

Assignment Sprint 1 - Technology Stack and Justification

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The multi-player and cross-platform board game Nine Men's Morris has been played for centuries. The game is played by two players, each with nine pieces, and the goal is to have more pieces than the opponent on the board when no more legal moves can be made, or decrease their pieces to less than three. Our aim is to create an object-oriented design and then develop a fully functional Nine Men's Morris game with a flexible and responsive GUI.

When creating a game, there are numerous platforms to consider, such as mobile app, web app, and desktop app installation. Design choices on the user interface and functionality also differ from one another. Furthermore, the fact that Nine Men's Morris is a multiplayer game, makes determining the best development method much more challenging.

We have considered the desktop app approach for developing the Nine-Men's Morris game based on several factors. A desktop app can potentially reach out to a larger audience since it can be used by both laptop and desktop users. Players may be more likely to engage with the desktop app because it offers a larger screen and is more accurate using keyboard and mouse to select the new position of a piece. Furthermore, a desktop app can be more secure than a mobile app since a desktop app might have more built-in security functionality and might be less vulnerable to certain types of attacks compared to a mobile app. Moreover, a desktop app can be downloaded locally and can offer offline play. This can be a desirable feature for the users who want to enjoy the game without internet access. Overall, a desktop app can provide several benefits that make it a more sustainable option compared to a mobile app.

A web application design may be insufficient for a Nine Men's Morris game due to performance, WiFi availability, security, and user experience. Internet apps are restricted to certain browsers and devices, cannot be used offline, and may pose security risks. Slower loading times, poor visual quality, and a constrained user experience can all detract from the enjoyment of a game. A desktop application for this game would be beneficial.

After deciding on the desktop method, the following step is to decide on the technologies to be used to do this. As a result, after careful study, we decided to choose Java and JFrame as our backend and GUI solutions, respectively. This assessment is based on the demonstrated technological capabilities.

Because it is simple to learn and use, allows object-oriented programming, and is extremely stable, Java is a popular programming language. It is an excellent choice for building desktop apps due to the numerous libraries and frameworks available for GUI development, database integration, and other activities.

Furthermore, Java Swing is a graphical user interface (GUI) development library that includes the JFrame component (GUI). JFrame is primarily designed for desktop applications. It comes with a number of pre-made widgets like buttons, text fields, and menus to help you quickly construct a UI. It is relatively easier to use compared to other frameworks, such as libGDX, and these are the main reasons why we decided to use JFrame.

The technologies described above enhance our team's experience. To begin, we are all comfortable working with OOPs in Java. Using our Java skills, we could use Java and JFrame to develop Nine Men Morris in a desktop application. Furthermore, we can also apply our knowledge on classes, objects, inheritance, encapsulation, and polymorphism for designing relationships between entities and implementing the game's back end functionality and rules. Students of computer science who are familiar with Java can practise Java programming, GUI development, data structures, algorithms, and software architecture by creating a Nine Men Morris desktop application with Java and JFrame.

With time, JFrame has become obsolete, and this will be our first time using it for Frontend development of our game; so, we may request help from the teacher on developing a JFrame application.

Apart from the previously stated programming languages and frameworks, we also decided to use various applications and tools to manage the development process. IntelliJ is a popular Integrated Development Environment (IDE) in the Java development community. IntelliJ streamlines the development process by providing an integrated development environment with debugging, code completion, and other useful features.

Furthermore, employing applications like Whatsapp allows us to communicate in real time. Group chat, file sharing, and audio calls are just a few of the numerous tools available to keep our team engaged and informed as the project moves forward. Google Drive also allows us to securely share and save files in the cloud. It includes a number of tools that allow our team to manage project files, including document editing, version control, and commenting.

Finally, Trello allows us to keep track of task progress, assign team members to specific projects, and create deadlines. This keeps the team organised and on schedule, which is especially important when working on huge projects with many moving elements. Because of its user-friendly design, extensive customization options, and emphasis on teamwork, Trello is a suitable alternative for software development teams looking for a flexible, agile project management tool.

All in all, given the game's performance, offline availability, accuracy, and precision, creating a desktop application for Nine Men's Morris using Java and JFrame would be a wise choice. Java is a well-known and widely used programming language that supports object-oriented programming and provides a slew of libraries and frameworks for GUI development, database integration, and other tasks. The IntelliJ IDE and Java Swing with JFrame can be used for UI development. Whatsapp, Google Drive, and Trello may all be used for team communication, file sharing, and project management. Students with Java skills can practise Java programming, GUI development, data structures, algorithms, and software design by

creating a Nine Men's Morris desktop application. Generally, the best platform is determined by the audience and game needs, and for Nine Men's Morris, a desktop application created with Java and JFrame appears to be the best option.