Composite Design Pattern

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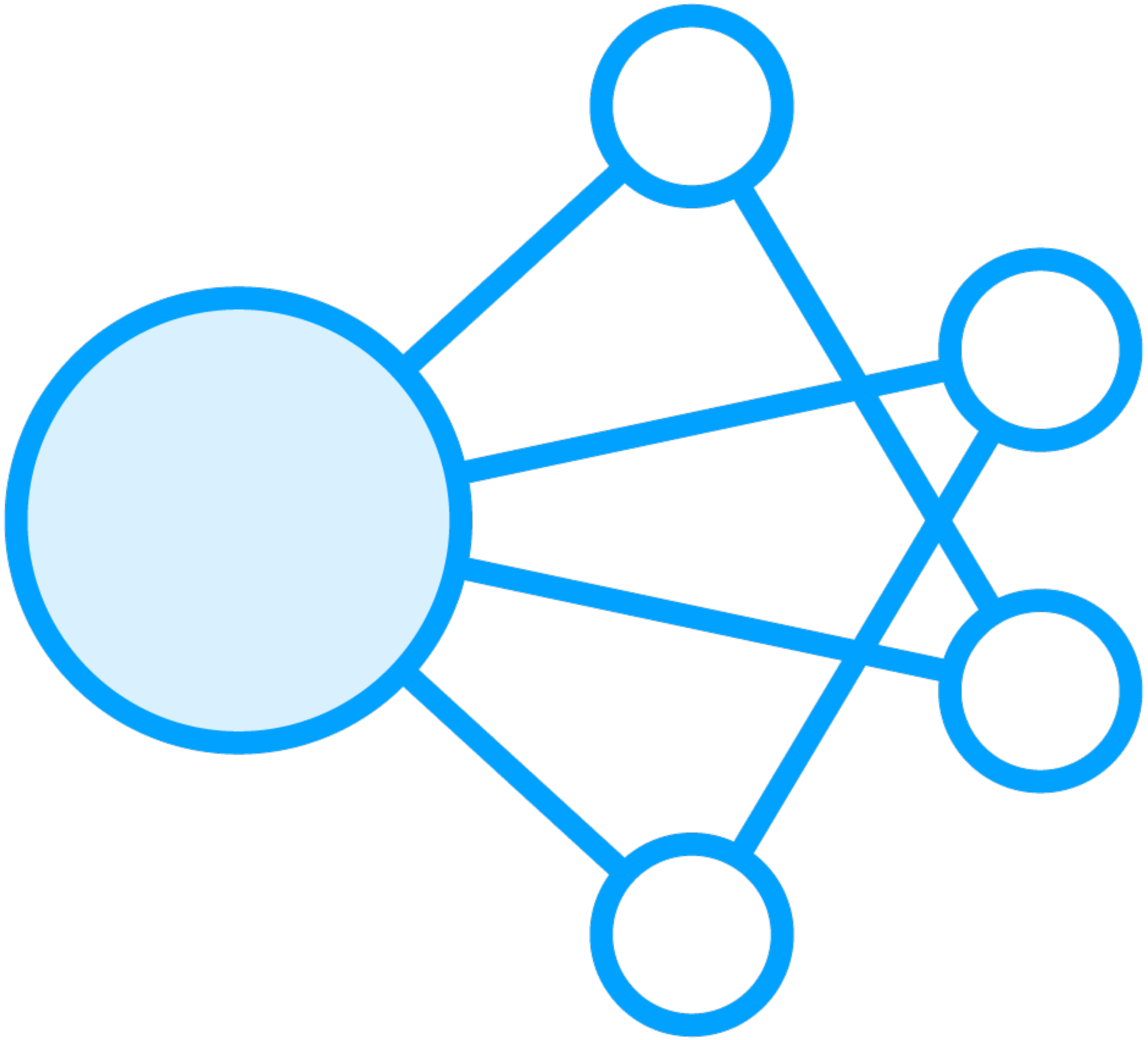
Composite



