-project report

George Cooper (GWC1) and Finley Aubin (FIA5) produced the end-of-project report. Work commenced on 8/5/23 and concluded on 10/05/23.

4. FINAL STATE OF THE PROJECT

4.1 Status of Documentation

4.1.1 Accomplishments

UI Specification

The teem managed to complete all User Interface Specification elements. Following feedback, we combine smaller use cases together, and added missing use cases to the UI presentation.

Design Specification

The team completed most aspects of the design specification however, some diagrams are missing.

Testing

All required elements are present. Following feedback, we improved the document by making tests more reproducible. To improve we could add more tests to cover more aspects of the program.

4.1.2 Improvements

UI Specification

To improve the UI presentation, a screen for use case 3.1 checkmate could be updated to show a check mate scenario.

Design Specification

As of time of writing there are a number of object and state diagrams missing. These diagrams may be present by the deadline.

Testing

To improve we could add more tests to cover more aspects of the program.

4.2 Status of Chess Program

4.2.1 Accomplishments

In its final state almost all of the project was completed, the main menu, player name input, and displaying the name of the current player at the top, handling rotation for the current turn, showing where a piece can and can’t

move to, piece movement, piece taking, castling, en passant (with issues if not used) pawn promotion, check/checkmate, pausing, resigning, offering a draw, saving, return to main menu, quitting and replaying a game and navigating forwards and backwards all seemed to work.

4.2.2 Improvements

the game window currently cannot be properly resized without looking weird. I would like to have made our own chess piece assets instead of using assets we found on the internet, also originally we had planned to make it so that instead of just black and white, we would allow the players to chose custom colours which would have been displayed on the pieces and overlayed onto the chequered pattern on the board, and the users could have chosen between materials like wood, plastic, metal, felt ect. Allowing for a very customisable experience, and it would be nice to implement a system like this. Also in places the gridpane and the actual board are a few pixels off meaning that in some situations a highlighted tile can appear to be overlapping onto the tile next to it, and it would have been good if we had packaged it into a .jar or .exe file in the end.

4.3 Known Problems

There were a few known problems with the project, the largest of these being that upon going to load up an old game, it will allow you to replay the moves that were made however this mode will not allow for you to continue playing from where it left off, however will from the starting position of that replay which isn't useful as it is the starting position of the board anyway, if you are to do this however and then press one of the movement buttons then the entire board can be put in what we call “Austrailian mode” where all of the pieces will be upside down for the rest of the replay, another issue with this is that the correct player names will not be shown and the board will not be rotated when replaying, and also the pause menu does not display here meaning that the only way to leave is to close the window and restart the game, another problem we face is that where en passant can occur, if a pawn moves past another pawn of the opposite colour. of where en passant could have occurred but it doesn’t then the piece being moved thinks it has been taken and removes its self.

5. PERFORMANCE OF EACH TEAM MEMBER

The following sections contain all team members duties and the week (first day) they worked on each task, along with performances.

5.1 Finley Aubin (FIA5)

5.1.1 Duties

- Familiarised and summarised documentation (30/01/23)
- Developed UI Screens (6/02/23 – 20/02/23)
- Worked on UI presentation (13/02/23 – 20/03/23)
- Spike Work (27/02/23)
- Programming UI Controllers, implementing UI screens, Replay functionality. (17/04/23 – 1/05/23)
- Contributed to final report (10/05/23 – 11/05/23)

5.1.2 Performance

Finley Aubin was a great asset to the team. He attended all weekly meetings and optional meetings. Aubin mostly worked on the design and implementation of the front end. All work assigned was uploaded in a timely manner before the weekly meeting. At meetings Aubin contributed to discussion particularly regarding UI implementation. To conclude, Finley Aubin greatly contributed to the project.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/fia5

5.2 Dustin Baker (DUB4)

5.2.1 Duties

- Testing during integration week, used a priority system to label bugs (1/05/23)
- Familiarised with documents (30/01/23)
- Managing issues (6/02/23 – 8/05/23)
- Ran review meetings for all deliverables (20/02/23 – 20/03/23)
- Worked on maintenance manual (1/5/23 – 10/05/23)
- Reviewed all deliverables to make sure they satisfied all requirements and followed correct quality assurance procedures (20/02/23 – 11/05/23)

5.2.2 Performance

Dustin Baker performed well as quality assurance manager. He took a leading role in system testing during integration week where he discovered bugs and assigned them different priorities. Baker attended most weekly meetings however failed to attend 2. He always reviewed work to make sure it lived up to quality expectations in a timely manner. In addition, he recorded and ran review meetings for all deliverables. To conclude, Dustin Baker performed well as quality assurance manager and greatly contributed to the project.

