Information Security Practical Assignment

Submitted to : Ms Upasna

Name : Kanish

Roll Number : CSC/21/53

University Roll No: 21059570017

1. **Implement the error correcting code**

Code:

```
#include <iostream>

using namespace std;

int main() {
    int data[7]; // Reduced size to 7 as we only need 4 data bits and 3 parity bits
    int dataatrec[7], c1, c2, c3, i;
0

    cout << "Enter 4 bits of data one by one\n";
    cin >> data[0];
    cin >> data[1];
    cin >> data[2];
    cin >> data[3]; // Corrected index

    // Calculation of even parity
    data[4] = data[0] ^ data[2] ^ data[3]; // Corrected index
    data[5] = data[0] ^ data[1] ^ data[3]; // Corrected index
    data[6] = data[1] ^ data[2] ^ data[3]; // Corrected index

    cout << "\nEncoded data is\n";
    for (i = 0; i < 7; i++)
        cout << data[i];

    cout << "\n\nEnter received data bits one by one\n";
    for (i = 0; i < 7; i++)
        cin >> dataatrec[i];

    c1 = dataatrec[3] ^ dataatrec[4] ^ dataatrec[5]; // Corrected indices
    c2 = dataatrec[3] ^ dataatrec[4] ^ dataatrec[6]; // Corrected indices
    c3 = dataatrec[3] ^ dataatrec[5] ^ dataatrec[6]; // Corrected indices

    int c = c3 * 4 + c2 * 2 + c1;

    if (c == 0) {
        cout << "\nNo error while transmission of data\n";
    } else {
        cout << "\nError on position " << c;
        cout << "\nData sent : ";
        for (i = 0; i < 7; i++)
            cout << data[i];
```

```
        cout << "\nData received : ";
        for (i = 0; i < 7; i++)
            cout << dataatrec[i];

        cout << "\nCorrect message is\n";
        if (dataatrec[c] == 0)
            dataatrec[c] = 1;
        else
            dataatrec[c] = 0;
        for (i = 0; i < 7; i++) {
            cout << dataatrec[i];
        }
    }
    return 0;
}
```

Output:

```
PROBLEMS 1  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR
PS C:\Users\91740\OneDrive\Desktop\Kanish\IT> cd "c:\Users\91740\OneDrive\Desktop\Kanish\IT\" ; if ($?) { g++ Question1.cpp -o Question1 } ; if ($?) { .\Questio
n1 }
Enter 4 bits of data one by one
0
1
1

0

Encoded data is
0110110

Enter received data bits one by one
1
0
1
0
1
1
0

Error on position 6
Data sent : 0110110
Data received : 1010110
Correct message is
1010111
PS C:\Users\91740\OneDrive\Desktop\Kanish\IT>
```