Source File: `~/1337/16/lab16.(C|CPP|cpp|c++|cc|cxx|cp)`
Input: Under control of `main` function
Output: Under control of `main` function
Value: 1

Write a function that receives a four-digit `unsigned int` as its argument. The function should return a new `unsigned int` as follows: Replace each digit by ((digit + 7) mod 10). Then looking at the number from the left, swap the first digit with the third, swap the second digit with the fourth, and return the new number.

A sample `main` function for testing your function is shown in Figure 1 and a sample execution sequence is shown in Figure 2.

```
1  #include <iostream>
2  #include <iomanip>
3
4  using namespace std;
5
6  // Function encrypt receives a four-digit integer abcd and returns a
7  // new integer as follows: Replace each digit of abcd by ((digit + 7) mod
8  // 10). Then looking at the number from the left, swap the first digit
9  // with the third, swap the second digit with the fourth, and return the
10 // new number.
11 unsigned int encrypt(unsigned int abcd);
12
13 // Function printLine writes n hyphens to output stream out
14 void printLine(ostream& out, int n);
15
16 int main()
17 {
18   unsigned int num;
19
20   printLine(cout, 23);
21   cout << "Original      Encrypted" << endl
22        << " Number        Number  " << endl;
23   printLine(cout, 23);
24
25   while (cin >> num)
26   {
27     cout << setw(8) << num << setw(6) << " "
28          << setw(9) << encrypt(num) << endl;
29   }
30
31   printLine(cout, 23);
32
33   return 0;
34 }
35
```

Figure 1. `/usr/local/1337/src/lab16main.C` (Part 1 of 2)

```
36 void printLine(ostream& out, int n)
37 {
38   char ch = out.fill();
39   out << setfill('-') << setw(n) << "-" << setfill(ch) << endl;
40   return;
41 }
```

Figure 1. `/usr/local/1337/src/lab16main.C` (Part 2 of 2)

```
1  newuser@csunix ~> cd 1337
2  newuser@csunix ~/1337> mkdir 16
3  newuser@csunix ~/1337> cd 16
4  newuser@csunix ~/1337/16> cp /usr/local/1337/data/16/* .
5  newuser@csunix ~/1337/16> cp /usr/local/1337/src/lab16main.C .
6  newuser@csunix ~/1337/16> touch lab16.cpp
7  newuser@csunix ~/1337/16> # Edit lab16.cpp
8  newuser@csunix ~/1337/16> g++ -g -Wall -std=c++11 -c lab16main.C
9  newuser@csunix ~/1337/16> g++ -g -Wall -std=c++11 -c lab16.cpp
10 newuser@csunix ~/1337/16> g++ -o lab16 lab16main.o lab16.o
11 newuser@csunix ~/1337/16> cat 01.dat | ./lab16
12 ------------------------
13 Original      Encrypted
14  Number        Number
15 ------------------------
16     6254           2139
17     1331            880
18     1341           1880
19     1351           2880
20     1361           3880
21     1362           3980
22     2305           7290
23     2311           8890
24     3302           7900
25     3324           9100
26     3344           1100
27     4301           7810
28     4302           7910
29     4316           8310
30     4318           8510
31     9876           4365
32     9999           6666
33 ------------------------
34 newuser@csunix ~/1337/16> cat 01.dat | ./lab16 > my.out
35 newuser@csunix ~/1337/16> diff 01.out my.out
36 newuser@csunix ~/1337/16>
```

Figure 3. Commands to Compile, Link, & Run Lab 16