

CSCI 485 Programming Languages

Assignment 4

Due Wednesday, February 17

1. Perform the pairwise disjointness test for the following grammar rules (3 sub-questions).

(a) $S \rightarrow aSb|bAA$

(b) $A \rightarrow baB|a$

(c) $B \rightarrow aB|a$

2. Show a trace of the recursive descent parser given in Section 4.4.1 of the textbook for the string $a * (b + c)$.
3. Given the following grammar and the right sentential form, draw a parse tree and show the phrases and simple phrases, as well as the handle.

$$S \rightarrow AbB|bAc$$

$$A \rightarrow Ab|aBB$$

$$B \rightarrow Ac|cBb|c$$

(a) $aAcccbbc$

(b) $AbcaBccb$

(c) $baBcBbbc$

4. Show a complete parse, including the parse stack contents, input string, and action for the string $(id + id) * id$, using the grammar and parse table in Section 4.5.3 of the textbook.