



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 #02
Course Title: Data Communication Lab
Course Code: CSE 308 Section: 221_D3

Experiment Name: Implementing Byte Stuffing and De-stuffing

Student Details

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Lab Date : 02 – 03 – 2024
Submission Date : 16 – 03 – 2024
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<u>Lab Report Status</u>	
Marks:	Signature:
Comments:	Date:

1. TITLE OF THE LAB EXPERIMENT:

Implementing Byte (Character) Stuffing and De-stuffing

2. OBJECTIVES:

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

- To implement the data link layer framing method Character stuffing.
- Implement the Byte (Character) stuffing and de-stuffing together where the system provides a choice to change the transmitted bit stream before de-stuffing. Consider the followings:

A B C D E F F E F D F E G

Where, F is the flag character and E is the escape character.

3. PROCEDURE:

First we code to stuff byte

Then again coded to destuff that input

Lastly, combined both code to implement both in a single code.

Two function for stuff and destuff byte..

byteStuffing()

byteDestuffing()

4. IMPLEMENTATION

De-stuffing code:

```
// 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 ll long long
#define pb push_back

// #ifdef LOCAL
// #include "debug.h"
// #endif

// #ifdef ONLINE_JUDGE
// #include "debug.h"
// #endif

string byteStuffing(const string& input, char flag, char escape) {
    string stuffed;
    for (char ch : input) {
        if (ch == flag || ch == escape) {
            stuffed += escape;
        }
        stuffed += ch;
    }
    return stuffed;
}

string byteDestuffing(const string& input, char escape) {
    string destuffed;
    bool prevEscape = false;
    for (char ch : input) {
        if (ch == escape && !prevEscape) {
            prevEscape = true;
        } else {
            destuffed += ch;
            prevEscape = false;
        }
    }
    return destuffed;
}
```

```

    }
}
return destuffed;
}

int main() {
    char flag = 'F';
    char escape = 'E';

    string input;
    getline(cin, input);

    // stuffing
    string stuffed = byteStuffing(input, flag, escape);
    cout << "Byte stuffing: " << endl;
    cout << stuffed << endl;
    cout << endl;
    // De-stuffing
    string destuffed = byteDestuffing(stuffed, escape);
    cout << "Byte destuffing: " << endl;
    cout << destuffed << endl;

    return 0;
}

```

5. OUTPUT

The screenshot shows a C++ IDE with a code editor, a terminal, and a test runner panel. The code editor displays the implementation of `byteStuffing` and `byteDestuffing` functions. The terminal shows the command to compile and run the program. The test runner panel on the right indicates that the test case failed.

```
6 using namespace std;
7 #define optimize() ios_base::sync_with_stdio(0);cin.tie(0);cout.tie(0);
8 #define endl '\n'
9 #define tt long long t; cin >> t;
10 #define ll long long
11 #define pb push_back
12
13 // #ifdef LOCAL
14 // #include "debug.h"
15 // #endif
16
17 // #ifdef ONLINE_JUDGE
18 // #include "debug.h"
19 // #endif
20
21
22 string byteStuffing(const string& input, char flag, char escape) {
23     string stuffed;
24     for (char ch : input) {
25         if (ch == flag || ch == escape) {
26             stuffed += escape;
27         }
28         stuffed += ch;
29     }
30     return stuffed;
31 }
32
33 string byteDestuffing(const string& input, char escape) {
34     string destuffed;
35     bool prevEscape = false;
36     for (char ch : input) {
37         if (ch == escape && !prevEscape) {
38             prevEscape = true;
39         } else {
40             destuffed += ch;
41             prevEscape = false;
42         }
43     }
44 }
```

Local: byteStuff-task

TC 1
Failed 16ms

Input: ABCDEFFFDFFEG
Expected Output: ABCDEFFFDFFEG
Received Output: ABCDEFFFDFFEG

Byte stuffing: ABCDEFFFDFFEG
Byte destuffing: ABCDEFFFDFFEG

+ New Testcase

Set ONLINE_JUDGE

Feedback

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

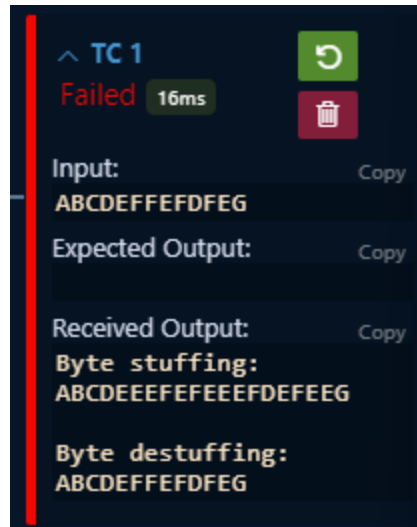
Code - labMan1

PS F:\cp resources\cf> cd "f:\cp resources\cf\cse308\labMan1\" ; if (\$?) { g++ byteStuff-task.cpp -o byteStuff-task } ; if (\$?) { .\byteStuff-task }

Byte stuffing:
ABCDEFFFDFFEG

Byte destuffing:
ABCDEFFFDFFEG

PS F:\cp resources\cf\cse308\labMan1>



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Code - labMan1 + v [ ] [ ] ... ^ X
```

```
● PS F:\cp resources\cf> cd "f:\cp resources\cf\cse308\labMan1\" ; if ($?) { g++ byteStuff-task.c  
pp -o byteStuff-task } ; if ($?) { .\byteStuff-task }  
○ ABCDEFFEFDFEG  
Byte stuffing:  
ABCDEEEFEFEFEFDFEEG  
  
Byte destuffing:  
ABCDEFFEFDFEG  
PS F:\cp resources\cf\cse308\labMan1> [ ]
```

Run Testcases 0 0 0 0 Ln 65 Col 2 Spaces: 4

6. ANALYSIS AND DISCUSSION:

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

7. SUMMARY: