# UML Examples

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What is UML?

- A standardized, graphical "modeling language" for communication in software design.

- We need a modeling language to:
  - help develop efficient, effective and correct designs, particularly Object Oriented designs.
  - communicate clearly with project stakeholders (concerned parties: developers, customer, etc).
  - give us the "big picture" view of the project.

Types of UML diagrams
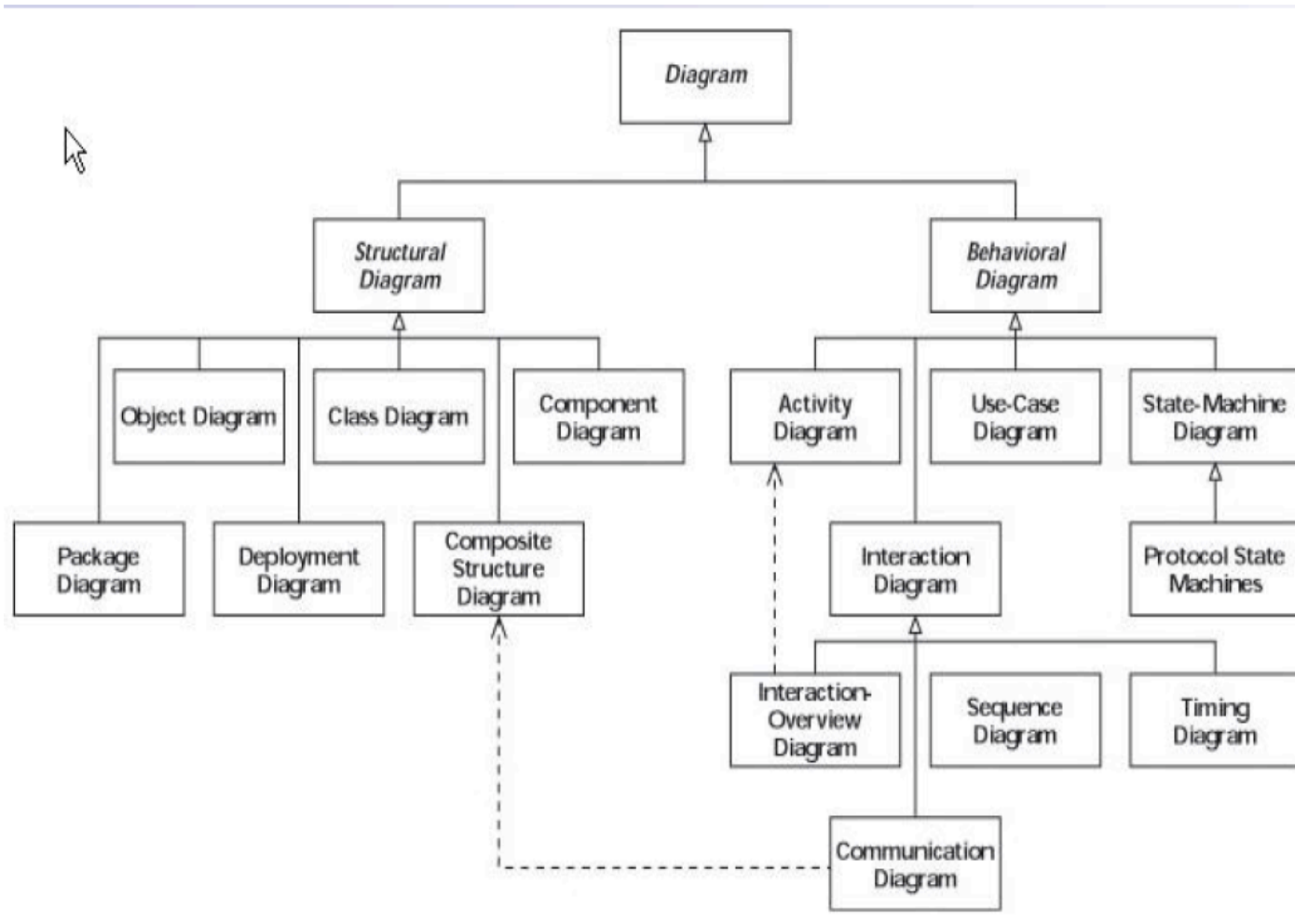
Types of UML diagrams

- **Structural diagrams**: Used to describe the building blocks of the system – features that do not change with time.

- **Behavioral diagrams**: Used to show how the system evolves over time (responds to requests, events, etc.)

Types of UML diagrams

There are different types of UML diagram:

- use cases diagram
- class diagram
- sequence diagram
- package diagram
- activity diagram

Use Case Diagram

- Describes what a system does from the standpoint of an external observer.
- Emphasizes on what a system does rather than how.

