

# Composite and Visitor

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Considering the previous programs. We now want to create and to structure group of soldiers and so to be able to compose armies:

- An army can be composed by several soldiers groups, themselves decomposed in sub-groups.
- Each group has the same behavior than an soldier, ie he can hit or ward-off.
  - The strength of the group is the total sum of the strength of the elements.
  - For the defensive action, the strength of the shot to ward-off is spread on each group element (soldiers and sub-groups).
- To Add an equipment to a group is the same than to add an equipment at each element of the group.

## Exercise 1

Using the Composite pattern:

- Complete the previous design in the goal to add army concept.
- Give the sequence diagrams for:
  - Creation of a small army containing a group of two infantrymen and a group of two horsemen.
  - The call of the method `ward-off` for this army.
  - The call of the methods `hit` for this army.
- Implement this design in adding unitary tests.

## Exercise 2

Using the pattern Visitor:

1. Modify the architecture to be able to add a new functionality for all soldiers at the same time and that without using an explicit extension (inheritance or delegation).
2. Implement two different visitor: one to display members of an army, the other to count the number of infantrymen and horsemen in an army.