Assignment 4: Intermediate Code Generation

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Code:

#include<iostream>

#include<string.h>

using namespace std;

int top=-1;

char stack[20][3];

char if2pf[20];

int convtop=-1;

int checkpriority(char infix)

{

if(infix=='^')

return 4;

else if(infix=='\*'||infix=='/')

return 3;

else if(infix=='-'||infix=='+')

return 2;

else return 0;

}

char\* postfix\_conv(char infix[100])

{

char str[100];

int k=0;

for(int i=0;infix[i]!='\0';i++)

{

if(isalpha(infix[i])||isdigit(infix[i]))

{

str[k]=infix[i];

k++;

}

else if(infix[i]=='(')

{

convtop++;

if2pf[convtop]=infix[i];

}

else if(infix[i]=='+'||infix[i]=='-'||infix[i]=='\*'||infix[i]=='/'||infix[i]=='^')

{

while(checkpriority(infix[i])<=checkpriority(if2pf[convtop]))

{

str[k]=if2pf[convtop];

k++;

convtop--;

}

convtop++;

if2pf[convtop]=infix[i];

}

else if(infix[i]==')')

{

while(if2pf[convtop]!='(')

{

str[k]=if2pf[convtop];

k++;

convtop--;

}

convtop--;

}

}

while(convtop!=-1)

{

str[k]=if2pf[convtop];

convtop--;

k++;

}

str[k]='\0';

return str;

}

int main()

{

char str[100],postfix[100];

cout<<"Enter the expression"<<endl;

cin>>str;

strcpy(postfix,postfix\_conv(str));

cout<<"\n";

cout<<"Postfix expression is: "<<postfix<<endl;

char table[20][6];

int k=0,j=0;

int memory[20];

cout<<"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"<<endl;

cout<<"Intermediate three code generated"<<endl;

for(int i=0;postfix[i]!='\0';i++)

{

if(isalpha(postfix[i])||(isdigit(postfix[i])))

{

top++;

char s[30];

s[0]=postfix[i];

s[1]='\0';

strcpy(stack[top],s);

}

else

{

char pop1[20],pop2[20];

strcpy(pop1,stack[top]);

top--;

strcpy(pop2,stack[top]);

top--;

char s[30];

s[0]=postfix[i];

s[1]='\0';

strcat(pop2,s);

strcat(pop2,pop1);

pop2[5]='\0';

strcpy(table[k],pop2);

memory[k]=\*table[k];

top++;

char temp[20];

temp[0]='t';

temp[1]=k+'0';

temp[2]='=';

temp[3]='\0';

strcat(temp,table[k]);

cout<<temp<<endl;

temp[2]='\0';

strcpy(stack[top],temp);

k++;

}

}

cout<<"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"<<endl;

cout<<"Quadraple format:"<<endl;

cout<<"arg1\t operator\t arg2\t result"<<endl;

for(int i=0;i<k;i++)

{ int j=0;

for(;isalpha(table[i][j])||isdigit(table[i][j]);j++)

cout<<table[i][j];

cout<<"\t\t";

cout<<table[i][j]<<"\t\t";

j++;

for(;table[i][j]!='\0';j++)

cout<<table[i][j];

cout<<"\t ";

cout<<"t"<<i<<endl;

}

cout<<"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"<<endl;

cout<<"\nTriple representation"<<endl;

cout<<"arg1\t operator\t arg2\t memory"<<endl;

for(int i=0;i<k;i++)

{ int j=0;

for(;isalpha(table[i][j])||isdigit(table[i][j]);j++)

{

if(table[i][j]=='t')

{

cout<<memory[table[i][j+1]-'0'];

j=j+2;

break;

}

else

cout<<table[i][j];

}

cout<<"\t\t";

cout<<table[i][j]<<"\t\t";

j++;

for(;table[i][j]!='\0';j++)

{

if(table[i][j]=='t')

{

cout<<memory[table[i][j+1]-'0'];

j=j+2;

break;

}

else

cout<<table[i][j];

}

cout<<"\t\t";

cout<<memory[i];

cout<<endl;

}

cout<<"\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_"<<endl;

}

OUTPUT:

