Ex No:9
Date:

IMPLEMENT CODE OPTIMIZATION TECHNIQUES CONSTANT FOLDING

AIM:

To write a C program to implement Constant Folding (Code optimization Technique).

ALGORITHM:

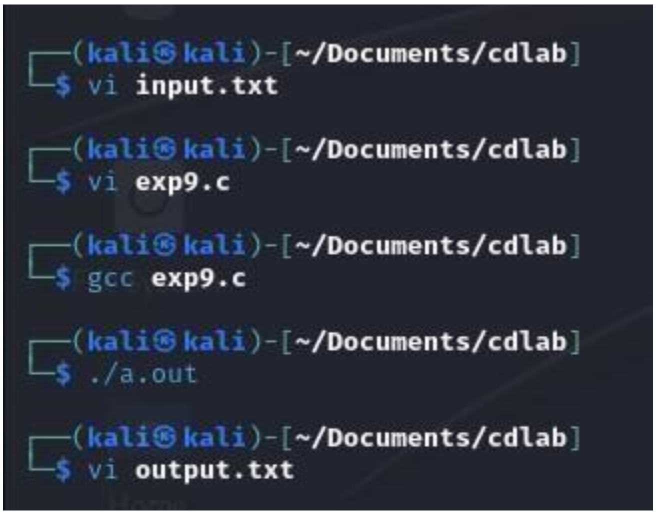
- The desired header files are declared.
- The two file pointers are initialized one for reading the C program from the file and one for writing the converted program with constant folding.
- The file is read and checked if there are any digits or operands present.
- If there is, then the evaluations 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);
}
```

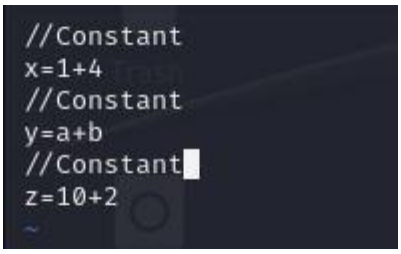
OUTPUT:

NAME ; KRISHNAKUMAR R
ROLL NUMBER : 210701126



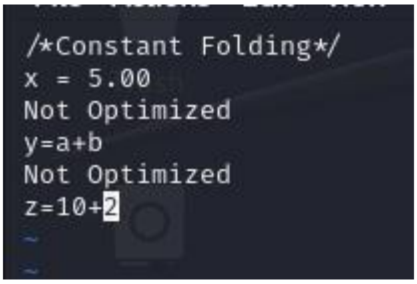
```
┌──(kali㉿kali)-[~/Documents/cdlab]
└─$ vi input.txt

┌──(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.

NAME ; KRISHNAKUMAR R
ROLL NUMBER : 210701126