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CMSC 331 Park

Homework 2

1a) This grammar defines the language consisting of strings N b's (where N >= 0) followed by 1 c and then 1 a.

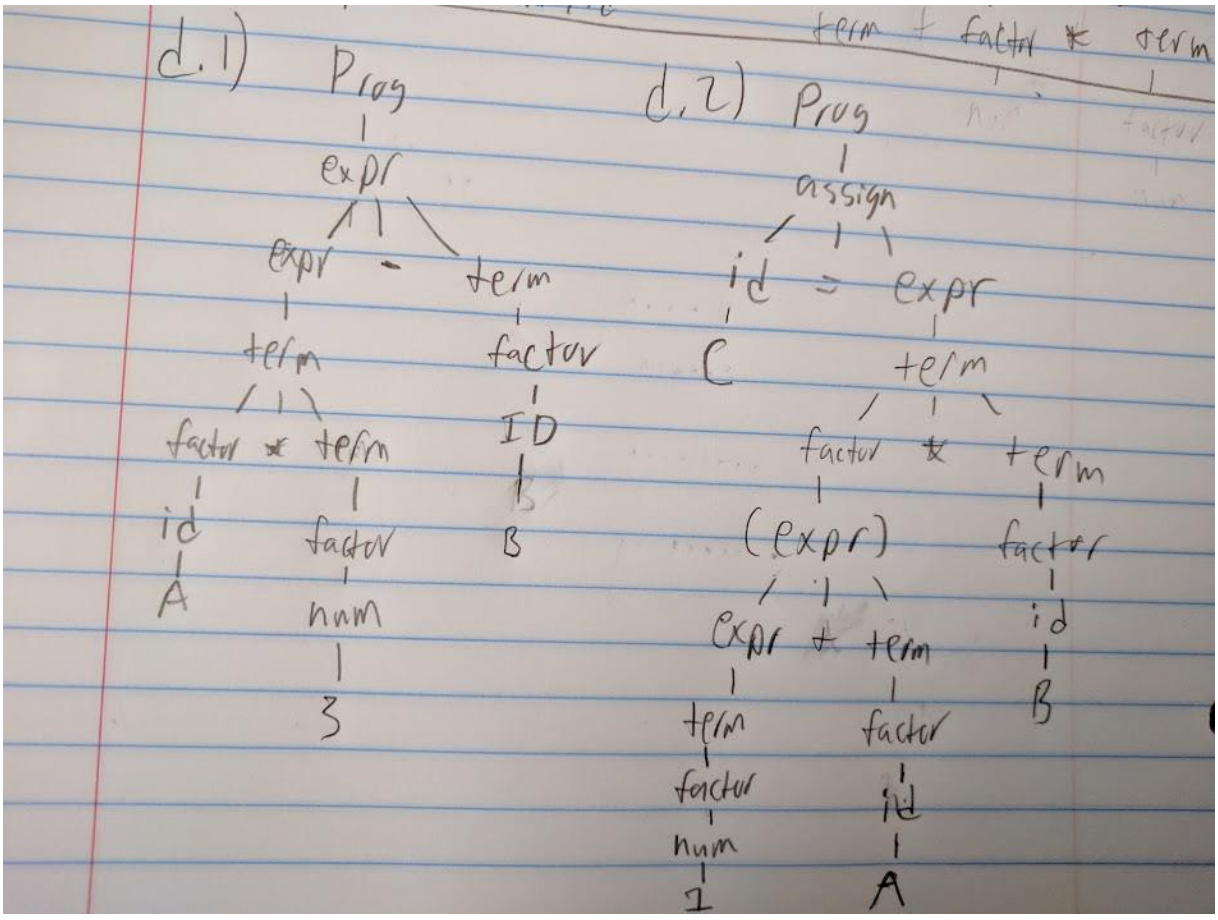
1b) This grammar defines the language consisting of strings N a's (where N >= 1) followed by P b's (where P >= 1) and then R c's (where R >= 3).

1c) This grammar defines the language consisting of strings N a's (where N >= 1) followed by P b's (where P >= 2) and then R a's (where R >= 1).

2a) The * operator has rightmost associativity.

2b) The + operator has leftmost associativity.

2c) The * operator has a higher precedence than the + operator does.



2d)

2e)

prog -> assign | expr

assign -> id = expr

expr -> expr + term | expr - term | term

term -> factor | factor * term

factor -> (expr) | - factor

factor -> id | num | factor ** expr

id -> A | B | C

num -> 0 | 1 | 2 | 3

3) expr -> +expr | -expr | D.D

D -> DD | D

D -> num

num -> 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9