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A New Approach of Right State Machine in Discrete Alphabets System.

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ABSTRACT

In this paper ,Right State Machine is a new approach of finite automata. The properties of recursive sets related to the Right State Machine is discussed in this paper. The easily understandable theorems are stated in this paper .The idea is applied to specified computer automata and formal language over a new machine.

KEY TERMS: *Finite automata, Right State Machine (RSM), Formal language, Discrete alphabets system (DAS).*

I. INTRODUCTION

The discrete alphabets system(DAS) is also known as message. The aim is to supervise it in specific order restricting its meaning and its behaviour without violating the specification. The properties of recursive set has a vital rule of this paper.

In communication system, the language reject due to noise information. The language is acceptable for correct information .The error arises during its channel and transmission time, and also the error arises in the defective machine. The processing of information have important in twenty first century of the world information system.We introduced discrete alphabet system (DAS) is one of the information processing model of the communication system.

II. NOTATION & TERMINOLOGY

The discrete alphabets system (DAS) called massage is modeled as state machine denoted by a five tuple $M = (Q,\Sigma,\delta,q_0 ,R)$. Where Q denotes set of states, Σ denotes the finite set of alphabets'. $\delta : Q \times \Sigma \rightarrow Q$ denotes the partial deterministic state transition function, $q_0 \in Q$ denotes the intial state , R denotes the right states A triple $(q_1,\sigma, q_2) \in Q \times \Sigma \times Q$
such that $\delta (q_1,\sigma) = (q_2,r_2)$ is the transition in M. Where $r_1 \in R$ denote for right move. The machine M is denote by R(M) is called language accepted by the right step machine.
$R(M) = \{ \omega \in \Sigma^*/\delta (q_0,\omega)$ is the right moves and same state to itself}.
Where Σ* denotes sequence of starting over Σ. ω is a path from vertex i to j in M is a path from i to j such that the concatenation of the labels along this path from the word ω. R be the right state. Where Σ* denotes the string of events belong to Σ including the zero length of the sequence ϵ the transition function $\delta : Q \times \Sigma^* \rightarrow Q$

In general, the alphabets can be partitioned into the set of reject symbols Σr, and the set of acceptance symbol $\Sigma_a = \Sigma\text{-}\Sigma_r$. A set S is a map S: $R(M) \rightarrow Q^{\Sigma\text{-}\Sigma r}$ that determines the set of alphabets $S(s) \subseteq (\Sigma\text{-}\Sigma_r)$ to occurrence of trace $S \in R(M)$.

For example if we consider a communication node as DAS with the alphabet set of acceptable and rejectable language. The alphabet is an example of reject able alphabet since the arrival of a language is not under the control of the microwave tower or satellite communication. The alphabet can be partitioned into the set of acceptable and reject able alphabet. In this paper we consider the alphabet to acceptable by the machine. $M^a = (Q^a,\Sigma^a,\delta^a,q_0^a ,R^a)$ and its acceptable language by $R(M^a)$ $\epsilon \in R(M^a)$

$s \in R(M^a), \sigma \in S(s), s_\sigma \in R(M) \Rightarrow s_\sigma \in R(M^a)$

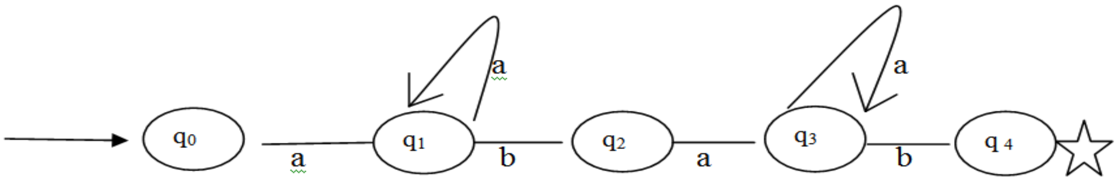
2.1. ILLUSTRATIVE EXAMPLES:-

Consider the right state machine $M=(Q,\Sigma,\delta,q_0 ,R)$ where $Q= \{q_0,q_1,q_2,q_3,q_4\}$

