On homework, you may discuss with other students in the course about how to solve a problem, but the write-up should be your own. You must include the names of any students you consulted with. Give credit where credit is due.

You may use jeLLRap for this assignment. It is an instructional tool for building LR parse tables. With jeLLRap, after the parse table is constructed you can see the parsing of strings animating the stack, the parse tree and the derivation. jeLLRap is on acpub in ~rodger/cps140/bin/jeLLRap and on cs machines in ~rodger/jellrap/jeLLRap. To run it type: java Jellrap

1. (6 pts) Calculate the FIRST and FOLLOW sets for all the variables (except P') in the LSYS programming language.

2. (8 pts) Construct the LR parse table for the following grammar by a) calculate FIRST and FOLLOW sets for the variables, b) construct the corresponding transition diagram, and c) construct the LR parse table. A new start symbol S' and production have already been added to the grammar.

$\begin{align*}
0) & S' \rightarrow S \\
1) & S \rightarrow SaA \\
2) & S \rightarrow c \\
3) & A \rightarrow Bb \\
4) & A \rightarrow \lambda \\
5) & B \rightarrow \lambda \\
\end{align*}$

3. (8 pts) Construct the LR parse table for the following grammar by a) calculate FIRST and FOLLOW sets for the variables, b) construct the corresponding transition diagram, and c) construct the LR parse table. A new start symbol S' and production have already been added to the grammar. 

NOTE the grammar is not LR(1), so you will have at least one conflict in the table.

$\begin{align*}
0) & S' \rightarrow S \\
1) & S \rightarrow CBa \\
2) & B \rightarrow bBS \\
3) & B \rightarrow b \\
4) & C \rightarrow a \\
5) & C \rightarrow \lambda \\
\end{align*}$