

Assignment 6

Title:

Prepare And Implement Sequence Model.

Problem Statement:

- Prepare Sequence Model. Identify at least 5 major scenarios (sequence flow) for your system.
- Draw Sequence Diagram for every scenario by using advanced notations using UML2.0
Implement these scenarios by taking reference of design model implementation using suitable object-oriented language.

Objective:

- To study and use communication.
- Draw sequence diagram
- To implement a sequence diagram.

Theory:

Sequence Diagrams:

Sequence Diagrams are interaction diagrams that detail how operations are carried out. They capture the interaction between objects in the context of a collaboration. Sequence Diagrams are time focused and they show the order of the interaction visually by using the vertical axis of the diagram to represent time, what messages are sent and when.

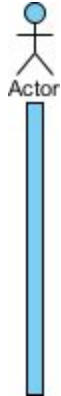
Sequence Diagrams captures:

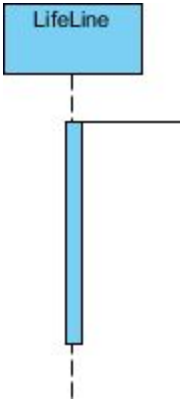
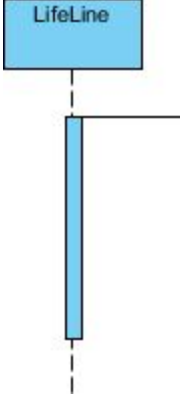
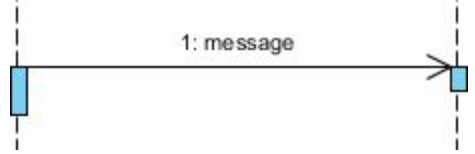
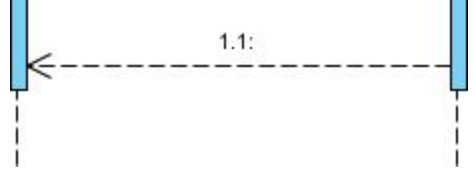
- the interaction that takes place in a collaboration that either realizes a use case or an operation (instance diagrams or generic diagrams)
- high-level interactions between user of the system and the system, between the system and other systems, or between subsystems (sometimes known as system sequence diagrams)


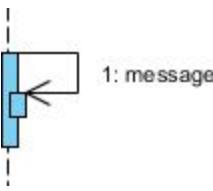
Purpose of Sequence Diagram


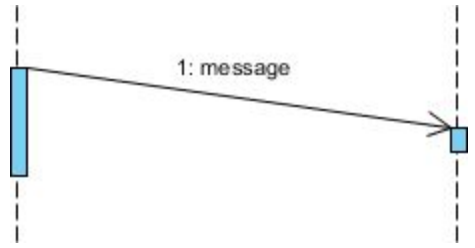

- Model high-level interaction between active objects in a system
- Model the interaction between object instances within a collaboration that realizes a use case
- Model the interaction between objects within a collaboration that realizes an operation
- Either model generic interactions (showing all possible paths through the interaction) or specific instances of a interaction (showing just one path through the interaction)

The sequence diagram consists of following notations:

| Notation Description | Visual Representation |
|--|---|
| <p>Actor</p> <ul style="list-style-type: none">• type of role played by an entity that interacts with the subject (e.g., by exchanging signals and data)• external to the subject (i.e., in the sense that an instance of an actor is not a part of the instance of its corresponding subject).• represent roles played by human users, external hardware, or other subjects. |  |