$\Sigma = \{a ,b\}$ and $R \subseteq Q$, $\delta : Q \times \Sigma \rightarrow (Q,R)$, $R \subseteq Q$

states	inputs	
Q	a	b
q_0	q_1	-
q_1	q_1	q_2
q_2	q_3	-
q_3	q_3	q_4

(Figure– 2.1)



(Figure–2.02(Transition diagram))

Suppose aabaab even number of a and even number of b's in Σ*

$$\rightarrow q_0 \xrightarrow{a} q_1 \xrightarrow{a} q_1 \xrightarrow{b} q_2 \xrightarrow{a} q_3 \xrightarrow{a} q_3 \xrightarrow{b} q_4 ☆$$

The arrow $\longrightarrow$ denotes the initial state and ☆ denotes the final state.

Here, q_4 is the right end state.

Example.2.2

Consider the right state machine M=(Q,Σ,δ,q_0 ,R) Where Q={q_0,q_1,q_2,q_3,q_4},

Σ ={a,b}and R $\underline{C}$ Q

States	**Inputs**	
Q	**a**	**b**
q_0	q_1	-
q_1	-	q_2
q_2	q_3	q_2
q_3	q_3	{q_2 ,q_4}

Figure-3.03

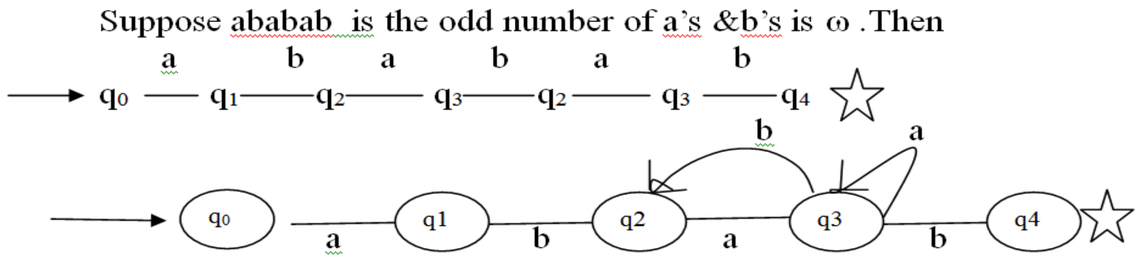


Figure 2.04(Transition Diagram)

Here, it is not a Right state machine because at q_3 state it return back to q_2.So, ababab is not in R (M^a).

III. PROPERTIES OF RECURSIVE SETS:-223

If a set S of words over Σ to be recursive are satisfied the following.

i) The Touring machine (™) accepts every words in S and reject every words in Σ*-S.

(ii) The Right State Machine (RSM) which accepts every words in S and reject every words in Σ*-S.

(iii) The Finite State Machine (FSM) with two push down stores which accepts every words in S and reject every words in Σ*-S.

IV. PROPOSED THEOREM:-

Theorem-4.1:
A set is regular over Σ iff it is accepted by some Right state machine M over Σ.

Proof: Let us prove this theorem, we apply to the method of induction on the word.

Basis: The empty word ^ is accepted by M iff the initial vertex is final.

Inductive steps: For a word of length n is ω Є Σ*, a ω path from vertex i to vertex j in M is a path from i to j such that the concatenation of the labels along this path from the word. A word ω Є Σ* is accepted by the` Right state machine M if the ω path from the initial vertex leads to the final one.

This is the complete proof of this theorem.

THEOREM-4.2.:-
If a set over Σ is recursive then its compliment Σ*-S is also recursive.

Proof: In order to prove this theorem, we follow the following steps.

Basis: If S is a recursive null or empty word set over Σ, then there is a Right State Machine M which always move towards right and same state to itself and accepts in S, and also rejects all words in Σ*-S .

Recursive steps: Construct a Right State Machine M´from M by inter changing the ACCEPT and REJECT words. Clearly M accepts all words in Σ*-S and reject all words in S.

V. CONCLUSION:-

This paper investigated as behaviour of communication on discrete alphabet system. It would be interesting that the words are not acceptable and examine the conditions. The Right State Machine is the viral rule for preparation of this paper. The error arises during the transmission are the issues of the paper.

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