

Midterm Exam 2 Trends

Nov. 14, 2022

Q. 1

What went well:

- Most students were able to identify correct answers for the given statements.

What can be improved:

- A good number of students identified “True” answer for the second statement: “A class can be abstract and leaf”. A leaf class cannot be extended and therefore there is no means to make the abstract class concrete.
- A good number of students identified “**False**” answer for the third statement: “A concrete class can be instance scoped”.

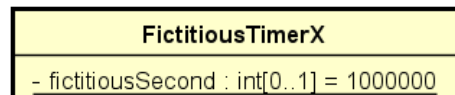
Q. 2

What went well:

- Most students were able to differentiate the UML class attributes and the JAVA programming language and provide correct answers.

What can be improved:

- Most students have marked “NO” for “Note” for class attributes. In any UML class diagram, notes can be used for providing observations or anything that cannot be included in the class specification (e.g., in Astah, the Base tab can be used to define details such as Definition and multiplicity).
- Most students have identified “**Multiplicity**” as No with respect to Java Programming language. Example: the attribute “- fictitiousSecond : int[0..1] = 1000000” specified for the **FictitiousTimer** class below corresponds to “private static final int[] fictitiousSecond = 1000000” in the Java programming language.



Midterm Exam 2 Trends

Nov. 14, 2022

- Most students have identified “**Note**” as “Yes” with respect to the Java Programming language attribute. Definitions defined for attributes are different than any notes that may be attached to them.

Q. 3

What went well:

- The question has asked to categorize given features with respect to UML communication and sequence diagrams. Many students understood the question correctly and answered it accordingly.

What can be improved:

- Most students have marked “**Yes**” for States of Objects as a feature of the Sequence Diagram. The correct answer is “**No**”
- Most students have marked “**No**” for States of objects as a feature of the Communication Diagram. The correct answer is “**Yes**”

Q. 4:a

What went well:

- Question referred to the general categories of UML diagrams. Many students have understood the categorization correctly and answered as the “structural” category.

What can be improved:

- Few students correctly identified the Object Diagram to be logical. This diagram is also static.
- Most of the students have identified “Class” as a category for the UML object diagram.

Q. 4:b

What went well:

- A good number of students have identified the correct set of diagrams such as “**State Machine**”, “**Sequence**” and “**Communication**” (interaction diagrams are also acceptable), as these UML diagrams belong to the “behavioral” category, to which the object diagram does not belong to.

Midterm Exam 2 Trends

Nov. 14, 2022

What can be improved:

- A good number of students have identified some other diagrams (those that belong to the structural category).
- A few students have identified the UML **use-case diagram** to be closely related to the object diagram and are given partial credits for the same.

Q. 5

What went well:

- Many understood the partial sequence diagram and correctly identified the correct answer for all 3 blanks.

What can be improved:

- Nearly half of the students didn't identify "one" as an object.
- More than half of the students didn't identify "XYZ" as a class.
- About one-third of the students didn't identify the relationship between "one" and "XYZ".
One: XYZ defines the relationship as "one" being an instance of the class "XYZ"

Q. 6

What went well:

- Many students identified correct relationships and constraints between the classes using generalization sets. A generalization set with valid constraints is {incomplete, disjoint}. The constraints {incomplete, overlapping} are also valid.

What can be improved:

- Few students have shown the relationships using generalization sets but did not provide meaningful constraints between classes.
- Some students have defined dependency or aggregation relationships between the classes which were not meaningful for the given problem description.

Midterm Exam 2 Trends

Nov. 14, 2022

- Few students provided relationships that belong to other UML diagrams. Each language (e.g., Use Case and State Machine) has its own syntax and semantics. The elements of these languages are not interchangeable, even though, at the conceptual level, they may only have some similarities.

Q. 7

What went well:

- Most students correctly identified correct relationships between {**R** and **AB**}, {**R** and **QZ**}, and {**AB** and **QZ**}. Given the R interface, a set of meaningful relationships is:
 - AB (abstract class) realizes R (interface) and QZ (concrete class) generalizes AB (abstract class)
- Other relationships, such as aggregation, between AB and QZ are also meaningful.

What can be improved:

- A few students have identified the wrong relationships between these classes.
- A small number of students provided the explanation but did not draw the visual notations for relationships between classes
- A few students did not provide correct visual syntaxes to represent these relationships

Q. 8:a

What went well:

- Most students answered this correctly.

What can be improved:

- Many students marked the answer as “No” but it is key to specify the public visibility for the method but not for the attribute.

Midterm Exam 2 Trends

Nov. 14, 2022

Q. 8:b

What went well:

- Most students identified the advantage of specifying public visibility for the method.

What can be improved:

- A few students identified the answer in part (a) without providing meaningful explanations for their answers.

Q. 8:c

What went well:

- Most students correctly identified all possible states for the source and the target (low, medium, and high).

What can be improved:

- A few students identified the states which were not meaningful to the problem statement such as start order and incomplete order.

Q. 8:d

What went well:

- Most students have correctly identified 9 transitions such as low \rightarrow low, low \rightarrow medium, low \rightarrow high, and medium \rightarrow low.
- Identifying 6 transitions was also acceptable (self-transitions are important to be included).
- Few students have also provided an explanation for the transitions they identified.

What can be improved:

- A small number of students did not identify at least 6 correct transitions.
- A few students identified an incorrect number of transitions such as 5 and 12.

Midterm Exam 2 Trends

Nov. 14, 2022

Q. 9:a

What went well:

- It was expected to identify a classification approach and provide valid values for the tube volume. Many students were able to identify the correct classification approach which is conceptual clustering and provided the correct set of values for it.

What can be improved:

- Identifying the correct classification approach for the variable that holds the tube volume is important. A few students have answered classical classification and prototyping. They have received partial credit.
- A few students didn't provide any classification approach.
- A few students identified the approach but did not provide any values. It is important to provide valid values which justify the identified classification approach.

Q. 9:b

What went well:

- Many students were able to provide the UML class as per the requirements mentioned in the problem statement. They have provided a UML class diagram, an advanced property for any one of the identified attributes, and detailed specifications for their methods and attributes.
- A few students provided detailed specifications such as a definition for one of the attributes and one of the methods, which was acceptable.

What can be improved:

- Some students have provided incorrect arguments, visibility, or return type for the methods. For example, the **getValue** (the method returning the volume) with the return type **void** is not meaningful.
- Most of the students haven't provided detailed specifications such as definitions for both the attributes and the methods.
- A good number of students haven't provided advanced detailed specification for attributes such as initial values.

Midterm Exam 2 Trends

Nov. 14, 2022

Q. 10

What went well:

- Almost every student identified one suitable actor and two appropriate use cases.
- Meaningful relationships (at least one include and one exclude) were identified.
- Almost everyone was able to provide valid definitions for these actors and use cases.

What can be improved:

- Directions of the relationships are very important. They have distinct (visual) syntax and semantics.
- Some students have mentioned incorrect directions for the include and exclude relationships.
- In some cases, the “include” relationship was mentioned where the “extend” relationship was meaningful and vice versa.