| | |
|---|---|
| <h2>Lifeline</h2> <p>A lifeline represents an individual participant in the Interaction.</p> |  <p>The diagram shows a single lifeline. It consists of a blue rectangular box at the top labeled "LifeLine". A vertical dashed line extends downwards from the box. A thin blue vertical rectangle is drawn on this dashed line, representing an activation period. A horizontal line segment extends to the right from the top of this activation rectangle.</p> |
| <h2>Activations</h2> <ul style="list-style-type: none"> • A thin rectangle on a lifeline) represents the period during which an element is performing an operation. • The top and the bottom of the of the rectangle are aligned with the initiation and the completion time respectively |  <p>This diagram is identical to the one in the first row, showing a lifeline with an activation rectangle and a horizontal line segment extending from its top.</p> |
| <h2>Call Message</h2> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Call message is a kind of message that represents an invocation of operation of target lifeline. |  <p>The diagram shows two lifelines, each represented by a vertical dashed line with a small blue activation rectangle. A solid horizontal arrow points from the activation rectangle of the left lifeline to the activation rectangle of the right lifeline. The text "1: message" is written above the arrow.</p> |
| <h2>Return Message</h2> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Return message is a kind of message that represents the pass of information back to the caller of a corresponded |  <p>The diagram shows two lifelines, each represented by a vertical dashed line with a small blue activation rectangle. A dashed horizontal arrow points from the activation rectangle of the right lifeline back to the activation rectangle of the left lifeline. The text "1.1:" is written above the arrow.</p> |

