MINI PROJECT TOPICS

1. **Finite State Automata Simulator -** Build a tool that simulates both Deterministic Finite Automata (DFA) and Non-deterministic Finite Automata (NFA). It should allow users to input transition rules and run a string to check acceptance.
2. **Regular Expression to DFA Converter-** Create a mini-project where you develop a program that takes a regular expression as input and converts it to its equivalent DFA, demonstrating each intermediate step.
3. **Mealy and Moore Machine Design -** Implement a graphical tool for designing Mealy and Moore machines. The user should be able to visually create states and transitions, and the tool should simulate the machine's operation on given inputs.
4. **DFA Minimization Tool -** Develop a DFA minimization program using the equivalence theorem. Given a DFA, the program should minimize the number of states and display the minimized DFA.
5. **Pumping Lemma Visualizer -** Create an interactive visualization tool for the Pumping Lemma for Regular Languages. The tool should allow users to input a string and see if it satisfies the lemma for a regular language.
6. **Context-Free Grammar (CFG) Simplifier -** Build a program that simplifies a given CFG by removing epsilon productions and unit productions and converting it into Chomsky Normal Form (CNF).
7. **Pushdown Automata (PDA) Simulator -** Design a PDA simulator that can recognize Context-Free Languages (CFLs). It should allow users to define a PDA and check if an input string belongs to the language recognized by the PDA.
8. **Turing Machine Visualizer -** Implement a visual Turing Machine simulator that lets users design a Turing Machine with multi-tape or single-tape. The project should also allow users to input strings and watch how the machine processes them step by step.
9. **Chomsky Hierarchy Explorer -** Create an educational tool that allows users to explore the different levels of the Chomsky Hierarchy. The tool should provide examples and explain the differences between regular languages, context-free languages, context-sensitive languages, and recursively enumerable languages.
10. **Linear Bounded Automata Simulator -** Build a Linear Bounded Automaton (LBA) simulator where users can define an LBA and test its behaviour on specific inputs, demonstrating its constraints in terms of space usage compared to Turing Machines.