

CSC 3380 Midterm Exam – version b

Aymond, CSC 3380, Louisiana State University

10:30AM 3/4/2020

True/False (2 points each) Circle T or F.

1. (☒ T / ☐ F) Stories are requirements from the perspective of the user
2. (☐ T / ☒ F) The software system architect models the solution in a design framework.
3. (☐ T / ☒ F) With incremental phased development, the initial release has limited functionality.
4. (☐ T / ☒ F) In the client/server architecture, clients are programs, which are run by users or specialized applications.
5. (☐ T / ☒ F) According to the Agile Manifesto, responding to change is valued more than following a plan.
6. (☐ T / ☒ F) Components in a component diagram, act like white boxes in the sense that we know what is going on inside the component.
7. (☐ T / ☒ F) In the pipe and filter architecture, each component transforms data for use by the next component.
8. (☐ T / ☒ F) You can inherit and override a private method.
9. (☐ T / ☒ F) At the architectural level, all implementation details are hidden.
10. (☐ T / ☒ F) The choice of what models to create has a profound influence on how a problem is attacked and how a solution is shaped
11. (☐ T / ☒ F) Agile Software Development is an approach that emphasizes working closely with customers/stakeholders.
12. (☐ T / ☒ F) Unified Modeling Language (UML) is a graphical meta-language for visualizing, specifying, and documenting software systems
13. (☐ T / ☒ F) In the client/server architecture, servers rely on clients for resources, such as files, devices, data, and computations (e.g., processing power)
14. (☐ T / ☒ F) In the pipe and filter architecture, process control is dictated by the system state.
15. (☐ T / ☒ F) In the pipe and filter architecture, data flows in only one direction.
16. (☐ T / ☒ F) Non-functional stories never have validation criteria.

17. (T / F) According to the Agile Manifesto, processes and tools are valued more than individuals and interactions.
18. (T / F) System requirements are requirements from the perspective of the software system.
19. (T / F) Requirements are not necessary for every software project.
20. (T / F) Story cards are short phrases about what the software developer wants the software to be.
21. (T / F) In the client/server architecture, the client “guards” access to the important resources that it manages.
22. (T / F) Every software project starts with requirements.
23. (T / F) A key component of extreme programming (XP) is test driven development.
24. (T / F) The deployment architecture view focuses on system engineering issues.
25. (T / F) The Scrum Master works to remove any impediments that are obstructing the team from achieving its sprint goals.
26. (T / F) The software designer models the full solution in a design framework.
27. (T / F) Agile Software Development is an approach to software development that emphasizes development cycles of 6 – 8 months.

Multiple Choice (3 points each)

1. What does CI/CD stand for?
 - ☒ Continuous Integration/ Continuous Deployment <answer>
 - ☐ Constant Integration/ Constant Deployment
 - ☐ oCcasional Integration/ oCcasional Deployment
 - ☐ Continuous Investigation/ Constant Improvement
2. Which of the following statements is NOT true of structured programming?
 - ☐ Focuses on logic and process flow
 - ☐ Defines operations on data manipulation
 - ☐ “Does something to data”
 - ☒ Promotes data abstraction <answer>

3. Which of the following statements is not true of object oriented programming?

- ☐ Focuses on logic and process flow <answer>
- ☐ Hides how data manipulation operations are performed
- ☐ "Tells data to do something"
- ☐ Promotes data abstraction

4. Designing for change means

- ☐ Locking in requirements to ensure no surprise changes
- ☐ Embed 3rd party systems, so change is not your problem, it's theirs.
- ☐ Plan to scale up
- ☐ Create specific solutions, not general ones

5. What does it mean for a software system to be flexible?

- ☐ It anticipates and deals effectively with human error
- ☐ Easily changeable <answer>
- ☐ Its components can be repurposed for other applications
- ☐ It is intuitive to use and access

6. What does it mean for a software system to be reusable?

- ☐ Its components can be repurposed for other applications <answer>
- ☐ It can be easily corrected, adapted and extended
- ☐ It is intuitive to use and access
- ☐ It employs efficient use of processing time, memory, and disk space

7. What does abstraction mean in the object oriented programming paradigm?

- ☐ Hidden data <answer>
- ☐ Data and methods on that data are bundled together
- ☐ A class can take on the properties of another class
- ☐ Derived objects can behave differently

Short answer (5 points each)

1. What are the 4 principles of object oriented programming?

Answer: Abstraction, encapsulation, inheritance, and polymorphism

2. Suppose Square inherits from Rectangle. Suppose when the user calls “setWidth(float w)”, the square sets all 4 of its sides to w. Suppose that when the user calls “setHeight(float h)”, Square throws an InvalidOperationException exception. The five principles of class design are often referred to as SOLID. Which SOLID principle is being violated and why? (1 sentence)

Answer: Liskov Substitution Principle – because the derived class breaks a call to the base class.

3. What is bottom up design and when should it be used?

Answer: Composition; Design pieces in isolation before deciding how they will fit together as a whole; components are handed off to development team for bottom-up software design.

