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CIS 4362
Exercise 3

Report

I implemented the 3 programs (frequency, nibble substitution, transposition) primarily using get and getline commands to read in the input file and storing the input into char or string vectors. Then for nibble substitution and transposition, I read in the keys and stored them using similar methods as used for the input files, than using for-loops and simple algorithms I made, I either sorted it according to the transposition key or substituted according to the nibble key. The most "buggy" program would be the transposition one, and the one that had no known bugs was the frequency program. One major hurdle was being able to implement all 3 programs in my main at once, which ended up to creating segmentation faults. I solved this problem by having the transposition and nybble programs create their respective outputs files, which can used as input files for the other 2 programs. All proper compilation instructions and known bugs are listed in the README.txt.

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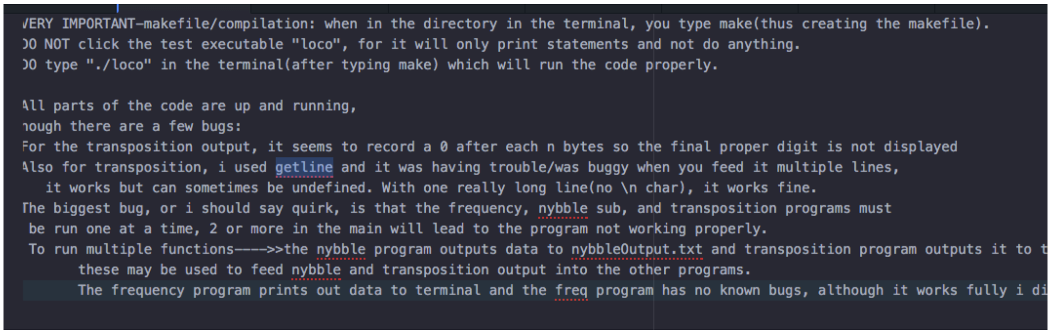
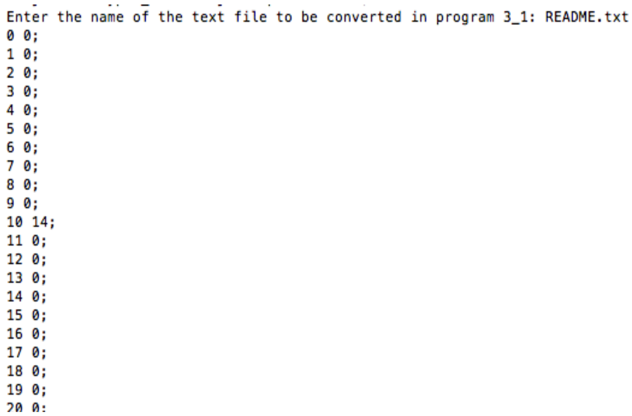
Frequency Only Program: tested on README.txt for Exercise 3

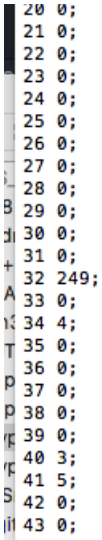


```
VERY IMPORTANT—makefile/compilation: when in the directory in the terminal, you type make(thus creating the makefile).
DO NOT click the test executable "loco", for it will only print statements and not do anything.
DO type "./loco" in the terminal(after typing make) which will run the code properly.

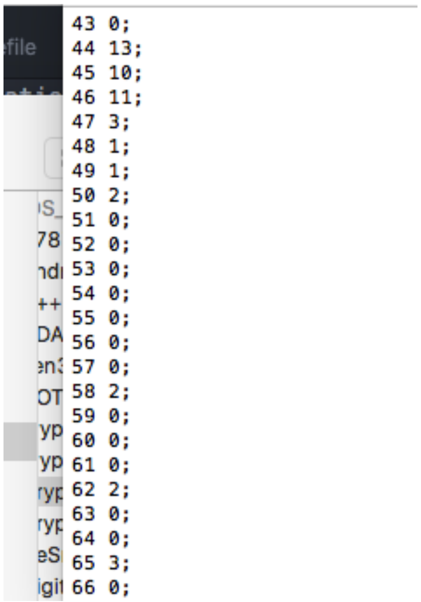
All parts of the code are up and running,
hough there are a few bugs:
For the transposition output, it seems to record a 0 after each n bytes so the final proper digit is not displayed
Also for transposition, i used getline and it was having trouble/was buggy when you feed it multiple lines,
   it works but can sometimes be undefined. With one really long line(no \n char), it works fine.
The biggest bug, or i should say quirk, is that the frequency, nybble sub, and transposition programs must
 be run one at a time, 2 or more in the main will lead to the program not working properly.
 To run multiple functions---->>the nybble program outputs data to nybbleOutput.txt and transposition program outputs it to t
      these may be used to feed nybble and transposition output into the other programs.
      The frequency program prints out data to terminal and the freq program has no known bugs, although it works fully i di
```