Concepts

Components represent part or whole structure

Compose objects into tree structures

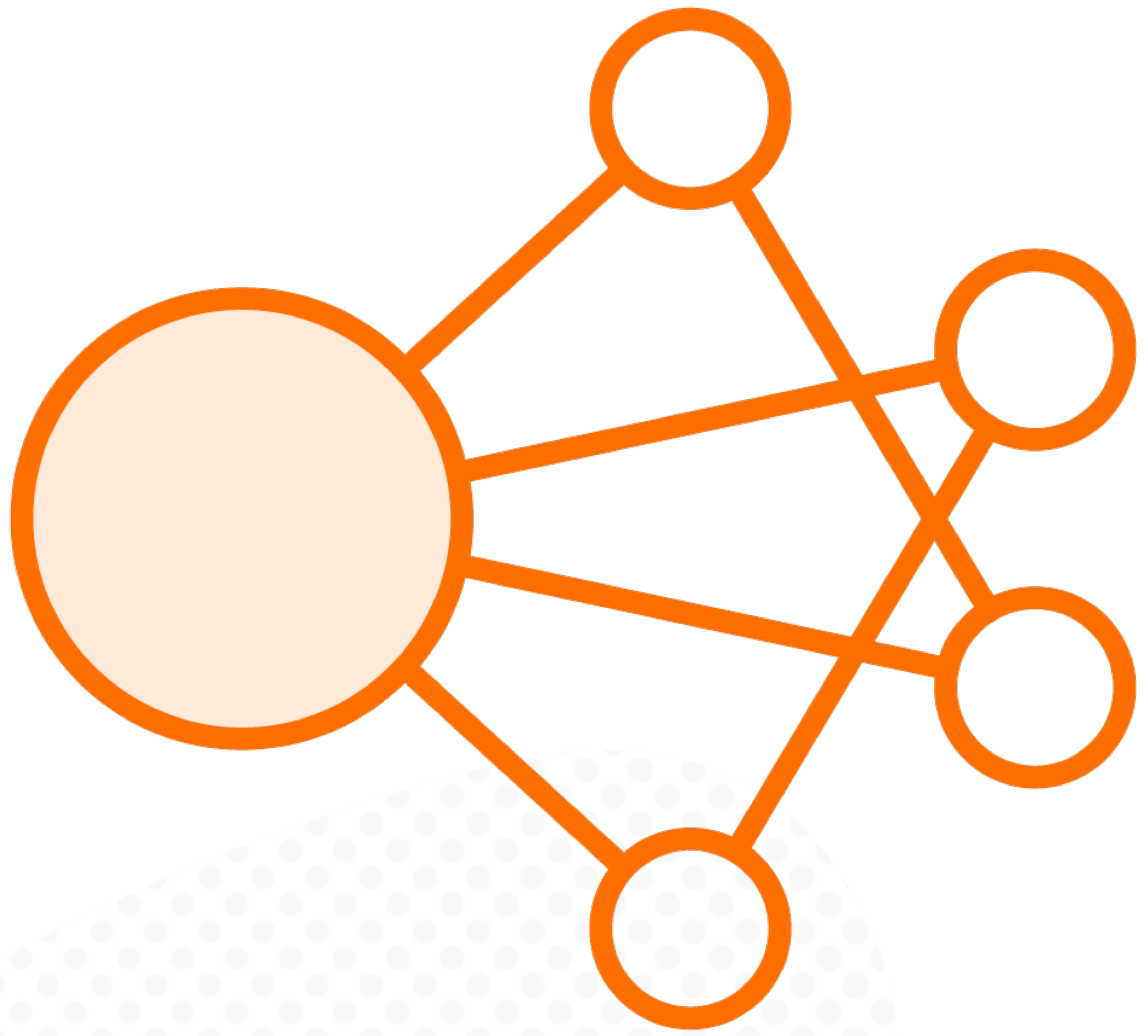
Individual object treated as a Composite

