Structural

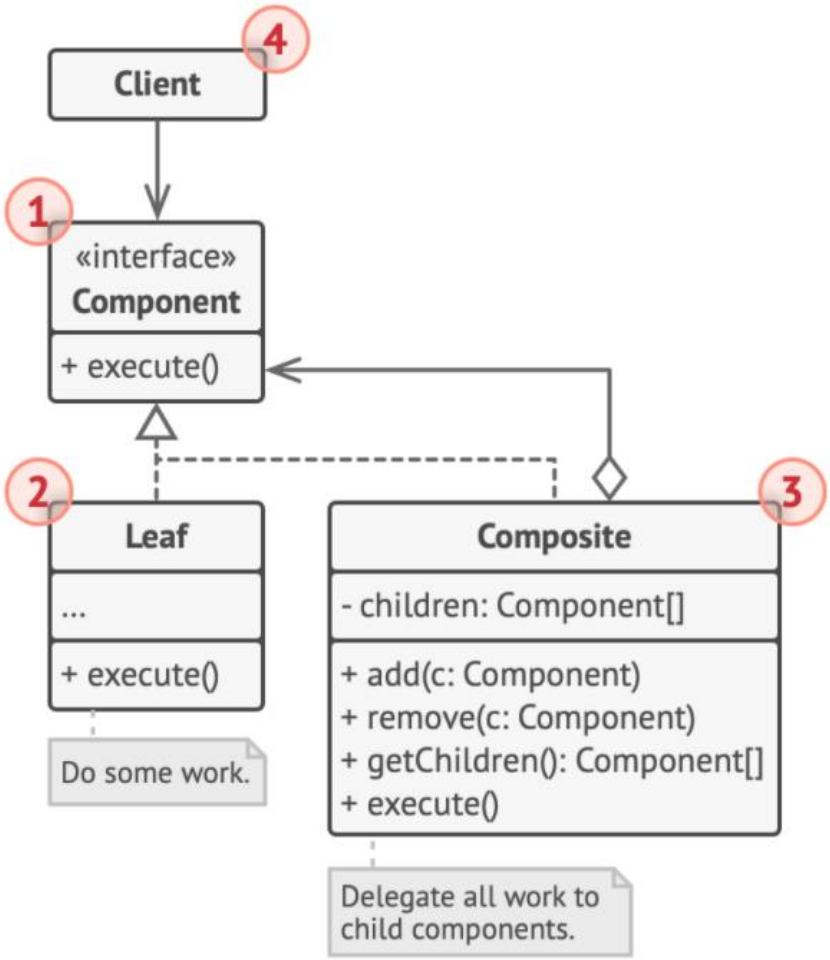
Composite

Composite is a structural design pattern that lets you compose objects into tree structures and then work with these structures as if they were individual objects.

Using the Composite pattern makes sense only when the core model of your app can be represented as a tree.

For example, imagine that you have two types of objects: `Products` and `Boxes`. A `Box` can contain several `Products` as well as a number of smaller `Boxes`. These little `Boxes` can also hold some `Products` or even smaller `Boxes`, and so on.

Structure



1. The **Component** interface describes operations that are common to both simple and complex elements of the tree.
2. The **Leaf** is a basic element of a tree that doesn't have sub-elements.

Usually, leaf components end up doing most of the real work, since they don't have anyone to delegate the work to.

3. The **Container** (aka *composite*) is an element that has sub-elements: leaves or other containers. A container doesn't know the concrete classes of its children. It works with all sub-elements only via the component interface.

   Upon receiving a request, a container delegates the work to its sub-elements, processes intermediate results and then returns the final result to the client.

4. The **Client** works with all elements through the component interface. As a result, the client can work in the same way with both simple or complex elements of the tree.

Code Structure: