The Composite Pattern is a structural design pattern that allows you to compose objects into tree-like structures to represent part-whole hierarchies

* The **Component** interface declares the operation method.
* The **Leaf** class represents the leaf nodes, implementing the Component interface.
* The **Composite** class represents the composite nodes, managing their children and implementing the Component interface.
* The **Client** class demonstrates how the composite pattern can be used to create complex structures and perform operations on them.

*package* com.govtech.viswa.designpatterns.composite;

*import* java.util.ArrayList;
*import* java.util.*List*;

*/\*\*
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 \** ***@project*** *govtech
 \** ***@package*** *com.govtech.viswa.designpatterns.composite
 \** ***@class*** *Composite
 \*/

// Component
interface Component* {
 *void* operation();
}

*// Leaf
class* Leaf *implements Component* {
 *private* String name;

 *public* Leaf(String name) {
 *this*.name = name;
 }

 @Override
 *public void* operation() {
 System.*out*.println("Leaf: " + name + " - Operation performed");
 }
}

*// Composite
public class* Composite *implements Component* {
 *private List*<*Component*> children = *new* ArrayList<>();

 *public void* add(*Component* component) {
 children.add(component);
 }

 *public void* remove(*Component* component) {
 children.remove(component);
 }

 @Override
 *public void* operation() {
 System.*out*.println("Composite - Operation performed");
 *for* (*Component* component : children) {
 component.operation();
 }
 }
}

*// Client
class* Client {
 *public static void* main(String[] args) {
 *// Create leaf nodes* Leaf leaf1 = *new* Leaf("Leaf 1");
 Leaf leaf2 = *new* Leaf("Leaf 2");
 Leaf leaf3 = *new* Leaf("Leaf 3");

 *// Create composite node and add leaf nodes* Composite composite = *new* Composite();
 composite.add(leaf1);
 composite.add(leaf2);

 *// Create another composite node and add leaf and composite nodes* Composite composite2 = *new* Composite();
 composite2.add(leaf3);
 composite2.add(composite); *// Adding a composite node as a child

 // Perform operation on composite node* composite2.operation();
 }
}

Composite - Operation performed

Leaf: Leaf 3 - Operation performed

Composite - Operation performed

Leaf: Leaf 1 - Operation performed

Leaf: Leaf 2 - Operation performed