String Functions

Problem ID: p05stringfunctions

Write a program which allows the user to repeatedly input one character, denoting one of three possible functions to execute, followed by a string which is used as an argument in the function call. The loop is run until the character input is `"q"`.

The three possible functions that the user should be able to run are:

1. For input character `"c"`, the function `collect_digits(a_str)`: This function takes a string, `a_str`, as an argument and returns a string which contains the digits from `a_str`.
2. For input character `"i"`, the function `inverse_case(a_str)`: This function takes a string, `a_str`, as an argument and returns a string in which upper case letters in `a_str` are replaced with lower case letters, and vice versa. It is NOT allowed to use the built-in function `swapcase` for this task.
3. For input character `"h"`, the function `to_hex(an_int)`: This function takes an integer, `an_int`, as an argument and returns a string which is the hexadecimal representation of `an_int`. It is NOT allowed to use the built-in function `hex` for this task.

The resulting string from the function calls should be printed out.
Hint: Converting an integer to hex has been discussed in the course "Tölvuhögun". Information about the method can also be found on the Internet.

Input

The program should repeatedly read a line, one character, denoting the function to call. If the line is the string `"q"`, the program should quit immediately. Otherwise the program should read another line as a string and call the appropriate function on it.

Formally, the input consists of $2n - 1$ lines, where $n \geq 1$. Line no. $2i - 1$, $i \geq 1$, contains one character from the set `{"c", "i", "h", "q"}`. If line no. $2i - 1$, $i \geq 1$, is not the character `"q"`, then line no. $2i$ contains one string. If line no. $2i - 1$, $i \geq 1$, is the character `"h"`, then line no. $2i$ contains a string s, which only contains digits, where $1 \leq |s| \leq 5$, otherwise s consists of a sequence of alphanumeric letters, where $1 \leq |s| \leq 20$.

Note: Your program is not supposed to validate this input, or refuse other input.

Output

For each input pair of a character and a string (except when the character is `"q"`), the output is a string which is the result of the function that was called.

Sample Input 1	Sample Output 1
c a1b2c3 i prOGramMinG h 16 q	123 PRogRAMmINg 10

Sample Input 2

```
c
abc
i
123
h
15
h
1
i
abcDEF
c
23ab45cd67
h
4567
q
```

Sample Output 2

```
123
F
1
ABCdef
234567
11D7
```

Sample Input 3

```
q
```

Sample Output 3