Objective - Application Design Concepts and Principles - Test

Review of attempt 1

Finish review

Started on	Monday, 17 December 2012, 09:09 AM
Completed on	Monday, 8 July 2013, 03:18 AM
Time taken	202 days 18 hours
Overdue	202 days 17 hours
Grade	**0** out of a maximum of 19 (**0**%)
Feedback	FAIL

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1. You suggested 3-tier architecture to a company for its order processing system to increase scalability. This architecture will have a thin client for presentation logic, shared server in the middle to run business logic and a database server. Which of the following statements are true?

- a. Thin clients will make sure client application is faster hence increasing scalability ✓
- b. Shared server can maintain client requests in a queue and process one by one hence increasing scalability ✗
- c. Shared server can cache and share frequently requested objects, hence reduce the load on database server ✓
- d. Shared server can keep client specific data in stateful session beans ✗

Choice A and C are correct
Choice A is correct because fast application clients will reduce load on web server

Choice C is correct because caching frequently accessed data on shared server will reduce load on database server, hence improving scalability

Choice B is incorrect because because scalability cannot be at the cost of performance.

Choice D is incorrect because caching client specific data can increase the memory consumption significantly hence slowing down the whole system

Professional Java Server Programming, Second Edition, 2nd edition By Subrahmanyam Allamaraju (Publisher: Wrox Press Ltd)

Incorrect
Marks for this submission: 0/1.

Feedback to Author

2. It is a characteristic of being able to assign a different behavior or value in a subclass, to something that was declared in a parent class. What does this statement describe?

- a. Inheritance ✗
- b. Abstraction ✗
- c. Encapsulation ✗
- d. Polymorphism ✓

The statement describes Polymorphism. So, Option D is correct.

Polymorphism is a characteristic of being able to assign a different behavior or value in a subclass, to something that was declared in a parent class.

For example, a method can be declared in a parent class, but each subclass can have a different implementation of that method.

Inheritance is the ability of objects in Java to inherit properties and methods of other objects.

An abstraction denotes the essential characteristics of an object that distinguish it from all other kinds of object and thus provide crisply defined conceptual boundaries, relative to the perspective of the viewer."

Encapsulation (also information hiding) consists of separating the external aspects of an object which are accessible to other objects, from the internal implementation details of the object, which are hidden from other objects.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

3. In a recent survey,ABC company's website has been voted as most popular. Current application has lot of static content like images,javascripts, video and audio files and deployed on one web Server. After this survey, the userbase has increased and customer care started recieving complaints that web site is not available.

What would you recommend?

- a. Add another web server, application server and use a load balancer. ✗
- b. Add another web server and a load balancer ✓
- c. Increase the servlet thread pool of the current webserver, increase JVM settings,increase the RAM of the machine.Optimize EJB pool configuration ✗
- d. Replace the existing web server with a Java EE Server. ✗

Option B is correct.

As the application mostly contains static content there is no role of an application server. So, options A and D are incorrect.

Option C is incorrect. Static content is not typically served through servlets (not recommended though can be done), so increasing servlet thread pool will not solve the problem.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

4. Which of the following statements are true about Polymorphism Concept?

- a. Overloaded methods MUST change the argument list ✓
- b. Overloaded methods CAN change the return type ✓
- c. Overloaded methods CAN change the access modifier ✓
- d. A method can not be overloaded in the same class or in a subclass ✗

Option A, B and C are correct.

Option D is incorrect. Using Method Overloading, A method can be overloaded in the same class or in a subclass.

For more information, please refer :
http://docs.oracle.com/javase/tutorial/java/concepts/object.html

Incorrect
Marks for this submission: 0/1.

Feedback to Author

5. Which of the following are invalid statements?

- A. Writing all the data access logic in stored procedures can affect performance badly because database server may get bogged down with number of requests ✗
- B. Using dedicated business layer allows us to optimize object access (caching shared objects) and improve scalability ✗

Choice C is correct.

Choice C is correct as "always increase system performance", It's not always true, even if you separate business logic from presentation layer.
It depends on other factors like request/response throughput and session management etc., while designing layers.

Choice A is incorrect as multiple concurrent calls to stored procedures can affect database server performance

Choice B is incorrect as dedicated business layer can cache frequently accessed data, hence improving performance and scalability

Choice D is incorrect, “separation of concerns” is the right reason for separating presentation and business layers.

For Further Reference: "It Architectures And Middleware: Strategies For Building Large, Integrated Systems" by Chris Britton (Publisher: Addison-wesley Professional)

Incorrect
Marks for this submission: 0/1.

Feedback to Author

6. You have deployed a new application and you often find that CPU utilization is high. On bringing this to notice of your Lead Architect, he has suggested you to move static content from application server to web server.

What are the implications of this decision? Select two choices.

- a. This is not achievable as Java EE specifies that static content has to be part of WAR. ✗
- b. The application server is generally performing critical work. It is best to move static content serving off of the application server machine. ✓
- c. It is easier to implement a solution where static content resides on a web server and requires no configuration changes to implement. ✗
- d. This is inline with Separation of Concerns principle. ✓

Options B and D are correct.

Option A is an incorrect statement.

Option C is incorrect because it adds difficulty and resources to make this solution work.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

7. In a project you have to architect, it is an assumption that significant requests will be for same set of data. Moreover the number of concurrent users are significant, so performance will be a concern. What will be best architecture, in your view ?

- a. Use a 3 tier architecture (thin client -> application server -> database) because application server can execute business requests faster than executing requests on client side ✗
- b. Use stored procedures to access data at fast speed and client application will invoke stored procedures directly ✗
- c. Use a 2-tier architecture with thick client accessing data directly using JDBC ✗
- d. Use a 3 tier architecture (thin client -> application server -> database) because it allows server to cache data with high number of hits to reduce database server load ✓

Choice D is correct.

Choice D is correct because data caching of frequently used data reduces load on the database server, hence improving response time

Choice A and C are incorrect because server side will still be accessing database for each request even though request may be for common data

Choice B is incorrect because multiple parallel calls to stored procedures will overload database server

Further Reference: Professional Java Server Programming, Second Edition, 2nd edition By Subrahmanyam

Allamaraju Publisher: Wrox Press Ltd

Incorrect
Marks for this submission: 0/1.

Feedback to Author

8. You are analyzing architecture of a system under development. You find out that a single Webserver is proposed to be used in production deployment. What do you think can be the problems with this approach?

- a. Single point of failure ✓
- b. High Availability may not be guaranteed ✓
- c. Manageability may be an issue ✗
- d. With single webserver, scalability can be an issue ✓

Choice A, B and D are correct.
Choice A is correct because if single webserver goes down, system will fail.
Choice B is correct because with a single point of failure, the risk is high and here are no alternate servers to make the site available in case of any failure. Therefore the availability is always a concern.
Choice D is correct because with increasing number of requests to single webserver, it may get overloaded and fail to respond.
Choice C is incorrect because managing a single server is in fact easier than managing multiple servers.

Further Reference: It Architectures And Middleware: Strategies For Building Large, Integrated Systems by Chris Britton (Publisher: Addison-wesley Professional)

Incorrect
Marks for this submission: 0/1.

Feedback to Author

9. You have designed an Internet Banking Application for a major Bank and planning to host the same. It requires a high level of scalability, availability and security. You are planning to deploy the application.

Which one would you choose?

- a. Use a single web server, application server with very high-end configuration. ✗
- b. Use 5 load-balanced web servers,3 application servers & 2 database servers. Use server & database clustering techniques. ✓
- c. Use a single web server & 3 application servers ✗
- d. Use 3 web servers, single web server and a load balancer. ✗

Out of all the above 4 options, Option B offers the best configuration. So, option B is the correct choice.

In Options A and C, since there is only one web server it could act as a single point of failure.

In option D, a single application server may become single point of failure.

Out of all the options, Option B provides better availability and performance.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

10. You have an online shopping application with moderate userbase. The popularity of your application has increased and there has been a massive increase in users visiting your site. You have recommended adding 2 new web servers and 3 new application servers.

What is the impact of adding additional servers?

- A. This will increase security, extensibility, and decrease performance. ✗
- B. This will decrease manageability, performance, and increase maintainability. ✗
- C. This will increase availability, performance, and reliability ✓
- D. This will decrease security, performance, and increase manageability. ✗

Option C is correct.

Options A, B and D are incorrect because adding the additional servers will increase the performance of the application.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

11. Which of the following is true about Model-View-Controller (MVC) architecture? Select two choices.

- a. It is a security architecture ✗
- b. Changes to the user interface will not affect data handling, and that the data handling routines can be re-organized without changing the user interface. ✓
- c. A standard implementation is usually seen in Two-Tier thick client applications. ✗
- d. It applies separation of concerns principle ✓

Options B and D are correct.

Options A and C are incorrect statements. It is not a security architecture and usually seen in 3-Tier architectures.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

12. You are designing a new web application which will interact with another application using XML through a messaging system synchronously. Back-end changes will be completed more or less at the same time as yours.

Which of the following would you recommend to the application development team?

- a. Develop your application and wait for the back-end changes to complete before testing. ✗
- b. Develop a Simulator code which picks messages from the request queue of your application and puts hard-coded xml in response queue. This will ease testing. ✓
- c. Synchronous messaging is not possible with Messaging System. Explore another solution. ✗
- d. Use SOAP XML ✗

Option C is an incorrect statement.

Option D is incorrect as there is no requirement for SOAP protocol. If the interfacing request and response XMLs are defined, it is possible to develop a simulator and perform some level of testing rather than wait for the back-end changes to be completed. In this approach, some of the application related flows (test cases) can be tested through simulator.

Option B is better than option A so, option B is correct.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

13. You are designing an online shopping application. You need to display a list of products on the website in multiple pages. You want to read the data from the database and cache the results. Different views in the application display different categories of products. You only want one instance of this class to hold master data which can be filtered for each view.

