Deodorizing Primitive Obsession

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Implicit Tree

You implicitly form a tree structure, using a primitive representation, such as String.

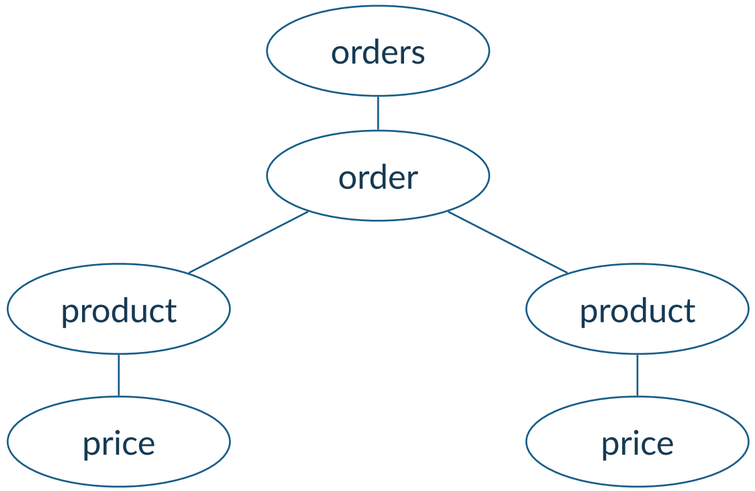
- Bloated code, difficult to work with
- Coupling between the code that builds the tree and how the tree is represented
- Issues related to primitive obsession

```
xml.append("<orders>");
for (int i=0; i < orders.getOrderCount(); i++) {
  Order order = orders.getOrder(i);
  xml.append("<order");
  xml.append(" id='");
  xml.append(order.getOrderId());
  xml.append("'>");
  for (int j=0; j < order.getProductCount(); j++) {
    Product product = order.getProduct(j);
    xml.append("<product");
    xml.append(" id='");
    xml.append(product.getID());
    xml.append("'");
    xml.append(" color='");
    xml.append (getColorFor(product));
    xml.append("'");
    if (product.getSize() != ProductSize.NOT _APPLICABLE) {
      xml.append(" size='");
      xml.append(getSizeFor(product));
      xml.append(“'");
    }
    xml.append(">");
    xml.append(“<price");
    xml.append(" currency=‘");
    xml.append(getCurrencyFor(product));
    xml.append (“'>");
    xml.append(product.getPrice());
    xml.append("</price>");
    xml.append(product.getName());
    xml.append("</product “);
  }
  xml.append(“</order>”);
}
xml.append("</orders>");
```

Implicit Tree

Data or code forms an implicit tree when it's not explicitly structured as a tree but may be represented as a tree.

```
String expectedResult =
  "<orders>" +
    "<order id='321'>" +
      "<product id='f1234' color='red' size= 'medium'>" +
        "<price currency='USD'>" +
          "8.95" +
        "</price>" +
        "Fire Truck" +
      "</product>" +
      "<product id='p1112' color='red'>" +
        "<price currency= 'USD'>" +
          "230.0" +
        "</price>" +
        "Toy Porsche Convertible" +
      "</product>" +
    "</order>" +
  "</orders>";
```



The code in the previous slide outputs strings representing XML data.

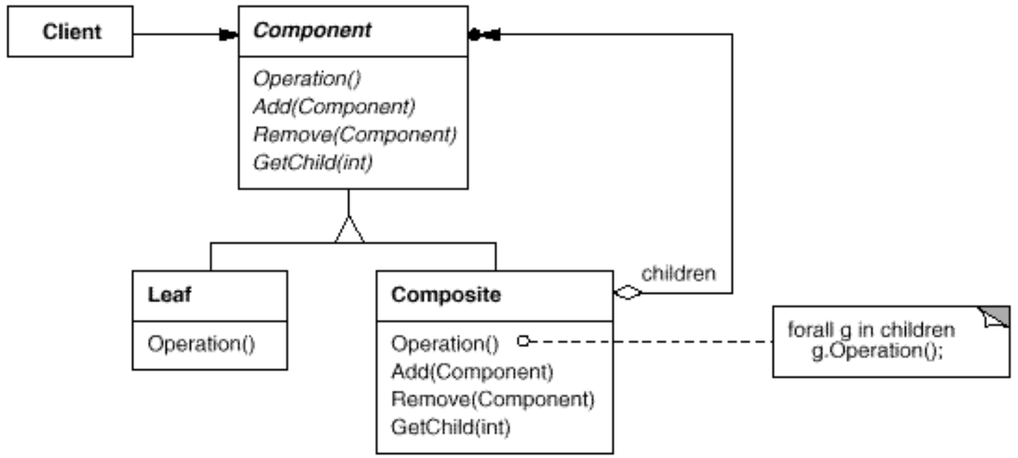
Tree structure of the XML data may be represented as a tree.

Composite

Compose objects into tree structures to represent part-whole hierarchies. Composite lets client treat individual objects and compositions of objects uniformly.

