Part 1)

Download the source code (**lecture_30_composite_tutorial_code**) from LMS

Create a new Java project, include the classes you downloaded from LMS into your project

You will find 5 classes in the given source code folder; Menu, MenuComponent, MenuItem, MenuTestDrive, and the waitress (client). Both the Menu (composite) and the MenuItem (leaf) are of type MenuComponent

1) Before you start have a look at the MenuComponent code; the abstract component which contains implementation of methods that might be suitable for MenuItem or Menu
2) MenuItem (leaf, single item)
    1) Implement the methods needed by the MenuItem; name, description, price, is vegetarian, print
3) Menu (composite, collection, aggregate)
    1) Implement the methods that are suitable for the Menu; add new item which could be another composite or a leaf, name of the composite, description of the composite, print method which print first the name and description of the Menu and then iterate on the items to do the printing
4) In the client code (waitress)
    1) Add the constructor that get a root composite which might contain composites, sub-composites, sub-sub-composites, leaves.
    2) Add implementation of a method that will do the printing
5) MenuTestDrive class
    1) Define a top level menu
    2) Define three menus with few items in each of them
        i. In one of the menus, add one item which is a composite
    3) Make an instance of the waitress and call the print method

Part 2)

Download the source code (**lecture_30_composite_with_iterator_tutorial_code**) from LMS

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The print method implementation is an example of using the iterator but here the print method inside the Menu (composite) takes care if the iteration, if we need different thing with tree, such as traversing the tree and print vegetarian items. To deal with iteration, we need an iterator suitable for composite item, another for the single item. The client will delegate the task to the element to handle its iteration.

1) In the MenuComponent, add a new abstract method name it **createIterator** which returns an iterator of MenuComponent
2) The **NullIterator** is a concrete iterator for the MenuItem, always return false. Update the code for this class
3) MenuItem, the only change is implement the createIterator method which must make use of the **NullIterator**
4) **The CompositeIterator,** knows how to deal with iteration on complex composite,
5) In the Menu, add an implementation of the createIterator, this method must make of the Composite iterator
6) In the Waitress, add implementation for **printVegetarianMenu** method which gets the iterator on the high level composite and checks whether the element is vegetarian or not, if yes call its print method
7) In the MenuTestDrive, only add the code to test the **printVegetarianMenu**