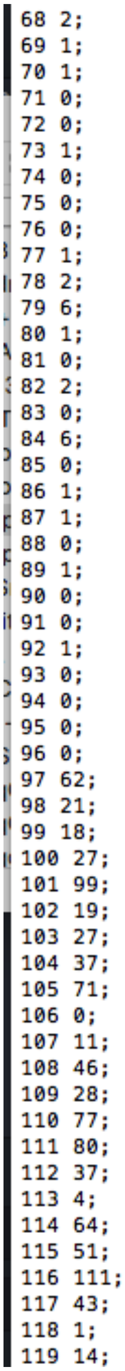
```
Enter the name of the text file to be converted in program 3_1: README.txt
0 0;
1 0;
2 0;
3 0;
4 0;
5 0;
6 0;
7 0;
8 0;
9 0;
10 14;
11 0;
12 0;
13 0;
14 0;
15 0;
16 0;
17 0;
18 0;
19 0;
20 0;
```



```
20 0;
21 0;
22 0;
23 0;
24 0;
25 0;
26 0;
27 0;
28 0;
29 0;
30 0;
31 0;
32 249;
33 0;
34 4;
35 0;
36 0;
37 0;
38 0;
39 0;
40 3;
41 5;
42 0;
43 0;
```



```
43 0;
44 13;
45 10;
46 11;
47 3;
48 1;
49 1;
50 2;
51 0;
52 0;
53 0;
54 0;
55 0;
56 0;
57 0;
58 2;
59 0;
60 0;
61 0;
62 2;
63 0;
64 0;
65 3;
66 0;
```



```
68 2;
69 1;
70 1;
71 0;
72 0;
73 1;
74 0;
75 0;
76 0;
77 1;
78 2;
79 6;
80 1;
81 0;
82 2;
83 0;
84 6;
85 0;
86 1;
87 1;
88 0;
89 1;
90 0;
91 0;
92 1;
93 0;
94 0;
95 0;
96 0;
97 62;
98 21;
99 18;
100 27;
101 99;
102 19;
103 27;
104 37;
105 71;
106 0;
107 11;
108 46;
109 28;
110 77;
111 80;
112 37;
113 4;
114 64;
115 51;
116 111;
117 43;
118 1;
119 14;
```

