

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];
```

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```

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:

```

(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.