## EXPERIMENT - VI

**Aim:** Write program to generate machine code from the intermediate code of Quadruple representation.

**Program:**

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
int label[20];
int no=0;
int main()
{
FILE *fp1,*fp2;
char fname[10],op[10],ch;
char operand1[8],operand2[8],result[8];
int i=0,j=0;
printf("\n Enter filename of the intermediate code");
scanf("%s",fname);
fp1=fopen(fname,"r");
fp2=fopen("target.txt","w");
if(fp1==NULL || fp2==NULL)
{
printf("\n Error opening the file");
exit(0);
}
while(!feof(fp1))
{
fprintf(fp2,"\n");
fscanf(fp1,"%s",op);
i++;
if(check_label(i))
fprintf(fp2,"\nlabel#%d",i);
```

```
if(strcmp(op,"print")==0)
{
fscanf(fp1,"%s",result);
fprintf(fp2,"\n\t OUT %s",result);
}
if(strcmp(op,"goto")==0)
{
fscanf(fp1,"%s %s",operand1,operand2);
fprintf(fp2,"\n\t JMP %s,label#%s",operand1,operand2);
label[no++]=atoi(operand2);
}
if(strcmp(op,"[]=")==0)
{
fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n\t STORE %s[%s],%s",operand1,operand2,result);
}
if(strcmp(op,"uminus")==0)
{
fscanf(fp1,"%s %s",operand1,result);
fprintf(fp2,"\n\t LOAD -%s,R1",operand1);
fprintf(fp2,"\n\t STORE R1,%s",result);
}
switch(op[0])
{
case '*': fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD",operand1);
fprintf(fp2,"\n \t LOAD %s,R1",operand2);
fprintf(fp2,"\n \t MUL R1,R0");
fprintf(fp2,"\n \t STORE R0,%s",result);
break;
case '+': fscanf(fp1,"%s %s %s",operand1,operand2,result);
```

```
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n \t LOAD %s,R1",operand2);
fprintf(fp2,"\n \t ADD R1,R0");
fprintf(fp2,"\n \t STORE R0,%s",result);
break;
case '-': fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n \t LOAD %s,R1",operand2);
fprintf(fp2,"\n \t SUB R1,R0");
fprintf(fp2,"\n \t STORE R0,%s",result);
break;
case '/': fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n \t LOAD %s,R1",operand2);
fprintf(fp2,"\n \t DIV R1,R0");
fprintf(fp2,"\n \t STORE R0,%s",result);
break;
case '%': fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n \t LOAD %s,R1",operand2);
fprintf(fp2,"\n \t DIV R1,R0");
fprintf(fp2,"\n \t STORE R0,%s",result);
break;
case '=': fscanf(fp1,"%s %s",operand1,result);
fprintf(fp2,"\n\t STORE %s %s",operand1,result);
break;
case '>': j++;
fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n\t JGT %s,label#%s",operand2,result);
label[no++]=atoi(result);
```

```
break;
case '<': fscanf(fp1,"%s %s %s",operand1,operand2,result);
fprintf(fp2,"\n \t LOAD %s,R0",operand1);
fprintf(fp2,"\n\t JLT %s, label#%d",operand2,result);
label[no++]=atoi(result);
break;
} }
fclose(fp2); fclose(fp1);
fp2=fopen("target.txt","r");
if(fp2==NULL)
{
printf("Error opening the file\n");
exit(0);
}
do
{
ch=fgetc(fp2);
printf("%c",ch);
}while(ch!=EOF);
fclose(fp1);
return 0;
}
int check_label(int k)
{
int i;
for(i=0;i<no;i++)
{
if(k==label[i])
return 1;
}
return 0;
```

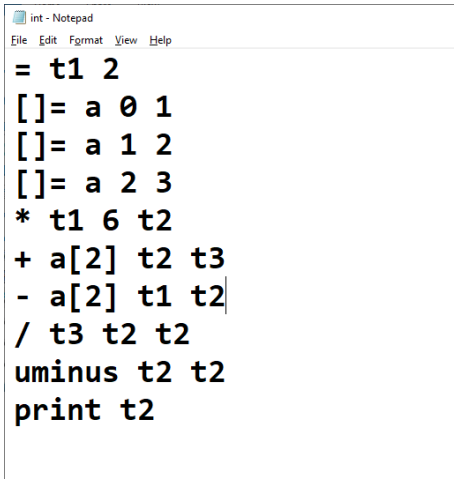
}

**Output:**

```
C:\TURBOC3\BIN>TC

 Enter filename of the intermediate codeint.txt
```

**Input (Quadruple representation) is provided in a separate text file named** "int.txt" **as shown below**




**Result (Assembly Code) is stored in** "target.txt"**, as shown below:**

```
STORE t1 2
STORE a[0],1
STORE a[1],2
STORE a[2],3
LOAD t1,R0
LOAD 6,R1
MUL R1,R0
STORE R0,t2

LOAD a[2],R0
LOAD t2,R1
ADD R1,R0
```

```
STORE R0,t3

LOAD a[2],R0
LOAD t1,R1
SUB R1,R0
STORE R0,t2

LOAD t3,R0
LOAD t2,R1
DIV R1,R0
STORE R0,t2

LOAD -t2,R1
STORE R1,t2
OUT t2
```