Project Summary: Regular Expression Visualizer Project Summary

Overview

Problem Statement: Although tools exist that visualize regular expressions and automata, most are outdated or lim

Project Description: The proposed project, titled **Regular Expression Visualizer**, implements a Rust-based appl

Goals and Purpose

Implement a manual lexer, parser, and automata generator for regular expressions without built-in regex or parser libraries.

Apply Thompson's construction for $RE \to NFA$ and subset construction for optional $NFA \to DFA$ conversion.

Create an interactive GUI using the **iced** framework for visualizing automata and testing strings in real time.

This project functions as both an educational demonstration of formal language theory and a usable teaching aid for ex

Implementation Details

Developed entirely in **Rust**, the project emphasizes performance and safety. It consists of three core components:

Core Engine: Tokenizer and recursive-descent parser for regular expressions, constructing ε-NFAs and optionally DFAs.

Simulation: Implements ε-closure and transition functions to test if input strings are accepted.

Visualization: GUI for entering expressions, rendering state diagrams, and showing acceptance results through iced's canv

Evaluation and Expected Results

Evaluation will focus on correctness of automata construction, clarity of visualization, and accuracy across benchmark