ExNo:9

Date:23/4/24

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";
        charresult,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:

```
thirueswaran@thirueswaran-Inspiron-3443:~$ touch input.txt
thirueswaran@thirueswaran-Inspiron-3443:~$ touch 290_ex9.c
thirueswaran@thirueswaran-Inspiron-3443:~$ cc 290_ex9.c
thirueswaran@thirueswaran-Inspiron-3443:~$ ./a.out
thirueswaran@thirueswaran-Inspiron-3443:~$ touch output.txt
```

//output.txt

```
a=7
b=10
c=5
d=7
~
```

RESULT:

Thus to implement code optimization techniques in constant folding using c program has been executed successfully.