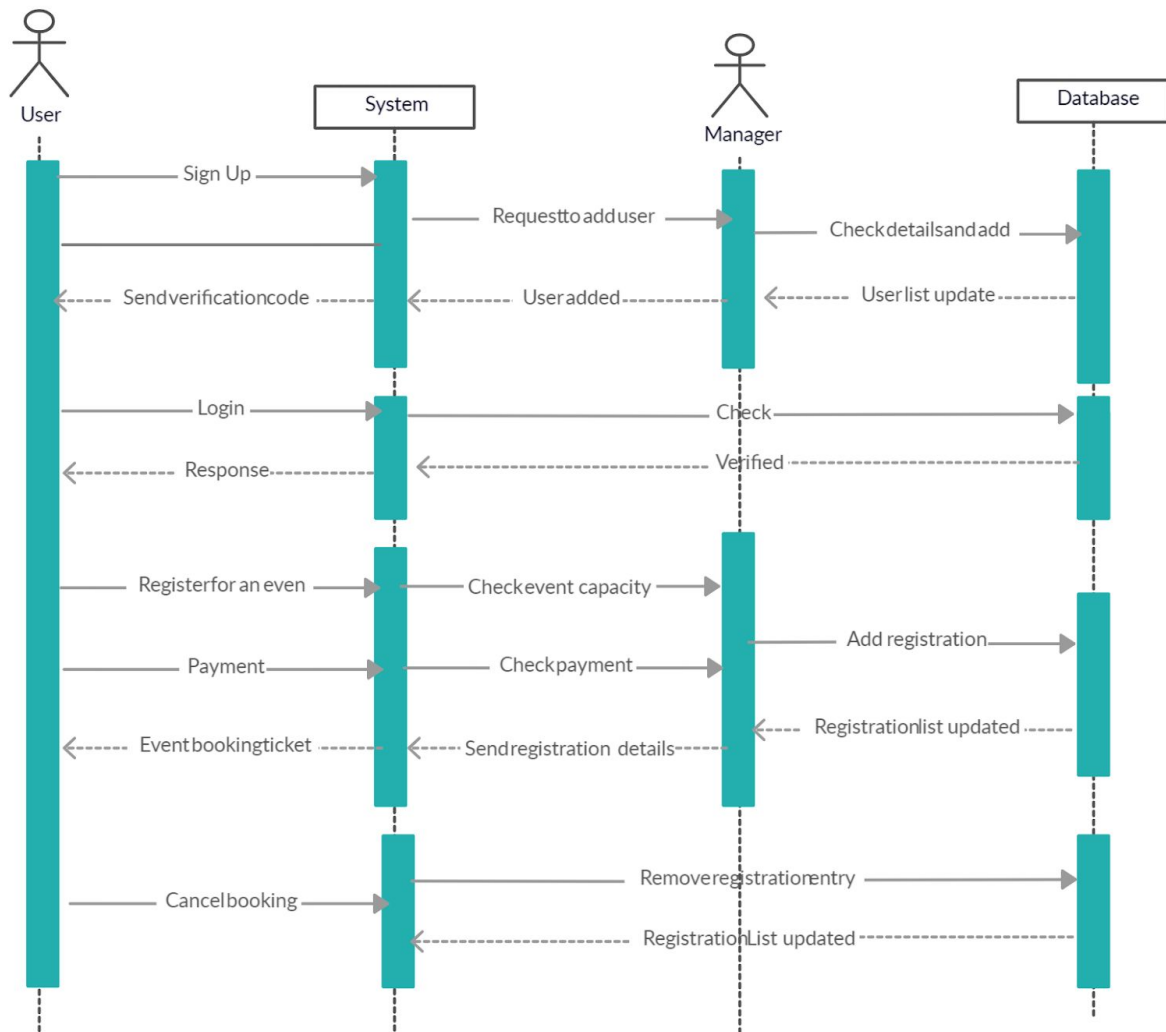
| | |
|--|--|
| <p>former message.</p> | |
| <p>Self Message</p> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Self message is a kind of message that represents the invocation of a message of the same lifeline. |  <p>The diagram shows a vertical dashed line representing a lifeline. A blue rectangular activation bar is positioned on this line. A message arrow originates from the right side of this activation bar and points back to the left side of the same activation bar. To the right of the arrow's tail is the text "1: message".</p> |
| <p>Recursive Message</p> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Recursive message is a kind of message that represents the invocation of a message of the same lifeline. It's target points to an activation on top of the activation where the message was invoked from. |  <p>The diagram shows a vertical dashed line representing a lifeline. A blue rectangular activation bar is positioned on this line. Within this bar, there is a smaller, nested blue rectangular activation bar. A message arrow originates from the right side of the outer activation bar and points to the top edge of the inner activation bar. To the right of the arrow's tail is the text "1: message".</p> |
| <p>Create Message</p> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Create message is a kind of message that represents the instantiation of (target) lifeline. | |

