

**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.