

Andrew Plumm

CS 210

Assignment 1

2/13/2023

1) a) $\langle 1 \rangle ::= \langle 2 \rangle b$

$\langle 2 \rangle ::= \langle 2 \rangle a$

| a

1) b) $\langle s \rangle ::= \langle \text{lower} \rangle \langle \text{rest} \rangle$

$\langle \text{rest} \rangle ::= \langle \text{middle} \rangle \langle \text{suffix} \rangle$

$\langle \text{middle} \rangle ::= \langle \text{lower} \rangle \langle \text{middle} \rangle$

| $\langle \text{upper} \rangle \langle \text{middle} \rangle$

| $\langle \text{digits} \rangle \langle \text{middle} \rangle$

| $\langle \text{empty} \rangle$

$\langle \text{suffix} \rangle ::= .\text{cpp} | .\text{txt}$

$\langle \text{lower} \rangle ::= a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z$

$\langle \text{upper} \rangle ::= A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z$

$\langle \text{digits} \rangle ::= 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | -$

1) c) $\langle 1 \rangle ::= \text{begin} \langle 2 \rangle \text{end}$

$\langle 2 \rangle ::= \langle \text{statement} \rangle ; \langle 2 \rangle$

| $\langle \text{empty} \rangle$

3) c) $\langle \text{exp} \rangle ::= \langle \text{exp} \rangle + \langle \text{mul exp} \rangle$

| $\langle \text{exp} \rangle - \langle \text{mul exp} \rangle$

| $\langle \text{mul exp} \rangle$

$\langle \text{mul exp} \rangle ::= \langle \text{mul exp} \rangle * \langle \text{root exp} \rangle$

| $\langle \text{mul exp} \rangle / \langle \text{root exp} \rangle$

| $\langle \text{root exp} \rangle$

$\langle \text{root exp} \rangle ::= \langle \text{exp} \rangle$

| a

| b

| c