What pattern will give you clear separation of concern?

- a. Factory method ✗
- b. Builder pattern ✗
- c. Singleton pattern ✓
- d. Prototype pattern ✗

Option C is correct.

Singleton pattern is a design pattern that is used to restrict instantiation of a class to one object. You can implement a single class which fetches data from database and caches the data in memory; different views in the application can access the data from this singleton object.

Option A is incorrect because the factory method provides a simple decision making class which returns one of several possible subclasses of an abstract base class depending on data it is provided.

Option B is incorrect because the builder pattern separates the construction of a complex object from its representation, so that several different representations can be created depending on the needs of the program.

Option D is incorrect because the prototype pattern starts with an initialized and instantiated class and copies or clones it to make new instances rather than creating new instances.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

14. You have instructed the team to implement a solution that focuses on run-time flexibility and a design approach that will favor objects forwarding certain method calls to another object. What is this design concept commonly know as?

- a. Polymorphism ✗
- b. Encapsulation ✗
- c. Inheritance ✗
- d. Delegation ✓

Option D is correct.

The statement describes the concept of delegation.

Encapsulation (also information hiding) consists of separating the external aspects of an object which are accessible to other objects, from the internal implementation details of the object, which are hidden from other objects.

Polymorphism is a characteristic of being able to assign a different behavior or value in a subclass, to something that was declared in a parent class.

For example, a method can be declared in a parent class, but each subclass can have a different implementation of that method.

Delegation is the implementation of objects that forward certain method calls to another object, a delegate.

Separation of Concerns principle states that every unit in the system needs to have a clearly defined responsibility and functionality. This applies to all levels of the system, from EARs to methods.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

15. Which two statements describe the advantages of designing an application using inheritance compared to designing and application using interfaces? Select two choices.

- a. Inheritance enforces encapsulation while interfaces do not. ✗
- b. Inheritance allows you to restrict the behavior of objects. ✓
- c. Inheritance is a way to form new classes using classes that have already been defined. ✓
- d. Inheritance allows you to choose which of the properties of parent object are inherited but with interface all the properties are inherited automatically. ✗

Options B and C are correct.

Option A is incorrect because interfaces do help enforce encapsulation.

Option D is incorrect because it is an incorrect statement.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

16. Java EE Specification specifies various roles (Product provider, component provider etc..) for application development and deployment flow. This idea is close to which of the following principles?

- a. Separation of concerns ✓
- b. Polymorphism ✗
- c. Delegation ✗
- d. Encapsulation ✗

Option A is correct.

What the Separation of Concerns principle means is - Every unit in the system needs to have a clearly defined responsibility and functionality. Units that combine multiple concerns must be split into smaller pieces. These roles are also defined on the samelines.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

17. Which of the following statements is NOT true about Model View Controller design?

- a. Multiple views can use the same model ✗
- b. Easier support for new types of clients ✗
- c. It is not extensible. ✓
- d. It is aligned with separation of concern principle. ✗

Option C is correct as MVC design is highly extensible.

Options A, C and D are correct about MVC Design.

The MVC architecture has the following benefits:

- Multiple views using the same model:The separation of model and view allows multiple views to use the same enterprise model. Consequently, an enterprise application's model components are easier to implement, test, and maintain, since all access to the model goes through these components.
- Easier support for new types of clients: To support a new type of client, you simply write a view and controller for it and wire them into the existing enterprise model.
- Efficient modularity of the design. Changes to one aspect of the program aren't coupled to other aspects. Also, development of the various components can progress in parallel, once the interface between the components is clearly defined.
- Ease of growth: Controllers and views can grow as the model grows; and older versions of the views and controllers can still be used as long as a common interface is maintained.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

18. Which of the following resource optimization techniques could be available with Java EE Servers? Select two choices.

- a. Datasource Connection Pools ✓
- b. WebService connection pools ✗
- c. JAAS configurations ✗
- d. Ability to increase JVM Heap Size. ✓

Options A and D are correct.

Java EE servers do not provide any web service connection pools. JAAS deals with security;it is not a optimization technique.

Incorrect
Marks for this submission: 0/1.

Feedback to Author

19. You are starting the development of a newly designed application. In the design, you have clearly identified various layers in the application and clearly defined interfaces for each of these units. Which of the following is NOT true about this approach?

- a. Developers of each unit can work on implementations parallely ✗
- b. There will be no integration issues with these layers. Once they are individually developed, there will be no need for testing the application. Everything will work smoothly. ✓
- c. Upgrades on individual unit will not lead to recompilation of code in other layers ✗
- d. Eases testing as developers of a unit can develop proxies/stubs with hard-coded data for their testing. ✗

Option B is correct.

This approach minimizes integration issues directly but does not assure that there will not be any bugs in the application (for eg: Poor requirements analysis, missed specifications for a component etc..)

Incorrect
Marks for this submission: 0/1.

Feedback to Author

Finish review