

Assignment-4

Due : 1st March, 2022

Design a syntax analyzer using Bison which will accept an input code written in a toy programming language. For this assignment, the syntax analyzer accepts some declaration statements written in a function. You have already designed a lexical analyzer which tokenizes the inputs in assignment 2. Please return appropriate tokens to the parsers for the input lexemes. Some example tokens, the symbols and the context-free grammar are given below.

Terminals :

Expression	Symbol in grammar
<i>abc</i>	<i>ID</i>
12	<i>INTEGER.CONSTANT</i>
1.2	<i>FLOAT.CONSTANT</i>
<i>int</i>	<i>INT</i>
<i>float</i>	<i>FLOAT</i>
;	<i>SEMICOLON</i>
,	<i>COMMA</i>
=	<i>ASSIGN</i>
<i>if</i>	<i>IF</i>
<i>else</i>	<i>ELSE</i>
&&	<i>AND</i>
	<i>OR</i>
!	<i>NOT</i>
==	<i>EQ</i>
>=	<i>GE</i>
<=	<i>LE</i>
<	<i>LT</i>
>	<i>GT</i>
!=	<i>NE</i>
<i>while</i>	<i>WHILE</i>
<i>return</i>	<i>RETURN</i>

Non-terminals :

*prog funcDef type argList declList stmtList argList arg type decl varList
stmtList*

Start symbol : *prog*

Production Rules :

$prog \rightarrow funcDef$

$funcDef \rightarrow type\ id\ '('\ argList\ '\{'\ declList\ stmtList\ '\}'$

$argList \rightarrow arg\ '\,' arg\ | \epsilon$

$arg \rightarrow type\ ID$

$declList \rightarrow declList\ SEMICOLON\ decl|\epsilon$

$decl \rightarrow type\ varList$

$varList \rightarrow ID\ COMMA\ varList|ID$

$type \rightarrow INT|FLOAT$

$stmtList \rightarrow \epsilon$

A sample accepted input is given below.

```
int main()
{
    int a, b;
    float d;
    char c;
}
```