**Software Requirements Specification (SRS) for UVSim**

## **Functional Requirements**

UVSim should be able to:

1. Execute Basic Machine Language (BML) instructions sequentially.
2. Accept a text file as user input and load BML programs.
3. Provide a text area in the GUI for users to input program instructions.
4. Store and retrieve data in a scrollable table that displays memory addresses and values.
5. Use an Accumulator register to hold special values and perform arithmetic operations.
6. Support branching and control flow based on accumulator values.
7. Execute programs with an "Execute" button that runs until completion.
8. Provide a "Step" button to execute one instruction at a time, updating the GUI accordingly.
9. Detect and handle errors for invalid instructions with informative error messages in plain language.
10. Save and load programs for future use by opening and writing to a text file.
11. Allow users to halt program execution when needed.
12. Display the entire memory state for user inspection.
13. Display the current accumulator value for user inspection.
14. Maintain a complete execution log for debugging and review.
15. Accept and process user input for operations requiring interaction.

## **Non-Functional Requirements**

1. The system shall provide a GUI designed using Kivy for usability and ease of navigation.
2. The system shall execute BML programs with minimal delay for optimal performance.
3. The system shall handle invalid inputs gracefully to ensure reliability and prevent crashes.