Agreement was reached.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/dub4

5.3 George Cooper (GWC1)

5.3.1 Duties

- Familiarised and summarised documentation (30/01/23 - 06/02/23)
- Compiled and assigned tasks for each team member and kept track of their progress as well as each of their dependencies (06/02/23 - 10/05/23)
- Worked on Design Specification (13/02/23 - 14/02/23)
- Managed each team-members total hours (20/02/23 - 10/05/23)
- Assisted with review meetings for all deliverables (20/02/23 - 20/03/23)
- Worked on Test Specification (20/02/23 - 06/03/23)
- Worked on the implementation of each chess piece and flow of the program (06/03/23 - 5/05/23)
- Worked on developing controller classes, button handling, highlights and board rotation on the front-end of the program (06/03/23 - 5/05/23)
- Booked rooms for meetings and integration sessions (13/03/23 - 28/04/23)
- Produced minutes for meetings (30/01/23 - 24/04/23)

5.3.2 Performance

George Cooper worked as a valuable team member. Cooper ensured workflow throughout the team in-order to meet deadlines on most occasions. He attended all weekly meetings with all his work uploaded in a timely manner. Cooper's main contributions included the implementations of each of the piece sub-classes as well as developing a large proportion of the front-end. He made sure that all team-members were assigned an equal proportion of the work each week, providing extra assistance to those in need. In conclusion, Cooper worked well in the team, providing good communication and workflow for the project.

Agreement was reached.

Blog Link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/gwc1

5.4 Adrian Enache (ADE12)

5.4.1 Duties

- Familiarised and summarised documentation (30/01/23 – 06/02/23)
- Worked on UI specification document (13/02/23 – 13/03/23)
- Worked on Test Specification (27/02/23 – 6/03/23)
- Worked on saving and loading systems for the chess tutor program (17/04/23 – 3/05/23)
- Worked on pawn taking method (20/03/23)

5.4.2 Performance

Adrian Enache worked well in the team. He made large contributions to UI specification. Enache attended all weekly meetings. On the whole, he uploaded work in a timely manner and to a high standard. Progress on the saving/loading was slow (20/03/23 – 3/05/23) however, he worked well with Tate Moore to complete most of the saving/loading/replay functionality. To conclude Adrian Enache performed well.

Agreement was reached.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/ade12

5.5 Kieran Foy (KIF11)

5.5.1 Duties

- Familiarised and summarised documentation (30/01/23)
- Prototype Code – Structure of project, contents of classes, pseudo code (30/01/23 – 6/03/23)
- Worked on Design Specification – Section 1 (9/02/23)
- Worked on Test Specification (27/02/23 – 24/04/23)
- Wrote Junit Tests (24/04/23 – 01/05/23)
- Worked on Chess Program – Structure of project, backend (13/03/23)

5.5.2 Performance

Kieran Foy worked well in the team. He made large contributions to the test specification and early content of the chess project code. He attended all weekly meetings and optional meetings including review meetings where his feedback was much appreciated by the rest of the group. There were a couple times where work was pushed

late including just before the submission deadline during integration week. To conclude Kieran Foy performed well.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/kif11

5.6 Jack Grant (JAG89)

5.6.1 Duties

N/A

5.6.2 Performance

Jack Grant did not contribute any work to the project. Grant failed to turn up to all but one meeting (20/02/23). Following this, he withdrew from university. This put a huge strain on the rest of the team as all other members had to work harder and put in more hours to make up for the reduced team size. In addition, the uncertainty around whether he had dropped out or not in the first 4 weeks of the project did not help matters.

5.7 Tate Moore (TAM41)

5.7.1 Duties

- Conducted research on technologies for chess tutor (30/01/23)
- Worked on UI specification (6/02/23 – 27/02/23)
- Worked on design specification (27/02/23 – 10/05/23)
- Worked on Junit tests (17/04/23 – 2/05/23)
- Worked on saving, loading and replay (1/5/23 – 5/5/23)

5.7.2 Performance

Tate Moore was a great asset to the team. He attended all weekly meetings apart from one (17/04/23) due to covid. Moore made large contributions to the design and Replay class. He worked particularly hard over integration week finishing the saving/replay methods. Moore worked well with the rest of the team and was great at communicating activity. To conclude Tate Moore greatly contributed to the project.

Agreement was reached.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/tam41

5.8 James Owen (JCO3)

5.8.1 Duties

- Familiarised and summarised documentation (30/01/23)
- Worked on UI presentation (13/02/23 – 27/02/23)
- Worked on design specification (6/03/23 – 11/05/23)
- Spike work/research for en passant, check/checkmate, castling (13/03/23 – 3/5/23)

5.8.2 Performance

James Owen contributed to the project. Owen missed a couple of meetings due to medical appointments. He underdelivered on a substantial number of promised actions and contributed fewer hours than other members of the group. This was due to circumstances outside of his control. However, this increased the workload on other group members and resulted in a rush to implement check/checkmate and castling during integration week. To conclude, James Owen did not perform to the same standard as other members.

Agreement was reached.

Blog link: https://gitlab.dcs.aber.ac.uk/cs22220-gp17/gp17/-/tree/main/config/blogs/jco3

6. CRITICAL EVALUATION

Our group Performed relatively well, for the most part, our communication was decent and most of us completed tasks when asked, however at times there were definitely misallocation of resources at times, Far too much time was spent on the back end for saving and loading, and also on the UI presentation, we should have moved on from that much sooner than we did, and also in the last few hours we should have allowed for more time to be allocated to getting the project into the correct package structure and into the SRC folder.
The project for the most part was a decent problem to try to tackle, however there could have been more resources for how to do some of the diagrams. There was some confusion with the group example docs too, they're only there to show the structure but many took it as the perfect example. And when the diagrams on there are different to the ones shown by Chris in the recorded lecture slides it's confusing.
There were a few important lessons about group work learnt in this assignment, the big one being how to use version control with git, and how to handle conflicts, as well as how to successfully communicate with a team to ensure that everyone knows what they are doing and there is no conflict where 2 people have written the same piece of code.

REFERENCES

[1] Loftus C.W., Software Engineering Group Projects: General Documentation Standards. SE.QA.03. 2.5 Release

[2] Loftus C.W., Software Engineering Group Projects: Producing the Final Report. SE.QA.10. 2.4 Release

[3] Loftus C.W., Software Engineering Group Projects: Chess Tutor Requirements Specification. SE.QA.RS-CS22120. 1.2 Release.

[4] Foy K, Baker D, Enache A, Software Engineering Group Project Maintenance Manual., 1.0, SE_GP17_MaintenanceManual, 11th May 2023

[5] Moore T., Enache A., “Software Engineering Group 17 User Interface”, 1.0, SE_GP17_UISpecification, 27th February 2023

[6] Cooper G, Foy K, Owen J, Moore T, “Software Engineering Group Project Design Specification” 1.10, SE_GP17_DesignSpecification, 10th May 2023

[7] Cooper G, Foy K, Baker D, Enache A, “Software Engineering Group 17 Test Specification”, 1.7, SE_ GP17_TestSpecification, 2nd May 2023

DOCUMENT HISTORY

Version	*Issue No.*	*Date*	*Changes made to document*	*Changed by*
0.1	N/A	08/05/23	Completed section 1	GWC1
0.2	N/A	10/05/23	Completed section 2	GWC1
0.3	N/A	10/05/23	Completed section 3	GWC1
0.4	N/A	10/05/23	Completed section 5.3	DUB4
0.5	N/A	10/05/23	Completed section 5 (excluding 5.3 section)	GWC1
0.6	N/A	11/05/23	Completed section 4.2, 4.3 and 6	FIA5
0.7	N/A	11/05/23	Added to section 4.1	GWC1
1.0	N/A	11/05.23	Initial Release	GWC1
1.1	N/A	11/05/23	Added blog links	GWC1