INTERMEDIATE CODE GENERATOR FOR WHILE - YACC PROGRAM - COMPILER LAB

Program:

(Lex Program: intwh.l)

```
ALPHA [A-Za-z]
DIGIT [0-9]
%%
while            return WHILE;
{ALPHA}({ALPHA}|{DIGIT})*    return ID;
{DIGIT}+          {yylval=atoi(yytext); return NUM;}
[ \t]             ;
\n             yyterminate();
.             return yytext[0];
%%
```

(Yacc Program: intwh.y)

```
%token ID NUM WHILE
%right '='
%left '+' '-'
%left '*' '/'
%left UMINUS
%%

S : WHILE{lab1();} '(' E ')'{lab2();} E ';'{lab3();}
  ;
E :V '='{push();} E{codegen_assign();}
  | E '+'{push();} E{codegen();}
  | E '-'{push();} E{codegen();}
  | E '*'{push();} E{codegen();}
  | E '/'{push();} E{codegen();}
  | '(' E ')'
  | '-'{push();} E{codegen_umin();} %prec UMINUS
  | V
  | NUM{push();}
  ;
V : ID {push();}
  ;
%%

#include "lex.yy.c"
#include<ctype.h>
char st[100][10];
int top=0;
char i_[2]="0";
char temp[2]="t";

int lnum=1;
int start=1;
main()
 {
 printf("Enter the expression : ");
```

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```
 yyparse();
 }



push()
 {
  strcpy(st[++top],yytext);
 }

codegen()
 {
 strcpy(temp,"t");
 strcat(temp,i_);
  printf("%s = %s %s %s\n",temp,st[top-2],st[top-1],st[top]);
  top-=2;
 strcpy(st[top],temp);
 i_[0]++;
 }

codegen_umin()
 {
 strcpy(temp,"t");
 strcat(temp,i_);
 printf("%s = -%s\n",temp,st[top]);
 top--;
 strcpy(st[top],temp);
 i_[0]++;
 }

codegen_assign()
 {
 printf("%s = %s\n",st[top-2],st[top]);
 top-=2;
 }



lab1()
{
printf("L%d: \n",lnum++);
}


lab2()
{
 strcpy(temp,"t");
 strcat(temp,i_);
 printf("%s = not %s\n",temp,st[top]);
 printf("if %s goto L%d\n",temp,lnum);
 i_[0]++;
 }

lab3()
{
printf("goto L%d \n",start);
printf("L%d: \n",lnum);
}
```

Output :

```
nn@linuxmint ~ $ lex intwh.l
nn@linuxmint ~ $ yacc intwh.y
nn@linuxmint ~ $ gcc y.tab.c -ll -ly
nn@linuxm./a.out
Enter the expression : while(k=c/s)k=k*c+d;
L1:
t0 = c / s
```

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```
k = t0
t1 = not k
if t1 goto L0
t2 = k * c
t3 = t2 + d
k = t3
goto L1
L0:
nn@linuxmint ~ $
```

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