Ex No: 8

Date:

GENERATE THREE ADDRESS CODES

AIM:

To generate three address code using C program.

ALGORITHM:

- Get address code sequence.
- Determine current location of 3 using address (for 1st operand).
- If the current location does not already exist, generate move (B, O).
- Update address of A (for 2nd operand).
- If the current value of B and () is null, exist.
- If they generate operator () A, 3 ADPR.
- Store the move instruction in memory.

PROGRAM:

```
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
void pm();
void plus();
void divi();
int i,ch,j,l,addr=100;
char ex[10], exp0[10] ,exp1[10],exp22[10],id1[5],op[5],id2[5];
char *strrev(char *str){
    char *p1, *p2;
    if (! str || ! *str)
        return str;
    for (p1 = str, p2 = str + strlen(str) - 1; p2 > p1; ++p1, --p2){
        *p1 ^= *p2;
        *p2 ^= *p1;
        *p1 ^= *p2;
    }
    return str;
}
void main(){
while(1){
printf("\n1.assignment\n2.arithmetic\n3.relational\n4.Exit\nEnter the choice:");
scanf("%d",&ch);
switch(ch){
case 1:
```

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```
printf("\nEnter the expression with assignment operator:");
scanf("%s",exp0);
l=strlen(exp0);
exp22[0]='\0';
i=0;
while(exp0[i]!='=')
	i++;
strncat(exp22,exp0,i);
strrev(exp0);
exp1[0]='\0';
strncat(exp1,exp0,l-(i+1));
strrev(exp1);
printf("Three address code:\ntemp=%s\n%s=temp\n",exp1,exp22);
break;
case 2:
printf("\nEnter the expression with arithmetic operator:");
scanf("%s",ex);
strcpy(exp0,ex);
l=strlen(exp0);
exp1[0]='\0';
for(i=0;i<l;i++){
if(exp0[i]=='+'||exp0[i]=='-'){
if(exp0[i+2]=='/'||exp0[i+2]=='*'){
pm();
break;}
else{
plus();
break;}
}
else if(exp0[i]=='/'||exp0[i]=='*'){
divi();
break;}
}
break;
case 3:
printf("Enter the expression with relational operator");
scanf("%s%s%s",id1,op,id2);
if(((strcmp(op,"<")==0)||(strcmp(op,"&gt;")==0)||(strcmp(op,"<=")==0)||(strcmp(op,"&gt;=")==
0)||(
strcmp(op,"==")==0)||(strcmp(op,"!=")==0))==0)
printf("Expression is error");
else{
printf("\n%d\tif %s%s%s goto %d",addr,id1,op,id2,addr+3);
addr++;
printf("\n%d\t T:=0",addr);
addr++;
```

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```
printf("\n%d\t goto %d",addr,addr+2);
addr++;
printf("\n%d\t T:=1",addr);
}
break;
case 4:
exit(0);
}
}
}
void pm(){
strrev(exp0);
j=l-i-1;
strncat(exp1,exp0,j);
strrev(exp1);
printf("Three address code:\ntemp=%s\ntemp1=%c%ctemp\n",exp1,exp0[j+1],exp0[j]);
}
void divi(){
strncat(exp1,exp0,i+2);
printf("Three address code:\ntemp=%s\ntemp1=temp%c%c\n",exp1,exp0[i+2],exp0[i+3]);
}
void plus(){
strncat(exp1,exp0,i+2);
printf("Three address code:\ntemp=%s\ntemp1=temp%c%c\n",exp1,exp0[i+2],exp0[i+3]);
}
```

OUTPUT:

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Name: Keerthanaa SP

```
┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ vi exp8.c

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ gcc exp8.c

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ ./a.out

1.assignment
2.arithmetic
3.relational
4.Exit
Enter the choice:1

Enter the expression with assignment operator:a=b+c
Three address code:
temp=b+c
a=temp

1.assignment
2.arithmetic
3.relational
4.Exit
Enter the choice:4
```

RESULT:

Thus, three address code is generated using C program.

Roll No: 210701119
Name: Keerthanaa SP