

C&NS Lab Assignment 5

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Batch B2

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Columnar encryption

- Explain the Columnar encryption.
- Implement the Columnar encryption algorithm using any programming language.

Columnar encryption

More complex approach to encrypting plain text. We need a key for rearranging columns. The plaintext is written in rectangle row by row and read column by column for encryption

Eg “the world is big”

1	2	3	4
t	h	e	w
o	r	l	d
i	s	b	i
g			

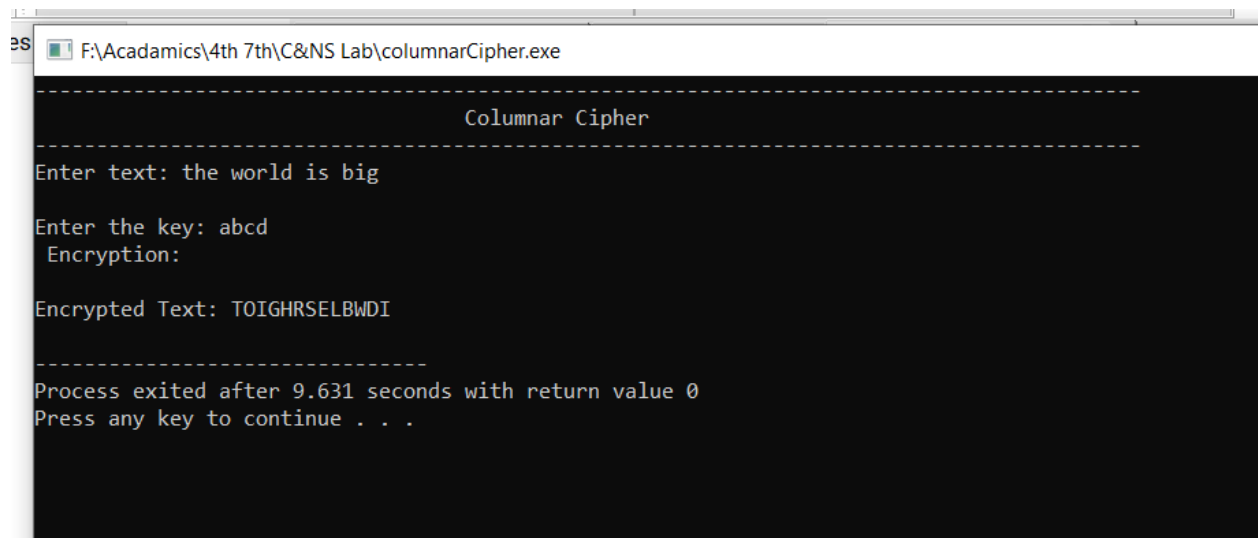
Cipher text: TOIGHRSELBWDI

Code

```
columnarCipher.cpp
1 // Cryptography and Network Security Lab
2 // Assignment 5
3 // Onkar Gavali
4 // 2019BTECS00037
5 // Batch B2
6 // This program implements the Columnar Cipher
7 #include <iostream>
8 #include <map>
9 #include <vector>
10 #include <iomanip>
11 using namespace std;
12
13 char upper(char c){
14     if(c>='a' && c<='z') return 'A'+c-'a';
15     return c;
16 }
17 string encrypt(string plainText, string key){
18     string cipherText{};
19     map<char,string> columnar;
20
21     for(size_t i = 0, j=0; i < plainText.size(); i++, j=(j+1)%key.size()){
22         if(plainText[i]==' '){
23             j--;
24             continue;
25         }
26         columnar[key[j]]+=upper(plainText[i]);
27     }
28     for(auto a:columnar){
29         cipherText+=a.second;
30     }
31     return cipherText;
32 }
33
34 int main() {
35     string text{};
36     string key{};
37
38     char patternChar = '-';
39     char resetChar = ' ';
40     int lineWidth = 90;
41     int initialWidth = 50;
42
43     cout << setfill(patternChar) << setw(lineWidth) << patternChar << endl;
44     cout << setfill(resetChar);
45     cout << setw(initialWidth) << "Columnar Cipher" << endl;
46     cout << setfill(patternChar) << setw(lineWidth) << patternChar << endl;
47     cout << setfill(resetChar);
48
49     cout << "Enter text: ";
```

```
51     getline(cin, text);
52
53     cout << " Encryption:" << endl;
54
55     if(choice == 1){
56         string encryptedText = encrypt(text, key);
57         cout << "\nEncrypted Text: " << encryptedText << endl;
58     }else {
59         cout << "Invalid choice..." << endl;
60         cout << "Program Terminated." << endl;
61     }
62
63     return 0;
64 }
```

Output



```
F:\Academics\4th 7th\C&NS Lab\columnarCipher.exe
-----
Columnar Cipher
-----
Enter text: the world is big
Enter the key: abcd
Encryption:
Encrypted Text: TOIGHRSELBWDI
-----
Process exited after 9.631 seconds with return value 0
Press any key to continue . . .
```