

BU CS320 Assignment 6: Context Free Grammars

November 6, 2023

1. Given the following grammar where $\langle expr \rangle$ is the starting symbol:

$\langle id \rangle$	$::=$	$a \mid b \mid c \mid \dots \mid z$
$\langle dig \rangle$	$::=$	$0 \mid 1 \mid 2 \mid \dots \mid 9$
$\langle expr \rangle$	$::=$	$() \mid \langle dig \rangle \mid \langle id \rangle$
		$\mid \text{let } \langle id \rangle = \langle expr \rangle \text{ in } \langle expr \rangle$
		$\mid \langle expr \rangle ; \langle expr \rangle$
		$\mid \text{begin } \langle expr \rangle \text{ end}$

Demonstrate the grammar above is ambiguous.

2. Modify the grammar (reproduced below) to be unambiguous. Hint: There is not just one way.

$\langle id \rangle$	$::=$	$a \mid b \mid c \mid \dots \mid z$
$\langle dig \rangle$	$::=$	$0 \mid 1 \mid 2 \mid \dots \mid 9$
$\langle expr \rangle$	$::=$	$() \mid \langle dig \rangle \mid \langle id \rangle$
	\mid	$\text{let } \langle id \rangle = \langle expr \rangle \text{ in } \langle expr \rangle$
	\mid	$\langle expr \rangle ; \langle expr \rangle$
	\mid	$\text{begin } \langle expr \rangle \text{ end}$

3. Demonstrate your modified grammar fixes the previously shown ambiguity.