Theory of Automata (CS402)
Assignment # 01
Fall 2022

Total marks = 20

VuCopier

Due Date :
December 06, 2022

Virtual University

Please carefully read the following instructions before attempting the assignment.

RULES FOR MARKING

It should be clear that your assignment would not get any credit if:

- **The assignment is submitted after the due date.**

- **The submitted assignment does not open or the file is corrupt.**

- **Strict action will be taken if the submitted solution is copied from any other student or the internet.**

You should be concerned about the recommended books to clarify your concepts as handouts are insufficient.

You are supposed to submit your assignment in Doc or Docx format.
Any other formats like Scan Images, PDF, Zip, Rar, Ppt, and Bmp will not be accepted.

Topic Covered:
The objective of this assignment is to assess the understanding of students about:
- Regular Expressions (RE)
- Finite Automata (FA)
- Transition Graph (TG)
- Generalized Transition Graph (GTG)

NOTE

No assignment will be accepted _after the due date via email in any case_ (whether it is the case of load shedding or internet malfunctioning etc.). Hence refrain from uploading assignments in the last hour of the deadline. It is recommended to upload the solution file at least two days before its closing date.

If you people find any mistake or confusion in the assignment (Question statement), please consult with your instructor before the deadline. After the deadline, no queries will be entertained in this regard.
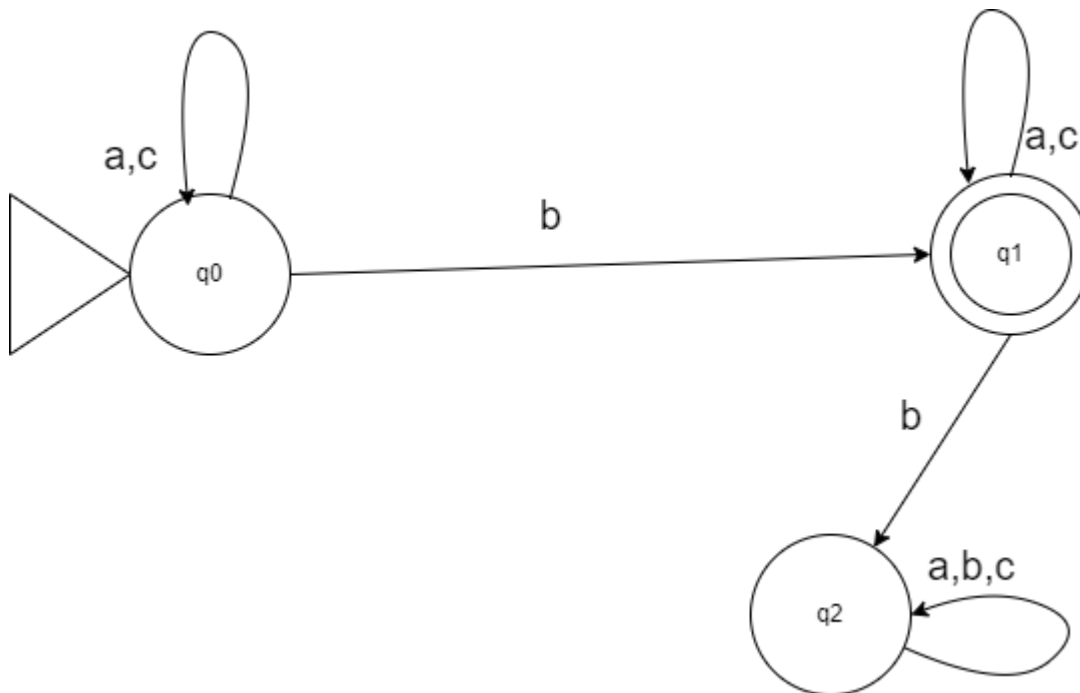
For any query, feel free to email me at:
cs402@vu.edu.pk

Questions No 01   **Marks: (5+5+4)=14**
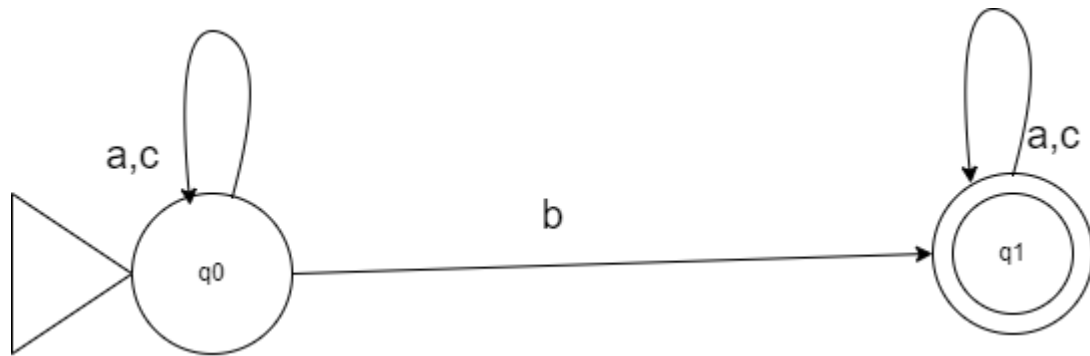
Consider a language 'L' defined over ∑= {a, b, c} such that it contains all words in which **'b'** occurs exactly once in a string.
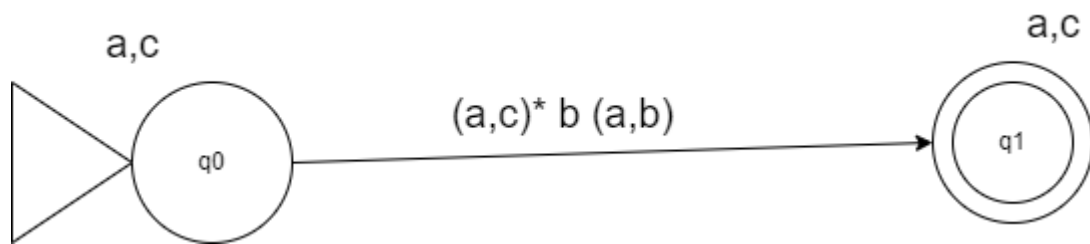
a)   Construct a Finite Automata (FA) for the language 'L'.

b)   Construct a Transition Graph for the language 'L'.

c)   Construct a Generalized Transition Graph for the language 'L'.

Provide the regular expression RE defined over $\sum = \{0,1\}$ for the strings belonging to the following languages:

a)   All strings having zeros in multiples of three.

((1)* 0 (1)* 0 (1)* 0 (1)*)*

b)   All strings that do not start with double zero.

(0+1) 1 (0+1)*

c)   All strings starting with zero have no consecutive 1's in them.

(0 (1) 0 (1) 0 (1))*