

OCTAL TO BINARY CONVERSION

EXP NO: 31

AIM: To write a C program to implement octal to binary conversion.

ALGORITHM:

1. Start with the given octal number.
2. Convert each octal digit into its 3-bit binary equivalent:
 - 0 → 000
 - 1 → 001
 - 2 → 010
 - 3 → 011
 - 4 → 100
 - 5 → 101
 - 6 → 110
 - 7 → 111
3. Concatenate the binary values of all digits to get the final binary number.
4. Output the binary equivalent of the given octal number.

PROGRAM:

```
#include <stdio.h>

int main() {
    int octal_num, decimal_num = 0, binary_num = 0, base = 1, rem;

    // Prompt the user to enter an octal number
    printf("Enter the octal number: ");
    scanf("%o", &octal_num); // %o is used to input an octal number

    // Convert octal to decimal
    int temp = octal_num;
    int base_decimal = 1;
    while (temp > 0) {
        rem = temp % 10;
        decimal_num += rem * base_decimal;
        base_decimal *= 8;
        temp /= 10;
    }
```

```
// Convert decimal to binary

base = 1;

while (decimal_num > 0) {

    rem = decimal_num % 2;

    binary_num += rem * base;

    decimal_num /= 2;

    base *= 10;

}

// Display the corresponding binary value

printf("The binary value is: %d\n", binary_num);

return 0;

}
```

INPUT & OUTPUT:

The screenshot displays the Embarcadero Dev-C++ 6.3 IDE. The main window shows the source code for 'dummy.c', which includes the following logic:

```
1 #include <stdio.h>
2
3 int main() {
4     int octal_num, decimal_num = 0, binary_num = 0, base = 1, rem;
5
6     // Prompt the user to enter an octal number
7     printf("Enter the octal number: ");
8     scanf("%o", &octal_num); // %o is used to input an octal number
9
10    // Convert octal to decimal
11    int temp = octal_num;
12    int base_decimal = 1;
13    while (temp > 0) {
14        rem = temp % 10;
15        decimal_num += rem * base_decimal;
16        base_decimal *= 8;
17        temp /= 10;
18    }
19
20    // Convert decimal to binary
21    base = 1;
22    while (decimal_num > 0) {
23        rem = decimal_num % 2;
24        binary_num += rem * base;
25        decimal_num /= 2;
26        base *= 10;
27    }
28
29    // Display the corresponding binary value
30    printf("The binary value is: %d\n", binary_num);
31    return 0;
32 }
```

The console window on the right shows the program's execution:

```
Enter the octal number: 32
The binary value is: 10110

-----
Process exited after 4.996 seconds with return value 0
Press any key to continue . . . |
```

The bottom status bar indicates the compiler output: 0 Errors, 0 Warnings, and a compilation time of 0.25s.

RESULT: Thus, the program was executed successfully using DevC++.