

Problem Set # 1

In the following grammar, words beginning with capital letters are variables. Words all in lower case are terminals (tokens).

`Decl -> Type Vlist`

`Type -> Itype | Ftype | char`

`Itype -> Modi1 Modi2 int`

`Modi1 -> unsigned | epsilon`

`Modi2 -> short | long | epsilon`

`Ftype -> float | double`

`Vlist -> id Mlist`

`Mlist -> comma id Mlist | semi`

The words are intended to suggest the role played in a programming language. I.e.,

Decl represents a declaration statement.

Type represents a type specification.

IType represents an integer type specification.

Modi1 represents a first modifier for an integer type.

Modi2 represents a second modifier for an integer type.

FType represents an floating point type specification.

Vlist represents an list of variables.

Mlist provides recursion to allow a comma separated list.

Your tasks:

1. Give a derivation for the sentence `long int id, id ;`
2. Compute **FIRST(X)** for every variable X in the grammar. *Hint: Use the methods discussed in class.*
3. Compute **FOLLOW(X)** for every variable X in the grammar. *Hint: Use the methods discussed in class.*
4. Modify the grammar to allow for fixed-sized array declarations. E.g., `short int A [10] ;`