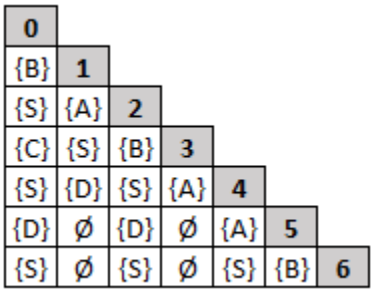
CMPS 130 Homework 9

Given a CNF grammar below, are the strings “babaab” and “bababb” in the language?

S → AB | BA | SS | AC |BD
A → a
B → b
C → SB
D → SA

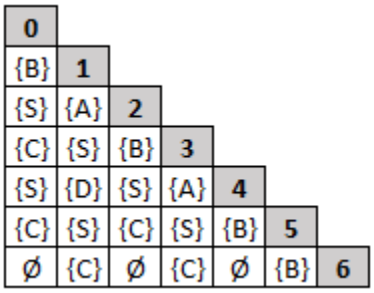
|b|a|b|a|a|b|
0 1 2 3 4 5 6



0						
{B}	1					
{S}	{A}	2				
{C}	{S}	{B}	3			
{S}	{D}	{S}	{A}	4		
{D}	Ø	{D}	Ø	{A}	5	
{S}	Ø	{S}	Ø	{S}	{B}	6

“babaab” is in the language

|b|a|b|a|b|b|
0 1 2 3 4 5 6



0						
{B}	1					
{S}	{A}	2				
{C}	{S}	{B}	3			
{S}	{D}	{S}	{A}	4		
{C}	{S}	{C}	{S}	{B}	5	
Ø	{C}	Ø	{C}	Ø	{B}	6

“bababb” is not in the language

Give the Turing machine transition table for a TM that accepts the language: $\{x \in \{0,1\}^* \mid x \text{ begings with 0 and has as many 1 to 0 transitions as 0 to 1 transitions}\}$.

Below, I give two possible solutions:

	0	1	␣
q_0	R	q_1R	Acc
q_1	q_0R	R	Rej

Read every symbol and change states if you see a transition, or

	0	1	␣
q_0	R	R	q_1L
q_1	Acc	Rej	—

Skip to the last symbol and accept if it is a 0.