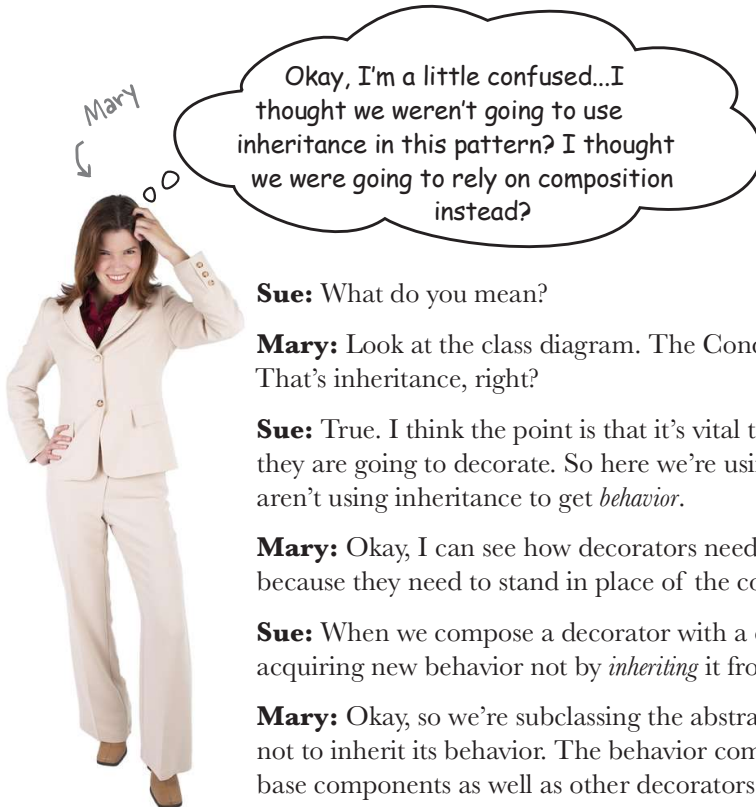


Cubicle Conversation

Some confusion over Inheritance versus Composition



Sue: What do you mean?

Mary: Look at the class diagram. The CondimentDecorator is extending the Beverage class. That's inheritance, right?

Sue: True. I think the point is that it's vital that the decorators have the same type as the objects they are going to decorate. So here we're using inheritance to achieve the *type matching*, but we aren't using inheritance to get *behavior*.

Mary: Okay, I can see how decorators need the same "interface" as the components they wrap because they need to stand in place of the component. But where does the behavior come in?

Sue: When we compose a decorator with a component, we are adding new behavior. We are acquiring new behavior not by *inheriting* it from a superclass, but by *composing* objects together.

Mary: Okay, so we're subclassing the abstract class Beverage in order to have the correct type, not to inherit its behavior. The behavior comes in through the composition of decorators with the base components as well as other decorators.

Sue: That's right.

Mary: Oh, I get it! And because we are using object composition, we get a whole lot more flexibility about how to mix and match condiments and beverages. Very slick.

Sue: Yes, if we rely on inheritance, then our behavior can only be determined statically at compile time. In other words, we get only whatever behavior the superclass gives us or that we override. With composition, we can mix and match decorators any way we like...*at runtime*.

Mary: I get it—we can implement new decorators at any time to add new behavior. If we relied on inheritance, we'd have to go in and change existing code anytime we wanted new behavior.

Sue: Exactly.

Mary: I just have one more question: if all we need to inherit is the type of the component, how come we didn't use an interface instead of an abstract class for the Beverage class?

Sue: Well, remember, when we got this code, Starbuzz already *had* an abstract Beverage class. Traditionally the Decorator Pattern does specify an abstract component, but in Java, obviously, we could use an interface. But we always try to avoid altering existing code, so don't "fix" it if the abstract class will work just fine.