Ex No:9

Date:

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:

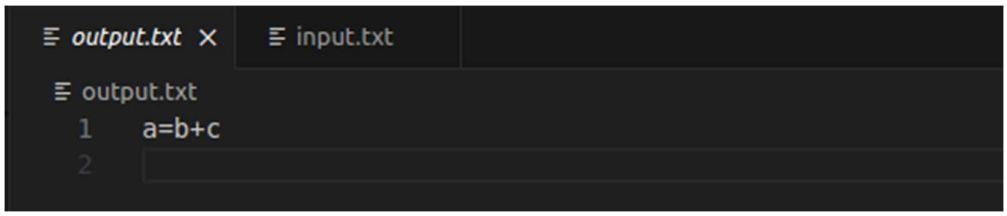
```
#include<stdio.h>
#include<string.h>
void main() {
        char s[20];
        char flag[20]="//Constant";
        char result,equal,operator;
        double op1,op2,interrslt;
        int a,flag2=0;
        FILE *fp1,*fp2;

        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 '+':
                                                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;
                                        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:




```
➜  ~ vi 278.c
➜  ~ cc 278.c
278.c: In function ‘main’:
278.c:21:28: warning: implicit declaration of function ‘isdigit’ [-Wimplicit-function-declaration]
   21 |                         if(isdigit(s[2])&& isdigit(s[4])) {
      |                            ^~~~~~~
278.c:3:1: note: include ‘<ctype.h>’ or provide a declaration of ‘isdigit’
    2 | #include<string.h>
  +++ |+#include <ctype.h>
    3 | void main() {
➜  ~ ./a.out
➜  ~
```

RESULT: