Ex No: 8
Date: 16/04/24

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:

```c
#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)
{
```

```c
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);
```

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```
}
strcpy(preg[reg].var,var[vc-3]);
}
}
```

OUTPUT:

```
[root@localhost-live liveuser]# vi 515_exp8.c
[root@localhost-live liveuser]# cc 515_exp8.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,R0
Mov x,R0
Mov R1,b
Mul R0, R1
Mov R0,a
Sub d,R0
Mov c,R0[root@localhost-live liveuser]#
```

RESULT:

Thus to generate three address code using C program has been executed.

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