Karan Sachdeva 301368050

CMPT 276 Assignment 2+3 Report

Composite Pattern

Composite pattern is a partitioning design pattern and describes a group of objects that is treated the same way as a single instance of the same type of object. The intent of a composite is to "compose" objects into tree structures to represent part-whole hierarchies. It allows you to have a tree structure and ask each node in the tree structure to perform a task.

The Composite Pattern has four participants:

1. Component – Component declares the interface for objects in the composition and for accessing and managing its child components. It also implements default behavior for the interface common to all classes as appropriate.
2. Leaf – Leaf defines behavior for primitive objects in the composition. It represents leaf objects in the composition.
3. Composite – Composite stores child components and implements child related operations in the component interface.
4. Client – Client manipulates the objects in the composition through the component interface.

Implementation in the File System:

- Client - Main
- Component - Node
- Leaf - Filee
- Composite - Directory

Observer Pattern

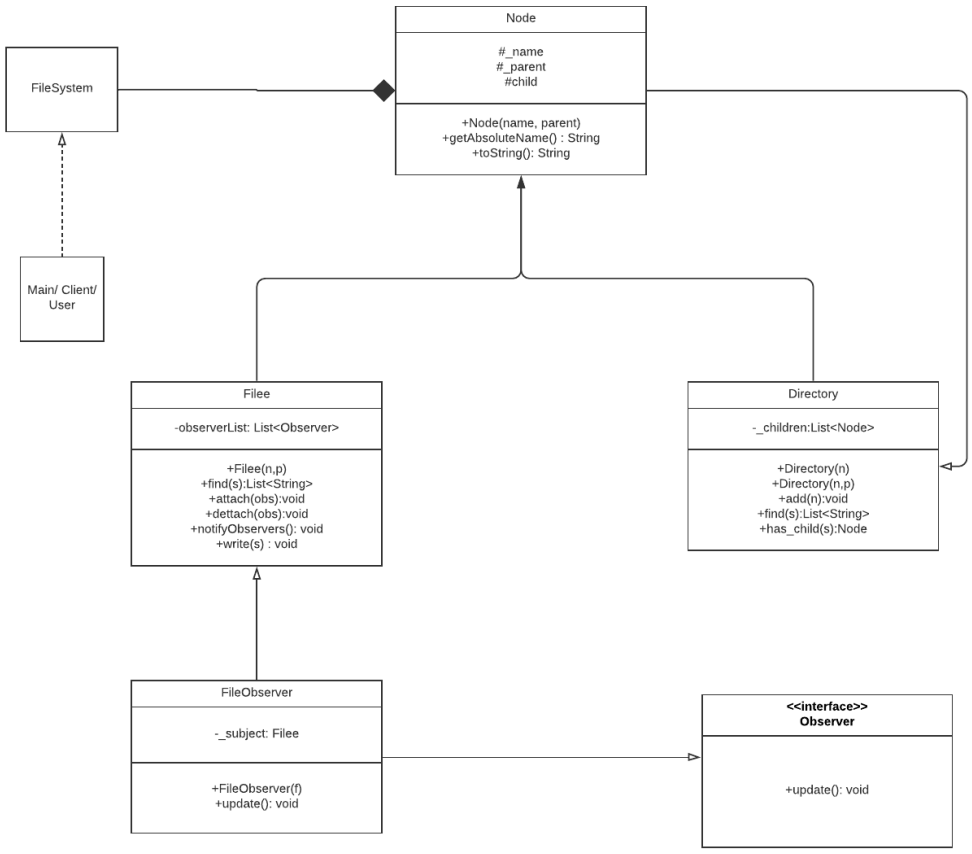
The Observer Pattern defines a one to many dependencies between objects so that one object changes state, all its dependents are notified and updated automatically.

We can apply observer when an abstraction has two aspects, one dependent on the other or when changing one object has effects on the other object or when objects should be able to notify about other objects without any assumptions of the identity.

Implementation in the File System

- Interface Observer: Observer
- Concrete Observer: FileObserver
- Subject: Filee

UML Class Diagram for Assignment 2+3:



File System Classes:

- Main: Contains the void main function and acts as the client where the user can call various classes of the file system.
- Node: Part of the composite design pattern and acts as the component participant.
- Directory: Another part of the composite design pattern and acts as the composite participant.
- Filee: Plays a role in both the design patterns used. Acts as a leaf in composite pattern and as a subject in observer pattern.
- Observer: Part of the observer design pattern and plays the role of interface observer.
- FileObserver: Another component of observer design pattern which acts as the Concrete Observer.