Génie Logiciel Avancé

Exercises: Diagramme de classe

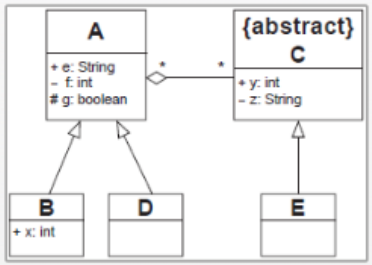
Bui Thi Mai Anh[1]
anhbtm@soict.hust.edu.vn

[1]School of Information and Communication Technology
Ha Noi University of Science and Technology

23 mars 2020

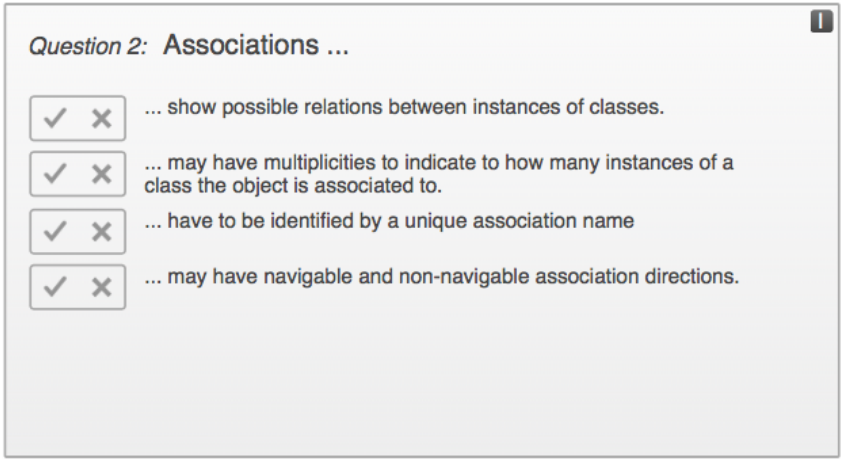
Question 1

Question 1: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?



- ✓ ✗ An object of `A` may or may not contain objects of `C`.
- ✓ ✗ Objects of `C` and `B` can see `f`.
- ✓ ✗ An instance of `A` can see `y`.
- ✓ ✗ Objects of `B` and `D` can see `g`.

Question 2


Question 2: Associations ...
... show possible relations between instances of classes.
... may have multiplicities to indicate to how many instances of a class the object is associated to.
... have to be identified by a unique association name
... may have navigable and non-navigable association directions.

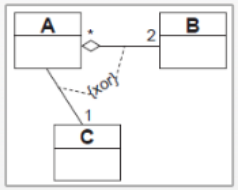
Question 3

Question 3: Which of the following statements about compositions (composite aggregations) are true?

- ✓ ✗ The composite aggregation is a transitive relationship.
- ✓ ✗ The multiplicity of a composite aggregation may be ≥1.
- ✓ ✗ When the composite element is deleted, the parts also die.
- ✓ ✗ In a composition, a part may belong to only one composite at a time.

Question 4

Question 4: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?

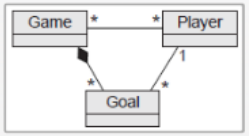


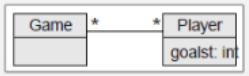
- If an instance of A is deleted, all contained instances of B are deleted as well.
- One object of A is associated with exactly one object of C and two objects of B.
- One object of A may contain two objects of B.
- The diamond near A is called composition.
- One object of B may be associated with multiple objects of A.

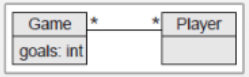
Question 5

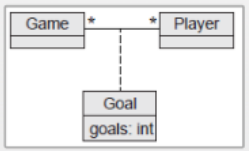
Question 5: ***How do you model the following situation with a UML2 class diagram:***

During one soccer season, multiple players participate in multiple games. Each player scores in each game a certain number of goals.



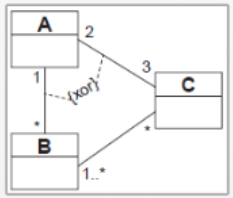






Question 6

Question 6: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?



- ✓ ✗ One object of A is associated with exactly three objects of C or any amount of objects of B; One object of C is associated with exactly two objects of A.
- ✓ ✗ One object of A can never be associated with objects of C and B at the same time.
- ✓ ✗ One object of C is associated with exactly one object of B.
- ✓ ✗ One object of B is associated with exactly one object of A.

Question 7

Question 7: A class diagram describes ...

- ✓ ✗ shows the static view of a system.
- ✓ ✗ shows the interaction view of a system.
- ✓ ✗ shows the dynamic view of a system.
- ✓ ✗ shows the practical view of a system.

Question 8

Question 8: Primitive data types ...

- ✓ ✗ ... are defined strictly and cannot be defined by the user.
- ✓ ✗ ... are a synonym for classes.
- ✓ ✗ ... have no internal structure.
- ✓ ✗ ... cannot have operations.

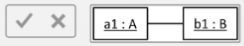
Question 9

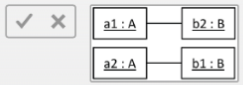
Question 9: ***How do you model the following situation with a UML2 class diagram:***

On a blind date exactly two people take part. A person can take part in multiple blind dates. It is not sufficient to know a person to derive all his/her dates.

Question 10

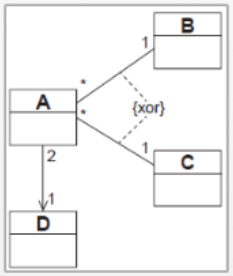
Question 10: You are given the following clipping of a UML2 class diagram. Which of the following object diagrams are consistent with the class diagram?





Question 11

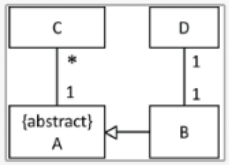
Question 11: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?

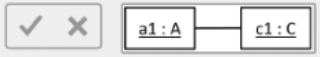


- ✓ ✗ One object of A is associated with exactly one object of B or one object of C.
- ✓ ✗ Several objects of A are associated with exactly one object of B or one object of C.
- ✓ ✗ One object of B is associated with exactly two objects of A.
- ✓ ✗ The association between A and D can be navigated coming from A.

Question 12

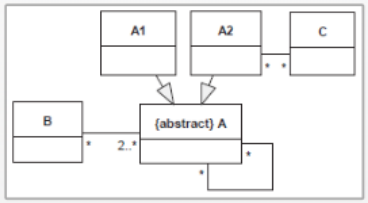
Question 12: You are given the following clipping of a UML2 class diagram. Which of the following object diagrams are consistent with the class diagram?





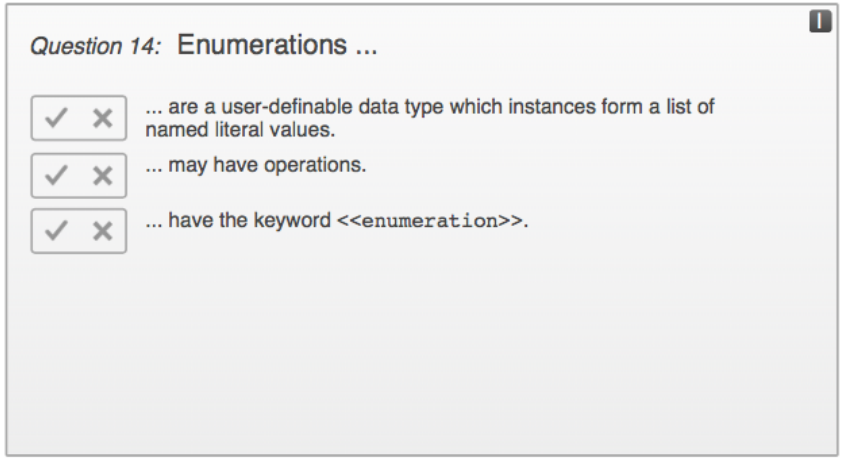
Question 13

Question 13: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?



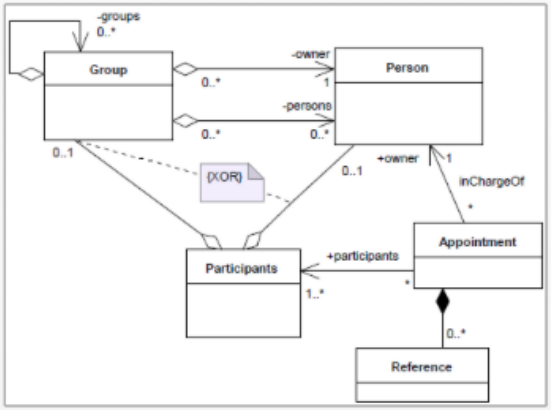
- ✓ ✗ An object of `A1` can directly be associated with an object of `B`.
- ✓ ✗ One (indirect) object of `A` may be associated with an object of `A2`.
- ✓ ✗ Each object of `A1` has to be an instance of `A`.
- ✓ ✗ There exist objects of class `B` that are not associated with objects of class `A2`.

Question 14


Question 14: Enumerations ...
... are a user-definable data type which instances form a list of named literal values.
... may have operations.
... have the keyword <<enumeration>>.

Question 15

Question 15: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?



- ✓ ✗ One person can be included in several groups.
- ✓ ✗ If a group is deleted all persons that are in that group are deleted as well.
- ✓ ✗ There are appointments that do not have any participants assigned yet.
- ✓ ✗ A participant that has been assigned to an appointment can be group and person at the same time.
- ✓ ✗ One group can consist of several persons.
- ✓ ✗ There are groups that do not have any persons assigned.
- ✓ ✗ It is possible to navigate from an appointment to the person who is in charge of it.
- ✓ ✗ Several persons are in charge of one appointment.
- ✓ ✗ If an appointment is deleted all references linked with it are deleted as well.
- ✓ ✗ An appointment can be made for multiple participants.
- ✓ ✗ It is possible to navigate from a person to the appointments that he is in charge of.
- ✓ ✗ Groups can only consist of persons, they cannot comprise of other groups.

Question 16

Question 16: Which kind of navigability belongs to which kind of arrowhead, considering the navigability from A to B?

- please choose -

- please choose -

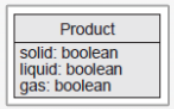
- please choose -

Question 17

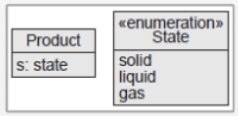
Question 17: ***How do you model the following situation with a UML2 class diagram:***

Every product is in one of the three following states: solid, liquid or gas.

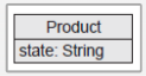
✓ ✗



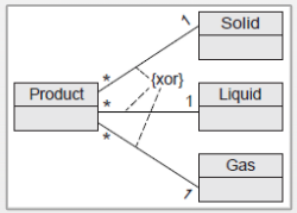
✓ ✗



✓ ✗



✓ ✗

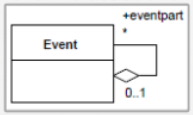


Question 18

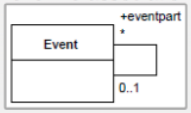
Question 18: *How do you model the following situation with a UML2 class diagram:*
An event may be part of another event.

enumeration

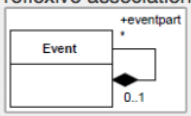
reflexive association and aggregation



reflexive association



reflexive association and composition

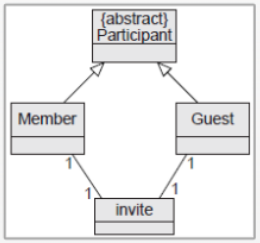


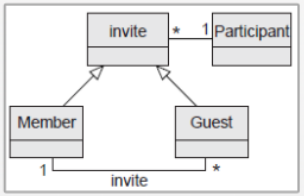
Question 19

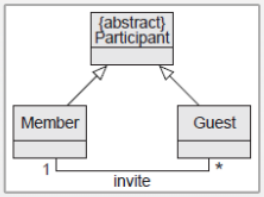
Question 19: ***How do you model the following situation with a UML2 class diagram:***
Every restaurant has at least one kitchen, one kitchen is part of exactly one restaurant.

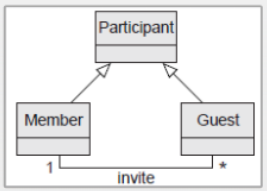
Question 20

Question 20: ***How do you model the following situation with a UML2 class diagram:***
There are exactly two kinds of participants, namely members and guests. Guests are invited by members.



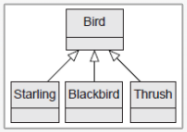


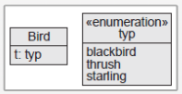


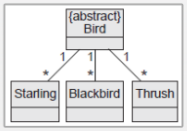


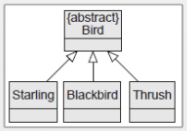
Question 21

Question 21: *How do you model the following situation with a UML2 class diagram:*
There are multiple different bird species, e.g. blackbird, thrush and starling.



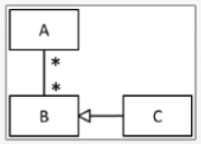


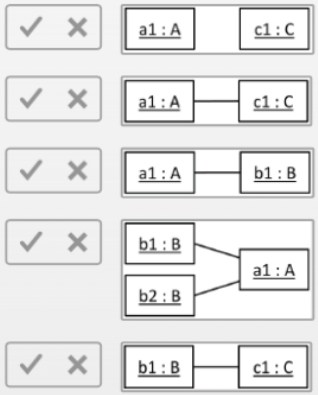




Question 22

Question 22: You are given the following clipping of a UML2 class diagram. Which of the following object diagrams are consistent with the class diagram?