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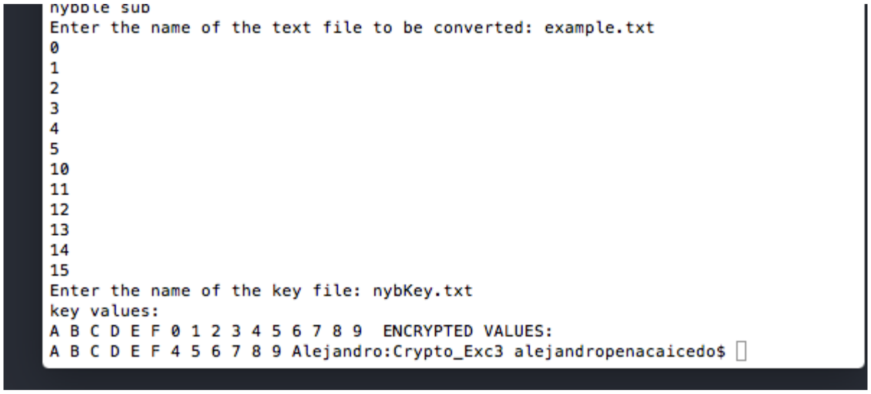
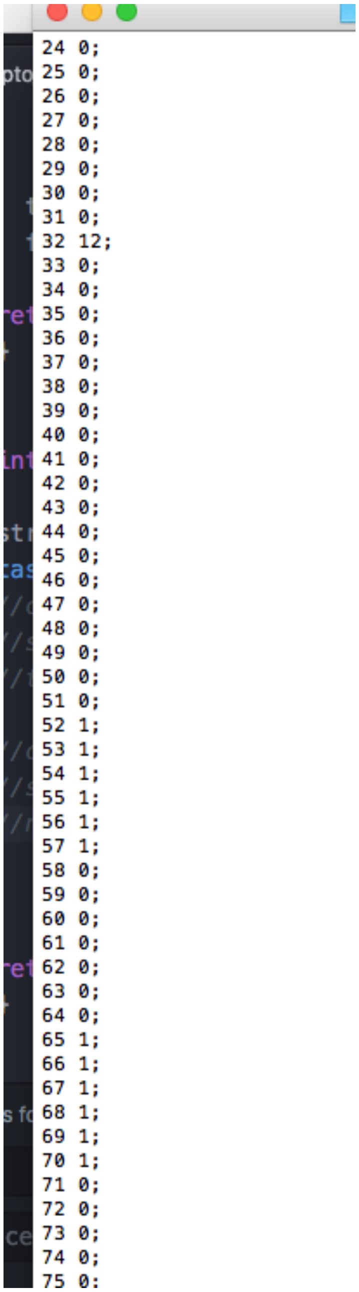
Nybble Substitution Followed By Frequency Program-3 Files

Nybble File 1 test



```
nybble sub
Enter the name of the text file to be converted: example.txt
0
1
2
3
4
5
10
11
12
13
14
15
Enter the name of the key file: nybKey.txt
key values:
A B C D E F 0 1 2 3 4 5 6 7 8 9  ENCRYPTED VALUES:
A B C D E F 4 5 6 7 8 9 Alejandro:Crypto_Exc3 alejandropenacaicedo$ 
```



```
24 0;
25 0;
26 0;
27 0;
28 0;
29 0;
30 0;
31 0;
32 12;
33 0;
34 0;
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 0;
49 0;
50 0;
51 0;
52 1;
53 1;
54 1;
55 1;
56 1;
57 1;
58 0;
59 0;
60 0;
61 0;
62 0;
63 0;
64 0;
65 1;
66 1;
67 1;
68 1;
69 1;
70 1;
71 0;
72 0;
73 0;
74 0;
75 0;
```

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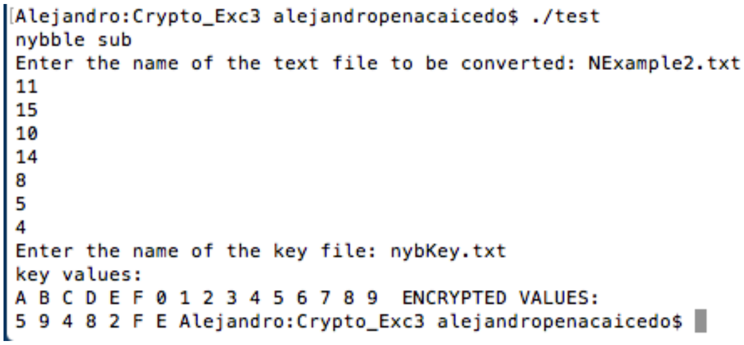
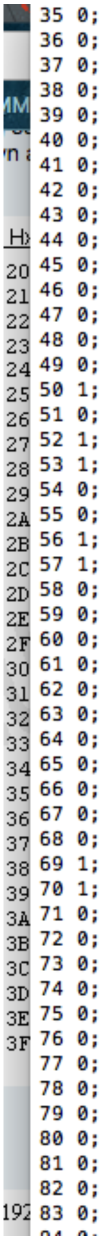
Exercise 3
Nybble File 2 Test



```
Alejandro:Crypto_Exc3 alejandropenacaicedo$ ./test
nybble sub
Enter the name of the text file to be converted: NExample2.txt
11
15
10
14
8
5
4
Enter the name of the key file: nybKey.txt
key values:
A B C D E F 0 1 2 3 4 5 6 7 8 9  ENCRYPTED VALUES:
5 9 4 8 2 F E Alejandro:Crypto_Exc3 alejandropenacaicedo$ 
```



```
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 0;
49 0;
50 1;
51 0;
52 1;
53 1;
54 0;
55 0;
56 1;
57 1;
58 0;
59 0;
60 0;
61 0;
62 0;
63 0;
64 0;
65 0;
66 0;
67 0;
68 0;
69 1;
70 1;
71 0;
72 0;
73 0;
74 0;
75 0;
76 0;
77 0;
78 0;
79 0;
80 0;
81 0;
82 0;
83 0;
```

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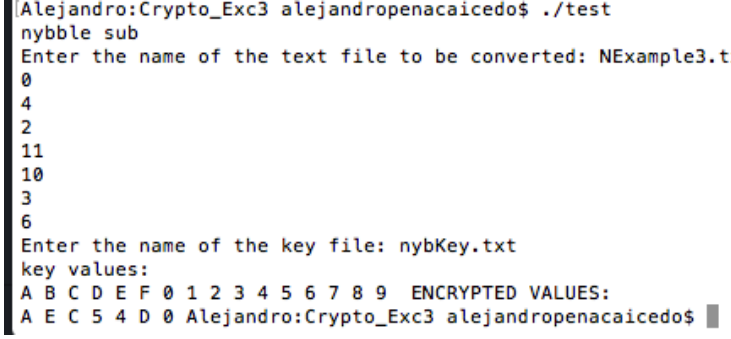
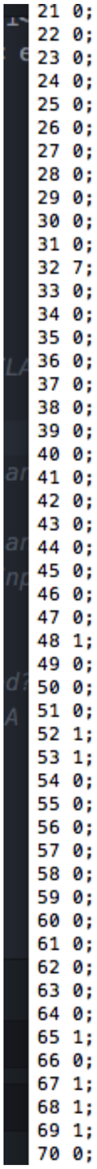
Exercise 3
Nybble File 3 Test



```
Alejandro:Crypto_Exc3 alejandropenacaicedo$ ./test
nybble sub
Enter the name of the text file to be converted: NExample3.txt
0
4
2
11
10
3
6
Enter the name of the key file: nybKey.txt
key values:
A B C D E F 0 1 2 3 4 5 6 7 8 9  ENCRYPTED VALUES:
A E C 5 4 D 0 Alejandro:Crypto_Exc3 alejandropenacaicedo$
```



```
21 0;
22 0;
23 0;
24 0;
25 0;
26 0;
27 0;
28 0;
29 0;
30 0;
31 0;
32 7;
33 0;
34 0;
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 1;
49 0;
50 0;
51 0;
52 1;
53 1;
54 0;
55 0;
56 0;
57 0;
58 0;
59 0;
60 0;
61 0;
62 0;
63 0;
64 0;
65 1;
66 0;
67 1;
68 1;
69 1;
70 0;
```

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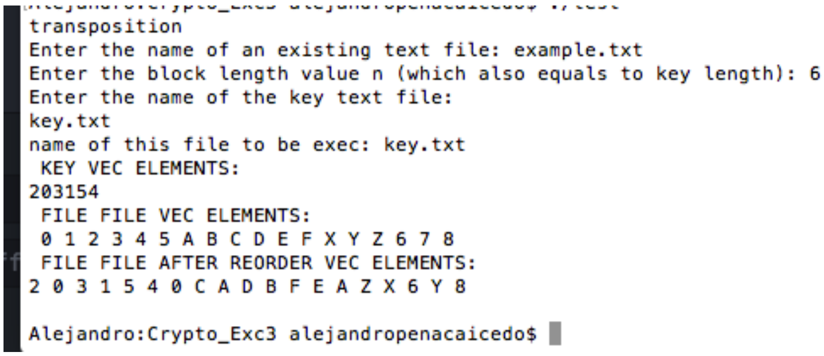
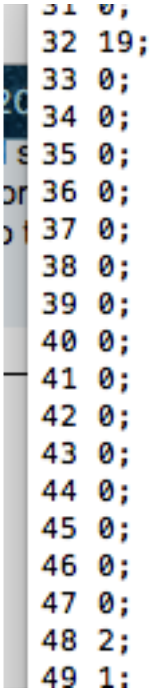
Transposition Followed By Frequency Program-3 Files

Transposition File 1 Test

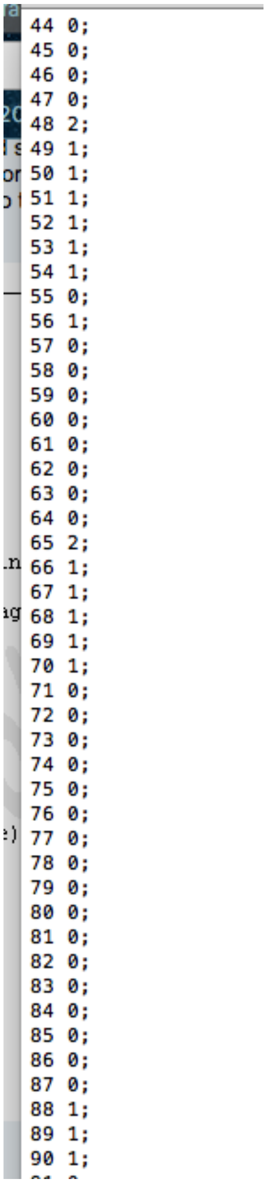


```
Alejandro:Crypto_Exc3 alejandropenacaicedo$ ./test
transposition
Enter the name of an existing text file: example.txt
Enter the block length value n (which also equals to key length): 6
Enter the name of the key text file:
key.txt
name of this file to be exec: key.txt
 KEY VEC ELEMENTS:
203154
 FILE FILE VEC ELEMENTS:
 0 1 2 3 4 5 A B C D E F X Y Z 6 7 8
 FILE FILE AFTER REORDER VEC ELEMENTS:
2 0 3 1 5 4 0 C A D B F E A Z X 6 Y 8

Alejandro:Crypto_Exc3 alejandropenacaicedo$ 
```



```
31 0;
32 19;
33 0;
34 0;
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 2;
49 1;
```



```
44 0;
45 0;
46 0;
47 0;
48 2;
49 1;
50 1;
51 1;
52 1;
53 1;
54 1;
55 0;
56 1;
57 0;
58 0;
59 0;
60 0;
61 0;
62 0;
63 0;
64 0;
65 2;
66 1;
67 1;
68 1;
69 1;
70 1;
71 0;
72 0;
73 0;
74 0;
75 0;
76 0;
77 0;
78 0;
79 0;
80 0;
81 0;
82 0;
83 0;
84 0;
85 0;
86 0;
87 0;
88 1;
89 1;
90 1;
```

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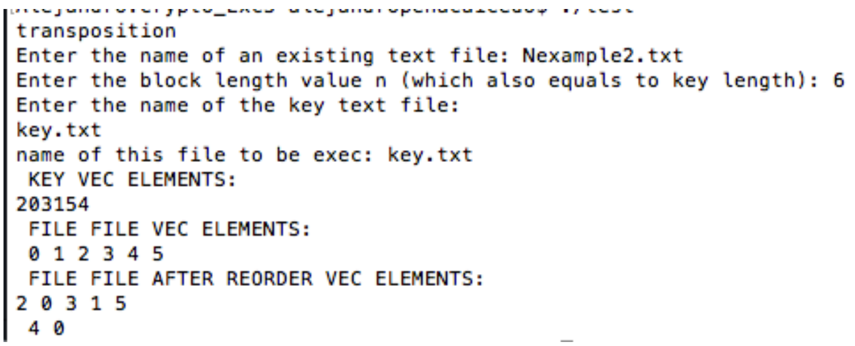
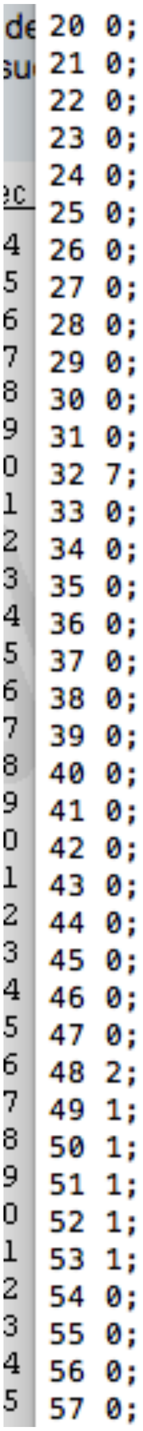
Transposition File 2 Test



```
transposition
Enter the name of an existing text file: Nexample2.txt
Enter the block length value n (which also equals to key length): 6
Enter the name of the key text file:
key.txt
name of this file to be exec: key.txt
 KEY VEC ELEMENTS:
203154
 FILE FILE VEC ELEMENTS:
 0 1 2 3 4 5
 FILE FILE AFTER REORDER VEC ELEMENTS:
2 0 3 1 5
 4 0
```



```
20 0;
21 0;
22 0;
23 0;
24 0;
25 0;
26 0;
27 0;
28 0;
29 0;
30 0;
31 0;
32 7;
33 0;
34 0;
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 2;
49 1;
50 1;
51 1;
52 1;
53 1;
54 0;
55 0;
56 0;
57 0;
```

