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.

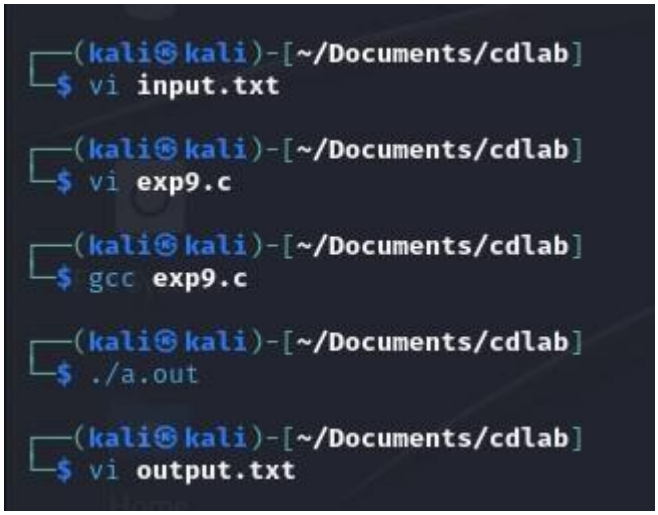
PROGRAM:

```
#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])) {
```

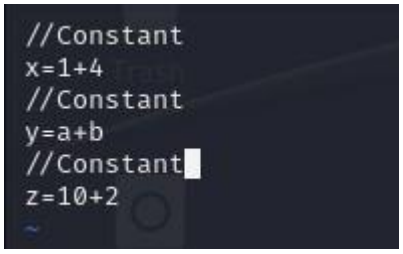
```
        if (s[3] == '+' || s[3] == '-' || s[3] == '*' || s[3] == '/') {
            operator = s[3];
            op1 = s[2] - '0';
            op2 = s[4] - '0';
            switch (operator) {
                case '+':
                    interrslt = op1 + op2;
                    break;
                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);
}
```

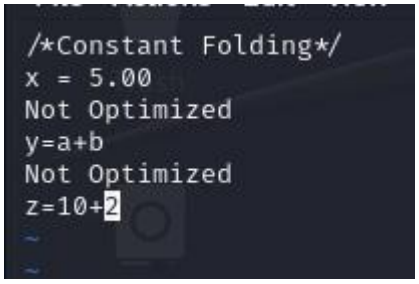
OUTPUT:



Input.txt:



Output.txt:



RESULT:

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