

**EXPT NO:**

**DATE:**

## **BINARY TO OCTAL CONVERSION**

**Theory:** The octal numeral system, or oct for short, is the base-8 number system, and uses the digits 0 to 7. Octal numerals can be made from binary numerals by grouping consecutive binary digits into groups of three (starting from the right)

Since, there are only 8 digits (from 0 to 7) in octal number system, so we can represent any digit of octal number system using only 3 bit.

So, if you make each group of 3 bit of binary input number, then replace each group of binary number from its equivalent octal digits. That will be octal number of given number. Note that you can add any number of 0's in leftmost bit (or in most significant bit) for integer part and add any number of 0's in rightmost bit (or in least significant bit) for fraction part for completing the group of 3 bit, this does not change value of input binary number.

### **Algorithm:**

1. Start
2. Input the binary number
3. Divide the binary number into groups of three from right to left
4. Find the decimal equivalent of each group
5. The decimal equivalent of each group from left to right gives the equivalent octal number of the given binary number
6. Stop

## Programme:

```
#include<iostream>
#include<cmath>
#include<iomanip>

using namespace std;

int conver(int a)
{
    if(a==000)
        return 0;
    if(a==001)
        return 1;
    if(a==010)
        return 2;
    if(a==011)
        return 3;
    if(a==100)
        return 4;
    if(a==101)
        return 5;
    if(a==110)
        return 6;
    if(a==111)
        return 7;
}

int b2o(int d)
{
    int i=0,c=0,m=0,r,s1=0,s2=0,oct=0;
    while(d>0)
    {
        while(c<3)
        {
            if(d>0)
            {
                r=d%10;
                d=d/10;
                s1=s1+r*pow(10,i);
            }
            i++;
            c++;
        }
        s2=conver(s1);
        oct=oct+s2*pow(10,m);
        m++;
        c=0;
        i=0;
        s1=0;
    }
    return oct;
}

int main()
{
    int n;
    cout<<"Give the binary no\n";
    cin>>n;
    cout<<"The octal equivalent of "<<n<<" is
    "<<b2o(n);
    return 0;
}
```

**Output:**

```
PS C:\Users\PANKAJ PATIL\Desktop\COA> ./a
Give the binary no
101101
The octal equivalent of 101101 is 55
```

**Conclusion:**

The programme for converting a binary number to octal number has been successfully written, debugged, compiled and executed.