

## Practical-5

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### Problem Statement:

Write a program to implement subnet calculator.

### Code:

```
#include <bits/stdc++.h>
using namespace std;

int a[1000];
int noofbit = 0;

void decToBinary(int n)
{
    int i;
    for (i = 0; n > 0; i++)
    {
        a[i] = n % 2;
        n = n / 2;
    }
    cout << "Binary of the given number= ";
    for (i = i - 1; i >= 0; i--)
    {
        cout << a[i];
        noofbit++;
    }
    cout << endl;
}

int main()
{
    int ip[4];
    cout << "input ip address: ";
    for (int i = 0; i < 4; i++)
    {
        cin >> ip[i];
    }
    cout << "\nip address is: ";
    for (int i = 0; i < 4; i++)
    {
        cout << ip[i] << ".";
    }
    int host;
    cout << "\ninput no of host: ";
```

```

cin >> host;
cout << "\nClass of the IP address is: ";
if (0 <= ip[0] && ip[0] <= 127)
{
    cout << " A";
    cout << "\n it is class A so subnet mask of class A is 255.0.0.0" << endl;
    decToBinary(host);
    int j = 24 - noofbit;
    // int ans[32];
    cout << endl
        << "subnet in binary form :" << endl;
    int cal = 0;
    for (int i = 0; i < 8; i++)
    {
        cout << 1;
    }
    cout << ".";
    for (int i = 0; i < j; i++)
    {
        if (cal == 8)
        {
            cout << ".";
            cal = 0;
        }
    }
    cout << 1;
    cal++;
    for (int i = 0; i < noofbit; i++)
    {
        if (cal == 8)
        {
            cout << ".";
            cal = 0;
        }
        cout << 0;
    }
    cout << "\n\nsubnetmask of the ip address for " << host << " host is: ";
    cout << 255 << ".";
    int k = 0;
    int i = 1;
    int count = 0;
    for (i = 1; i <= j; i++)
    {
        if (count == 8)
        {
            count = 0;
            break;
        }
    }

```

```

        k += pow(2, 8 - i);
        count++;
    }
    cout << k << ".";
    k = 0;
    i = i - 1;
    for (int q = 1; i <= j; q++ && i++)
    {
        if (count == 8)
        {
            count = 0;
            break;
        }
        k += pow(2, 8 - q);
        count++;
    }
    cout << k << ".";
    k = 0;
    i = i - 1;
    for (int q = 1; i <= j; q++ && i++)
    {
        if (count == 8)
        {
            count = 0;
            break;
        }
        k += pow(2, 8 - q);
        count++;
    }
    cout << k << ".";
}
else if (128 <= ip[0] && ip[0] <= 191)
{
    int cal = 0;
    cout << "B";
    cout << "\n - it is class B so subnet mask of class B is 255.255.0.0" << endl;
    decToBinary(host);
    cout << endl;
    int j = 16 - noofbit;
    // int ans[32]; int cal=0;
    cout << endl
        << "subnet in binary form :" << endl;
    for (int i = 0; i < 8; i++)
    {
        cout << 1;
    }
    cout << ".";
    for (int i = 0; i < 8; i++)

```

```

{
    cout << 1;
}
cout << ".";
for (int i = 0; i < j; i++)
{
    if (cal == 8)
    {
        cout << ".";
        cal = 0;
    }
    cout << 1;
    cal++;
}
for (int i = 0; i < noofbit; i++)
{
    if (cal == 8)
    {
        cout << ".";
        cal = 0;
    }
    cout << 0;
    cal++;
}
cout << endl
    << 255 << "." << 255 << ".";
int k = 0;
int count = 0;
int i = 1;
for (i = 1; i <= j; i++)
{
    if (count == 8)
    {
        count = 0;
        break;
    }
    k += pow(2, 8 - i);
    count++;
}
cout << k << ".";
int l = 0;
i = i - 1;
for (int q = 1; i <= j; q++ && i++)
{
    l += pow(2, 8 - q);
}
cout << l;
}

```

```

else if (192 <= ip[0] && ip[0] <= 223)
{
    int cal = 0;
    cout << "C";
    cout << "\n - it is class C so subnet mask of class C is 255.255.0.0";
    decToBinary(host);
    int j = 8 - noofbit;
    int ans[32];
    cout << endl
        << "subnet in binary form :" << endl;
    for (int i = 0; i < 8; i++)
    {
        cout << 1;
    }
    cout << ".";
    for (int i = 0; i < 8; i++)
    {
        cout << 1;
    }
    cout << ".";
    for (int i = 0; i < 8; i++)
    {
        cout << 1;
    }
    cout << ".";
    for (int i = 0; i < j; i++)
    {
        if (cal == 8)
        {
            cout << ".";
            cal = 0;
        }
    }
    cout << 1;
    cal++;
    for (int i = 0; i < noofbit; i++)
    {
        if (cal == 8)
        {
            cout << ".";
            cal = 0;
        }
        cout << 0;
    }
    int k = 0;
    for (int i = 1; i <= j; i++)
    {

```

```

        k += pow(2, 8 - i);
    }
    cout << endl
        << endl
        << 255 << "." << 255 << "." << 255 << "." << k;
    }
    return 0;
}

```

## OUTPUT:

The screenshot shows a Visual Studio Code editor with a C++ file named `SubnetCalculator.cpp`. The code implements a function to calculate the subnet mask for a given IP address. The terminal output shows the execution of the program, including the input IP address, the resulting subnet mask, and the binary representation of the subnet mask.

```

SubnetCalculator.cpp:1
1 #include <bits/stdc++.h>
2 using namespace std;
3
4 int a[1000];
5 int noofbit = 0;
6
7 void decToBinary(int n)
8 {
9     int i;
10    for (i = 0; n > 0; i++)
11    {
12        a[i] = n % 2;
13        n = n / 2;
14    }
15    cout << "Binary of the given number= ";
16    for (i = i - 1; i >= 0; i--)
17    {
18        cout << a[i] << " ";
19    }
20    cout << endl;
21 }
22
23 int main()
24 {
25     string ip;
26     int host;
27     cout << "Enter IP address: ";
28     getline(cin, ip);
29     cout << "Enter host number: ";
30     cin >> host;
31
32     int n = ip[0] - '0';
33     int m = ip[1] - '0';
34     int o = ip[2] - '0';
35     int p = ip[3] - '0';
36
37     int n1 = n * 1000 + m * 100 + o * 10 + p;
38
39     decToBinary(n1);
40
41     return 0;
42 }

```

```

PS D:\MIT\SEM 5\CN(Lab\5)\output> cd "d:\MIT\SEM 5\CN(Lab\5)\output"
PS D:\MIT\SEM 5\CN(Lab\5)\output> & .\SubnetCalculator.exe
input ip address: 50.4.2.4

ip address is: 50.4.2.4.
input no of host: 20

Class of the IP address is: A
it is class A so subnet mask of class A is 255.0.0.0
Binary of the given number= 10100

subnet in binary form :
11111111.100000

subnetmask of the ip address for 20 host is: 255.255.255.248.
PS D:\MIT\SEM 5\CN(Lab\5)\output> & .\SubnetCalculator.exe
input ip address: 192.168.0.0

ip address is: 192.168.0.0.
input no of host: 30

Class of the IP address is: C
- it is class C so subnet mask of class C is 255.255.0.0binary of the given number= 11110

subnet in binary form :
11111111.11111111.11111111.100000

255.255.255.224
PS D:\MIT\SEM 5\CN(Lab\5)\output>

```