

**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 288.c
→ ~ cc 288.c
288.c: In function 'main':
288.c:21:28: warning: implicit declaration of function 'isdigit' [-Wimplicit-function-declaration]
   21 |         if(isdigit(s[2])&& isdigit(s[4])) {
       |                        ^
288.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
→ ~
```

```
≡ output.txt ×  ≡ input.txt
≡ output.txt
1  a=b+c
2  
```

## RESULT: