Project : Theory of Automata

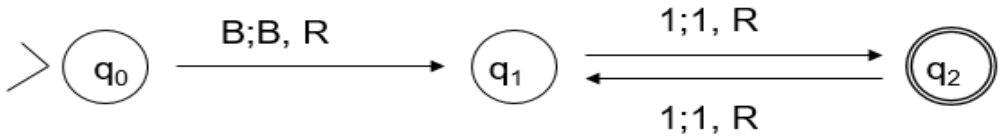
Sections A1 and A4 will design Turing Machine

Section A2 and A3 will design Push Down Automata

Requirement

- The students are required to read a file that contains encoding of Turing machine or PDA as input.
- The encoding of TM/ PDA is provided in the next slide of Godels encoding of TM /PDA.
- Then they will load the TM/ PDA into Data structure of their own choice.
- The input would be provided by user on Command Prompt
- The output can be a graphical interface of a running machine or it can be a command line printed message of Accept or Reject.

Gödel-coding of TMs

Let M= 

M accepts strings *n* that represent even natural numbers.

To encode M's symbols: use 0s as separators and

- let input symbol 0 be coded as 1, symbol 1 as 11, and symbol B as 111
- let state q_0 be encoded as 1, state q_1 as 11, and state q_2 as 111
- let move L be 1, move R be 11.

Gödel-coding of TMs……

- The encoded transitions become
- $\delta(q_0, B) = [q_1, B, R]$ 101110110111011
- $\delta(q_1, 1) = [q_2, 1, R]$ 110110111011011
- $\delta(q_2, 1) = [q_1, 1, R]$ 111011011011011

- Between transitions use 00, to begin and end use 000.

- So the string representing M is R(M) =
- **0010111011011101100110110111011011001110110110110110001**

Your choice

- The project is optional and can earn you bonus marks.
- You are free to choose any language or platform of your choice
- You can check online resources for help.
- The output is up to you how you want to present it.
- The students can work in groups of 2 and each should be able to explain the working upon viva.