

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
```

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```

        '+': 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.