2CS701 Compiler Construction

PRACTICAL 6

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Semester :7th

Aim :

Intermediate Code Generation: To generate Three Address code for assignment statement

File.l

```
%{
#include"y.tab.h"
%}

%%


[0-9]+?{yylval.sym=(char)yytext[0];return NUMBER;}
[a-zA-Z]+?{yylval.sym=(char)yytext[0];return LETTER;}

\n {return0;}
.{returnyytext[0];}

%%
yywrap()
{
return1;
}
```

File.y

```
%{
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
voidThreeAddressCode();
void triple();
voidqudraple();
charAddToTable(char,char,char);

intind=0;//count number of lines
char temp ='1';//for t1,t2,t3.....
structincod
{
char opd1;
char opd2;
charopr;
};
%}

%union
{
charsym;
}

%token <sym> LETTER NUMBER
%type <sym> expr
%left '+'
%left '*''/'
%left '-'
%%

statement: LETTER '=' expr ';'{AddToTable((char)$1,(char)$3,'=');}
| expr ';'
;

expr:
 expr '+' expr {$$ =AddToTable((char)$1,(char)$3,'+');}
| expr '-' expr {$$ =AddToTable((char)$1,(char)$3,'-');}
| expr '*' expr {$$ =AddToTable((char)$1,(char)$3,'*');}
| expr '/' expr {$$ =AddToTable((char)$1,(char)$3,'/');}
|'(' expr ')'{$$ =(char)$2;}
| NUMBER {$$ =(char)$1;}
| LETTER {$$ =(char)$1;}
|'-' expr {$$ =AddToTable((char)$2,(char)'\t','-');}
;

%%

yyerror(char*s)
{
printf("%s",s);
exit(0);
}
```

```
structincod code[20];

charAddToTable(char opd1,char opd2,charopr)
{
 code[ind].opd1=opd1;
 code[ind].opd2=opd2;
 code[ind].opr=opr;
ind++;
return temp++;
}

voidThreeAddressCode()
{
intcnt=0;
char temp ='1';
printf("\n\n\t THREE ADDRESS CODE\n\n");
while(cnt<ind)
{
if(code[cnt].opr!='=')
printf("t%c : = \t",temp++);

if(isalpha(code[cnt].opd1))
printf(" %c\t",code[cnt].opd1);
elseif(code[cnt].opd1 >='1'&& code[cnt].opd1 <='9')
printf("t%c\t",code[cnt].opd1);

printf(" %c\t",code[cnt].opr);

if(isalpha(code[cnt].opd2))
printf(" %c\n",code[cnt].opd2);
elseif(code[cnt].opd2 >='1'&& code[cnt].opd2 <='9')
printf("t%c\n",code[cnt].opd2);

cnt++;
}
}



main()
{
printf("\n Enter the Expression : ");
yyparse();
ThreeAddressCode();
}
```

OUTPUT :

```
D:\BE\Sem-7\CC\Lab\Practical\Practical 6>a.exe

 Enter the Expression : 1+2+3-4;


         THREE ADDRESS CODE

t1 : =  t1       +      t2
t2 : =  t3       -      t4
t3 : =  t1       +      t2

D:\BE\Sem-7\CC\Lab\Practical\Practical 6>a.exe

 Enter the Expression : a*b+c-d*e
syntax error
D:\BE\Sem-7\CC\Lab\Practical\Practical 6>a.exe;

 Enter the Expression : a*b+c-d*e;


         THREE ADDRESS CODE

t1 : =   a       *       b
t2 : =   c       -       d
t3 : =  t2       *       e
t4 : =  t1       +      t3
```