

Name \_\_\_\_\_

Answer 9 of the following questions. Indicate which of the questions you wish to be graded. Answer essay questions as briefly as possible. Since the midterm we have covered the following patterns: Functor, Interpreter, Strategy, State, Flyweight, Factory Method, Abstract Factory, Prototype, Builder, Model-View-Controller, Smart UI, Memento, Bridge, Facade, Pipe & Filters and Broker.

1. Many design patterns make it easy to change some aspect of a system. Which pattern would best make it easy to change:
  - A. The type of an object that a method returns.
  - B. You need to change what is created from a complex description of the object.
  - C. You need to be able to change the hardware and software platform an object runs on.
2. The text claims that design patterns help overcome some common causes of redesign of a system. What pattern would you use to handle the following issues.
  - A. Algorithmic dependencies.
  - B. Dependence on object representations or implementations.
3. Since the midterm we have covered three patterns that often use the Flyweight pattern. List two such patterns.
4. What is the difference between intrinsic and extrinsic state? Give an example of each.
5. Under what conditions does the Smart UI pattern indicate that one should not use the MVC pattern in developing desk-top GUI applications?
6. The Builder pattern would be simpler to implement if the directory and builder were combined into one class. What advantages does we gain by keeping them separate?
7. The text states that one can allow clients to bypass a facade and interact with components of the subsystem. What are the consequences (good & bad) of doing this?

8. We have a class Foo that has one field (instance variable or data member) of type Bar. The class Bar has one field of type int (integer). Show how to implement a deep copy of Foo in your language of choice (Java, C++, or Smalltalk).
9. The memento pattern states that it does not violate encapsulation but yet accesses an object's internal state. Explain how the memento does not violate encapsulation and discuss your language's support for this feature of the memento.
10. Explain the Pipe and Filters pattern.
11. Explain the State pattern.
12. Explain the MVC pattern.