# KING SAUD UNIVERSITY

COLLEGE OF COMPUTER & INFORMATION SCIENCES
DEPT OF COMPUTER SCIENCE

CSC339 Theory of Computation
First Semester 1446/47 AH
Due: TBA
Instructor: Prof. Aqil Azmi

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## Group Term Project

**Problem**

The objective of this project is to simulate Non-deterministic Finite State Automata (NFA) with $\lambda$ transition. The inputs to the simulation are:

1. Alphabet
2. Number of states in NFA
3. Start state(s)
4. Final state(s)
5. Transition function `(from_state, symbol, to_state)`

For simplicity the states are numbered 1, 2, 3, .... Use **#** instead of $\lambda$ in the transition function.

The next input is the string which the NFA will work on. During the simulation as you process each symbol from the string, print the symbol and the set of state(s) you end up at. Once the entire string is processed, print the message "Input Accepted" or "Input Rejected".

**Instructions**

This is a group project. Each **three** students will work as a team. You are free to use any convenient programming language.

This project is worth 10 points. If you graphically draw the input NFA machine and show the step by step simulation as each symbol is processed highlighting the current state(s) then you will get an extra 5 bonus points.

**What to submit**

(a) Cover sheet with your names and a signed pledge.
(b) Write-up of the project (a brief description of your algorithm; the data structure used; cost analysis; sample runs and the conclusion).
(c) Hardcopy of your source code + memory flash/CD with source and executable.