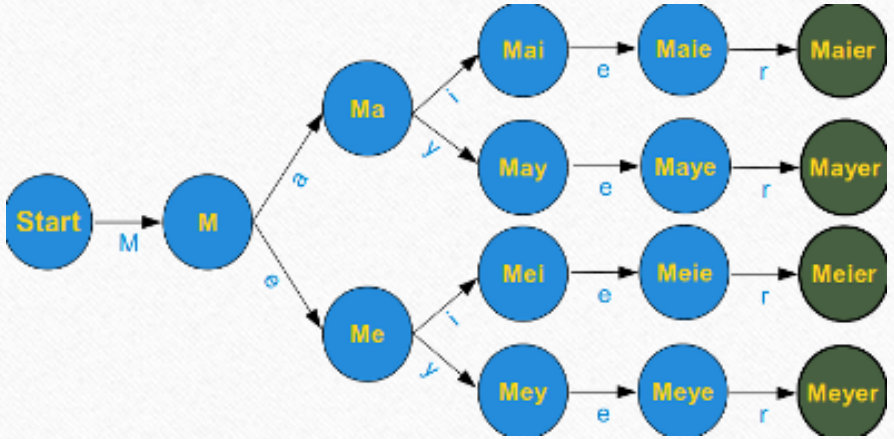
Finite –State Machines

Introduction

- There are several types of structures used in models of computation.
- namely, grammars, finite-state machines, and Turing machines
- Finite-state machines are used extensively in applications in computer science and data networking.

Application

- spell checking
- grammar checking
- indexing or searching large bodies of text
- recognizing speech,



Definition

1. Set I, called the **input alphabet**, of input symbols:

2. Set **S** of **states** the automation can be in

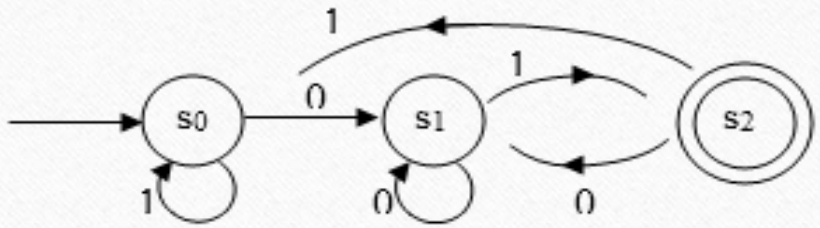
3. Designated state s_0 , called the **initial state**:

4. Designated set of states called the set of **accepting states**:

5. a **next-state function:** $S \times I \rightarrow S$ that associates a "next-state" to each ordered pair consisting of a "current-state" and a "current input".

Question 01

Consider the finite state automaton A defined by the transition diagram shown in figure given below



a) What are the states of A?
b) What are the input symbols of A?
c) What is the initial state of A?
d) What are the accepting states of A?
e) Find N(s1 , 1)
f) Find the annotated next state table for A.

Question 2

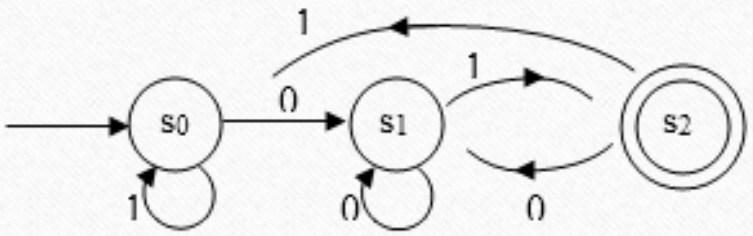
Consider the finite state automaton A defined by the following annotated next state table.

State	Input: a	b	c
→ U	Z	Y	Y
◎ V	V	V	V
Y	Z	V	Y
◎ Z	Z	Z	Z

a) What are the states of A?
b) What are the input symbols of A?
c) What is the initial state of A?
d) What are the accepting states of A?
e) Find N(U , c).
f) Draw the transition diagram for A.

Question 3

Consider the finite state automaton A defined by the transition diagram shown in figure given below

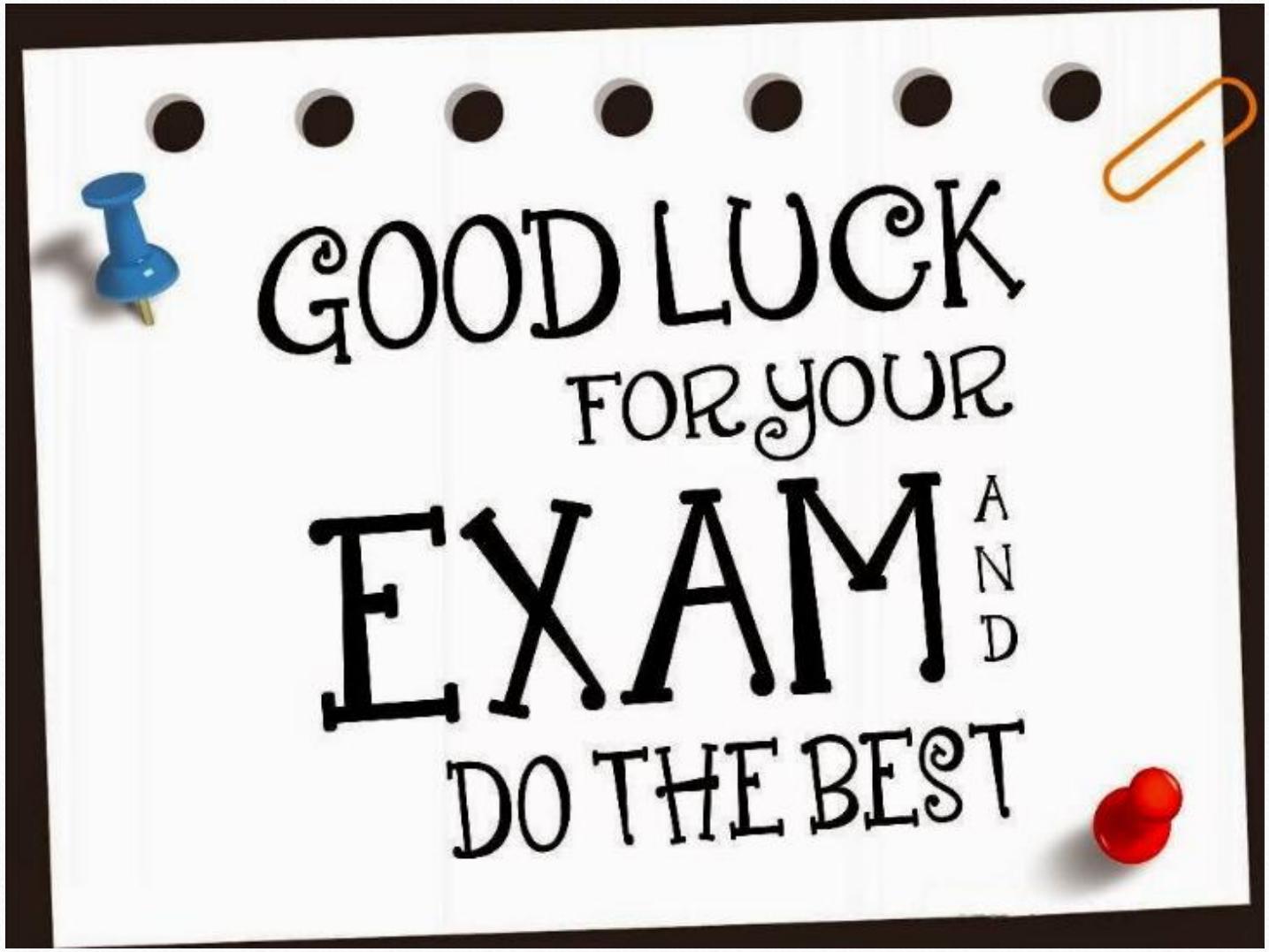


a) To what state does A go if the symbols of the following strings are input to A in sequence starting from the initial state?

1) 01 2) 011 3) 0101100 4) 10101

b) Which of the strings in part a) send A to an accepting state?

c) What is the language accepted by A?


GOOD LUCK
FOR YOUR
EXAM
AND
DO THE BEST