

**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:**

```
#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)
18

```

```

{
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]);
19

```

```

    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)
    {

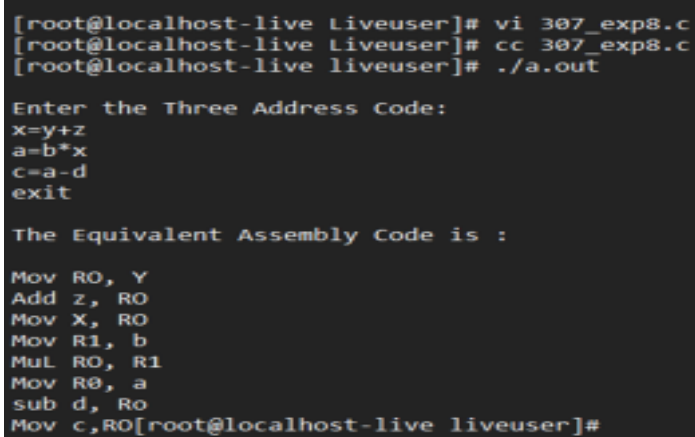
```

```

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]);
}
}
20

```

## OUTPUT:



```

[root@localhost-live liveuser]# vi 307_exp8.c
[root@localhost-live liveuser]# cc 307_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 RO, Y
Add Z, RO
Mov X, RO
Mov R1, b
Mul RO, R1
Mov R0, a
sub d, R0
Mov c,R0[root@localhost-live liveuser]#

```

**RESULT:** To generate three address code using C program has verified

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