

Experiment No: 4

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Program:

```
#include <iostream>
#include<algorithm>
using namespace std;

void hammingCode() {
    int a[30], b[30], c[30], d[30];
    int i, j, len;
    int count1 = 0, count2 = 0, count3 = 0;
    cout << "Enter length of code : " << endl;
    cin >> len;
    cout << "Enter 1st code : " << endl;
    for (i = 1; i <= len; i++)
    {
        cin >> a[i];
    }
    cout << "Enter 2nd code : " << endl;
    for (i = 1; i <= len; i++)
    {
        cin >> b[i];
    }
    cout << "Enter 3rd code : " << endl;
    for (i = 1; i <= len; i++)
    {
        cin >> c[i];
    }
    for (i = 1; i <= len; i++)
```

```

{
    if (a[i] != b[i])
    {
        count1++;
    }
}

cout << "Hamming distance between 1st codeword & 2nd codeword is = " << count1 << endl;
for (i = 1; i <= len; i++)
{
    if (a[i] != c[i])
    {
        count2++;
    }
}

cout << "Hamming distance between 1st codeword & 3rd codeword is = " << count2 << endl;
for (i = 1; i <= len; i++)
{
    if (b[i] != c[i])
    {
        count3++;
    }
}

cout << "Hamming distance between 2nd codeword & 3rd codeword is = " << count3 << endl;
cout << "Minimum hamming distance is : " << std::min({ count1,count2,count3 }) << "\n";
}

```

```

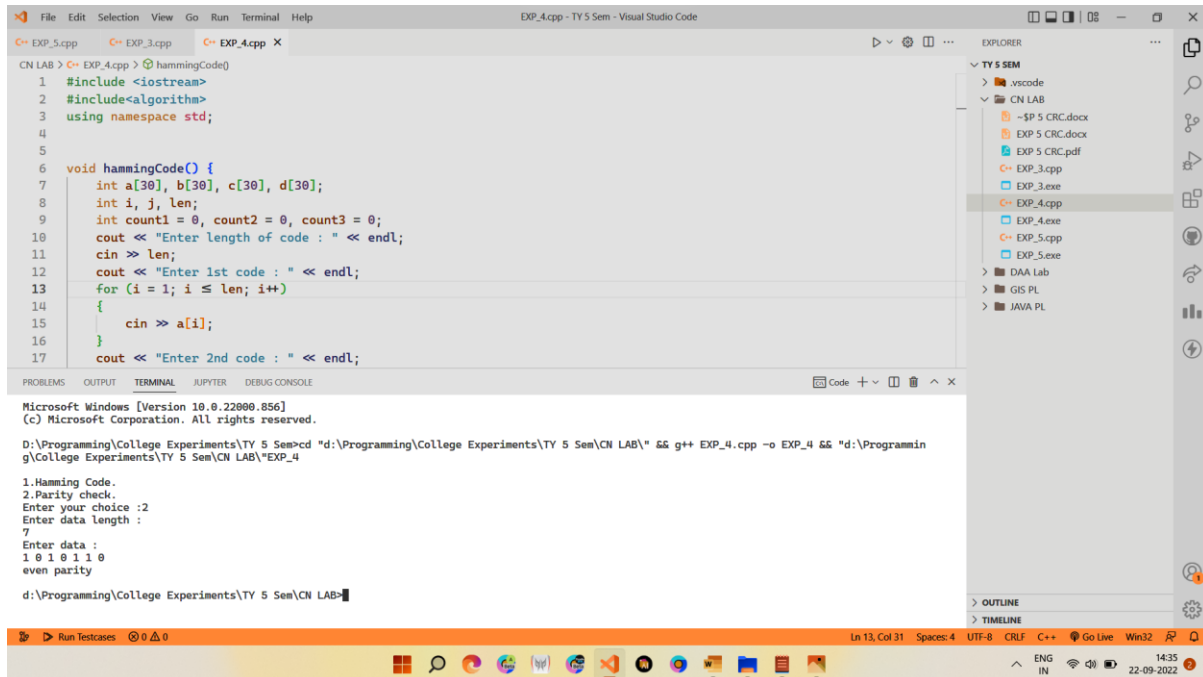
void parity() {
    int n, parity = 0;
    cout << "Enter data length : " << endl;
    cin >> n;
    int a[n];
    cout << "Enter data : " << endl;

```

```
for (int i = 0; i < n; i++) {  
    cin >> a[i];  
    if (a[i] == 1)  
        parity++;  
}  
if (parity % 2 == 0)  
    cout << "even parity" << endl;  
else  
    cout << "odd parity" << endl;  
}  
  
int main()  
{  
  
    cout << endl << "1.Hamming Code.";  
    cout << endl << "2.Parity check.";  
    cout << endl << "Enter your choice :";  
    int x;  
    cin >> x;  
    if (x == 1)  
        hammingCode();  
    if (x == 2)  
        parity();  
}
```

Output:

Parity check



```
File Edit Selection View Go Run Terminal Help
EXP_4.cpp - TY 5 Sem - Visual Studio Code

EXP_5.cpp EXP_3.cpp EXP_4.cpp X

CN LAB > C++ EXP_4.cpp > hammingCode()
1 #include <iostream>
2 #include <algorithm>
3 using namespace std;
4
5
6 void hammingCode() {
7     int a[30], b[30], c[30], d[30];
8     int i, j, len;
9     int count1 = 0, count2 = 0, count3 = 0;
10    cout << "Enter length of code : " << endl;
11    cin >> len;
12    cout << "Enter 1st code : " << endl;
13    for (i = 1; i <= len; i++)
14    {
15        cin >> a[i];
16    }
17    cout << "Enter 2nd code : " << endl;
```

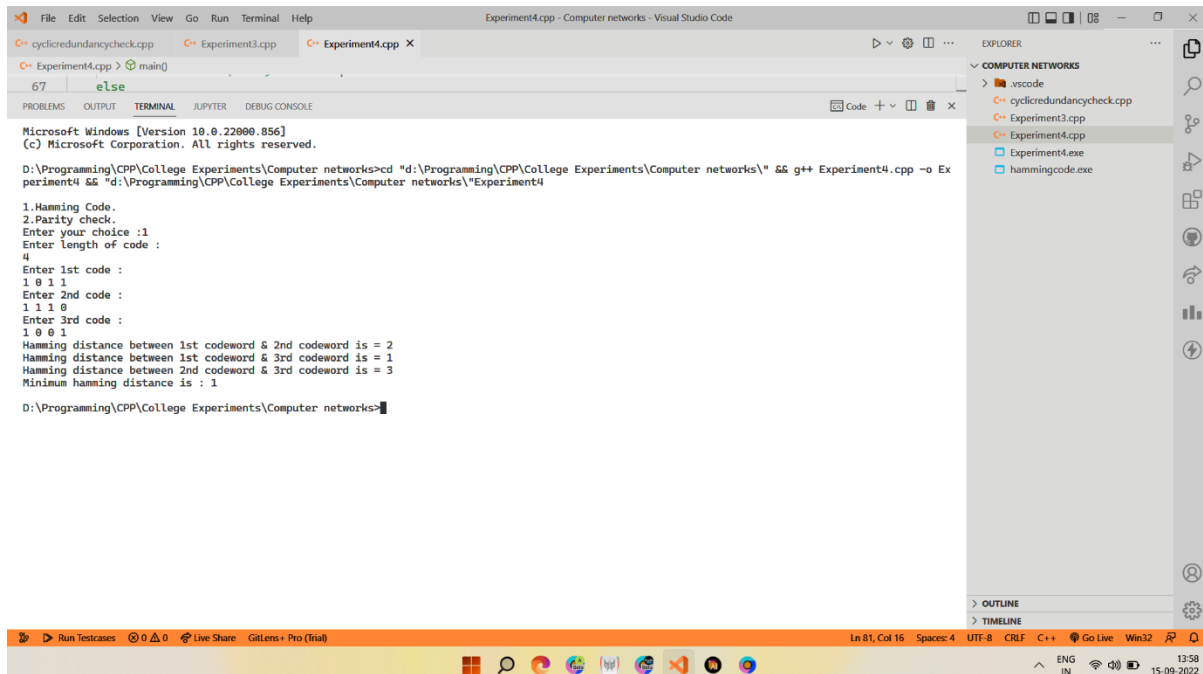
```
Microsoft Windows [Version 10.0.22000.856]
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D:\Programming\College Experiments\TY 5 Sem\CN LAB> g++ EXP_4.cpp -o EXP_4 &&
D:\Programming\College Experiments\TY 5 Sem\CN LAB> .\EXP_4

1.Hamming Code.
2.Parity check.
Enter your choice :2
Enter data length :
7
Enter data :
1 0 1 0 1 1 0
even parity

D:\Programming\College Experiments\TY 5 Sem\CN LAB>
```

Hamming Code



```
File Edit Selection View Go Run Terminal Help
Experiment4.cpp - Computer networks - Visual Studio Code

cyclicredundancycheck.cpp Experiment3.cpp Experiment4.cpp X
Experiment4.cpp > main()
67 else
```

```
Microsoft Windows [Version 10.0.22000.856]
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D:\Programming\CPP\College Experiments\Computer networks> cd "d:\Programming\CPP\College Experiments\Computer networks\" && g++ Experiment4.cpp -o Experiment4 &&
D:\Programming\CPP\College Experiments\Computer networks> .\Experiment4

1.Hamming Code.
2.Parity check.
Enter your choice :1
Enter length of code :
4
Enter 1st code :
1 0 1 1
Enter 2nd code :
1 1 1 0
Enter 3rd code :
1 0 0 1
Hamming distance between 1st codeword & 2nd codeword is = 2
Hamming distance between 1st codeword & 3rd codeword is = 1
Hamming distance between 2nd codeword & 3rd codeword is = 3
Minimum hamming distance is : 1

D:\Programming\CPP\College Experiments\Computer networks>
```