CAPABILITIES AND LIMITATIONS

1. Periodic statement of finite states
2. No infinite Sequence
3. Limited Memory

1. Periodic statement of finite states: With n-state machine we can generate periodic sequence of n states or smaller than n states. For example, in 5 state machines we can have maximum periodic sequence as 0, 1, 2, 3, 4, 0, 1 . . . .

2. No infinite Sequence : Consider an infinite sequence such that an output is 1 when and only when the number of inputs received so far is equal to k(k + 1)/2, for k = 1, 2, 3, . . . i.e., the desired input output sequence has the form.

Input : x x x x x x x x x x x x x x x x x x x x x x

Output : 1 0 1 0 0 1 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 1 . . . .

Such infinite sequence cannot be produced by finite state machine.

3. Limited Memory: The finite state machine has a limited memory and due to limited memory it cannot produce certain outputs. Consider a binary multiplier circuit for multiplying two arbitrarily large binary numbers. If we implement this with a finite - state machine capable of performing serial multiplication, we can find that it is not possible to multiply certain numbers. Such limitation does occur due to the limited “memory” available to the machine. This memory is not sufficient to store arbitrarily large partial products resulted during multiplication.