Ex No:9
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IMPLEMENT CODE OPTIMIZATION TECHNIQUES CONSTANT FOLDING

AIM:

To write a C program to implement Constant Folding (Code optimization Technique).

ALGORITHM:

- The desired header files are declared.
- The two file pointers are initialized one for reading the C program from the file and one for writing the converted program with constant folding.
- The file is read and checked if there are any digits or operands present.
- If there is, then the evaluations are to be computed in switch case and stored.
- Copy the stored data to another file.
- Print the copied data file.

PROGRAM:

```
#include<stdio.h>
#include<string.h>
void main() {
        char s[20];
        char flag[20]="//Constant";
        char result,equal,operator;
        double op1,op2,interrslt;
        int a,flag2=0;
        FILE *fp1,*fp2;

        fp1 = fopen("input.txt","r");
        fp2 = fopen("output.txt","w");

        fscanf(fp1,"%s",s);
        while(!feof(fp1)) {
                if(strcmp(s,flag)==0) {
                        flag2 = 1;
                }
                if(flag2==1) {
                        fscanf(fp1,"%s",s);
                        result=s[0];
                        equal=s[1];
                        if(isdigit(s[2])&& isdigit(s[4])) {
                                if(s[3]=='+'||'-'||'*'||'/') {
                                        operator=s[3];
                                        switch(operator) {
                                                case '+':
```

```
                                        break;
                                case '-':
                                        interrslt=(s[2]-48)-(s[4]-48);
                                        break;
                                case '*':
                                        interrslt=(s[2]-48)*(s[4]-48);
                                        break;
                                case '/':
                                        interrslt=(s[2]-48)/(s[4]-48);
                                        break;
                                default:
                                        interrslt = 0;
                                        break;
                        }
                        fprintf(fp2,"/*Constant Folding*/\n");
                        fprintf(fp2,"%c = %lf\n",result,interrslt);
                        flag2 = 0;
                }
        } else {

                fprintf(fp2,"Not Optimized\n");
                fprintf(fp2,"%s\n",s);
        }
} else {

        fprintf(fp2,"%s\n",s);
}
fscanf(fp1,"%s",s);
}
fclose(fp1);
fclose(fp2);
}
```

OUTPUT:

```
[root@localhost-live 210701701]# vi input.txt
[root@localhost-live 210701701]# vi 701_exp9.c
[root@localhost-live 210701701]# cc 701_exp9.c
[root@localhost-live 210701701]# ./a.out
[root@localhost-live 210701701]# vi output.txt
```

//output text

```
a=7
b=10
c=5
d=7
```

RESULT:

Constant folding (a code optimization technique) has been implemented using C program.