

For our final project, we are developing a lightweight Trello-style web application that allows users to manage tasks by creating and moving cards between various column stacks. While the current implementation is minimal and operates locally through WebAssembly, the long-term goal is to build a functional foundation that could be extended for real-world use if integrated with a scalable database or backend. This project demonstrates how our advanced C++ classes can power an interactive web interface, while showcasing the potential for growth into a fully featured productivity tool.

Our app interface will consist of several vertical columns (or “stacks”), each containing cards that represent tasks or notes. Users will be able to create new cards, assign dynamic tags to them, and drag and drop them between different stacks. Each card will include metadata such as a title, annotations, and potentially dynamically changing content. The design will be simple and intuitive, with clearly labeled buttons and draggable elements for ease of use.

We will be using Emscripten to compile our C++ code into WebAssembly, allowing it to run directly in the browser without needing a backend or database. This approach eliminates the need for a server or external data storage, as all data will exist locally in the user's session. It also helps simplify deployment and testing, making our application entirely frontend-driven and lightweight.

Our project will utilize the C++ classes developed throughout the semester. The AnnotatedWrapper class will serve as a foundation for cards, enabling the use of annotations such as tags or labels. The TagManager class will help associate and track tags across multiple cards, allowing for efficient filtering and categorization. The DynamicString class will support dynamic content within cards, such as displaying timestamps or variables that change in real time. We will use the RandomAccessSet to manage cards within each stack, giving us the ability to access or move cards efficiently. The AuditedPointer class will be a smart debugging tool that helps track memory usage in a program. It keeps a record of all active pointers and assigns each one a unique ID. If a pointer is not properly deleted (if there's a memory leak), the program will report which pointer was left behind, making it easier to find and fix memory issues.

Overall, our goal is to build a lightweight, fully client-side web application that leverages the power of modern C++ design patterns and Emscripten to produce a responsive and functional Trello-style task manager. The project is intentionally scoped to be manageable within four weeks while providing meaningful opportunities for each group member to contribute to both the frontend and backend logic. By using our own C++ classes and compiling to WebAssembly, we aim to showcase how modern C++ can be integrated into web development without relying on traditional server-side architectures.