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<ctype.h
> typedef struct {
char var[10]; int alive;
}
regist; regist preg[10]; void
substring(char exp[],int st,int end)
{
int i,j=0; char
dup[10]="";
for(i=st;i<end;i++
)
dup[j++]=exp[i];
dup[j]='0';

strcpy(exp,dup);
}

int getregister(char var[])
{
int i; for(i=0;i<10;i++)
{
if(preg[i].alive==0)
{
```

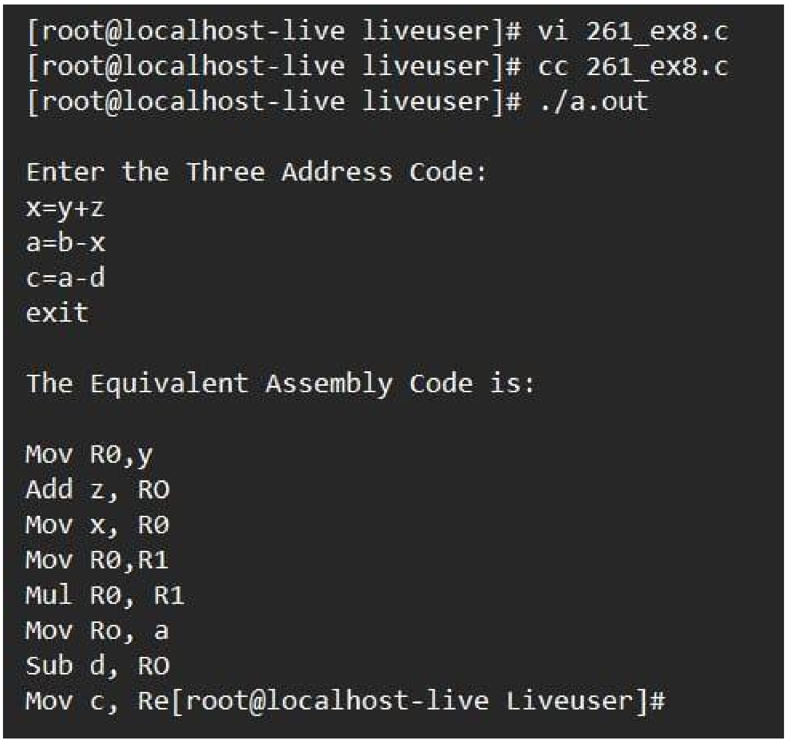
```
strcpy(preg[i].var,var)
; break; }
}
return(i);
}
void getvar(char exp[],char v[])
{
int i,j=0; char
var[10]="";
for(i=0;exp[i]!='\0';i++
) if(isalpha(exp[i]))
var[j++]=exp[i]; else
break;
strcpy(v,var)
; } void
main() {
char   basic[10][10],var[10][10],fstr[10],op;
int   i,j,k,reg,vc,flag=0;   printf("\nEnter   the
Three Address Code:\n");

for(i=0;;i++)
{
gets(basic[i]);
if(strcmp(basic[i],"exit")==0
) break; }
printf("\nThe Equivalent Assembly Code is:\n");
for(j=0;j<i;j++)
{
getvar(basic[j],var[vc++]); strcpy(fstr,var[vc-1]);
substring(basic[j],strlen(var[vc-
1])+1,strlen(basic[j])); getvar(basic[j],var[vc++]);
reg=getregister(var[vc-1]);
if(preg[reg].alive==0)
{
printf("\nMov R%d,%s",reg,var[vc-1]);
preg[reg].alive=1; }
op=basic[j][strlen(var[vc-1])];
substring(basic[j],strlen(var[vc-
1])+1,strlen(basic[j])); getvar(basic[j],var[vc++]);
switch(op) {
case '+':
printf("\nAdd"
); break; case '-
':
```

```
printf("\nSub")
; break; case
'*':
printf("\nMul")
; break; case
'/':
printf("\nDiv")
; break; }

flag=1;
for(k=0;k<=reg;k++)
{
if(strcmp(preg[k].var,var[vc-1])==0)
{ printf("R%d,
R%d",k,reg);
preg[k].alive=0; flag=0;
break; }
}
if(flag)
{
printf(" %s,R%d",var[vc-1],reg);
printf("\nMov %s,R%d",fstr,reg);
}
strcpy(preg[reg].var,var[vc-3]);
}
}
```

OUTPUT:



```
[root@localhost-live liveuser]# vi 261_ex8.c
[root@localhost-live liveuser]# cc 261_ex8.c
[root@localhost-live liveuser]# ./a.out

Enter the Three Address Code:
x=y+z
a=b-x
c=a-d
exit

The Equivalent Assembly Code is:

Mov R0,y
Add z, RO
Mov x, R0
Mov R0,R1
Mul R0, R1
Mov Ro, a
Sub d, RO
Mov c, Re[root@localhost-live Liveuser]#
```

RESULT: