

Before Midterm lecture 1 to 5

- 1- System design is in the process of problem solving and planning for a software solution.
a)true b>false

Answer: a

- 2- Module-based structures doesn't include which of the following:
a)decomposition
b)layered
c)generalization
d)deployment

Answer: d

- 3- This structure comprises components and connectors that create, store, and access persistent data in C&C structures.
a)communicating process
b)Concurrency
c)Shared data
d)Client-server

Answer: c

- 4- The architectural structures are very independent.
a)true b>false

Answer: b

- 5- Architectural styles is composed of which of the following?
a) A set of component types that perform some function at run-time
b) A topological layout of these components indicating their run-time inter relationships
c) A set of semantic constraints
d) All of the mentioned

Answer: d

6- Which architectural style goal is to achieve Integrability?

- a) Data Flow Architecture
- b) Call and Return Architecture
- c) Data Centered Architectures
- d) None of the mentioned

Answer: c

7- Which architectural style goal is to achieve Portability?

- a) Data Flow Architecture
- b) Call and Return Architecture
- c) Virtual Machine Architecture
- d) None of the mentioned

Answer: c

8- Which architectural style goal is to achieve Modifiability with Scalability?

- a) Data Flow Architecture
- b) Call and Return Architecture
- c) Virtual Machine Architecture
- d) None of the mentioned

Answer: b

9- Which architectural style goal is to achieve Modifiability with Reuse?

- a) Data Flow Architecture
- b) Call and Return Architecture
- c) Virtual Machine Architecture
- d) None of the mentioned

Answer: a

10- Data Centered architecture is subdivided into which of the following subtypes?

- a) Repository and Blackboard
- b) Batch Sequential, Pipes and Filters
- c) All of the mentioned
- d) None of the mentioned

Answer: a

11- Which of the following are types of Call and return architecture?

- a) Main program and subroutine Architecture
- b) Remote Procedure Call system
- c) Object Oriented or abstract data type system
- d) All of the mentioned

Answer: d

12- Which of the following type has the main goal to achieve Modifiability?

- a) Main program and subroutine Architecture
- b) Remote Procedure Call system
- c) Object Oriented or abstract data type system
- d) Main program and subroutine Architecture, Object Oriented or abstract data type system

Answer: d

13- What is pipes and filter style?

- a) They emphasize on incremental transformation of data by successive components
- b) It is used in UNIX family of the system
- c) They return no state information
- d) All of the mentioned

Answer: d

14- What are the advantage of pipe & filters?

- a) They interact with the environment in limited ways
- b) They simplify systems maintenance and enhance its reuse
- c) Interactive applications are encouraged by the style
- d) None of the mentioned

Answer: a

15- What is layered styles?

- a) The components are designed to layers to control inter component interaction
- b) The components are designed to layers to control the data flow into specific direction
- c) All of the mentioned
- d) None of the mentioned

Answer: c

16- The model of this architecture is presented with three major parts which are Knowledge sources, board data structure, control.

- a)Data-centered repository
- b)Data-centered blackboard
- c)Data-flow batch sequential
- d)a&b

Answer: b

17- The disadvantage of object-oriented call and return architecture is

- a)doesn't support decomposition
- b)doesn't support reusability and abstraction
- c)not efficient enough for high performance computing,
- d)All of them

Answer: c

18- Distributed architectural style that is considered a middleware architecture responsible for coordinating communication between clients and registered published servers.

- a)Client-server
- b)broker
- c)Multi-tier
- d)SOA

Answer: b

19- Hierarchical layers architecture is considered a

- a)Data-centered style
- d)Data-flow style
- c)call and return style
- d)none of them

Answer: c

20- In pipes and filters data-flow style , filters must be dependent.

- a>true b>false

Answer: b

21- Data-centered repository architecture is not vulnerable to failure.

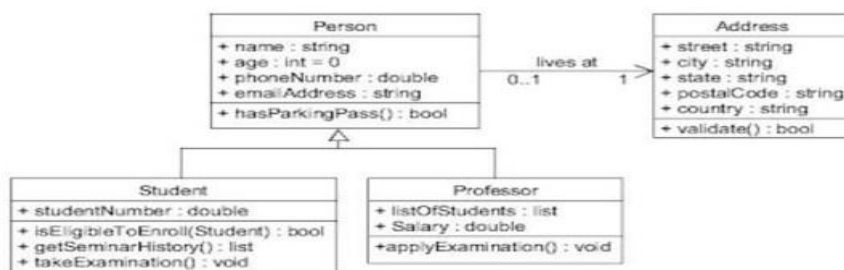
a)true b>false

Answer: b

Midterm exam:

1-

The following diagram represents



- ☐ Allocation Structure.
- ☐ C&C Structure.
- ☒ Module Structure.
- ☐ Data Repository.

2- Module structures focus on the way the elements interact with each other at runtime to carry out the systems's functions

a)true b>false

Answer: b

3- In module structures, decomposition shows how modules are related by "is a sub-module of" relation.

a)true b>false

Answer: a

- 4- Activity diagram is an example of C&C structure that shows concurrency.
a)true b>false

Answer: a

5-

In Repository Architecture Style

- ☐ Changing in data do not affect its clients.
- ☒ Data store is passive, and clients are active.
- ☐ Data store is active, and clients are passive.
- ☐ Re-usability of knowledge source agents is supported.

6-

Which of the architectural style is further subdivided into Batch sequential and Pipes & filters?

- ☐ Call and Return Architecture.
- ☒ Data Flow Architecture.
- ☐ Interactive Architectures.
- ☐ Data Centered Architectures.

- 7- What's the advantage of pipes and filters ?
- a)provides concurrency and high throughput
 - b)No overhead of data transformation between filters
 - c)Interactive application are encouraged by the style
 - d)None of them

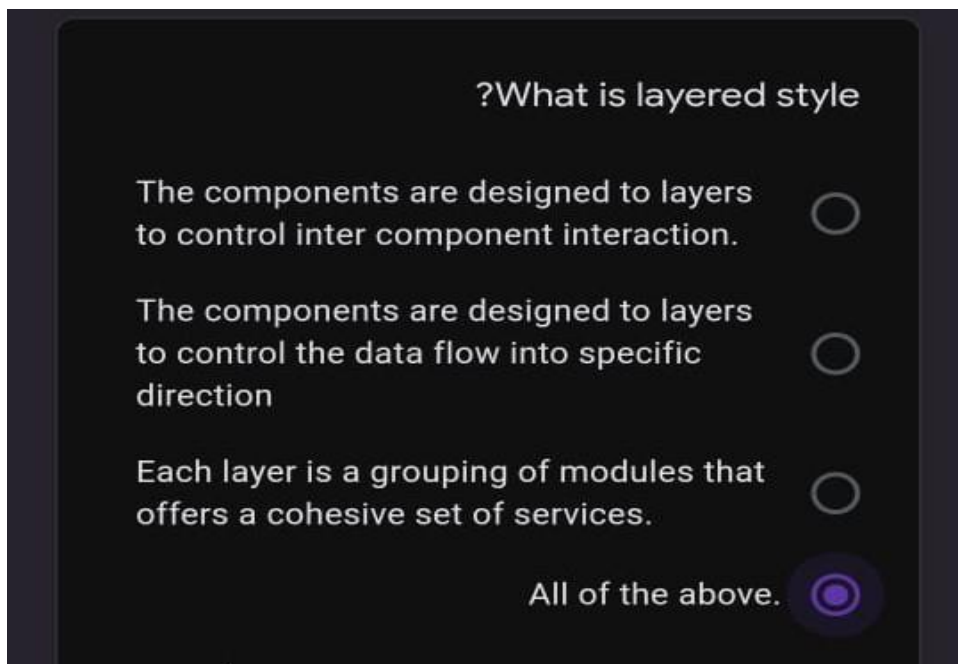
Answer: a

8- In open layers architecture:

- a) Don't support reusability
- b) A layer can use services of the layer immediately below
- c) A layer can use services from any lower layer
- d) none of them

Answer: c

9-



10- In which of the following style new clients can be added easily?

- a) Data Flow Architecture
- b) Call and Return Architecture
- c) Data Centered Architectures
- d) None of the mentioned

Answer: c

11-

In Data-Centered Architecture Style

- ☐ Agents can interact together directly.
- ☐ The main purpose is data availability.
- ☐ The data is the only means of communication among agents.
- ☐ All of the above.

Answer: The data is the only means of communication among agents.

12-

Sequence diagram is dynamic views of the system to describe it in execution.

- ☒ True
- ☐ False



13-

Which of the following are types of Call and return architecture?

- ☒ Object Oriented or abstract data type system
- ☒ Main program and subroutine Architecture
- ☐ Blackboards
- ☒ Virtual machines

14- Wants a system that can be divided into reusable, loosely coupled components that can be flexibly combined and arranged where various data formats can transform between them. The most appropriate architectural style would be:

- a) multi-tier
- b) pipe and filter
- c) broker
- d) None of them

Answers: b

اللي معاه بقية اسئلة الميديتيرم يخليه جدع و يحطها في الكومنتات أو بيعتها بلاش بكاسة.

ده جيه منه أسئلة في الميديتيرم و ريسورس للأسئلة اللي فوق

<https://www.sanfoundry.com/software-architecture-mcqs-architectural-styles-one/>

LECTURE 6 Software design-1

- 1- A problem solving process that aim to find and describe a way to implement the functional requirements while adhering to good quality principles.

- a)software architecture
- b)structuring
- c)software design
- d)design spacing

Answer: c

- 2- In the general model of the design process we can consider the interface design from the design inputs.

- a>true b>false

Answer: b

- 3- In the general model of the design process we can consider the component specification and system architecture from the design outputs.

- a>true b>false

Answer: a

- 4- The alternative solutions which the designer make decision to choose from when facing design issues are called

- a)design processes
- b)design principles
- c)design systems
- d)design options

Answer: d

- 5- The software engineer can make a design decision without being aware of the requirements and the available technology.

- a>true b>false

Answer: b

- 6- It can be isolated and it can any piece of hardware or software that has a clear job title.
- a)Module
 - b)Component
 - c)subsystem
 - d)specification

Answer: b

- 7- While exploring design alternatives prior to implementation the designer choose different sets of alternatives, the space of possible designs that can be achieved in this choice process is called
- a)architecture space
 - b)moduling space
 - c)design space
 - d)a & c

Answer: c

- 8- A module doesn't have the ability to represent a component.
- a>true b>false

Answer: b

- 9- Packages and built in methods in java can't be considered as modules.
- a>true b>false

Answer: b

- 10- When the system components get changed or replaced, the system can't exist anymore.
- a>true b>false

Answer: b

- 11- A systems is a logical entity that can have one or more component and if it has a subsystem it specifies interface.
- a>true b>false

Answer: a

- 12- If the designer started designing by choosing the kind of the database that's gonna be used and at the last phases of designing he was choosing types of specific inner data items then he was working using
- a)bottom-up approach
 - d)top-down approach
 - c)mix of both

Answer: b

- 13- Bottom-up design is almost always needed to give the system a good structure.
- a>true b>false

Answer: b

- 14- The design of computational mechanisms.
- a)class design b)algorithm design c)architecture design d)all of them

Answer: b

- 15- Design quality is not related to the organizational priorities.
- a>true b>false

Answer: b

- 16- Process oriented quality has 2 types of models which are hierarchical & relational models.
- a>true b>false

Answer: b

- 17- Design as a product should be:
- a)considering risk b)allow for time to market
 - c)simple & efficient c)All of them.

Answer: c

Lecture 7 Design principles -2

- 1- A design principle that depends on continuous decomposition of the software until fine-grained components are created.
- a)encapsulation
 - b)abstraction
 - c)modularization
 - d)none of them

Answer: c

- 2- Usually when the designer start modularizing the design , he also modularize ..
- a)programming
 - b)test cases
 - c)requirements
 - d)all of the above

Answer: d

- 3- We don't overdo modularization because that would
- a)overload requirements
 - b)destroy abstraction
 - c)complicate integration
 - d)a&c

Answer: c

- 4- Packages can be divided into one or more subsystem.
- a>true b) false

Answer: b

- 5- Which of the property of software modularity is incorrect with respect to benefits software modularity?
- a) Modules are robust
 - b) Module can use other modules
 - c) Modules Can be separately compiled and stored in a library
 - d) Modules are mostly dependent

Answer: d

- 6- Java packages and Fortran subroutine are examples of_____
- a) Functions
 - b) Modules
 - c) Classes
 - d) Sub procedures

Answer: b

- 7- Coupling and cohesion are closely linked in that as one increases, so does the other.
- a)True b) False

Answer: b

- 8- Given classes A and B, which of the following is not a common type of coupling in object-oriented software?
- a)A is a direct or an indirect subclass of B
 - b)A method parameter or local variable in A references B
 - c)A has an instance variable that refers to B
 - d)A invokes methods of B
 - e)None of the above

Answer: e

- 9- What is the typical relationship between coupling and cohesion?
- a)There is no relationship between coupling and cohesion.
 - b)As cohesion increases, coupling increases.
 - c)As cohesion increases, coupling decreases.

Answer: c

- 10- All else being equal, which is more desirable?
- a)Higher cohesion and higher coupling
 - b)Higher cohesion and lower coupling
 - c)Lower cohesion and lower coupling
 - d)Lower cohesion and higher coupling
 - e)None of the above is more desirable than the others.

Answer: b

11- We can say that an entity is cohesive if it ...

- a)has multiple defined tasks
- b)has restricted methods
- c)a&b
- d)single well-defined task

Answer: d

12- Logical cohesion is one of the most desirable cohesions.

- a>true b>false

Answer: b

13- I built STUDENT class that includes all methods of storing and manipulating the student data and nothing else making sure all the operations working on the same student data.

Then I am applying

- a)Informational cohesion
- b)functional cohesion
- c)temporal cohesion
- d)none of the above

Answer: a

14- If all tasks must be executed in the same time-span, what type of cohesion is being exhibited?

- a) Functional Cohesion
- b) Temporal Cohesion
- c) Functional Cohesion
- d) Sequential Cohesion

Answer: b

15- Which of the following is the worst type of module cohesion?

- a) Logical Cohesion
- b) Temporal Cohesion
- c) Functional Cohesion
- d) Coincidental Cohesion

Answer: d

16- What is the meaning of Functional Cohesion?

- a) Operations are part of single functional task and are placed in same procedures.
- b) All operations that access the same data are defined within one class.
- c) All operations that access the data from outside the module.
- d) None of the above.

Answer: a

17- Which of the following is the best type of module cohesion?

- a) Functional Cohesion
- b) Temporal Cohesion
- c) Functional Cohesion
- d) Sequential Cohesion

Answer: a

18- A developer created a method with some procedures inside a STUDENT class to calculate student total grade where Procedure1 takes total_grade and add quiz_marks to it then Procedure2 takes the output of Procedure2 and add project_marks to it then Procedure3 takes the output and add final_exam_marks to it. This developer is applying....

- a) Functional Cohesion
- b) Temporal Cohesion
- c) Functional Cohesion
- d) Sequential Cohesion

Answer: d

19- When the entity is responsible for a set of related tasks, one of which is selected by the caller in each case that's considered as logical cohesion.

- a) true b) false

Answer: a

20- In what type of coupling, the complete data structure is passed from one module to another?

- a) Control Coupling
- b) Stamp Coupling
- c) Common Coupling
- d) Content Coupling

Answer: b

21- Which of the following is the worst type of module coupling?

- a) Control Coupling
- b) Stamp Coupling
- c) Common Coupling
- d) Content Coupling

Answer: d

22- If class A generalizes class B , do we consider both classes coupled ?

- a)Yes, they're coupled
- b)No, they're not

Answer: a

23- If a class A depends on class B, and class B is modified, class A may need to change as well.

- a>true b>false

Answer: a

24- If more than one function can modify the value of the global variable, it can be extremely difficult to track the execution of this loop. And that is most likely to happen when we use....

- a)content coupling
- b)common coupling
- c)stamp coupling
- d)Data coupling

Answer: b

25- Which is the most desirable form of coupling?

- a) Control coupling
- b) Data coupling
- c) Common coupling
- d) Stamp coupling

Answer: b

26- What is / are the characteristics of a well-formed design class?

- a) Primitiveness
- b) High cohesion
- c) Low coupling
- d) All of the above

Answer: d

27- Read List-I and List-II and Match the following:

- a. Data coupling ----- i. Module A and Module B have shared data.
- b. Stamp coupling ----- ii. Dependency between modules is based on the fact they communicate by only passing of data.
- c. Common coupling ----- iii. When complete data structure is passed from one module to another.
- d. Content coupling ----- iv. When the control is passed from one module to the middle of another.

a) a - iii, b - ii, c - i, d - iv

b) a - ii, b - iii, c - i, d - iv

c) a - ii, b - iii, c - iv, d - i

d) a - iii, b - ii, c - iv, d - i

Answer: b

resources:

1- lectures

2- <https://www.sanfoundry.com/software-engg-mcqs-modularity-software-design/>

3- <https://www.careerride.com/mcq/software-design-concept-software-testing-mcq-questions-and-answers-209.aspx>

4- <https://weeklyitblogs.wordpress.com/tag/example-of-cohesion/>

Lecture 8

- 1- Which among the following best defines abstraction?
- a) Hiding the implementation
 - b) Showing the important data
 - c) Hiding the important data
 - d) Hiding the implementation and showing only the features

Answer: d

- 2- Hiding the implementation complexity can _____
- a) Make the programming easy
 - b) Make the programming complex
 - c) Provide more number of features
 - d) Provide better features

Answer: a

- 3- Abstraction gives higher degree of _____
- a) Class usage
 - b) Program complexity
 - c) Idealized interface
 - d) Unstable interface

Answer: c

- 4- Behavior abstraction simplifies reasoning about structural composition of data objects.
- a)true b>false

Answer: b

- 5- Abstraction can apply to _____
- a) Control and data
 - b) Only data
 - c) Only control
 - d) Classes

Answer: a

- 6- Abstraction principle includes_____
- a) Use abstraction at its minimum
 - b) Use abstraction to avoid longer codes
 - c) Use abstraction whenever possible to avoid duplication
 - d) Use abstraction whenever possible to achieve OOP

Answer: c

- 7- All of the following practices help abstraction to increase except:
- a)designing fewer public methods
 - b)passing fewer parameters inside methods
 - c)declaring all variables inside the class as privates
 - d)not to design abstractions and superclasses

Answer: d

- 8- During, interfaces are created to provide public access to services provided by the design unit while hiding unnecessary details, which include implementation.
- a)presentation
 - b)abstraction
 - c)encapsulation
 - d)none of them

Answer: c

- 9- means that the component should capture those characteristics of an abstraction that are necessary to permit a meaningful, sufficient and efficient interaction with the component for achieving the intent.
- a)sufficient
 - b)completeness
 - c)primitive
 - d)none of them

Answer: a

- 10- measures how good-designed units provide the required services to achieve the intent.

- a)sufficient
- b)completeness
- c)primitive
- d)none of them

Answer: b

11- When you specialize your design as much as possible that helps you increase it's reusability.

- a>true b>false

Answer: b

12- Cloning is one of the best examples of design reusability.

- a>true b>false

Answer: b

13- Good designers always anticipate changes so they reduce coupling and increase cohesion to reach design flexibility.

- a>true b>false

Answer: a

14- A designer working on a large machine learning project and decided to use an old version of a python library that can only work on pycharm editor environment to build a new component in the project. That's considered as example of

- a)good design
- b)ignoring obsolescence
- c)anticipating obsolescence
- d)separation of interface and implementation

Answer: b

15- Avoiding the use of facilities that are specific to one particular environment applies which of the following designing principles?

- a)design for flexibility
- b)design for portability

- c)design for testability
- d)design defensively

Answer: b

16- Java support good testability as when you can create a main method in each class in order to exercise the other methods.

- a>true b>false

Answer: a

17- Checking that all of the inputs to your component are valid and all the preconditions is example of:

- a)design for flexibility
- b)design for portability
- c)design for testability
- d)design defensively

Answer: d