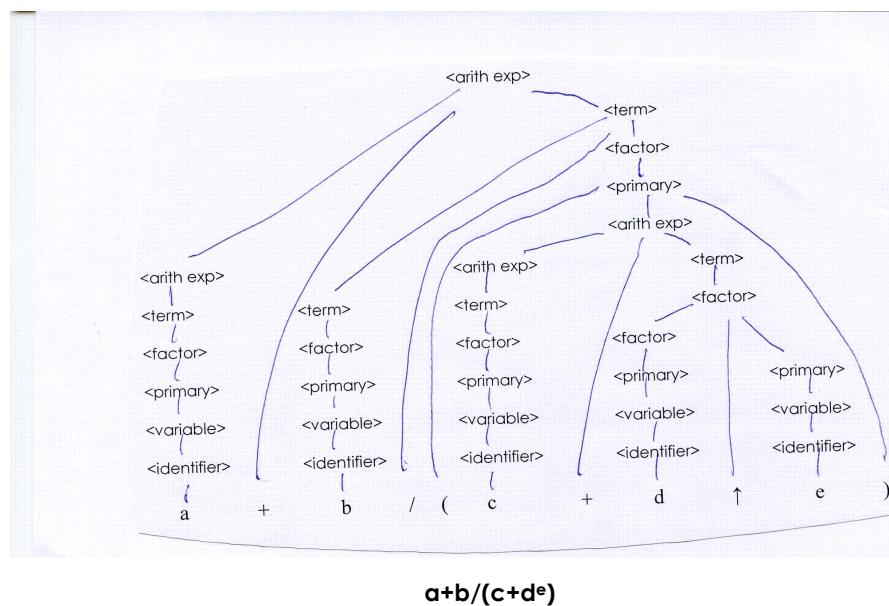


EECS6339 3.0 Introduction to Computational Linguistics
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Tuesdays, Thursdays 10:00-11:20 – LAS 3033
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BNF Example

G_1 is a (context free) BNF grammar for a simple programming language arithmetic expression.

$\langle \text{arithmetic expression} \rangle$	\square	$\langle \text{term} \rangle \mid \langle \text{arithmetic expression} \rangle + \langle \text{term} \rangle \mid$ $\langle \text{arithmetic expression} \rangle - \langle \text{term} \rangle$
$\langle \text{term} \rangle$	\rightarrow	$\langle \text{factor} \rangle \mid \langle \text{term} \rangle \times \langle \text{factor} \rangle \mid \langle \text{term} \rangle / \langle \text{factor} \rangle$
$\langle \text{factor} \rangle$	\rightarrow	$\langle \text{primary} \rangle \mid \langle \text{factor} \rangle \uparrow \langle \text{primary} \rangle$
$\langle \text{primary} \rangle$	\rightarrow	$\langle \text{variable} \rangle \mid \langle \text{number} \rangle \mid (\langle \text{arithmetic expression} \rangle)$
$\langle \text{variable} \rangle$	\rightarrow	$\langle \text{identifier} \rangle \mid \langle \text{identifier} \rangle [\langle \text{subscript list} \rangle]$
$\langle \text{subscript list} \rangle$	\rightarrow	$\langle \text{arithmetic expression} \rangle \mid \langle \text{subscript list} \rangle , \langle \text{arithmetic expression} \rangle$



The same language may be defined by many different grammars.

G_2 is another BNF grammar for a simple programming language arithmetic expression equivalent to grammar G_1 .

$\langle \text{arithmetic expression} \rangle$	\square	$\langle \text{term} \rangle \mid \langle \text{arithmetic expression} \rangle \uparrow \langle \text{term} \rangle \mid$ $\langle \text{arithmetic expression} \rangle x \langle \text{term} \rangle \mid$ $\langle \text{arithmetic expression} \rangle + \langle \text{term} \rangle$
$\langle \text{term} \rangle$	\rightarrow	$\langle \text{primary} \rangle \mid \langle \text{term} \rangle - \langle \text{primary} \rangle \mid \langle \text{term} \rangle / \langle \text{primary} \rangle$
$\langle \text{primary} \rangle$	\rightarrow	$\langle \text{variable} \rangle \mid \langle \text{number} \rangle \mid (\langle \text{arithmetic expression} \rangle)$
$\langle \text{variable} \rangle$	\rightarrow	$\langle \text{identifier} \rangle \mid \langle \text{identifier} \rangle [\langle \text{subscript list} \rangle]$
$\langle \text{subscript list} \rangle$	\rightarrow	$\langle \text{arithmetic expression} \rangle \mid \langle \text{arithmetic expression} \rangle , \langle \text{subscript list} \rangle$