

C++ Fundamentals – Regular Exam – 10 December 2023

Please submit your source code to all below-described problem in [Judge](#).

3. Train Composition

Let's have a train! The train consists of wagons, which can have content in them, or can be empty.

We need to make a program, which will allow shuffling the contents of our wagons. Your program must read the train's composition, and then process each command, printing out the train composition after each command.

The input is the following:

- First: the train composition is the content of each wagon:
 - Each wagon's contents are given on a separate line, describing the contents of the wagon;
 - If the line reads "empty", then the wagon is empty.
 - If the line reads "end", then this is not a wagon, but the end of our train, so we're done with the reading the wagons' contents.
- Then: we start processing commands. Each command is on a separate line and can have parameters!

Here's the list of the commands:

- P** – print the current train structure:
 - We start with '|', then we print the contents of each wagon, followed by another '|'
- M oldWagonPosition newWagonPosition**
 - Move the wagon at position oldWagonPosition to the newWagonPosition.
 - The moving happens as in the real world: the locomotive pulls the wagon from position oldWagonPosition, then pushes it in a way to become at the newWagonPosition.
- L wagonPosition**: leave the wagon at position wagonPosition at the station (e.g., remove the wagon from the train)
- E**: end
 - The last command, we're done with the commands processing.
 - Note**: after this command we do not print out the contents of the train!

Hints:

- You will never be given an empty train, or commands, which will lead to train becoming empty.

Examples

Input	Output	Explanation
wool empty empty UA coal empty sea salt empty end		Our train has 7 wagons. The first has wool, then we have two empty wagons, then one of "UA coal", then one empty, then one of "sea salt", then one empty, then we reach the end of the train. After reading, the train has the following structure: wool UA coal sea salt
P	wool UA coal sea salt	The command prints out the current train structure.

Input	Output	Explanation
M 2 1	wool UA coal sea salt	We're moving the empty wagon from position 2 to the beginning of the train on position 1.
M 4 2	UA coal wool sea salt	We're moving the 4 th wagon on position 2.
L 1	UA coal wool sea salt	We're leaving the wagon 1 (the empty one) at the station. Now our train has 6 wagons.
M 6 1	UA coal wool sea salt	Move the 6 th wagon in the beginning of the train.
E		That's it, no printing here. We're done!

Input	Output	Explanation
coal ore empty livestock grain end		Our train has 5 wagons. After reading all, the train has the following structure: coal ore livestock grain
P	coal ore livestock grain	The command prints out the current train structure.
M 2 3	coal ore livestock grain	We're moving the empty wagon from position 2 to position 3.
L 2	coal ore livestock grain	We're leaving wagon at position 2.
E		That's it!