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])) {
```

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```
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 = %.2If\n", result, interrslt);
       flag2 = 0;
    }
  } else {
    fprintf(fp2, "Not Optimized\n");
    fprintf(fp2, "%s\n", s);
  }
} else {
```

Roll Number: 210701114 Name: Kavin Manoharan

```
fprintf(fp2, "%s\n", s);
}
fscanf(fp1, "%s", s);
}
fclose(fp1);
fclose(fp2);
}
```

OUTPUT:

```
(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.

Roll Number: 210701114 Name: Kavin Manoharan