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);
```

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```
                                            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:~$ vi 310cf.c
vimal@KBVIMAL:~$ gcc 310cf.c -o calculator
310cf.c: In function 'main':
310cf.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) {
      |                                                     ^~~~~~
310cf.c:3:1: note: include '<string.h>' or provide a declaration of 'strcmp'
    2 | #include<ctype.h>
  +++ |+#include <string.h>
    3 |
vimal@KBVIMAL:~$ ./calculator
Enter expressions (enter 'quit' to exit):
> a=2+3
/*Constant Folding*/
a = 6.00
>
```

RESULT:

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