

975G5: Engineering Scalable and Reliable Software Project

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**Abstract**

This report presents the study, design and analysis of a software project targeted at creating a Book Lending application. This project is developed as a part of the course module – ESRS as a tool to learn software development to enable deploying software systems which are scalable and dependable. The project has been created by the collaborative and determined efforts of the team members of Group-9.

**Acknowledgement**

The team members of Group – 9 express sincere gratitude to our teacher and module convenor Prof. Hsi-Ming Ho for his constant support and invaluable insights throughout the course of this project. His expertise and guidance have been crucial in achieving success through the journey of the project development.

Furthermore, a heartfelt thank you to all the members of Project Group 9. The dedicated hard work, sheer determination, and collective effort of all the team members have played an important role in achieving the goals of developing this project. The commitment to excellence and working together has made this journey fulfilling and has provided a rewarding experience to all. Thank you all for your valuable contributions.

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# INTRODUCTION

## Overview

This comprehensive report unfolds an in-depth study and analysis, delving into a purposeful software initiative aimed at the development of book lending application. The primary objective of this application is to create a multi-user style application which enables like-minded persons to connect with each other and share their common love for books. This application allows them to request & share books with each other building towards a sense of community for book lovers. The application is robust enough to handle server failures and scalable whenever required.

The development approach for this application involved the adoption of the agile methodology where the project was being continuously made deployable with small incremental features and the developers kept adding various functionality. One real-life scenario of changing requirement was simulated as well when the team decided the UI-UX needs to be changed and be made much more sophisticated. This strategic choice allowed team to proactively respond to the evolving needs and made them feel the importance of strictly following software development techniques learned in the past module. Only because of such techniques, it was possible to accommodate changes in the project even in the later stages. The application is hosted on AWS cloud

# DEVELOPMENT

## Development Methodology

To replicate the authentic experience of a rigorous software development project, the development approach involved the adoption of the Agile methodology. This strategic choice allowed all parties to build features incrementally. GitHub & JIRA will be the platforms for all aspects of development tracking in collaboration with the client. GitHub provides an efficient environment that can be used to maintain version control, and project management was handled with the help of JIRA throughout the development process. By using GitHub, it is possible to maintain transparency and collaboration.

## Software Tools

The project utilized following set of tools to support various aspects of development:

* **Django:** The project was implemented using the Django framework.
* **HTML, CSS, and JavaScript:** These web technologies were utilized for frontend development.
* **MySQL:** The MySQL database management system was chosen to store and manage puzzle solutions efficiently.
* **Ubuntu Minimal Linux OS:** The project was hosted on the Ubuntu Minimal Linux operating system, providing a robust and secure environment for the application.

## Implementation

The project's implementation unfolded through a series of structured tasks, each contributing to the overall development and refinement of the application. Here's an elaboration on each task:

### Task 1: Create GitHub account and repository

In this phase, the project plan was devised to create a primary structure of the project.

### Task 2: Design & Plan architecture

### Task 3: Dividing tasks as per talent available

### Task 4: Incremental development of features

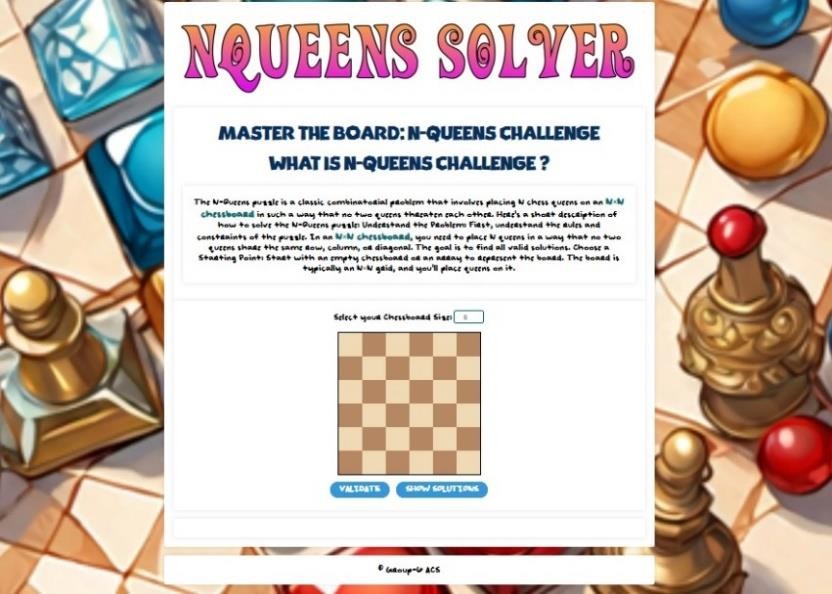
### Task 5: Deployment as per architecture

# TESTING

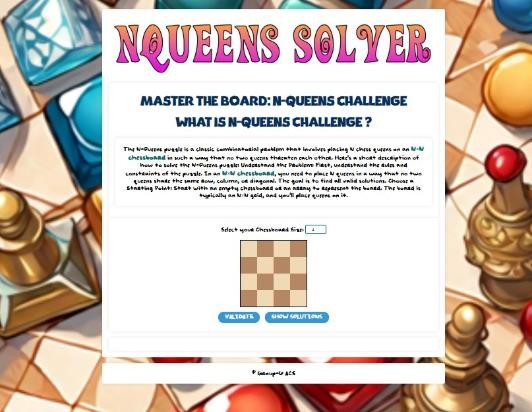
Following sections lists the test cases and results for each game to evaluate the software functionality is as expected and meets the specified functional requirements. The goal of this phase is to ensure the functionality and reliability of the implemented code and algorithm fulfilling its intended purpose.

## N-Queens Problem

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Test Case | Expected Result | Results |
| 1 | To test the deployment of Bingle app | Successful launch of application hosted on url – ‘ENTER URL HERE’ | Server launched. |
| 2 | To test adding of new book into your account |  |  |

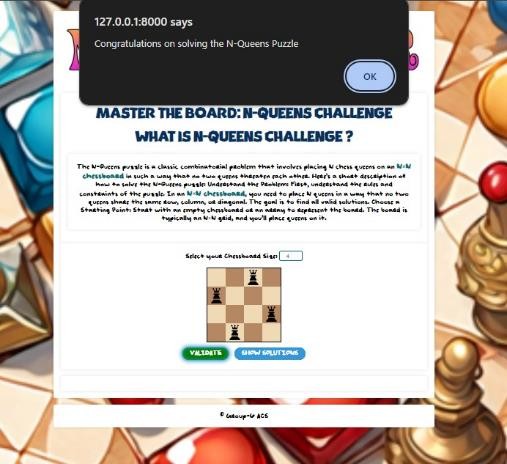


***Figure 1***

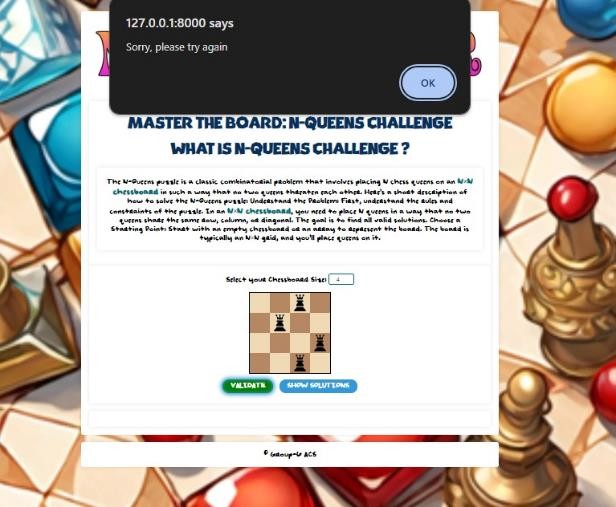


***Figure 2***

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Test Case | Expected Result | Results |
| 3 | To remove an existing book from your account |  |  |
| 4 | To test viewing the entire library |  |  |

