

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:

```

≡ output.txt ×  ≡ input.txt

≡ output.txt
1  a=b+c
2

```

```

→ ~ vi 275.c
→ ~ cc 275.c
275.c: In function 'main':
275.c:21:28: warning: implicit declaration of function 'isdigit' [-Wimplicit-function-declaration]
    21 |         if(isdigit(s[2])&& isdigit(s[4])) {
        |                ^
275.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: