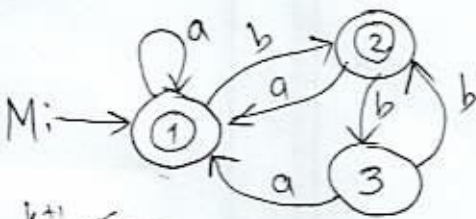# Kleene teoremi - Kısım 2

$$L(P,q,k+1) = L(P,q,k) + L(P,k+1,k) \, L(k+1,k+1,k)^* \, L(k+1,q,k)$$

M:

$$L(M) = L(1,2,3) + L(1,1,3)$$

$(i,j,2)$ leri hesaplamam gerekiyor.

$k+1$

$$L(1,2,3) = L(1,2,2) + L(1,3,2) \bullet L(3,3,2)^* \, L(3,2,2)$$

$$L(1,1,3) = L(1,1,2) + L(1,3,2) \cdot L(3,3,2)^* \, L(3,1,2) \quad \cdots \longrightarrow$$

$\circ$ $\quad L(1,1,2) = L(1,1,1) + L(1,2,1) \, L(2,2,1)^* \, L(2,1,1) \ .$

$\bullet\bullet$ $\ L(1,3,2) = L(1,3,1) + L(1,2,1) \, L(2,2,1)^* \, L(2,3,1) \ .$

$\bullet\bullet\circ$ $L(3,3,2) = L(3,3,1) + L(3,2,1) \, L(2,2,1)^* \, L(2,3,1) \ .$

$\bullet\bullet\bullet\circ$ $L(3,1,2) = L(3,1,1) + L(3,2,1) \, L(2,2,1)^* \, L(2,1,1) \ .$

$*$ $\quad L(1,2,2) = L(1,2,1) + L(1,2,1) \, L(2,2,1)^* \, L(2,2,1) \ .$

$**$ $\quad L(1,3,2) = L(1,3,1) + L(1,2,1) \, L(2,2,1)^* \, L(2,3,1)$ zaten vardı

WW $L(3,3,2) = L(3,3,1) + L(3,2,1) \, L(2,2,1)^* \, L(2,3,1)$ ll

$L(3,2,2) = L(3,2,1) + L(3,2,1) \, L(2,2,1)^* \, L(2,2,1) \ .$

$(i,j,1)$ leri hesaplamam gerekiyor.

Top-down

(1)

$$L(1,1,1) = \underset{a+\wedge}{L(1,1,0)} + \underset{a+\wedge}{L(1,1,0)} \cdot \underset{a+\wedge}{L(1,1,0)^*} \underset{a+\wedge}{L(1,1,0)} = \overset{*}{a}$$

$$L(1,2,1) = \underset{b}{L(1,2,0)} + \underset{a+\wedge}{L(1,1,0)} \underset{a+\wedge}{L(1,1,0)^*} \underset{b}{L(1,2,0)} = a^*b$$

$$L(2,1,1) = \underset{a}{L(2,1,0)} + \underset{a}{L(2,1,0)} \underset{a+\wedge}{L(1,1,0)^*} \underset{a+\wedge}{L(1,1,0)} = a\overset{*}{a}$$

$$L(1,3,1) = \underset{\varnothing}{L(1,3,0)} + \underset{a+\wedge}{L(1,1,0)} \cdot \underset{(a+\wedge)^*}{L(1,1,0)^*} \underset{\varnothing}{L(1,3,0)} = \varnothing$$

$$L(2,2,1) = \underset{\wedge}{L(2,2,0)} + \underset{a}{L(2,1,0)} \underset{a+\wedge}{L(1,1,0)^*} \underset{b}{L(1,2,0)} = \wedge + a\overset{*}{a}b$$

$$L(2,3,1) = \underset{b}{L(2,3,0)} + \underset{a}{L(2,1,0)} \underset{(\wedge+a)^*}{L(1,1,0)^*} \underset{\varnothing}{L(1,3,0)} = b$$

$$L(3,3,1) = \underset{\wedge}{L(3,3,0)} + \underset{a}{L(3,1,0)} \underset{(a+\wedge)^*}{L(1,1,0)^*} \underset{\varnothing}{L(1,3,0)} = \wedge$$

$$L(3,2,1) = \underset{b}{L(3,2,0)} + \underset{a}{L(3,1,0)} \underset{(a+\wedge)^*}{L(1,1,0)^*} \underset{b}{L(1,2,0)} = a^*b$$

$$L(3,1,1) = \underset{a}{L(3,1,0)} + \underset{a}{L(3,1,0)} \underset{(a+\wedge)^*}{L(1,1,0)^*} \underset{(a+\wedge)^*}{L(1,1,0)} = a\overset{*}{a}$$

$(i,j,1)$'ler hesaplandı.

Şimdi $(i,j,2)$'ler hesaplansın.

top-down ②

$$L(1,1,2) = a^* + a^*b \cdot (\Lambda + aa^*b)^* aa^* = a^*(baa^*b)^*$$

$$L(1,3,2) = \emptyset + a^*b \cdot (\Lambda + aa^*b)^* b = a^*(baa^*)^* bb$$

$$L(3,3,2) = \Lambda + a^*b(\Lambda + aa^*b)^* b = \Lambda + a^*b(aa^*b)^* b$$

$$L(3,1,2) = aa^* + a^*b(\Lambda + aa^*b)^* aa^* = aa^* + a^*baa^*(baa^*)^*$$

$$L(1,2,2) = a^*b + a^*b(\Lambda + aa^*b)^*(\Lambda + aa^*b) = a^*(baa^*)^* b$$

$$L(3,2,2) = a^*b + a^*b(\Lambda + aa^*b)^*(\Lambda + aa^*b) = a^*b(aa^*b)^*$$

k=1

$r(p,1,\textcircled{1})$	$r(p,2,\textcircled{1})$	$r(p,3,\textcircled{1})$
1		
2		
3		

k=2

$r(p,1,\textcircled{2})$	$r(p,2,\textcircled{2})$	$r(p,3,\textcircled{2})$
1		
2		
3		

topdown ③

$$L(M) = L(1,2,3) + L(1,1,3) \quad \text{idi.}$$

$$L(1,2,3) = a^* (ba a^*)^* b + a^* (ba a^*)^* bb \left(1 + a^* b (a a^* b)^* b\right)^*$$

$$L(1,1,3) = a^* (ba a^* b)^* + a^* (ba a^*)^* bb \left(1 + a^* b (a a^* b)^* b\right)^*$$

$$a^* (ba a^*)^* (1+b) \qquad (\cdots)$$

$$a a^* + a^* ba a^* (ba a^*)^*$$