Programming Assignment #3

Deadline: 2nd April, 2024

Full Marks: 15

1. <prog> ::= PROGRAM <prog-name> VAR <dec-list> BEGIN <stmt-list> END.
2. <prog-name> ::= **id**
3. <dec-list> ::= <dec> | <dec-list> | <dec>
4. <dec> ::= <id-list> : <type>
5. <type> ::= INTEGER
6. <id-list> ::= **id** | <id-list>,**id**
7. <stmt-list> ::= <stmt> | <stmt-list>; <stmt>
8. <stmt> ::= <assign> | <read> | <write> | <for>
9. <assign> ::= **id** := <exp>
10. <exp> ::= <term> | <exp> + <term> | <exp> - <term>
11. <term> ::= <factor> | <term>*<factor> | <term> DIV <factor>
12. <factor> ::= **id** | **int** | (<exp>)
13. <read> ::= READ(<id-list>)
14. <write> ::= WRITE(<id-list>)
15. <for> ::= FOR <index-exp> DO <body>
16. <index-exp> ::= **id** := <exp> TO <exp>
17. <body> ::= <stmt> | BEGIN <stmt-list> END

We are been provided above a simplified PASCAL grammar in BNF (Backus-Naur Form).

Write a LEX specification of the tokens of PASCAL and use the LEX compiler to construct a lexical analyzer for PASCAL.

Token coding scheme for the above grammar for *gettoken*( ) function is tabulated as below:

TOKEN	CODE
PROGRAM	1
VAR	2
BEGIN	3
END	4
END.	5
INTEGER	6
FOR	7
READ	8
WRITE	9
TO	10
DO	11
;	12
:	13
,	14
:=	15
+	16
-	17
*	18
DIV	19
(	20
)	21
id	22
int	23

Write the two auxiliary functions *install-id*( ) and *install-num*( ) using hashed symbol table organization.

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