

ED exercise for 2024.04.02

Art Gallery

HOW TO CHECK YOUR ANSWER

Send answers to ed.fdi.ucm.es/domjudge/team with your group name and password. Send a .cpp + any **official** .h header files it requires as an answer.

STATEMENT

You have just landed a job at a small art gallery. Automate it away with a program so that you can concentrate on appreciating the art itself, instead of doing all that boring work:

- `add <work> <artist> <price>` inserts a painting or sculpture into the system, or prints "ERROR: work already present" if the work is already present..
- `sell <work>` sells a work, removing it from the gallery. Prints "ERROR: no such work" if there was no such work available to sell.
- `best → <list-of-artists>` returns a list with all artists that have sold the best, as measured in sum-of-prices-of-sold-works. Order should be alphabetical.
- `oldest <k> → <list-of-works>` returns (up to) k works that have been in the system for the longest time (without being sold, of course), ordered from oldest to newest.

Input

The input will contain several independent blocks. In each block, lines will describe an operation with arguments separated by spaces. Blocks end with a line with the word **END**

Output

For each operation which returns something (note that some operations only generate output for errors), show the output in a line (with another line for each element of a list, prefixed with a single space, if output is of list format). Output a line with "---" after the end of each block.

Sample input and output

```
add Autorretrato Goya 150
add Las_meninas Velazquez 90
add La_metamorfosis Dali 45
add Fiesta_en_Figueras Dali 45
sell La_metamorfosis
add La_venus_del_espejo Velazquez 120
sell Fiesta_en_Figueras
best
oldest 2
sell Las_meninas
best
add Biarritz Sorolla 80
add El_pie_herido Sorolla 50
sell Autorretrato
best
add La_rendicion_de_Breda Velazquez 130
add Cosiendo_la_veda Sorolla 70
add Aquelarre Goya 100
sell El_pie_herido
add La_metamorfosis Dali 90
oldest 10
sell La_metamorfosis
best
END
add Autorretrato Goya 150
sell Las_meninas
best
END
```

```
best:
Dali
oldest:
Autorretrato
Las_meninas
best:
Dali
Velazquez
best:
Goya
oldest:
La_venus_del_espejo
Biarritz
La_rendicion_de_Breda
Cosiendo_la_veda
Aquelarre
La_metamorfosis
best:
Dali
---
ERROR: no such work
best:
---
```

IMPORTANT

Extra credit: get more mileage from your submission

- **+2** – For *correctly* annotating methods with their **big-oh complexity**. You don't even need to implement the method: as long as the claimed complexity is achievable given your choice of private implementation, you get the credit.
- **+2** – For *correctly* using **const** and **pass-by-reference** whenever possible

Once your program works, ask the teacher to verify that it is indeed OK – and to sign attendance. If you do *not* visit the teacher, the teacher will think that you skipped class.

Your code MAY use std containers instead of the official ones. This is an exception to the general rule.