

Diagram Types in Software Engineering

Answers

1. Which diagram represents the functional characteristics of a system?

- ☐ A. State Transition Diagram
- ☐ B. Data-Flow Diagram
- ☐ C. UML: Use Case Diagram
- ☐ D. Entity–Relationship Diagram

Answer: Data-Flow Diagram (B)

The Data-Flow Diagram is used to represent the functional characteristics of a system, including the flow of data and the operations performed on that data.

2. Which diagram is used to model thebehavioural..... aspects of a system?

- ☐ A. Structure Diagram (Jackson)
- ☐ B. Statechart
- ☐ C. UML: Class Diagram
- ☐ D. UML: Activity Diagram

Answer: Statechart (B)

The Statechart diagram is used to model the behavioural aspects of a system, including the states, transitions, and events that an entity can experience.

3. Which diagram represents thestatic relationships..... between design entities?

- ☐ A. UML: Activity Diagram
- ☐ B. UML: Use Case Diagram
- ☐ C. Statechart
- ☐ D. UML: Class Diagram

Answer: UML: Class Diagram (D)

The UML Class Diagram is used to represent the static relationships between design entities, such as classes, interfaces, and associations.

4. Which diagram is used to model theinteractions between a system and other 'actors'.....?

- ☐ A. UML: Use Case Diagram
- ☐ B. UML: Activity Diagram
- ☐ C. Data-Flow Diagram
- ☐ D. Entity–Relationship Diagram

Answer: UML: Use Case Diagram (A)

The UML Use Case Diagram is used to model the interactions between a system and other 'actors', such as users, external systems, or other stakeholders.

5. Which diagram is used to represent thesynchronization and coordination of system activities.....?

- ☐ A. State Transition Diagram
- ☐ B. UML: Activity Diagram
- ☐ C. UML: Class Diagram
- ☐ D. Structure Diagram (Jackson)

Answer: UML: Activity Diagram (B)

The UML Activity Diagram is used to represent the synchronization and coordination of system activities, including the flow of control and data between different actions and activities.

6. What is the primary purpose of a black box notation in software design modeling?

- ☐ A. To represent the physical hardware components of a system
- ☐ B. To document the coding standards and guidelines used in development
- ☐ C. To describe the internal implementation details of an element
- ☐ D. To describe the external properties and behavior of an element

Answer: To describe the external properties and behavior of an element (D)

A black box notation is concerned with the external properties of the elements, describing what an element will do rather than how it is implemented.

7. Which diagram is described as being more concerned with 'structure' and less explicitly related to any one viewpoint?

- ☐ A. Statechart
- ☐ B. State Transition Diagram (STD)
- ☐ C. Jackson Structure Diagram
- ☐ D. Entity-Relationship Diagram (ERD)

Answer: Jackson Structure Diagram (C)

The text states that the Jackson Structure Diagram offers an example of a notation that is more concerned with 'structure' and less explicitly related to any one viewpoint.

8. Which diagram is related to an architectural style focused on transaction-based forms?

- ☐ A. Unified Modeling Language (UML)
- ☐ B. Data-Flow Diagram (DFD)
- ☐ C. State Transition Diagram (STD)
- ☐ D. Entity-Relationship Diagram (ERD)

Answer: Entity-Relationship Diagram (ERD) (D)

The text mentions that the Entity-Relationship Diagram (ERD) is related to an important architectural style, albeit a very different one (transaction-based forms).

9. What is the primary purpose of a Data Flow Diagram (DFD)?

- ☐ A. To represent the static relationships between design entities
- ☐ B. To model the interactions between a system and external actors
- ☐ C. To model the control logic and sequential order of operations
- ☐ D. To provide a problem-oriented view of the system and emphasize data dependencies

Answer: To provide a problem-oriented view of the system and emphasize data dependencies (D)

DFDs are primarily used to provide a problem-oriented view of the system, focusing on the flow of data and dependencies between operations, rather than control logic or static relationships.

10. Which component of a DFD represents an external source or sink of information?

- ☐ A. The arc
- ☐ B. The box
- ☐ C. The circle (bubble)
- ☐ D. The parallel bars

Answer: The box (B)

The box component in a DFD represents an external source or sink of information, while the circle (bubble) denotes an operation, the parallel bars represent a data store, and the arc represents the flow of information.

11. Which statement about DFDs is true?

- ☐ A. DFDs are concerned with the control logic and sequential order of operations
- ☐ B. DFDs specify whether operations are performed serially or in parallel
- ☐ C. DFDs cannot be expanded in a hierarchical fashion
- ☐ D. DFDs predate the computer era and are effective for describing processes

Answer: DFDs predate the computer era and are effective for describing processes (D)

DFDs predate the computer era and are effective for describing processes, stressing dependencies and prerequisites. They can be expanded hierarchically but do not specify whether operations are performed serially or in parallel.

12. What is De Marco's distinction regarding DFDs?

- ☐ A. Logical DFD: what is being done to data, Physical DFD: who is doing it
- ☐ B. Logical DFD: data flow, Physical DFD: control logic
- ☐ C. Logical DFD: control logic, Physical DFD: data flow
- ☐ D. Logical DFD: who is doing it, Physical DFD: what is being done to data

Answer: Logical DFD: what is being done to data, Physical DFD: who is doing it (A)

De Marco's distinction is that a logical DFD represents what is being done to data, while a physical DFD represents who (or which physical entities) is doing it.

13. Which statement about DFDs is false?

- ☐ A. DFDs are concerned with the control logic of the system
- ☐ B. DFDs are widely used for initial modeling and analysis
- ☐ C. DFDs describe the architecture in terms of functions
- ☐ D. Changes at one level of a DFD can cause inconsistencies with other levels

Answer: DFDs are concerned with the control logic of the system (A)

DFDs are not concerned with the control logic of the system, but rather focus on the flow of data and dependencies between operations.

14. What is a potential drawback of using DFDs?

- ☐ A. DFDs cannot be expanded hierarchically
- ☐ B. Changes at one level can cause inconsistencies with other levels
- ☐ C. DFDs are difficult to understand for users
- ☐ D. DFDs do not model the interactions between a system and external actors

Answer: Changes at one level can cause inconsistencies with other levels (B)

A potential drawback of using DFDs is that changes at one level can cause inconsistencies with other levels, requiring careful management and consistency checking.