

Highlights from last lecture

- Regular expressions over Σ
- Basis:
 - \mathcal{Q}, λ are regular expressions
 - **–** \boldsymbol{a} is a regular expression for any $\boldsymbol{a} \in \Sigma$
- Recursive step:
 - If **A** and **B** are regular expressions then so are:
 - (A ∪ B)
 - (AB)
 - A*

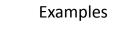
Each regular expression is a "pattern"

• λ matches the empty string

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- *a* matches the one character string *a*
- (A ∪ B) matches all strings that either A matches or B matches (or both)
- (AB) matches all strings that have a first part that A matches followed by a second part that B matches
- A* matches all strings that have any number of strings (even 0) that A matches, one after another

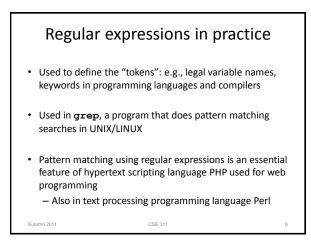
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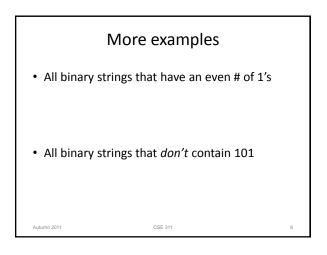
- 0*
- 0*1*
- (**0** \cup **1**)*
- (**0***1*)*
- (0 ∪ 1)* 0110 (0 ∪ 1)*
- (0 ∪ 1)* (0110 ∪ 100)(0 ∪ 1)*

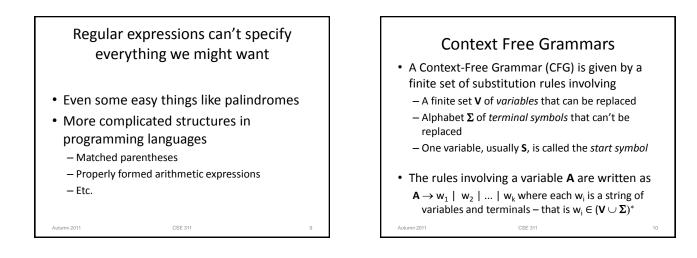
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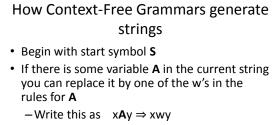




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Regular Expressions in PHP	
 int preg_match (string \$pattern , string \$subject,) 	
\$pattern syntax:	
[01] a 0 or a 1 ^ start of string \$ end of string	
[0-9] any single digit \. period comma \- minus	5
. any single character	
ab a followed by b (AB)	
(a b) a or b $(\mathbf{A} \cup \mathbf{B})$	
a? zero or one of a $(\mathbf{A} \cup \boldsymbol{\lambda})$	
a* zero or more of a A*	
a+ one or more of a AA*	
<pre>• e.g. ^[\-+]?[0-9]*(\.)?[0-9]+\$</pre>	
General form of decimal number e.g. 9.12 or -9,8 (Europe	e)
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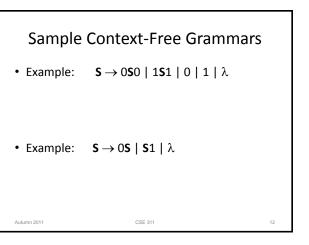


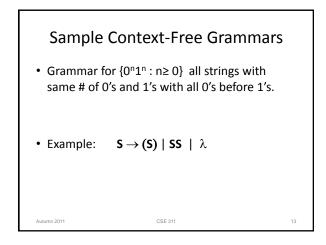
-Repeat until no variables left

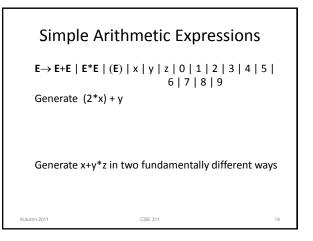
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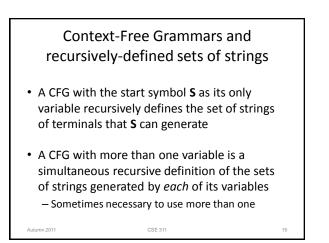
• The set of strings the CFG generates are all strings produced in this way that have no variables

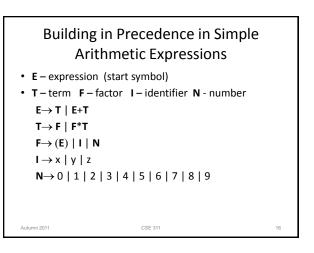
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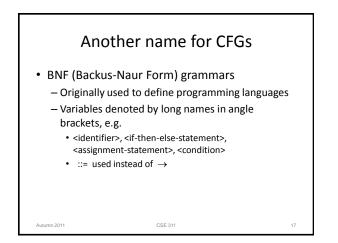


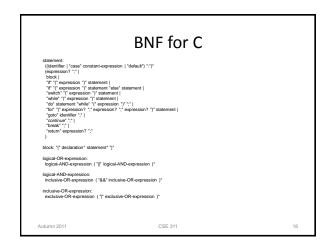












Parse Trees

Back to middle school:

<sentence>::=<noun phrase><verb phrase> <noun phrase>::=<article><adjective><noun> <verb phrase>::=<verb><adverb>|<verb><object> <object>::=<noun phrase>

Parse:

The yellow duck squeaked loudly The red truck hit a parked car

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