Assignment Objective: To develop a program to evaluate the set of FIRST for a given grammar

Instructions

This assignment has two phases, Part 1 and Part 2, to develop a program to print FIRST for a grammar; see section 4.4.2 of the text.

Part 1 will be to develop the entire program framework in C++ to calculate FIRST(α) for each terminal and non-terminal for the given grammar. It will read a grammar from a specified file and, using an appropriate set of classes/data structures, will store the Productions of the Grammar and identify the Terminals and the non-terminals, as well as the start symbol. For the purposes of this assignment, **ε (**epsilon) will be represented by the character ‘&’. This program will print the grammar that it has processed to demonstrate that the grammar has been stored correctly, with its components appropriately identified.

Part 2 will be to develop the algorithms to calculate and print FIRST(α) for each terminal and non-terminal for the given grammar.

The grammar will be of the following syntax/format:

S -> aBa | bCb ;

B -> a | b ;

C -> def | fed ;

C -> dog ;

The program shall be written in C++. Appropriate uses of .cpp, .h, and makefile files is expected.