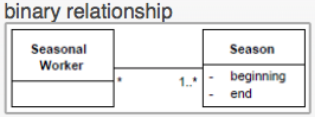


Question 23

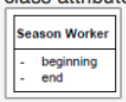
Question 23: ***How do you model the following situation with a UML2 class diagram:***

A season worker may be employed in one or several seasons, the beginning and the end of each employment period is saved.

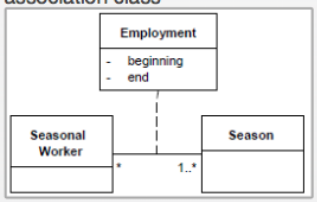
✓ ✗ binary relationship



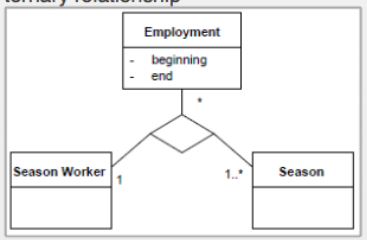
✓ ✗ class attributes



✓ ✗ association class



✓ ✗ ternary relationship



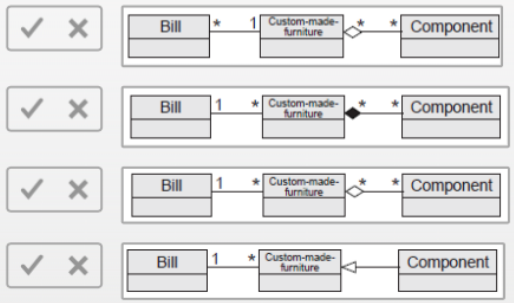
Question 24

Question 24: Which of the following statements are true?

- ✓ ✗ Classes always have a section showing a textual description.
- ✓ ✗ Every class in a class diagram must have attributes and operations.
- ✓ ✗ Operations may have parameters and return values.
- ✓ ✗ An attribute can have a type.

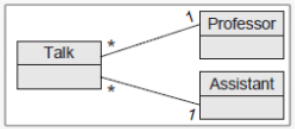
Question 25

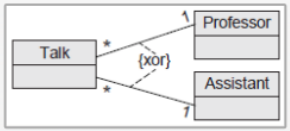
Question 25: ***How do you model the following situation with a UML2 class diagram:***
FurnitureFritz charges custom-made furniture which is assembled from prefabricated components.

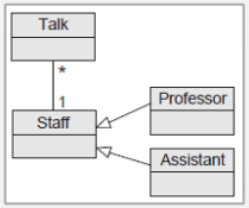


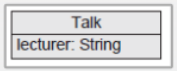
Question 26

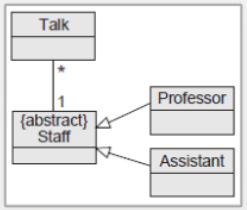
Question 26: *How do you model the following situation with a UML2 class diagram:*
Each talk is done by a professor or by an assistant.





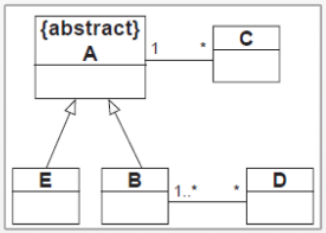






Question 27

Question 27: You are given the following clipping of a UML2 class diagram. Which of the following statements are true?



- ✓ ✗ One object of a subclass of `A` is associated with `*` objects of `C`.
- ✓ ✗ Direct instances of `A` exist.
- ✓ ✗ One object of `B` is associated with `1..*` objects of `D`.
- ✓ ✗ One object of `D` is associated with at least one object of `B`.

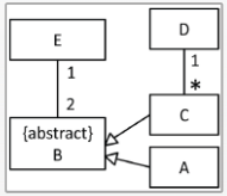
Question 28

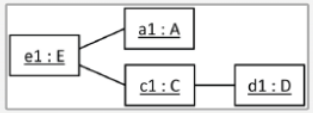
Question 28: Which of the following statements about the given diagram are true?

- ✓ ✗ B is part of A.
- ✓ ✗ A is part of B.
- ✓ ✗ If an instance of A is deleted, the contained instances of B are not affected.
- ✓ ✗ The composite objects form a tree structure.
- ✓ ✗ If an instance of A is deleted, all contained instances of B are also deleted.
- ✓ ✗ The chains of aggregation links form a directed, acyclic graph.
- ✓ ✗ If an instance of B is deleted, all contained instances of A are also deleted.

Question 29

Question 29: You are given the following clipping of a UML2 class diagram. Which of the following object diagrams are consistent with the class diagram?





Question 30

Question 30: Which visibilities can attributes and operations of classes have?

- [ ] `friends`
- [ ] `protected`
- [ ] `package`
- [ ] `all`
- [ ] `public`
- [ ] `private`