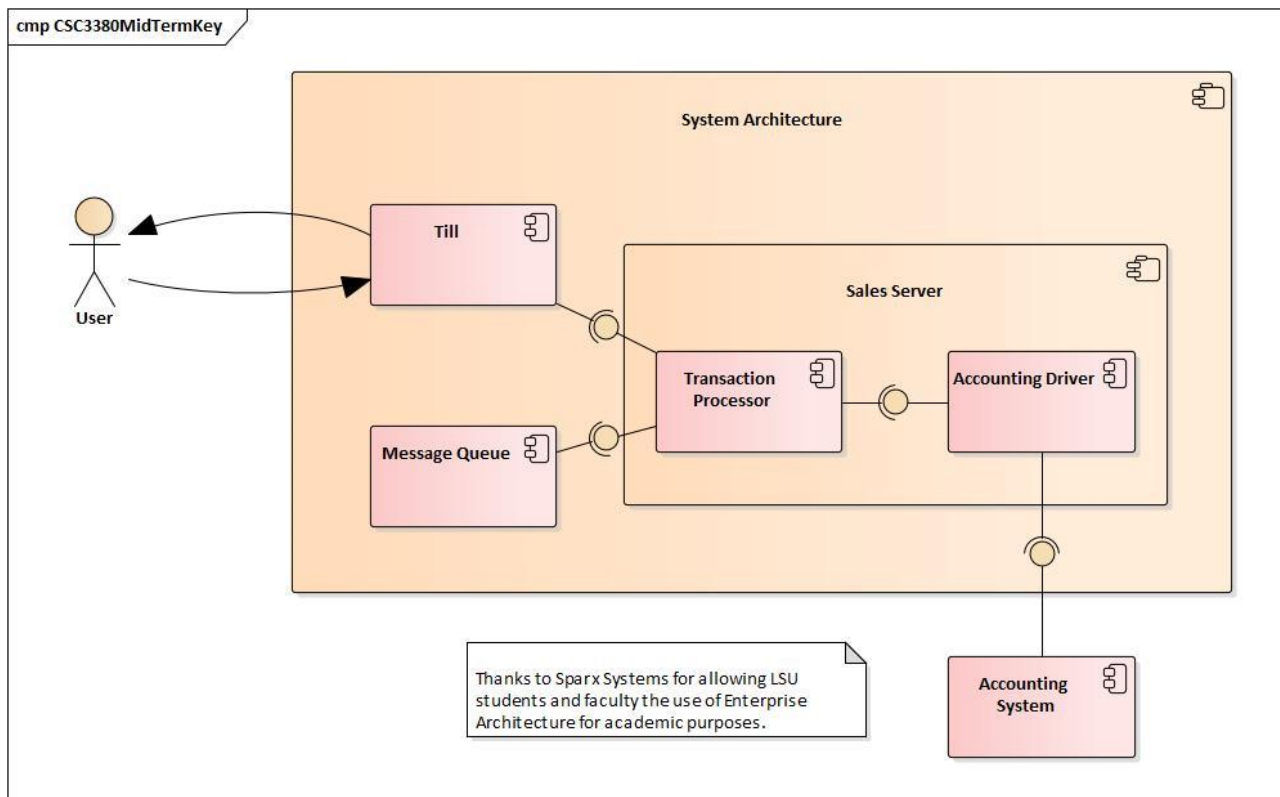
4. Bonus: How does a class follow the dependency inversion principle? (1 sentence)

Answer: By depending on interfaces rather than concrete classes.

Long Answer (10 points)

Provide a UML Component Diagram for the architecture described below:

- a. The system uses an external Accounting System that provides its own interface.
- b. The architecture has three major components:
 - i. Till
 1. The Till component connects to the Transaction Processor
 - ii. Message Queue
 1. The Message Queue connects to the Transaction Processor
 - iii. Sales Server
 1. The Sales Server connects to the Transaction Processor
- c. The Sales Server has two subcomponents:
 - i. Transaction Processor
 1. The Transaction Processor provides an interface.
 2. The Transaction Processor connects to the Accounting Driver
 - ii. Accounting Driver
 1. The Accounting Driver provides an interface.
 2. The Accounting Driver connects to the external Accounting System.
- d. Users interact directly with the Till component.



<https://sites.google.com/site/prattshomepage/home/uml/component-diagram>

- ____ (1 point) Diagram includes boundary for system architecture
- ____ (2 point) System contains 3 main components
- ____ (2 points) System includes external Accounting system component & user
- ____ (2 points) Sales Server component includes two subcomponents
- ____ (2 points) Interfaces and connections provided match specification
- ____ (1 point) Data flow between user and Till component

Extra Space (if needed)

Extra Space (if needed)

Name: _____

PAWSID: _____
(precedes @lsu.edu in email)

TA:

- ☐ Chanuka
- ☐ Clinton
- ☐ Qing