Theory of Computing

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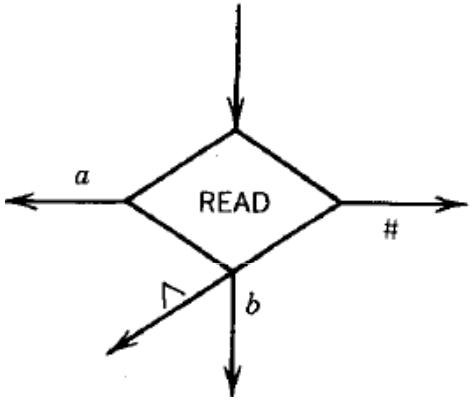
Post Machine

Post machine, denoted PM, is a collection of five things:

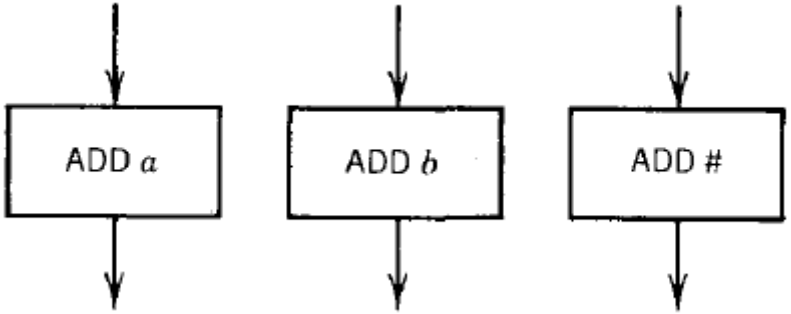
1. The alphabet Σ of input letters plus the special symbol **#.**

2. A linear storage location (a place where a string of symbols is kept) called the STORE, or QUEUE, which initially contains the input string. This location can be read, by which we mean the left-most character can be removed for inspection. The STORE can also be added to, which means a new character can be concatenated onto the right of whatever is there already. We allow for the possibility that characters not in Σ can be used in the STORE, characters from an alphabet Γ called the store alphabet.