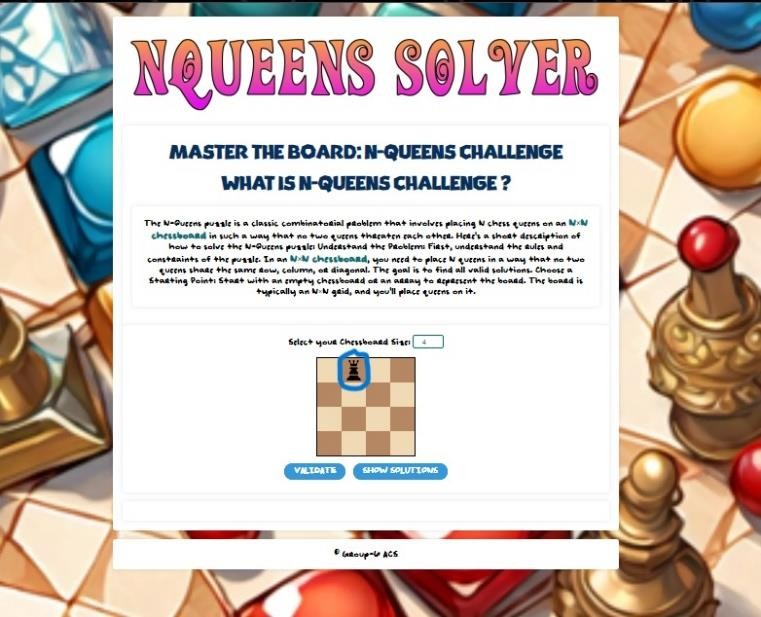


*Figure 3*

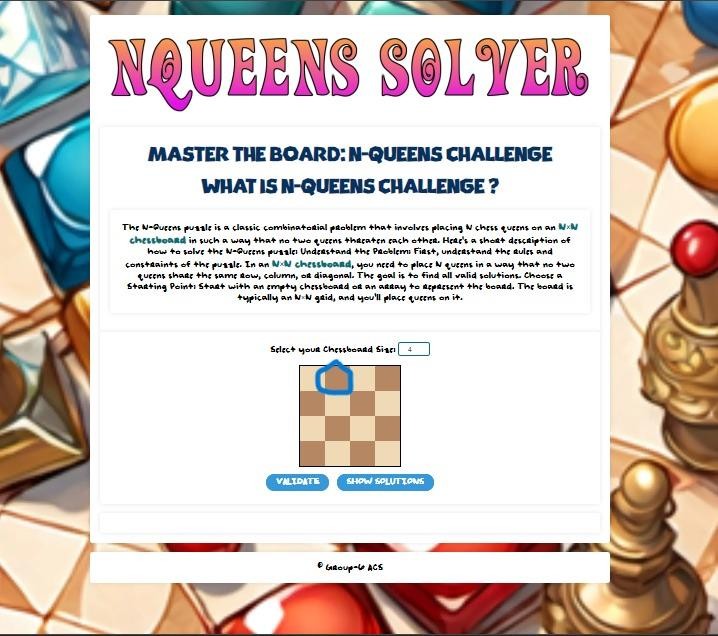


***Figure 4***

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Test Case | Expected Result | Results |
| 5 | To test requesting a particular book |  |  |

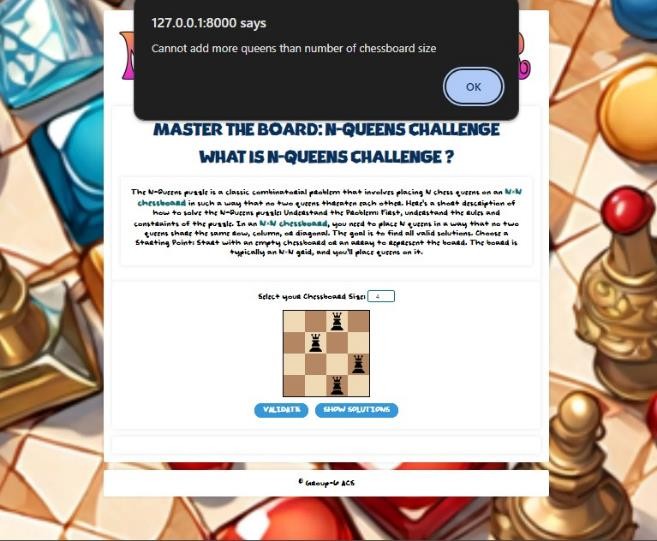


***Figure 5***



***Figure 6***

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Test Case | Expected Result | Results |
| 6 | To accept a book borrow request from a fellow user |  |  |



***Figure 7***

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Test Case | Expected Result | Results |
| 7 | To reject a book borrow request from a fellow user |  |  |
| 8 | To chat with a particular user |  |  |
| 9 | To view Booking history |  |  |
| 10 | To change personal information in profile page |  |  |
| 11 | Search for User in search page |  |  |
| 12 | Search for Book in search page |  |  |
| 13 | To view pending notifications |  |  |

# CONCLUSION

## Limitations

## Future Improvements