# C++ Fundamentals – Regular Exam

# 15 December 2024

You have to submit your solution here: <https://judge.softuni.org/Contests/5427/CPlusPlus-Fundamentals-Regular-Exam-15-December-2025>

# 3. Train

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

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

### Examples

| **Input** | **Output** | **Comments** |
| --- | --- | --- |
| 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 |
| 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 4th 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 6th wagon in the beginning of the train |
| E |  | End of the program |

| **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 |  | End of the program |