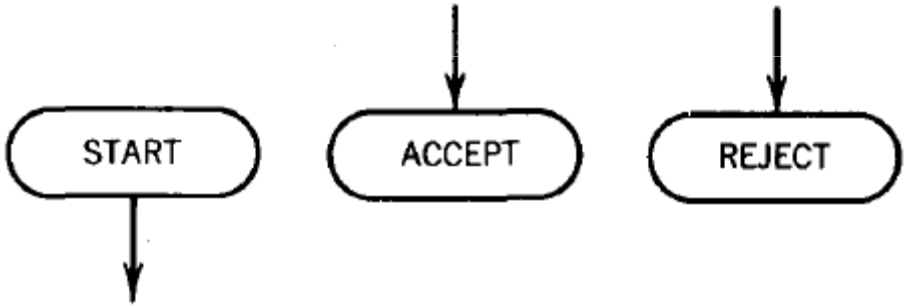
3. READ states, for example,



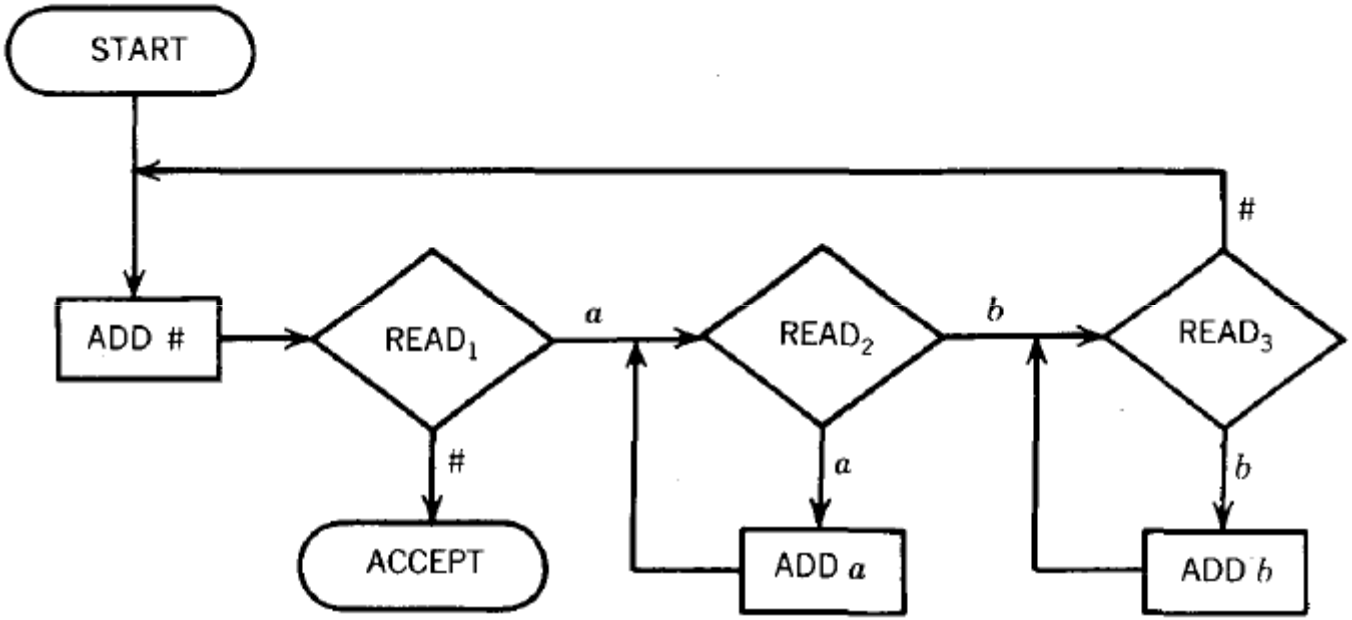
4. ADD states:



5. A START state and some halt states called ACCEPT and REJECT:



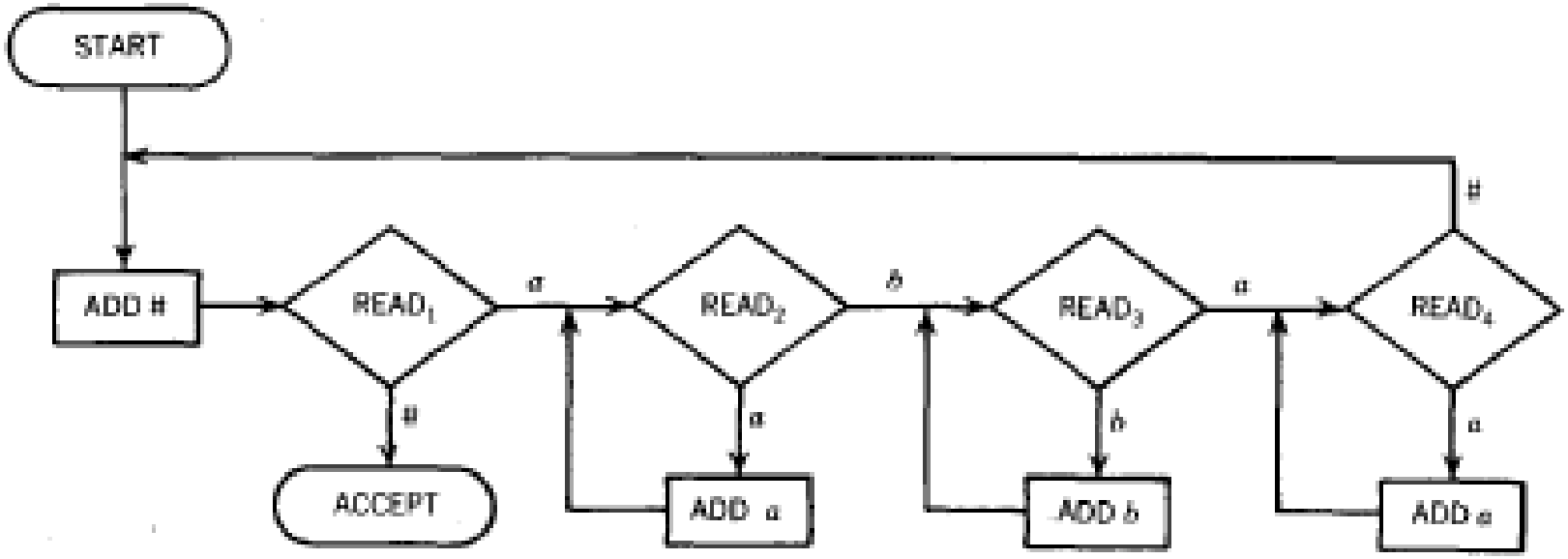
EXAMPLE-1: Consider the PM below:



