CM20029: Assignment 2

Set by:	J. P. Fitch
Set on:	2 April 2004
Due Date and Place:	11 May 2004, Pigeon Holes
Time estimate and Language:	10 hours ; (ANSI C / YACC or Bison) OR (Java/CUP)
Project Value:	$\frac{1}{2}$ of CM20029 coursework

Using YACC, Bison or CUP, create a parser which makes and outputs a parse tree for the language defined by the following grammar. The system should also perform sufficient semantic analysis to ensure that variables are only used after they have been defined (with D or F statements), and not used after they are undefined (U statement). In addition modify the arithmetic operators + and * so they become **+int** and ***int** if the arguments are both integer values (that is built from variables declared with a **D** or number constants), and **+float** and ***float** if the arguments are both floating values (build from variables declared with a **F** or number constants).

goal	⇒	statementlist
statementlist	⇒	statement **;** | statement **;** statementlist
statement	⇒	variable **=** expression | **D** varlist | **F** varlist | **U** varlist
varlist	⇒	variable | varlist **,** variable
expression	⇒	expression + term | term
term	⇒	term ***** factor | factor
factor	⇒	variable | number | **(** expression **)**
variable	⇒	[**a-z**]
number	⇒	[**0-9**]

Note: You should not need a lexical phase as all keywords are single characters.

Mark Scheme

Parser:	5
Semantics:	3
Evidence of working:	2
Total:	10

Notes on Marking Scheme

A first class mark can be obtained by writing a complete parser which has been tested and which satisfies the usual software requirements of being readable and clearly maintainable.

Second class performance would typically have an almost working program, or have a complete parser with a partial solution to the semantics issue, with some clear testing, but lacking either the completeness or clarity one expects from the best attainable standard.

Third class marks would be awarded to a program that while showing signs of working does not fit the above properties.

Marks below a classified grade may be awarded if none of the above apply.