Motivation

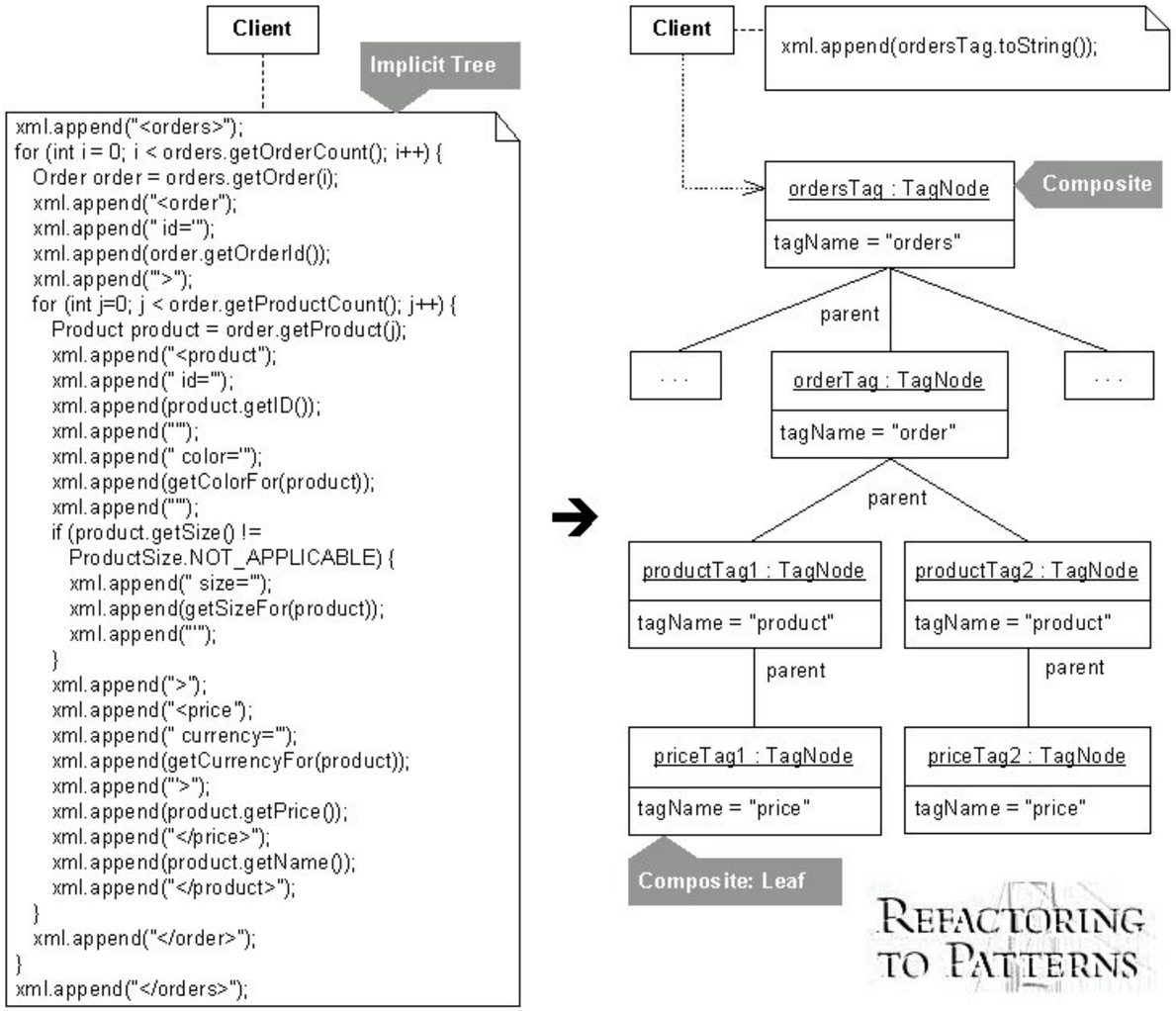
- Graphic application for building complex diagrams out of simple components.
- Application that manages tree-like object structures.



Applicability

- Representation of part-whole hierarchies of objects.
- Clients able to ignore the difference between composition of objects and individual objects.

Replace Implicit Tree with Composite



https://www.industriallogic.com/xp/refactoring/implicitTreeWithComposite.html
https://www.informit.com/articles/article.aspx?p=1398607&seqNum=5

Replace Implicit Tree with Composite

Benefits	Liabilities
Encapsulate repetitive instructions like formatting, adding, or removing nodes.	Complicates a design when its simpler to construct an implicit tree.
Provides a generalized way to handle a proliferation of similar logic.	
Simplifies construction responsibilities of a client.	

Replace Implicit Tree with Composite – Mechanics

1. Identify an **implicit leaf** and create a **leaf node** class by applying refactorings or TDD.

✓ Compile and test

2. Replace every occurrence of the implicit leaf with an instance of the leaf node.

✓ Compile and test that the implicit tree still functions correctly

3. Repeat 1 and 2 for any other implicit leaf. Make sure all leaf node share a common interface.
4. Identify an **implicit parent** and create a **parent node** class by applying refactorings or TDD.

✓ Compile and test that the implicit tree still functions correctly

5. Replace every occurrence of the implicit parent with code that uses a parent node instance.
6. Repeat 4 and 5 for any other implicit parents.

Replace Implicit Tree with Composite – Example

Let's apply this refactoring to the `OrdersWriter` class in the *implicit-tree* branch of the following repository.

https://github.com/dario-campagna/replace-implicit-tree-with-composite

- Example from Refactoring to Patterns
- Code comes from a shopping system