Trace the processing of the input **aaabbb** on this PM.

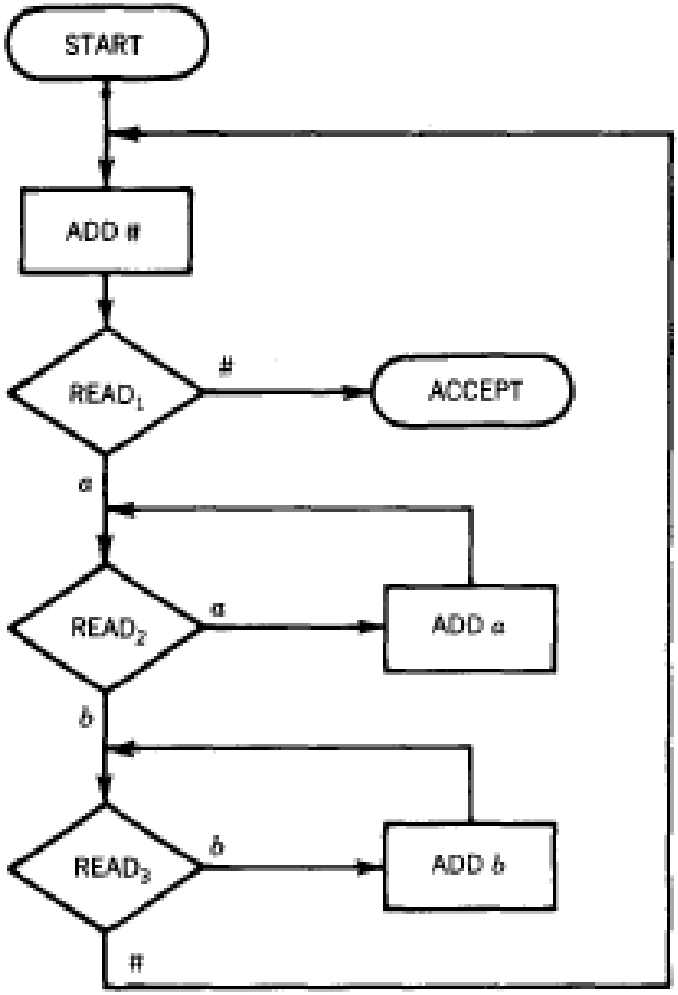
STATE	STORE
START	*aaabbb*
ADD #	*aaabbb#*
$READ_1$	*aabbb#*
$READ_2$	*abbb#*
ADD *a*	*abbb#a*
$READ_2$	*bbb#a*
ADD *a*	*bbb#aa*
$READ_2$	*bb#aa*
$READ_3$	*b#aa*
ADD *b*	*b#aab*
$READ_3$	*#aab*
ADD *b*	*#aabb*
$READ_3$	*aabb*
ADD #	*aabb#*
$READ_1$	*abb#*
$READ_2$	*bb#*
ADD *a*	*bb#a*
$READ_2$	*b#a*
$READ_3$	*#a*
ADD *b*	*#ab*
$READ_3$	*ab*
ADD #	*ab#*
$READ_1$	*b#*
$READ_2$	#
$READ_3$	Λ
ADD #	#
$READ_1$	Λ
ACCEPT	

EXAMPLE-2: Consider the PM below:



The language accepted by this PM is in the form $\{a^n b^n a^n\}$.

EXAMPLE-3: Consider the PM below:



The language accepted by this PM is in the form $\{a^n b^n\}$.