

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]=='+'||s[3]=='-'||s[3]=='*'||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:

```

vimal@KBVIMAL: ~
vimal@KBVIMAL:~$ vi 301constfold.c
vimal@KBVIMAL:~$ gcc 301constfold.c -o calculator
301constfold.c: In function 'main':
301constfold.c:12:51: warning: implicit declaration of function 'strcmp' [-Wimplicit-function-declaration]
   12 |         if (fgets(s, sizeof(s), stdin) == NULL || strcmp(s, "quit\n") == 0) {
       |                                                     ^~~~~~
301constfold.c:3:1: note: include '<string.h>' or provide a declaration of 'strcmp'
     3 | #include<ctype.h>
       | ^~~~~~
+++ |+#include <string.h>
     3 |
vimal@KBVIMAL:~$ ./calculator
Enter expressions (enter 'quit' to exit):
> v=5+10
/*Constant Folding*/
v = 20.00
>

```

RESULT: