



Green University of Bangladesh
Department of Computer Science and Engineering(CSE)
Faculty of Sciences and Engineering
Semester: (Spring, Year:2024), B.Sc. in CSE (Day)

LAB ASSIGNMENT NO #03

Course Title: Data Communication Lab
Course Code: CSE 308 Section: 221_D3

Experiment Name: IPv4 implementation of Decimal to Binary and vice versa

Student Details

| Name | | ID |
|------|---------------|-----------|
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Lab Date : 16 – 03 – 2024
Submission Date : 20 – 03 – 2024
Course Teacher's Name : Sakhaouth Hossan

[For Teachers use only: **Don't Write Anything inside this box**]

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| <u>Lab Report Status</u> | |
| Marks: | Signature: |
| Comments: | Date: |

1. TITLE OF THE LAB EXPERIMENT:

IPv4 implementation of Decimal to Binary and vice versa

2. OBJECTIVES:

After complementing this lab experiment, we will gain practical knowledge and the outcomes of this experiment are

- To implement ip number conversion.

4. IMPLEMENTATION

An ipv4 dotted binary IP to decimal IP:

```
// Bismillahir Rahmanir Rahim
// jahidulZaid
#include <bits/stdc++.h>
using namespace std;
#define optimize() ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
#define endl '\n'
#define tt long long t; cin >> t;
#define pb push_back

int main() {
    string dottedBinaryIP;
    cin >> dottedBinaryIP;
    stringstream ss(dottedBinaryIP);
    string octet;
    string binaryIP = "";
    while (getline(ss, octet, '.')) {
        binaryIP += octet;
    }
    bitset<32> binary(binaryIP);
    unsigned long decimalIP = binary.to_ulong();
    unsigned int octets[4];
    octets[0] = (decimalIP >> 24) & 0xFF;
    octets[1] = (decimalIP >> 16) & 0xFF;
    octets[2] = (decimalIP >> 8) & 0xFF;
    octets[3] = decimalIP & 0xFF;
    for (int i = 0; i < 4; ++i) {
        cout << octets[i];
        if (i < 3) cout << ".";
    }
    cout << endl;
    return 0;
}
```

5. OUTPUT

The image shows a C++ IDE with a file named `ip_binToDec.cpp` open. The code implements a function to convert a binary IP address (e.g., `11000000.10101000.00000001.00000001`) into a dotted decimal IP address (e.g., `192.168.1.1`). The code uses `bitset<32>` to handle the binary data and `stringstream` to process the input. The output is printed to the console.

```
1 // Bismillahir Rahmanir Rahim
2 // jahidulZaid
3
4 #include <bits/stdc++.h>
5 using namespace std;
6 #define optimize() ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
7 #define endl '\n'
8 #define tt long long t; cin >> t;
9 #define ll long long
10 #define pb push_back
11
12 int main() {
13
14     string dottedBinaryIP;
15     cin >> dottedBinaryIP;
16
17     stringstream ss(dottedBinaryIP);
18     string octet;
19     string binaryIP = "";
20     while (getline(ss, octet, '.')) {
21         binaryIP += octet;
22     }
23     bitset<32> binary(binaryIP);
24     unsigned long decimalIP = binary.to_ulong();
25
26     unsigned int octets[4];
27     octets[0] = (decimalIP >> 24) & 0xFF;
28     octets[1] = (decimalIP >> 16) & 0xFF;
29     octets[2] = (decimalIP >> 8) & 0xFF;
30     octets[3] = decimalIP & 0xFF;
31
32     for (int i = 0; i < 4; ++i) {
33         cout << octets[i];
34         if (i < 3) cout << ".";
35     }
36     cout << endl;
37
38     return 0;
39 }
40
```

The IDE also shows the output of the program in the terminal:

```
\n ; if ($?) { g++ ip_binToDec.cpp -o ip_binToDec } ; if ($?) { .\ip_binToDec }
11000000.10101000.00000001.00000001
192.168.1.1
PS F:\cp resources\cf\cse308\labMan3> cd "f:\cp resources\cf\cse308\labMan3\" ;
if ($?) { g++ tempCodeRunnerFile.cpp -o tempCodeRunnerFile } ; if ($?) { .\tempC
odeRunnerFile }
11000000.10101000.00000000.00000001
192.168.0.1
PS F:\cp resources\cf\cse308\labMan3>
```

On the right side of the IDE, the test results for the `ip_binToDec` function are displayed:

Local: ip_binToDec

TC 1 Passed 14ms

Input: `11000000.10101000.00000001.00000001`

Expected Output: `192.168.1.1`

Received Output: `192.168.1.1`

TC 2 Passed 18ms

Input: `11000000.10101000.00000000.00000001`

Expected Output: `192.168.0.1`

Received Output: `192.168.0.1`

Buttons for **+ New Testcase**, **Set ONLINE_JUDGE**, and **Feedback** are visible.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● PS F:\cp resources\cf> cd "f:\cp resources\cf\cse308\labMan3\" ; if ($?) { g+
+ ip_binToDec.cpp -o ip_binToDec } ; if ($?) { .\ip_binToDec }
11000000.10101000.00000001.00000001
192.168.1.1
○ PS F:\cp resources\cf\cse308\labMan3>
```

Local: ip_binToDec

^ TC 1 Passed 14ms

↺

🗑

Input:

Copy

11000000.10101000.00000001.00000001
Expected Output:

Copy

192.168.1.1
Received Output:

Copy

192.168.1.1

^ TC 2 Passed 18ms

↺

🗑

Input:

Copy

11000000.10101000.00000000.00000001
Expected Output:

Copy

192.168.0.1
Received Output:

Copy

192.168.0.1

+ New Testcase

6. ANALYSIS AND DISCUSSION:

After following the above steps we successfully obtained the desired results.