Same operations applied on individual and composites

Examples:

java.awt.Component

RESTful service GETs



Design

Tree structured

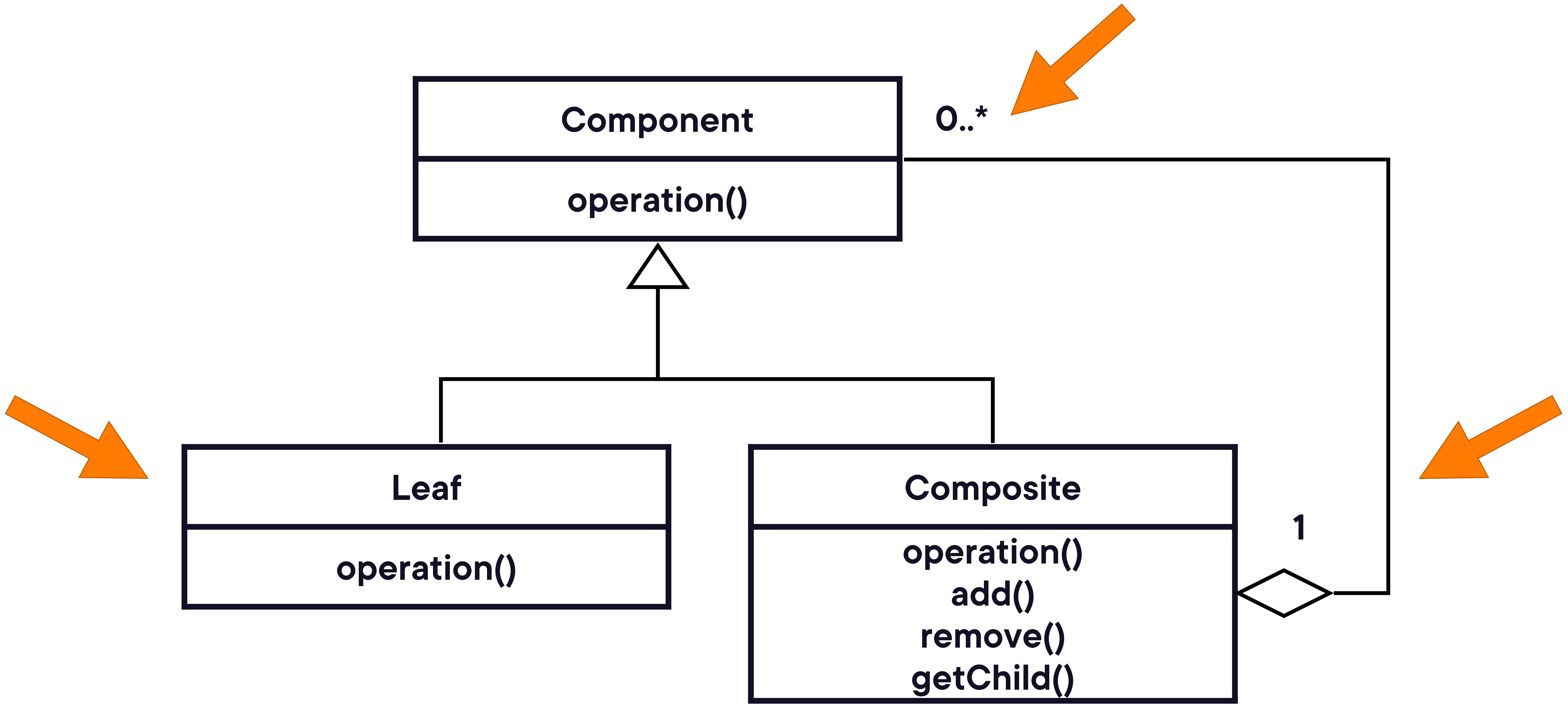
Component

Leaf or Composite, same operations

Composite knows about child objects

Component, Leaf, Composite

UML


Component
operation()
0..*
Leaf
operation()
Composite
operation()
add()
remove()
getChild()
1

Everyday Example - Map

```
Map<String, String> personAttributes = new HashMap<>();

personAttributes.put("site_role", “person");
personAttributes.put("access_role", "limited");

Map<String, String> groupAttributes = new HashMap<>();

groupAttributes.put("group_role", "claims");

Map<String, String> secAttributes = new HashMap<>();

secAttributes.putAll(personAttributes);
secAttributes.putAll(groupAttributes);
```

Exercise Composite

Menu, MenuItem, MenuComponent

Create Composite

Features Not Supported

Pitfalls

Can overly simplify system

Difficult to restrict

Implementation can be costly

Contrast

Composite	VS	Decorator
Tree structure		Contains another entity
Leaf and Composite same interface		Modifies behavior (adds)
Unity between objects		Doesn’t change underlying object

Composite Summary

Generalizes hierarchical structure

Can simplify things too much

Easier for clients

Composite != Composition