| | |
|--|--|
| <h3>Destroy Message</h3> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Destroy message is a kind of message that represents the request of destroying the lifecycle of the target lifeline. |  <p>The diagram shows two vertical dashed lines representing lifelines. The left lifeline has a blue rectangular activation bar. A horizontal arrow points from this bar to the right lifeline, labeled "1: message". The right lifeline has a blue rectangular activation bar, and an 'X' mark is placed on the dashed line below it, indicating the destruction of the lifeline.</p> |
| <h3>Duration Message</h3> <ul style="list-style-type: none"> • A message defines a particular communication between Lifelines of an Interaction. • Duration message shows the distance between two time instants for a message invocation. |  <p>The diagram shows two vertical dashed lines representing lifelines. The left lifeline has a blue rectangular activation bar. A diagonal arrow points from this bar to the right lifeline, labeled "1: message". The right lifeline has a blue rectangular activation bar, representing the duration of the message.</p> |
| <h3>Note</h3> <p>A note (comment) gives the ability to attach various remarks to elements. A comment carries no semantic force, but may contain information that is useful to a modeler.</p> |  <p>The diagram shows a blue rectangular note box with a folded top-right corner, representing a comment or note in a UML diagram.</p> |

Strategy for Creation of Sequence Diagram

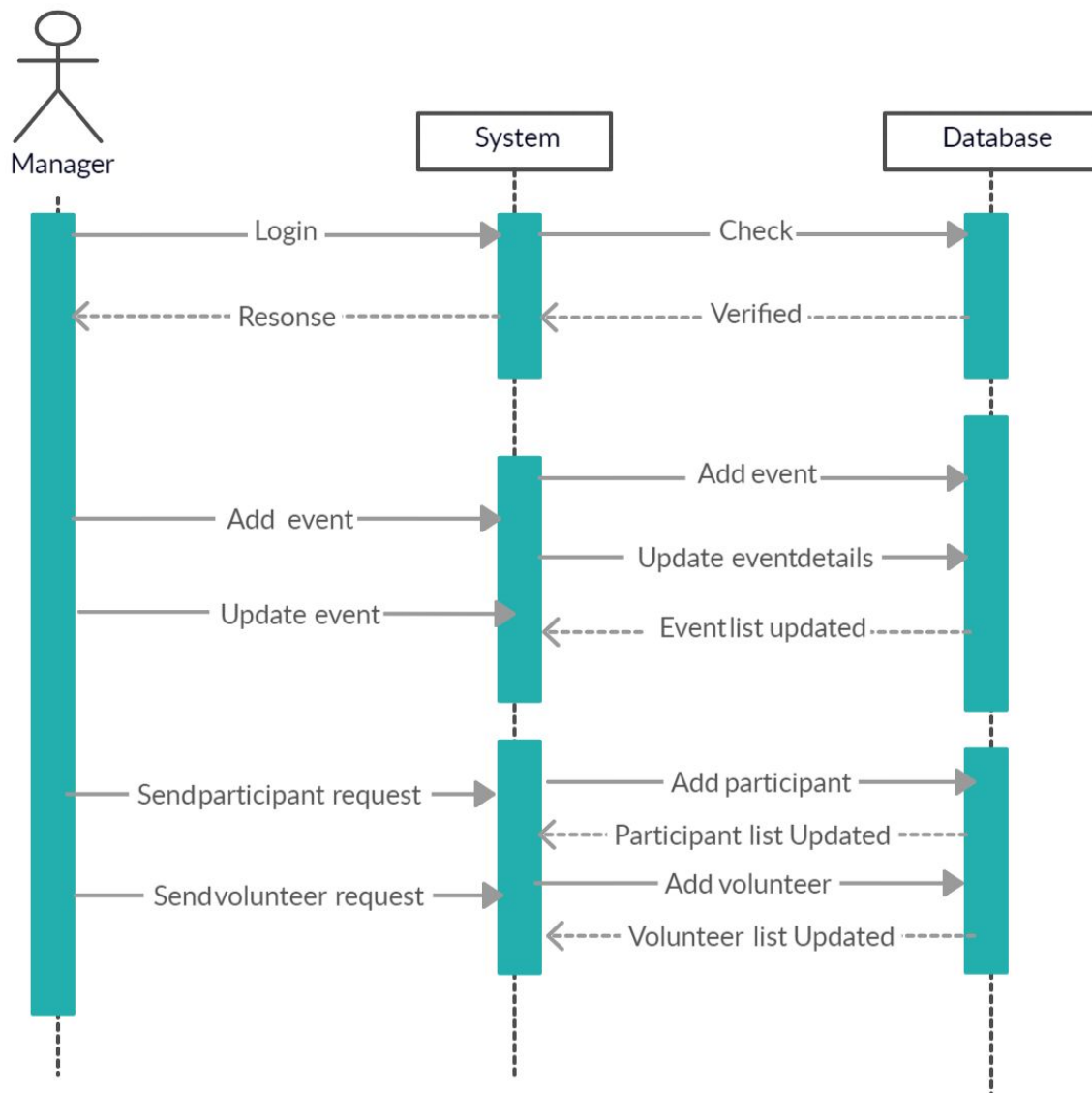
- In this assignment we tried to decide use cases for sequence diagrams according to the actor involved in it.
- Various actors such as User, Volunteer, Manager & Admin were identified and the lifelines were created accordingly.
- Objects such as System and Database are an integral part of our diagram and play a crucial part in all the interactions.

