

CS200 Spring 2015 written homework 1

name:

id:

1. Given the following grammar for identifiers:

$\langle \text{id} \rangle = \langle \text{let} \rangle \mid \langle \text{id} \rangle \langle \text{let} \rangle \mid \langle \text{id} \rangle \langle \text{dig} \rangle$

$\langle \text{let} \rangle = a \mid b \mid c$

$\langle \text{dig} \rangle = 0 \mid 1$

write a regular expression defining $\langle \text{id} \rangle^*$

2. Given the following two grammars for matching parentheses

Grammar 1: $\langle S \rangle = () \mid (\langle S \rangle)$

Grammar 2: $\langle M \rangle = () \mid (\langle M \rangle) \mid \langle M \rangle \langle M \rangle$

2a. Show a derivation of $((()))$ using Grammar 1

2b. Show a derivation of $()()()$ using Grammar 2

2c. Is $() ()$ produced by Grammar 1? (Y/N)

2d. Is $(())$ produced by

1. grammar 1 ? (Y/N)

2. grammar 2 ? (Y/N)

3. Complete the following table

Prefix expression	Infix expression	Postfix expression
$* + a b c$	$(a+b) * c$	$a b + c *$
	$a + b * c$	
$* / a b + c d$		
		$a b c d - + *$
	$(a+b) / (c - d)$	