Computer Network

Assignment 1

submitted by
ADITYA KUMAR SINGH
194CA004

1. Write a program to implement the data link layer framing methods such as bit stuffing

```cpp
#include <vector>
#include <iostream>
using namespace std;

int main() {
    int n;
    cout << "Enter no ob bits : ";
    cin >> n;
    vector<int> frame;
    int c = 0;
    for(int i=0; i<n; i++) {
        int t;
        cin >> t;
        if(t) c++;
        else c = 0
        frame.push_back(t);
        if(c == 5)
            frame.push_back(0), c=0;
    }
    cout << "Data abter stubbing : ";
    for(auto e : frame)
        cout << e;
}
```

```cpp
#include <vector>
#include <iostream>
using namespace std;

int main() {
    int n;
    cout << "Enter no of bits : ";
    cin >> n;
    vector<int> frame;
    int c = 0;
    for (int i = 0; i < n; i++) {
        int t;
        cin >> t;
        if (t) c++;
        else c = 0;
        frame.push_back(t);
        if (c == 5)
            frame.push_back(0), c = 0;
    }
    cout << "Data after stuffing : ";
    for (auto e : frame)
        cout << e;
}
```

```
themartian@mars ~/D/G/L/Networking (master)> ./framing_bit_stuffing
Enter no of bits : 10
1
0
1
0
1
1
1
1
1
1
Data after stuffing : 10101111101⏎
themartian@mars ~/D/G/L/Networking (master)> |
```

2. Write a program to implement the data link layer framing method such as character stuffing

```cpp
#include <iostream>
#include <vector>
#include <string>
using namespace std;

int main() {
    string msg, res = "dlestx";
    cout << "Enter message : ";
    getline(cin, msg);
    int pos, n = msg.size();
    char ch;
    cout << "Enter position: ";
    cin >> pos;
    cout << "Enter character: ";
    cin >> ch;
    for(int i = 0; i < n; i++) {
        if(i == pos-1) {
            res += "dle";
            res += ch;
            res += "dle";
        }
        if(i+1 < n && msg[i] == 'd' && msg[i+1] == 'l' &&
            msg[i+2] == 'e') {
            res += 'dle';
        }

        res += msg[i];
    }
}
```
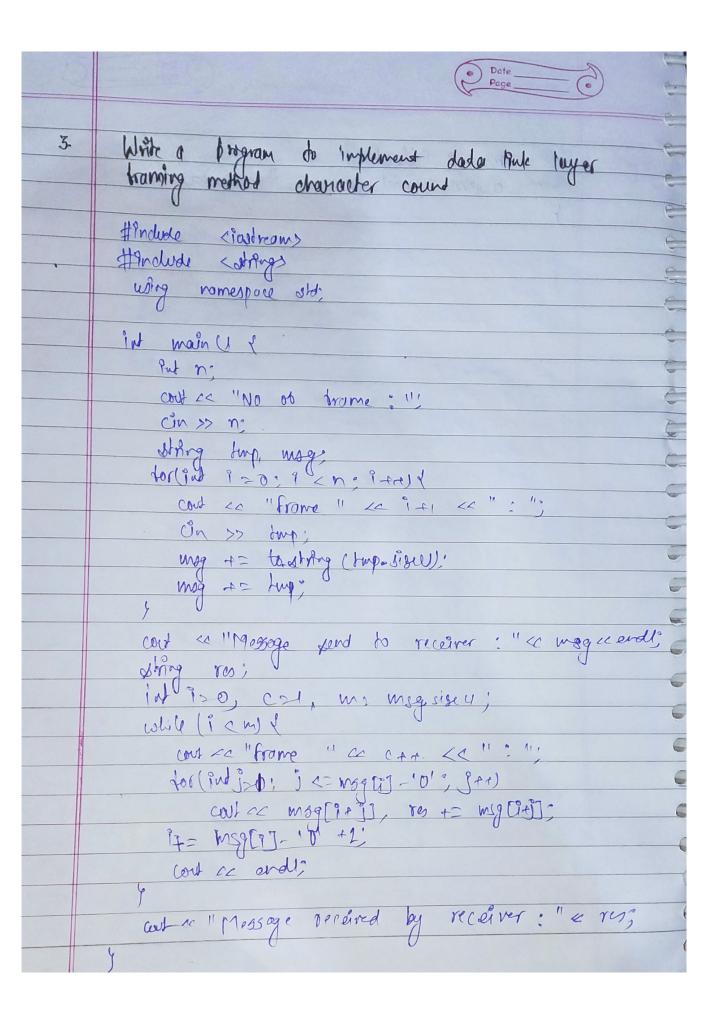
```
res += "direction";
cout << "final frame: " << res;
}
```

```cpp
1 #include <iostream>
2 #include <vector>
3 #include <string>
4 using namespace std;
5
6 int main() {
7    string msg, res = "dlestx";
8    cout << "Enter Message : ";
9    getline(cin, msg);
10   int pos, n = msg.size();
11   char ch;
12   cout << "Enter position : ";
13   cin >> pos;
14   cout << "Enter character : ";
15   cin >> ch;
16   for (int i = 0; i < n; i++) {
17     if (i == pos - 1) {
18       res += "dle";
19       res += ch;
20       res += "dle";
21     }
22     if (i + 2 < n && msg[i] == 'd' && msg[i + 1] == 'l' && msg[i + 2] == 'e') {
23       res += "dle";
24     }
25     res += msg[i];
26   }
27   res += "dleetx";
28   cout << "Final frame : " << res;
29 }
```

framing_character_stuffing.cpp

```
themartian@mars ~/D/G/L/Networking (master)> ./framing_character_stuffing
Enter Message : haiarchana
Enter position : 4
Enter character : k
Final frame : dlestxhaidlekdlearchanadleetx⏎
themartian@mars ~/D/G/L/Networking (master)> |
```

3. Write a program to implement data link layer framing method character count

```cpp
#include <iostream>
#include <string>
using namespace std;

int main() {
    int n;
    cout << "No of frame : ";
    cin >> n;
    string tmp, msg;
    for(int i = 0; i < n; i++) {
        cout << "frame " << i+1 << " : ";
        cin >> tmp;
        msg += to_string(tmp.size());
        msg += tmp;
    }

    cout << "Message send to receiver : " << msg << endl;
    string res;
    int i = 0, c = 1, m, msg.size();
    while(i < m) {
        cout << "frame " << c++ << " : ";
        for(int j = 0; j <= msg[i] - '0'; j++)
            cout << msg[i+j], res += msg[i+j];
        i += msg[i] - '0' + 1;
        cout << endl;
    }

    cout << "Message received by receiver : " << res;
}
```

```cpp
 1 #include <iostream>
 2 #include <string>
 3 using namespace std;
 4
 5 int main() {
 6    int n;
 7    cout << "No of frame : ";
 8    cin >> n;
 9    string tmp, msg;
10    for (int i = 0; i < n; i++) {
11       cout << "Frame " << i + 1 << " : ";
12       cin >> tmp;
13       msg += to_string(tmp.size());
14       msg += tmp;
15    }
16    cout << "Message send to receiver : " << msg << endl;
17    string res;
18    int i = 0, c = 1, m = msg.size();
19    while (i < m) {
20       cout << "Frame " << c++ << " : ";
21       for (int j = 1; j <= msg[i] - '0'; j++)
22          cout << msg[i + j], res += msg[i + j];
23       i += msg[i] - '0' + 1;
24       cout << endl;
25    }
```
framing_character_count.cpp

```
themartian@mars ~/D/G/L/Networking (master)> ./framing_character_count
No of frame : 2
Frame 1 : Computer
Frame 2 : Networks
Message send to receiver : 8Computer8Networks
Frame 1 : Computer
Frame 2 : Networks
Message received by receiver : ComputerNetworks⏎
themartian@mars ~/D/G/L/Networking (master)> |
```