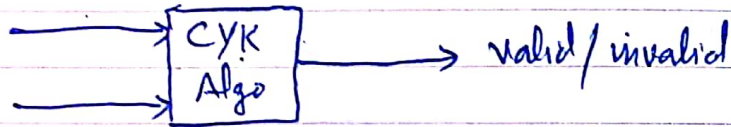


CYK (Cooke - Younger - Kasami) Algorithm :-

→ checks if the given word/string can be generated by the given grammar.

CFG in CNF

String/word



Ex-1

16 WEDNESDAY
رجب ۳

17 THURSDAY
رجب ۴

$S \rightarrow XY$
 $X \rightarrow XA | a | b$
 $Y \rightarrow AY | a$
 $A \rightarrow a$

and the string is 'babaa'

				a	X,Y,A
			b	X,Y,A	S,X,Y
		a	X	S,X	S,X
b	X,Y,A	φ	φ	φ	φ
X	S,X	φ	φ	φ	φ



if this cell does not contain 's' starting symbol then this grammar does not produce that word or string. Hence 'babaa' could not be produced through this given CFG.

JUNE						
M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

رجب ۱۳۳۱

JUNE 2010

Ex-2 ✓

$$\begin{aligned}
 S &\rightarrow XY \\
 X &\rightarrow XA \mid a \mid b \\
 Y &\rightarrow AY \mid a \\
 A &\rightarrow a
 \end{aligned}$$

for baaaa

				a	X,Y,A
			a	X,Y,A	S,X,Y
		a	X,Y,A	S,X,Y	S,Y,X
	b	X,Y,A	S,X,Y	S,Y,X	S,X,Y
X	S,X	S,X	S,X	S,X	S,X

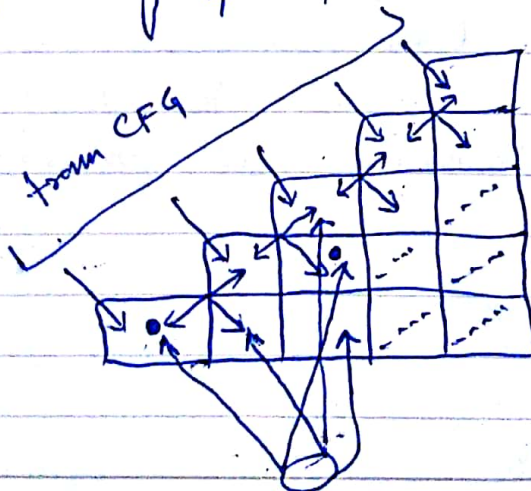
Evening

FRIDAY 18
رجب ۵

SUNDAY 20 SATURDAY 19
رجب ۷ رجب ۶

The cell contains 's', so this grammar is generating the word 'baaaa', we can also verify it manually.

The processing of CYK is as follows



Evening

رجب ۱۳۳۱

JUNE 2010

JUNE

M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

L.W

$S \rightarrow AB/BC$

$A \rightarrow BA/a$

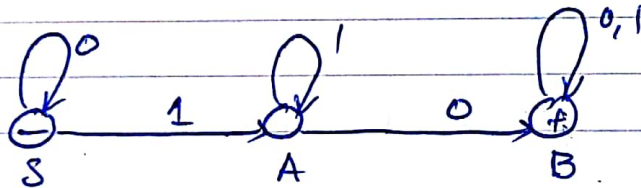
$B \rightarrow CC/b$

$C \rightarrow AB/a$

for baaba and baac

Conversion of DFA to CFG

Evening



21 MONDAY
رجب ۸

22 TUESDAY
رجب ۹

$S \rightarrow 0S$

$S \rightarrow 1A$

$A \rightarrow 1A$

$A \rightarrow 0B$

$B \rightarrow 0B$

$B \rightarrow 1B$

$B \rightarrow \Lambda$ (for final state, we have to include this Λ -production)

(this Λ -production terminates CFG properly).

Evening