COMP520: Written Assignment 1

Q1. Nullable, Starters, Followers. Determine the Nullable and the Starter/Follower sets for the grammar non-terminals.

S ::= A B **c**

A ::= a B | **ε**

B ::= **b** | **ε**

Non-terminals= {S,A,B}

Terminals= {**a,b,c**}

Q2. **Prediction Sets.** Identify the choice points (if any). Next, determine the Predict sets.

S ::= A B **c**

A ::= **a** B | ε

B ::= b | ε

Non-terminals= {S,A,B}

Terminals= {**a,b,c**}

Q3. **LL(1) Condition.** Is this Grammar LL(1)? Why or why not?

S ::= A B **c**

A ::= **a** B ε

B ::= **b** | ε

NT= {S,A,B}

T= {**a,b,c**}

Q4. **Nullable, Starters, Followers.** Determine the Nullable and the Starter/Follower sets for the grammar non-terminals.

S ::= A **c**

A ::= **a** A* b | b

NT= {S, A}

T= {**a,b,c**}

Q5. **Prediction Sets.** Identify the choice points (if any). Next, determine the Predict sets.

S ::= A **c**

A ::= **a** A* b | b

NT= {S, A}

T= {**a,b,c**}

Q6. **LL(1) condition.** Is this grammar LL(1)? Why or why not?

S ::= A **c**

A ::= **a** A* b | b

NT= {S, A}

T= {**a,b,c**}

Q7. **Rewrite Rules, Recursion.** Rewrite the CFG to an equivalent CFG where no non-terminal rule contains itself. You will need to add NT rules.

Consider the grammar G_0:

S ::= A $

A ::= (A)

A ::= A + A

A ::= num

NT= {S,A}

T= { (,), num, +, $ }

num= digit(digit)*

digit= 0,1,2,3,4,5,6,7,8,9

Q8. Checking input. For each w_i, is $w_i \in L(G_0)$?

$w_0 = (( )) \$$

$w_1 = (((3) + (5))) \$$

$w_2 = \$$

$w_3 = ( ) \$$

$w_4 = 1 \$$