Small Assignment #8
Due: Wednesday, 5/7/2025 by 11:59 PM

Submission. This assignment should be submitted as a PDF on Gradescope. Make sure you assign pages to questions correctly.

Instructions.
You are given some code. Answer each question about the code and make changes to the code accordingly.

Question 1.
These questions refer to the Composite demo code and to the diagram below, which is one example of COMPOSITE. The code you're given is another example of COMPOSITE. These questions are asking you to identify parts of the COMPOSITE pattern in the code and map them to the diagram below. Your answers need to demonstrate that you understand the COMPOSITE design pattern, how it is illustrated in the UML diagram, and how it is implemented in the code.

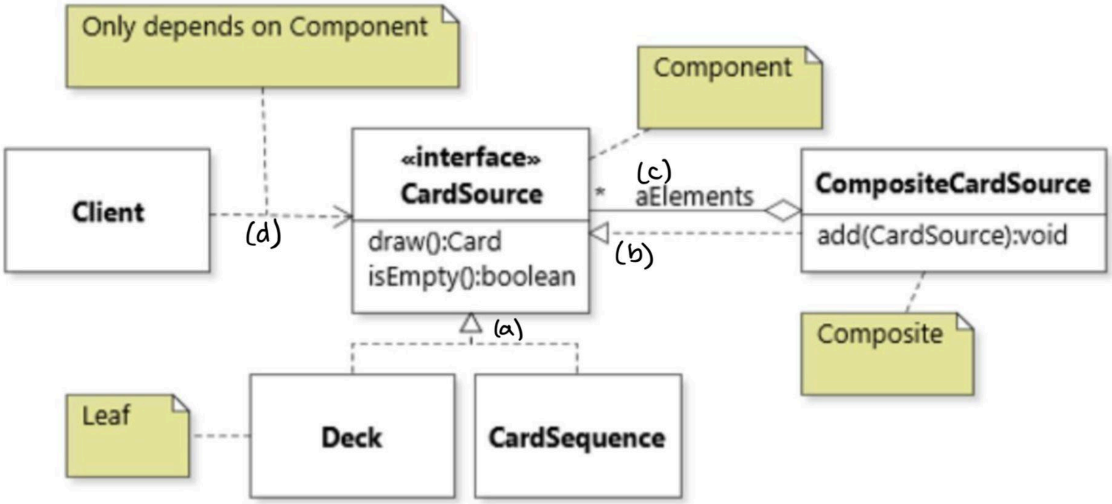

Fig. 6.2 Application of COMPOSITE to `CardSource`

i. In the code, what are the Leaf classes?
ii. In the code, what is the Composite class?
iii. In the code, what is the Component?
iv. In the diagram, four of the connectors are labeled (a - d). Describe how these same relationships are implemented in the code. Be specific.
v. Which class(es) does `CompositeMain.java` rely on? Explain how this relates to polymorphism.

Question 2.
This part refers to the Composite Demo code. Write a class called MetaMain.java that has a main method and *uses metaprogramming to do the following*. You should make sure your class

actually works, but for the PDF on Gradescope, include the full code and the output from when you run it. All of these should be done with metaprogramming.

- Get and print a list of the public methods in the Assignment class.
- Use the declared constructor to create an instance of Assignment.
- Get one of the private fields from the instance you created and change its value.
- Invoke the setGrade method for the instance you created.