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Table 1: Revision History

Date	**Developer(s)**	**Change**
28 January 2022	Kehao Huang	Completed topic: description
28 January 2022	Xunzhou Ye	Completed topic: relevance
28 January 2022	Anhao Jiao	Completed topic: context

SE 3XA3: Problem Statement
Finite State Machine Simulator

L02GRP16, NonDeterministic Key
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1 Problem Description

Finite state machine (FSM) is a mathematical model of computation that can be implemented with hardware or software, and can be used to simulate sequential logic and some computer programs. As an important topic in discrete mathematics, FSM is commonly included in the academic discipline of a multitude of majors like science, engineering and mathematics.

Throughout courses and academic activities where FSM is involved, people encounter situations where they need to demonstrate the construction of an FSM and simulate transitions between states in order to help others understand an FSM model. Meanwhile, professionals who work with FSMs might be in need of generating images of FSMs to include in technical documents in an academic setting.

2 Problem Relevance

Traditionally, visual representations of FSM are conducted by static images drawn by hands. Transitions between states, even those extremely similar ones, are exhaustively enumerated and listed in a tableau form. Operations on FSMs, therefore, can hardly be visualized in a dynamic way.

To conclude, working with FSM is relatively inefficient due to the fact that there aren't many easy-to-use tools tailored for simple FSMs. A piece of software is needed to reduce the workload of FSM-related jobs.

3 Problem Context

Stakeholders for the software are students and educators, and people who work with finite state machines. In the context of the course SFWRENG 3XA3,

stakeholders also include the course instructor Dr. Asghar Bokhari and TAs of this course.

FSMS (Finite State Machine Simulator) is a software that simulates a finite state machine. It can be used on either desktop or laptop, in Windows, Linux or Mac operating systems. In addition, the use of the software is not restricted by the workplace. For instance, the software is intended to be used at home offices, schools, public libraries, etc. Furthermore, the software is independent of other systems. Once users downloaded the software for the first time, they do not need internet connections to use the software. The software can be used as a standalone application running in the Python interactive shell.