1. The system shall allow users to select a text file containing instructions for the UVSIM.
2. The system shall parse the selected text file to extract the instructions for execution.
3. The system shall execute read operations, prompting the user to input values for specific memory locations.
4. The system shall execute write operations, displaying the value stored at a specified memory location.
5. The system shall execute load operations, loading values from specific memory locations into the accumulator.
6. The system shall execute store operations, storing the value in the accumulator into specified memory locations.
7. The system shall accurately emulate the behavior of the UVSIM machine, including arithmetic operations and memory management.
8. The system shall handle file loading errors, such as invalid file formats or inaccessible files, and notify users appropriately.
9. The system shall support the execution of programs with varying lengths and complexities, accommodating different input file sizes and instruction sets.
10. The system shall allow users to export the current state of the UVSIM machine, including memory contents and program counter, for analysis or sharing
11. The system shall provide functionality for users to create and save their own UVSIM programs within the application for future use.
12. The system shall allow users to pause, resume, and reset program execution at any point.
13. The system shall provide options for users to step through the program, executing one instruction at a time.
14. The system shall maintain the integrity of program execution by preventing unauthorized modifications to critical components, such as the program counter and accumulator.
15. The system shall log program execution details, including executed instructions and memory changes, for debugging and analysis purposes.
16. The system shall have a responsive and intuitive user interface for ease of use.
17. The system shall provide clear and informative error messages to assist users in troubleshooting.
18. The system shall be thoroughly tested using unit tests, integration tests, and system tests to verify its correctness and reliability.
19. The system shall be scalable, capable of handling increasing user loads and expanding functionality without significant performance degradation.