N-th Fibonacci Number

Exercise

Write a program that reads a number N and prints the N-th Fibonacci number, computed using the *Binet's formula*:

$$F_N = \frac{\phi^N - (-\phi)^{-N}}{\sqrt{5}}$$

where:

$$\phi = \frac{1 + \sqrt{5}}{2}$$

Hint: round to the closest integer

Example

Input	Output
`10`	`55`

Count occurrences

Exercise

Write a C program that takes in input a string S (it might contain spaces, length at most 40 chars) and a char c. The program prints the number of occurrences of c in S.
Note: the program is case sensitive, i.e., lower case is different from upper case.

Example

Input	**Output**
Hello World o	2

Reverse

Exercise

Write a C program that takes in input a string S (at most 40 chars, containing spaces) and prints the string in reverse order.

BONUS: can you do it *in place*, that is without allocating/using extra space, but just modifying the original string?

Example

Input	**Output**
Stringa invertita	atitrevni agnirtS

Palindrome

Exercise

Write a program that reads a word and prints 1 if the word is palindrome, 0 otherwise. A word is palindrome if that reads the same backward and forward.

Assumption: word has length of at most 40 chars

Example

Input	**Output**
`ingegni`	`1`

Palindrome first

Exercise

Write a program that reads an integer N and then N words (one per line). The program prints first all palindrome words (in the same order they have been inserted) and then all the others (again in the same order they have been inserted).

Assumption: each word has length of at most 40 chars.
Hint: to dynamically allocate an array of strings:

- first allocate an array of `char *`;
- for each position of the array, allocate memory to store a single string.

Example

Input

```
5
anna
prova
otto
ingegni
ciao
```

Output

```
anna
otto
ingegni
prova
ciao
```

Str3cat

Exercise

Write a function `str3cat` that takes three strings (each one of at most 40 chars) and returns a new string obtained by concatenating the three strings, separated by a space. Write then a program that reads 3 strings; then, it first prints them, and then the result of `str3cat` applied to them.

Example

Input	Output

`ciao`
`a`
`tutti`
	`ciao`
	`a`
	`tutti`
	`ciao a tutti`

From number to string

Exercise

Write a program, that reads a number N between 20 and 89 and prints its value expressed as a string.

Example

Input	Output
`23`	`twentythree`

Input	Output
`81`	`eightyone`