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> #include
<ctype.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];                    op1 = s[2] - '0';
op2 = s[4] - '0';
 switch (operator) {
 case '+':                           interrslt =
op1 + op2;                           break;
case '-':                            interrslt = op1
- op2;                          break;
case '*':                            interrslt =
op1 * op2;                           break;
case '/':
                        if (op2 != 0)                           interrslt =
op1 / op2;                           else {
fprintf(fp2, "Division by zero error.\n");
fclose(fp1);                              fclose(fp2);
return;                          }                          break;
default:                             interrslt = 0;
break;
                 }
                 fprintf(fp2, "/*Constant Folding*/\n");
fprintf(fp2, "%c = %.2lf\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:

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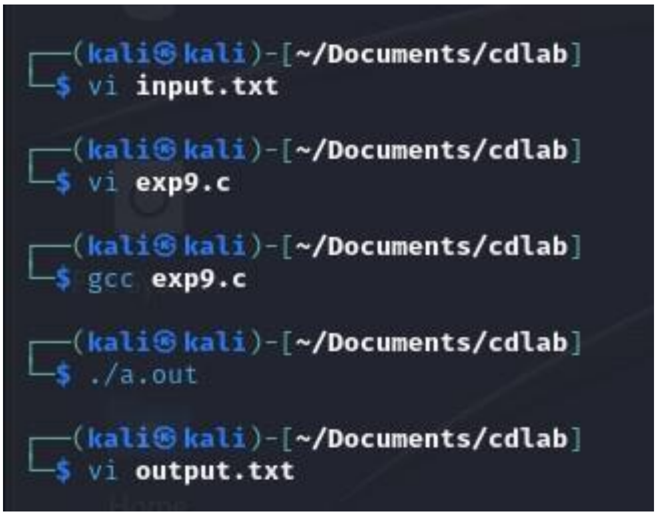
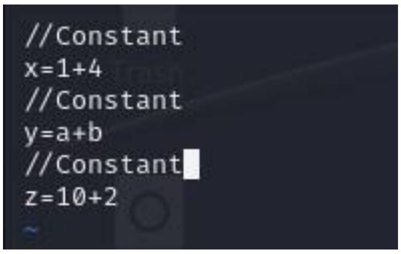


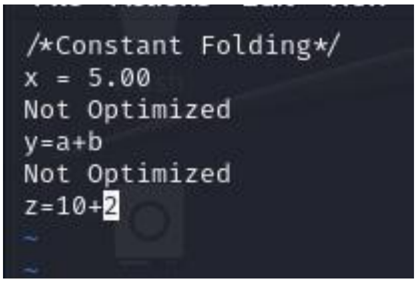
```
┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ vi input.txt

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ vi exp9.c

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ gcc exp9.c

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ ./a.out

┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ vi output.txt
```

Input.txt:



```
//Constant
x=1+4
//Constant
y=a+b
//Constant
z=10+2
~
```

Output.txt:



```
/*Constant Folding*/
x = 5.00
Not Optimized
y=a+b
Not Optimized
z=10+2
~
~
```

RESULT:

Thus, a C program to implement Constant Folding has been developed.