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# CS 410 - PROJECT 1 DESIGN REPORT

## Description

In this project, a program will be implemented that allows us to convert NFAs to DFAs.

## Tools

- Java 15 (JDK-15.0.2): A programming language for the project implementation.
- IntelliJ IDEA 2021.1.1: An Integrated Development Environment (IDE).

## Implementation

This is the solution design of the program, which will be implemented in phase 2:

In this design, epsilon transitions will be ignored.

1. An NFA will be read as input.
2. A blank state table will be created using a 2D array. A state table represents the NFA's every state.
3. Start state of the DFA will be marked as $Q_0$ (Same as the NFA).
4. The combination of NFA's every state $\{Q_0, Q_1, Q_2, Q_3, ...., Q_n\}$ will be examined for each possible input symbols.
5. We must repeat step 4 each time we generate a new DFA state under the input symbols columns; otherwise, step 6 will be performed.
6. The final states of the corresponding DFA are any states that contain one of the NFA's final states.