2. Encryption

Program Name: Encryption.java **Input File: encryption.dat**

The Texas Gnome Eatery does most of its sales with credit cards. In an effort to secure their data during transmission to their financial headquarters, they encrypt the 16 digit credit card numbers by using this algorithm:

- For each digit `d`, substitute `d = (d + 7) mod 10`.
- Divide the new digits into four groups of four digits:
  - For each group of four digits, interchange the first and third digits.
  - For each group of four digits, interchange the second and fourth digits.

You are to write a program that will encrypt the 16 digit credit card numbers as described above and print the resulting 16 digit number.

Input
The first line of input will contain a single integer `n` that indicates the number of credit card numbers to follow. Each of the following `n` lines will contain a 16 digit credit card number.

Output
For each credit card number input, print the encrypted number.

Example Input File

```
3
1234567890123456
4536278290123476
7685438920456431
```

Example Output to Screen

```
0189452389672301
0312599489674301
5243561012970831
```