Sequence Diagram for User Activities

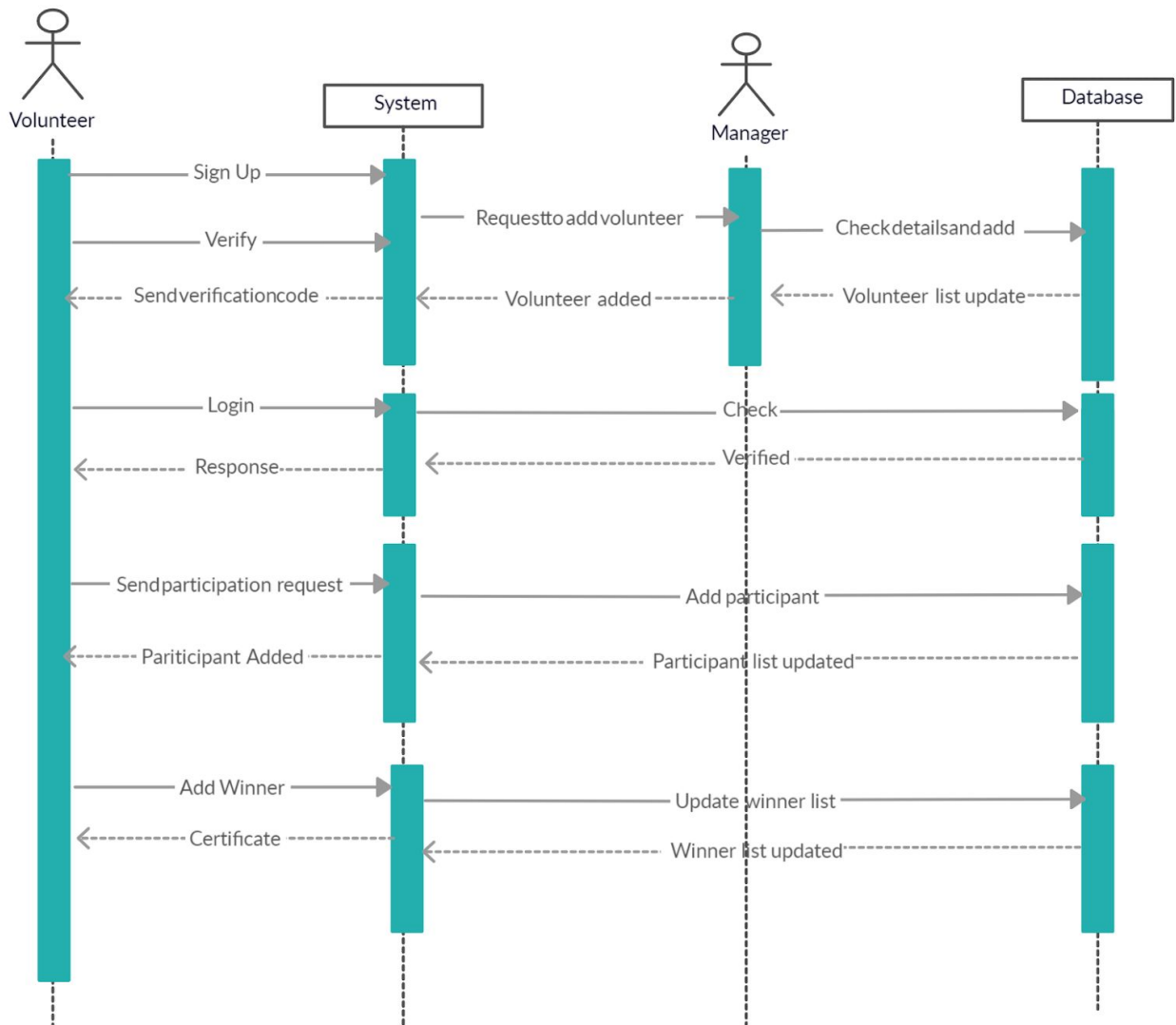


Sequence Diagram for Manager Activities

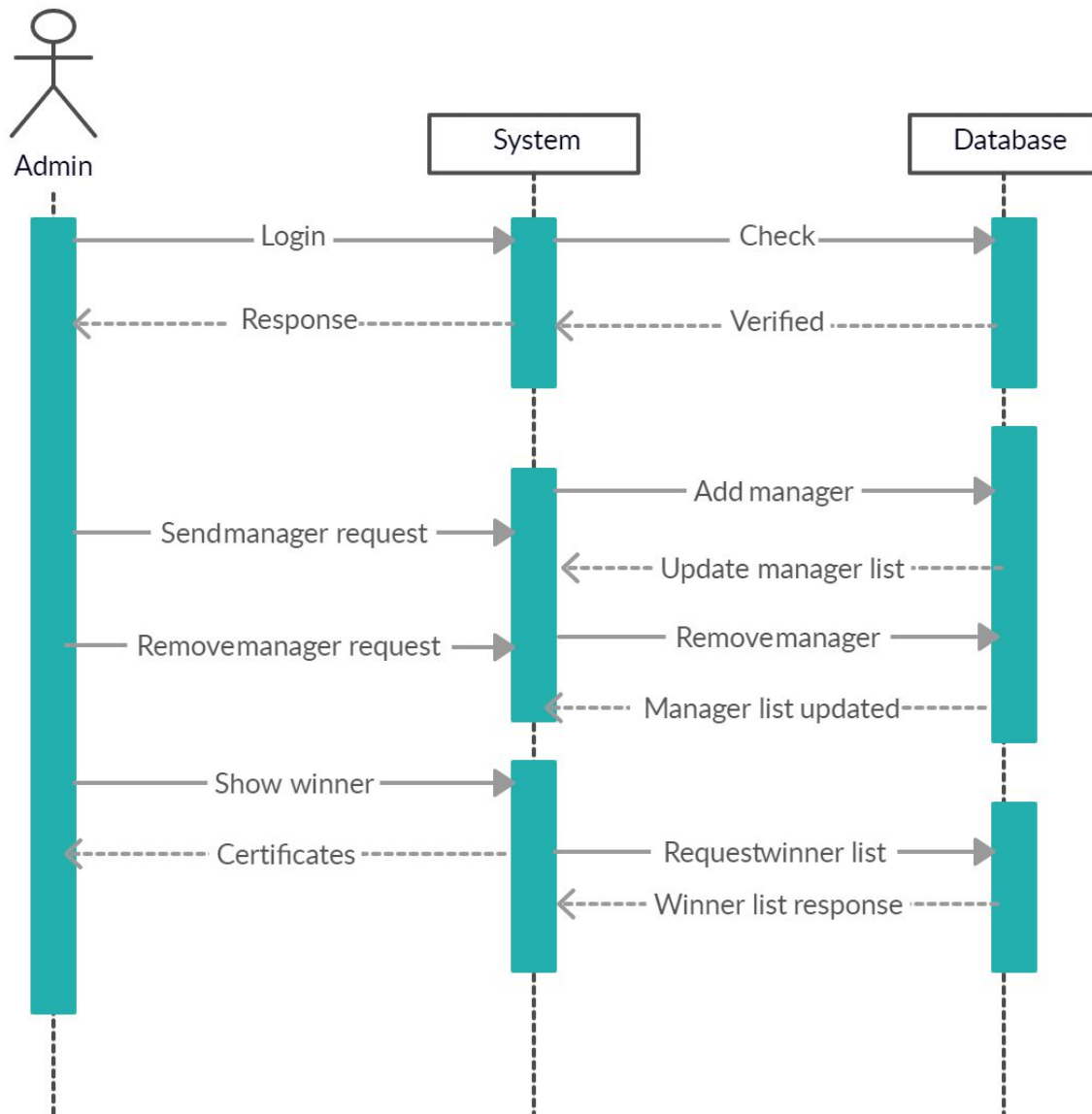
Manager



Sequence Diagram for Volunteer Activities



Sequence Diagram for Admin Activities



Conclusion:

In this assignment we learnt sequence diagrams, what are different components of the same and how to create a sequence diagram for a given scenario.