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# THEORY OF AUTOMATA

## ASSIGNMENT # 02

**Marks: 15**

**DUE DATES: 21, OCT 2023**

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**Instructor Name:** Mr. Tahir Iqbal

### **Rules for Marking:**

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

- *The assignment is submitted after due date*
- *The assignment is copied*
- *You may use any software for diagram but diagram should be clear. (If needed)*
- *No query will be entertained for the assignments. Understanding is part of it.*

### **Objective:**

*The objective of this assignment is to provide hands on experience of:*

- *Finite Automaton*
  - *Uses of FA in different applications*
  - *Understanding the FA and creating by using VAS Simulator.*
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**Q.1. Give a DFA for the following languages, specified by a transition diagram. For each one of them, give a short and clear description of how the machine works. The alphabet is  $\Sigma = \{0,1,2\}$ .**

- (a)  $L_1 = \{w \in \Sigma^* : w \text{ begins with } 0 \text{ or ends with } 0 \text{ but not both}\}$ .
- (b)  $L_2 = \{w \in \Sigma^* : w \text{ contains the pattern } 01 \text{ at least twice}\}$ .

**Q.2 Build an FA that accepts only the words baa, ab, abb and no other strings longer or shorter.**

**Q.3 Build DFA for the following languages, over the alphabet  $\{0,1\}$ .**

- (a) Set of all strings containing the substring 0110.
- (b) Set of all strings that are at least of length 4 and contains even number of 1's.

**Good Luck ☺**