**Experiment 1:**

**Implement the data link layer framing method using character stuffing and bit stuffing.**

**character stuffing:**

#include <stdio.h>

#include <string.h>

int main() {

char a[100], c[200]; // Input and stuffed strings

int i = 0, k = 0;

printf("Enter the string: ");

scanf("%s", a); // Read the input string

// Character stuffing logic

for (i = 0; a[i] != '\0'; i++)

{

if (a[i] == 'D' && a[i+1] == 'L' && a[i+2] == 'E')

{

// Check for DLE sequence

c[k++] = 'D';

c[k++] = 'L';

c[k++] = 'E';

c[k++] = 'D'; // Escape the DLE with an extra D

i += 2; // Skip the DLE in input

} else {

c[k++] = a[i]; // Copy other characters

}

}

c[k] = '\0'; // Null-terminate the stuffed string

// Printing the results

printf("DLESTX%sDLEETX\n", c); // Add protocol framing

return 0;

}

**Output:**







**bit stuffing:**

#include <stdio.h>

#include <string.h>

void bitStuffing(char input[], char output[]) {

int count = 0; // Counter for consecutive 1's

int j = 0; // Output index

for (int i = 0; input[i] != '\0'; i++)

{

output[j++] = input[i];

if (input[i] == '1') {

count++;

} else {

count = 0; // Reset count if 0 is encountered

}

// If 5 consecutive 1's are found, stuff a 0

if (count == 5) {

output[j++] = '0';

count = 0; // Reset count after stuffing

}

}

output[j] = '\0'; // Null-terminate the output string

}

int main() {

char input[100], output[200];

printf("Enter the input bit stream: ");

scanf("%s", input);

bitStuffing(input, output);

printf("Bit-stuffed output: %s\n", output);

return 0;

}

Output:







1. What is bit stuffing? What is the use of bit stuffing?
2. What is character stuffing? What is the use of character stuffing?
3. By which special bit pattern the frame begins and ends?

Each frame begins and ends with a special bit pattern called a flag byte [01111110].

1. What are the functions of data link layer?
2. Name the delimiters for character stuffing?

Each frame starts with the ASCII character sequence DLE STX and ends with the sequence DLE ETX

1. Expand DLE STX and DLE ETX?

DLE is Data Link Escape, STX is Start of TeXt

DLE is Data Link Escape, ETX is End of TeXt.