Theory of Computation

RegLang_EpsilonNFAtoNFA

Lecture 17

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1. $(a + b)^+ + (abba)^* = (a + b)^*$ True

2. $a(a + \varepsilon)^+ + b(a + \varepsilon)^+ = (a + b)^*$ False

ε

3. $(a(ba)^* + b(ab)^*)^* = (a + b)^*$ True

4. $(b^*a)^* + (a^*b)^* = (a + b)^*$ True

5. $a(a+b)^* + b(a+b)^* = (a + b)^*$ True

φ.a = φ
a. φ =φ
φ.R = φ
R. φ =φ
Φ is dominator

Regular Language vs Regular Language

1. L = { } over ∑ = {a,b}
   R = φ.ab = φ.aa = φ+
2. L = { } over ∑ = {a,b,c}
   R = φ.c
3. L = {ε } over ∑ = {a}
   R = φ* = ε = ε+ = ε* = $(a)^0$
4. L = {w | w ∈ {a,b}*, w>0}.
   R = $(a+b)^+$, Σ^+
5. L = {w | w ∈ {a,b}*, w starts with a}.
   R = $a(a+b)^*$, $a\Sigma^*$
6. L = {aw | w ∈ {a,b}*}.
   R =))
7. L = {awb | w ∈ {a,b}*}.
   R = $a\Sigma^*b$

$\phi^* = \{\}^*$

$\Sigma^0 = \varepsilon$

Regular Language vs Regular Language

1. $L = \{wx \mid w \in \{aa,bb\}, x \in (a+b)^*\}$. R = $(aa+bb)(a+b)^*$
2. $L = \{wx \mid w \in (a+b)^*, x \in \{aa,bb\}\}$. R = $(a+b)^*(aa+bb)$
3. $L = \{w \mid w \in \{a,b\}^*, |w|=2\}$. R = Σ^2, $aa+ab+ba+bb$
4. $L = \{w \mid w \in \{a,b\}^*, |w|=3\}$. R = Σ^3
5. $L = \{w \mid w \in a^*b^*, |w|=2\}$. R = $aa+bb+ab$

Regular Language vs Regular Language

1. L = {w | w ∈ a*, |w|=2}. R = aa , Σ^2
2. L = {w | w ∈ b*, |w|=2}. R = bb
3. L = {w | w ∈ {a,b}*, |w|<=2}. R = $\varepsilon + a + b + aa + ab + ba + bb$
4. L = {w | w ∈ {a,b}*, |w|<=100}. R = $\varepsilon + \ldots$
5. L = {w | w ∈ {a,b}*, |w|>=2}. R = $\Sigma^2 \cdot (a+b)^*$

$(\varepsilon + a + b)^2$

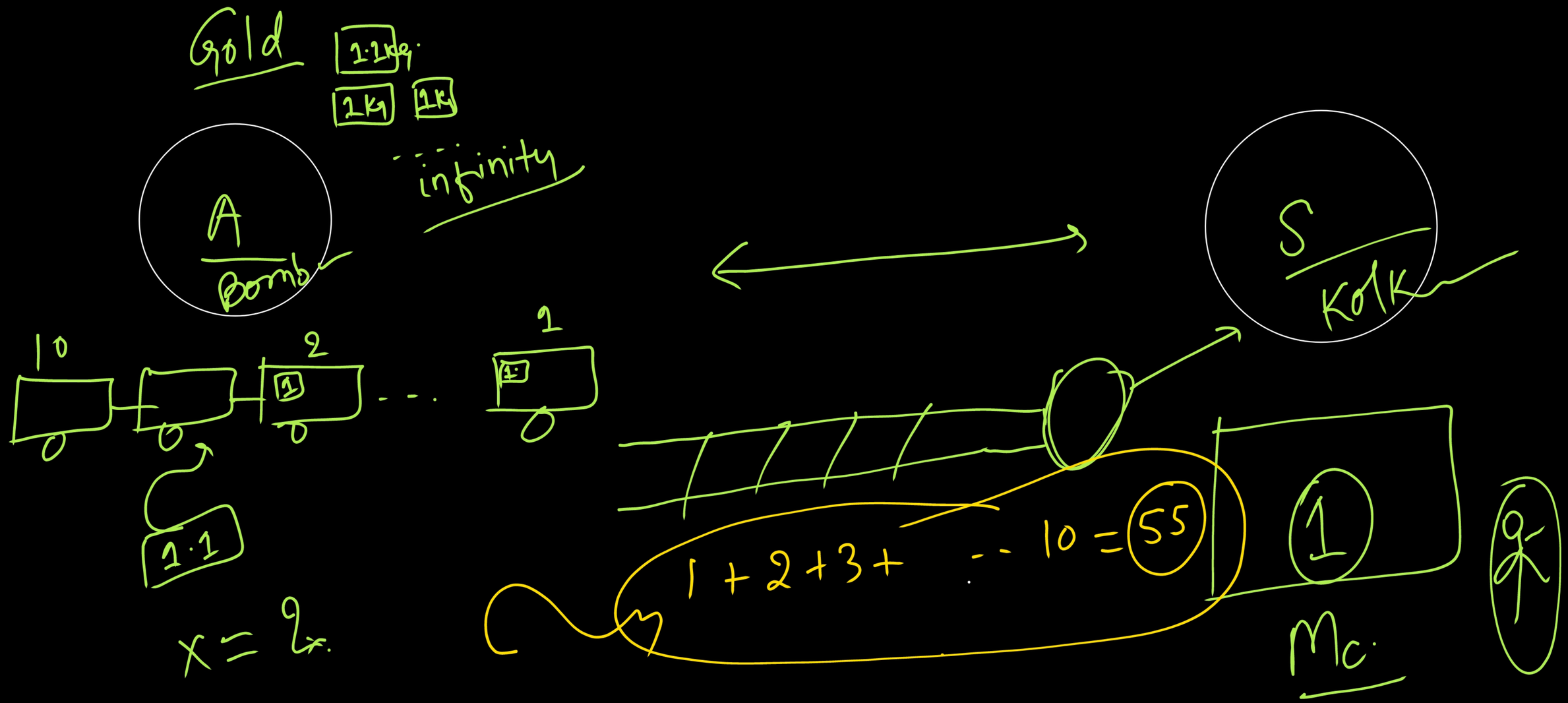
$(\varepsilon + a + b) \cdot (\varepsilon + a + b)$

~~$aa + ab$~~

Regular Language vs Regular Language

1. $L = \{w \mid w \in (a+b)^*, |w| = \text{even}\}$. $R = (\Sigma^2)^*, [(a+b)^2]^*$
2. $L = \{w \mid w \in (a+b)^*, |w| = \text{odd}\}$. $R = a(\Sigma^2)^* + b(\Sigma^2)^*$ $R = (a+b)(\Sigma^2)^*$
3. $L = \{w \mid w \in a^*, |w| = \text{even}\}$. $R = (aa)^*$
4. $L = \{w \mid w \in b^*, |w| = \text{odd}\}$. $R = b(bb)^*$
5. $L = \{w \mid w \in a^*b^*, |w| = \text{even}\}$. $R = (aa)^*.b(bb)^* + a(aa)^*.(bb)^*$ $R = \underset{\text{even}}{(aa)^*}.\underset{\text{even}}{(bb)^*} + \underset{\text{odd}}{a(aa)^*}.\underset{\text{odd}}{b(bb)^*}$
6. $L = \{w \mid w \in a^*b^*, |w| = \text{odd}\}$.
7. $L = \{w \mid w \in (aa)^*, |w| = \text{odd}\}$. $\downarrow$ $a(aa)^*$ $\not\subset$

Regular Language vs Regular Language



Thank You