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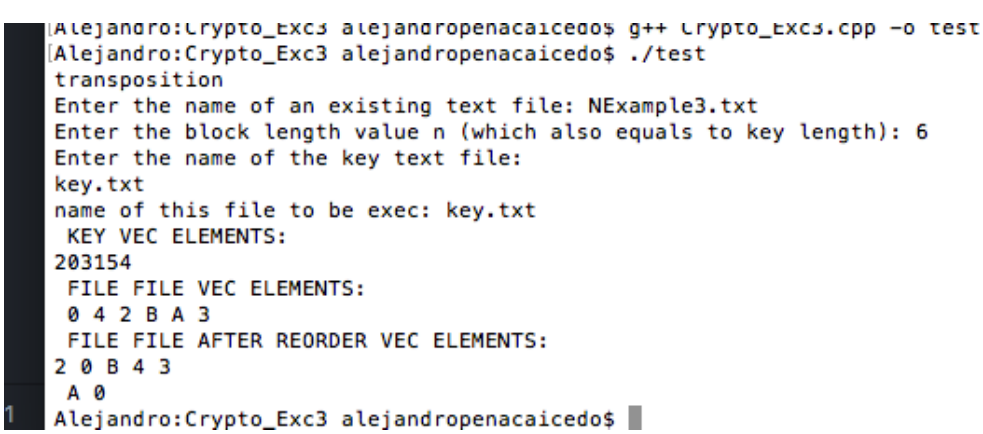
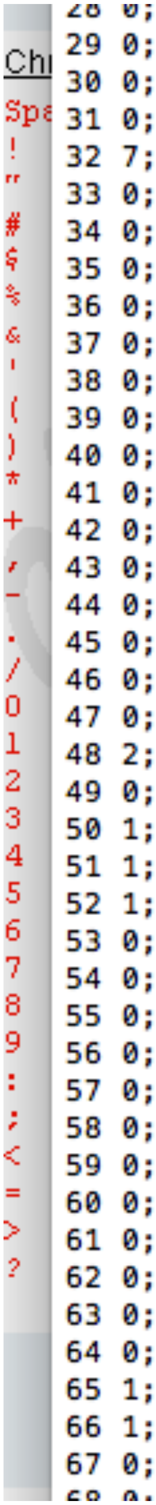
Transposition File 3 Test



```
Alejandro:Crypto_Exc3 alejandropenacaicedo$ g++ Crypto_Exc3.cpp -o test
Alejandro:Crypto_Exc3 alejandropenacaicedo$ ./test
transposition
Enter the name of an existing text file: NExample3.txt
Enter the block length value n (which also equals to key length): 6
Enter the name of the key text file:
key.txt
name of this file to be exec: key.txt
 KEY VEC ELEMENTS:
203154
 FILE FILE VEC ELEMENTS:
 0 4 2 B A 3
 FILE FILE AFTER REORDER VEC ELEMENTS:
2 0 B 4 3
 A 0
Alejandro:Crypto_Exc3 alejandropenacaicedo$
```



```
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```
28 0;
29 0;
30 0;
31 0;
32 7;
33 0;
34 0;
35 0;
36 0;
37 0;
38 0;
39 0;
40 0;
41 0;
42 0;
43 0;
44 0;
45 0;
46 0;
47 0;
48 2;
49 0;
50 1;
51 1;
52 1;
53 0;
54 0;
55 0;
56 0;
57 0;
58 0;
59 0;
60 0;
61 0;
62 0;
63 0;
64 0;
65 1;
66 1;
67 0;
68 0;
```