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Computer Networking Lab

Assignment -4

```

import java.math.*;
import java.util.Scanner;
public class Bitstuffing{
public static void main(String[] args) {
String str = "";
String str1,str2;
int i = 0, j = 1, k = 0;
int count = 0,count1=0;
Scanner sc = new Scanner(System.in);
System.out.println("Enter a hexadecimal string=");
str = sc.nextLine();
str2=str;
str1 = new BigInteger(str, 16).toString(2);
System.out.println("<-----BIT STUFFING----->");
System.out.println("ORIGIONAL SIGNAL IS =" +str1);
while (i < str1.length() - 5) {
count = 0;
j = 1;
if (str1.charAt(i) == '1') {
for (k = i; count < 5 && j == 1; k++) {
if (str1.charAt(k) == '1') {
count++;
}
if (str1.charAt(k) == '0')
j = 0;
}
}
if (count == 5) {
str = str1.substring(0, k);
str = str + '0';
str1 = str1.substring(k, str1.length());
str1 = str + str1;
count1++;
}
i++;
}
System.out.println("ENCODING SIGNAL IS =" +str1);
str1 = str1.replaceAll("111110", "11111");
System.out.println("DECODING SIGNAL IS =" +str1);
System.out.println("Total no of zero bit added is =" +count1);
System.out.println("<-----BYTE STUFFING----->");
System.out.println("ORIGIONAL SIGNAL IS =" +str2);
i=0;
count1=0;
while(i<str2.length()){
if((str2.charAt(i)=='1')&&(str2.charAt(i+1)=='6')) {
count1++;
}
i++;
}
str2=str2.replaceAll("16","1616");
System.out.println("ENCODING SIGNAL IS =" +str2);
str2=str2.replaceAll("1616","16");
System.out.println("DECODING SIGNAL IS =" +str2);

```

```
System.out.println("Total no of zeros added is "+8*count1);  
}  
}
```

```

Enter a hexadecimal string=
010ff4ff1616dfff415161601608
<-----BIT STUFFING----->
ORIGINAL SIGNAL IS =1000011111111010011111110001011000010110110111111111111010000010101000101100001011000000001011000001000
ENCODING SIGNAL IS =1000011111011101001111101110001011000010110110111110111110111010000010101000101100001011000000001011000001000
DECODING SIGNAL IS =1000011111111010011111110001011000010110110111111111111010000010101000101100001011000000001011000001000
Total no of zero bit added is =4
<-----BYTE STUFFING----->
ORIGINAL SIGNAL IS =010ff4ff1616dfff415161601608
ENCODING SIGNAL IS =010ff4ff16161616dfff4151616160161608
DECODING SIGNAL IS =010ff4ff1616dfff415161601608
Total no of zeros added is =40

Process finished with exit code 0

```

1)BIT STUFFING:

In this the original signal I gave in hexadecimal format it converted in to its equivalent binary number. At transmitter side (Encoding) when the 5 consecutive 1's occurs we will add 0 in it . At decoding (receiver side) we will remove the 0 which we added after 5 consecutive once to get original signal.The total no of '0' bit added is 4 in this example.

```

Enter a hexadecimal string=
010ff4ff1616dfff415161601608
<-----BIT STUFFING----->
ORIGINAL SIGNAL IS =1000011111111010011111110001011000010110110111111111111010000010101000101100001011000000001011000001000
ENCODING SIGNAL IS =1000011111011101001111011100010110000101101101111101111101111011010000010101000101100001011000000001011000001000
DECODING SIGNAL IS =1000011111111010011111110001011000010110110111111111111010000010101000101100001011000000001011000001000
Total no of zero bit added is =4
<-----BYTE STUFFING----->
ORIGINAL SIGNAL IS =010ff4ff1616dfff415161601608
ENCODING SIGNAL IS =010ff4ff16161616dfff4151616160161608
DECODING SIGNAL IS =010ff4ff1616dfff415161601608
Total no of zeros added is =40

Process finished with exit code 0

```

1)BYTE STUFFING:

In this the original signal I gave in hexadecimal format. At transmitter side (Encoding) when the '16' occurs we will add one more '16' in it .At decoding (receiver side) we will remove the '16' which we added after '16' to get original signal.The total no of bits of signal is added is $8 \times \text{no of '16' added in signal}$ because '16' contain total 8 bits.Since original signal contains five '16' so total no of bits added is $= 8 \times 5 = 40$.