- Action: an example of what happens when someone interacts with the system.

- Actor: A user or another system that interacts with the modeled system.

- A use case diagram describes the relationships between actors and actions.
- Provides system requirements from the user's point of view.
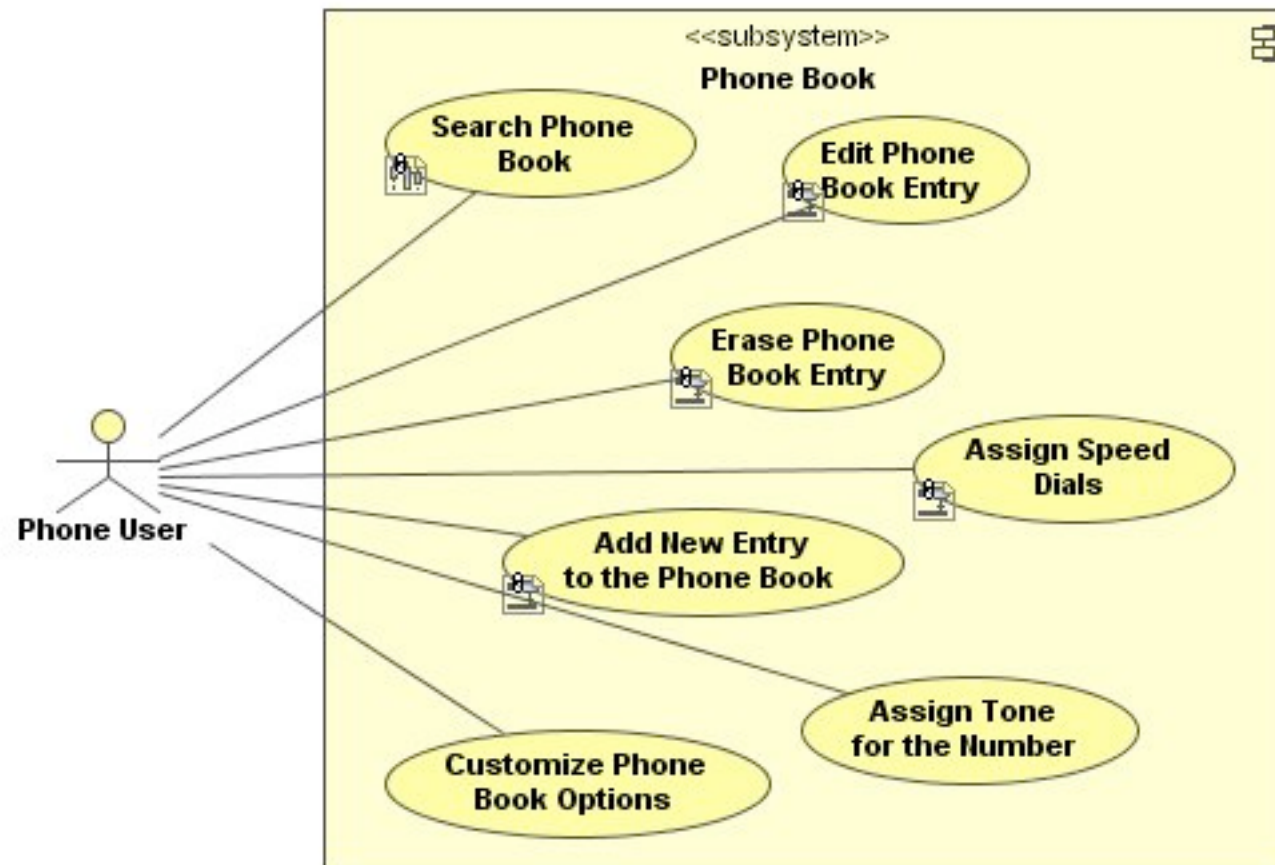
Use Case Diagram
Example #1
Restaurant model
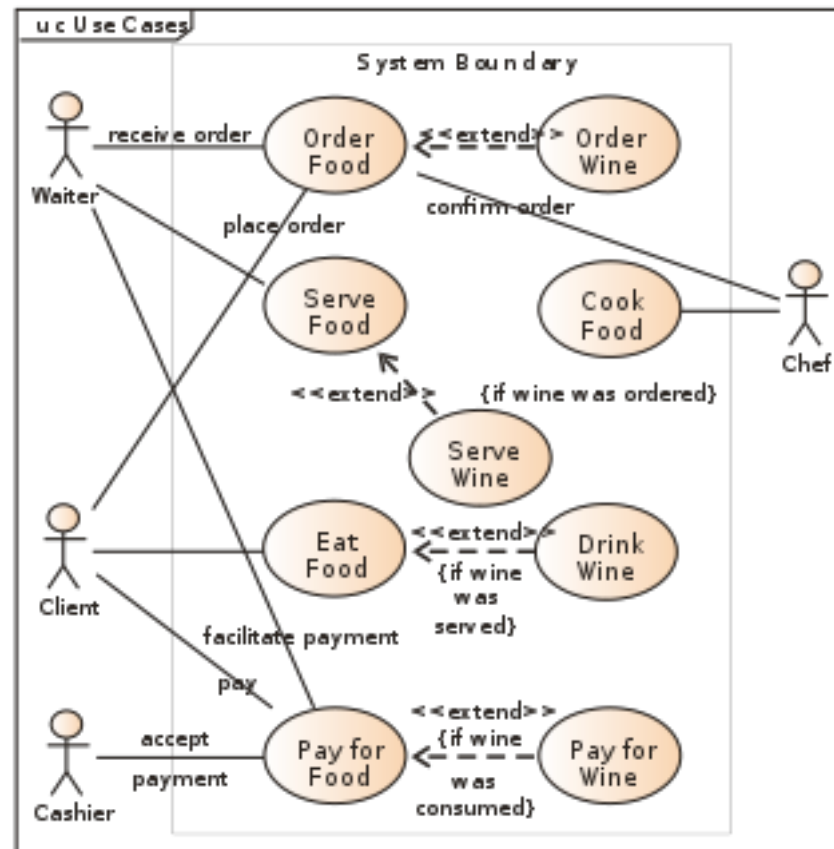
Source: Wikipedia

Use Case Diagram
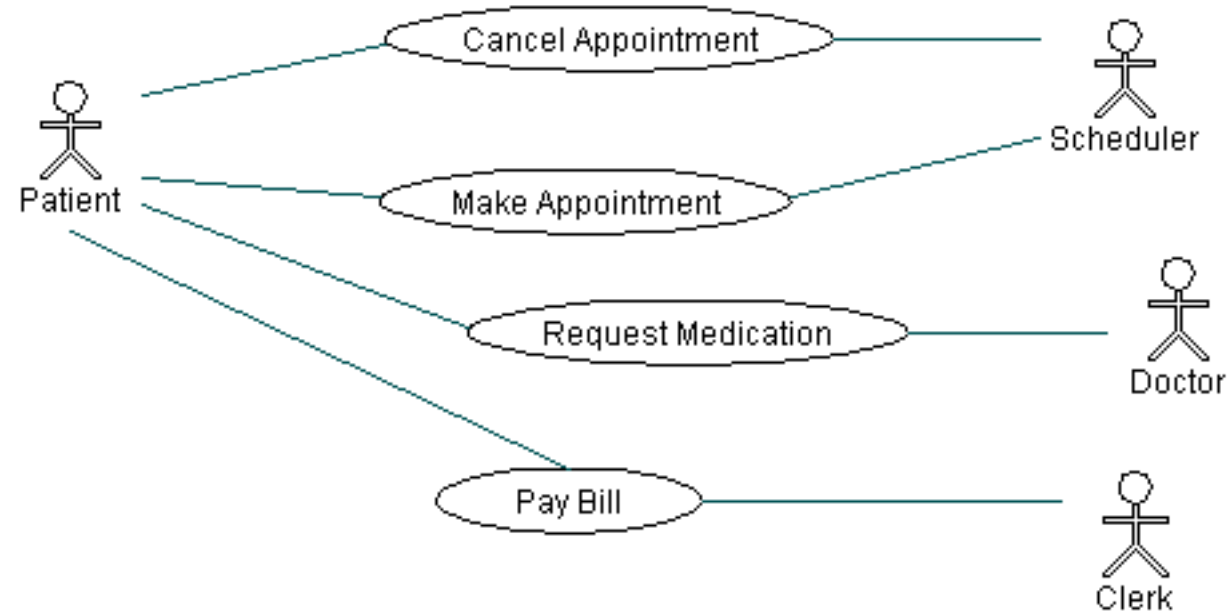# Example #2
Room Reservation
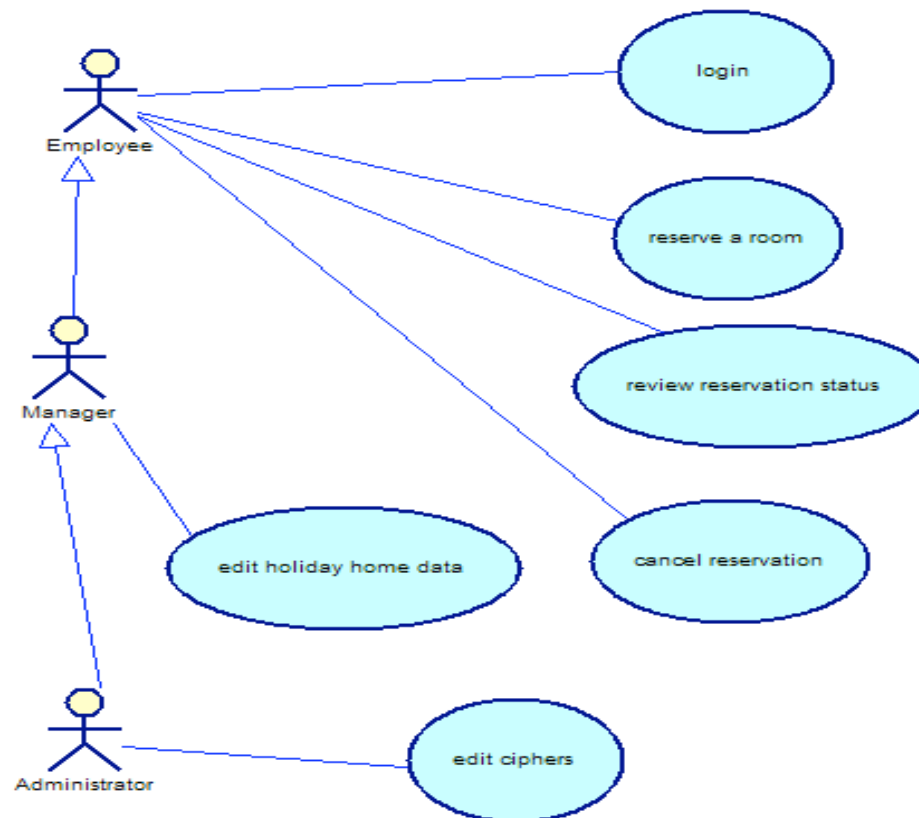
Source: webeks.net/computer/other/use-case-example-uml-2.html

Use Case Diagram
Example #3
Phone Book

Source: magicdraw.com/images/uml/use_case_diagrams

Use Case Diagram
Example #4
Visiting Doctor

Interaction Diagram

- Used to model the behavior of several objects in a use case. Demonstrates collaboration between the different objects.

  - Sequence Diagram displays the time sequence of the objects participating in the interaction.

  - Collaboration Diagram displays a interaction organized around the objects and their links to one another.
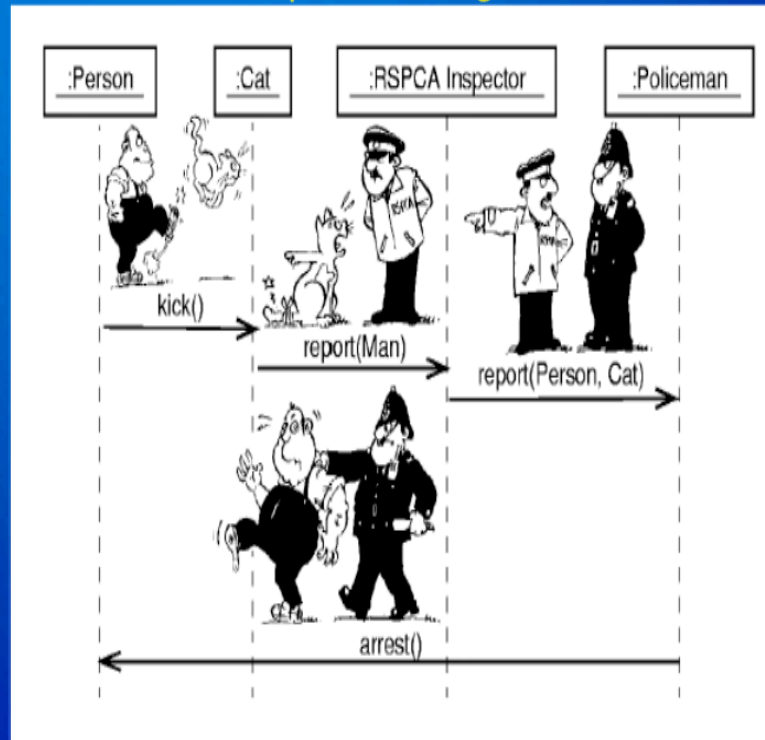
Interaction Diagram

Fun Example
Objects
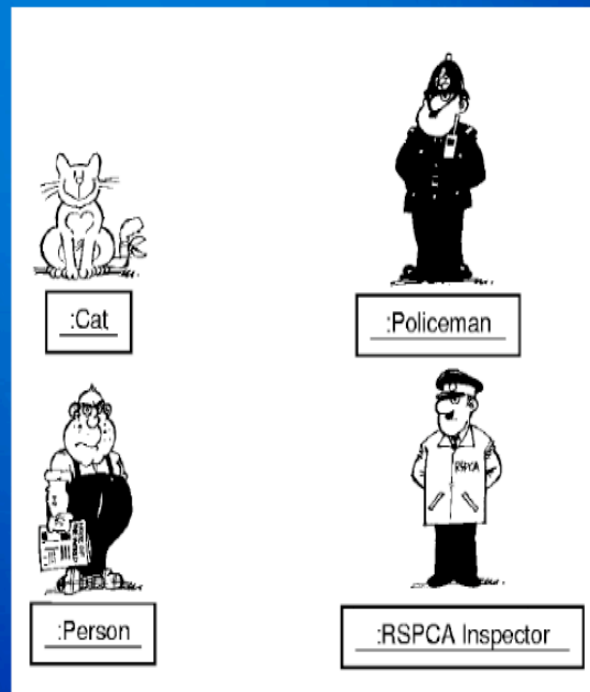
Fun Example
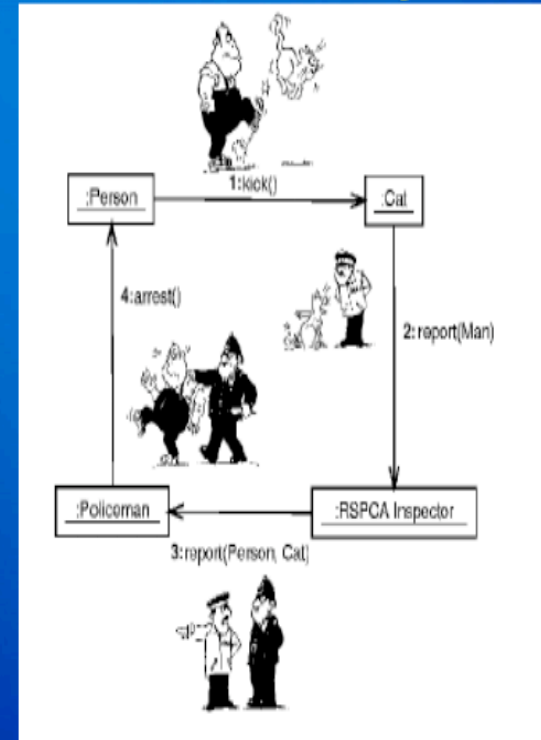Sequence diagram
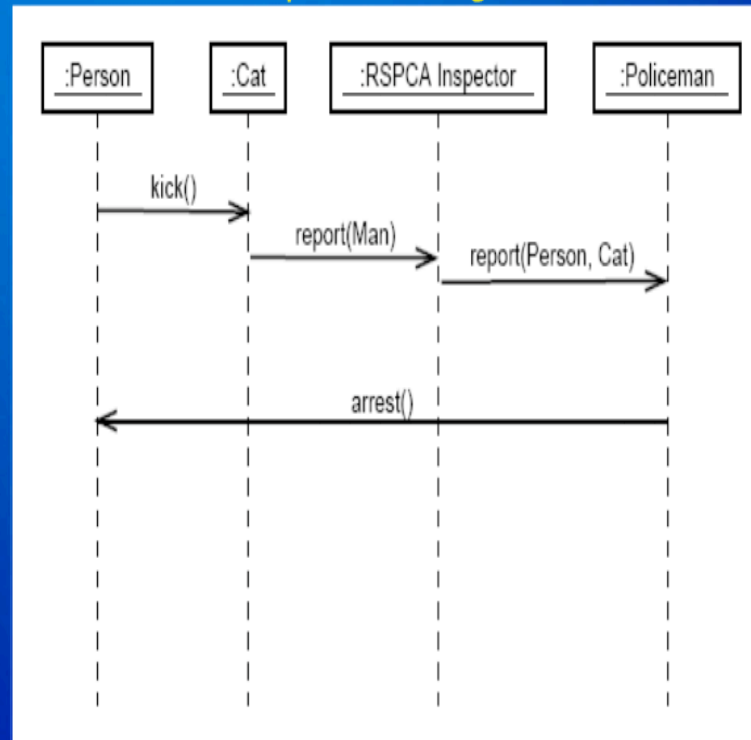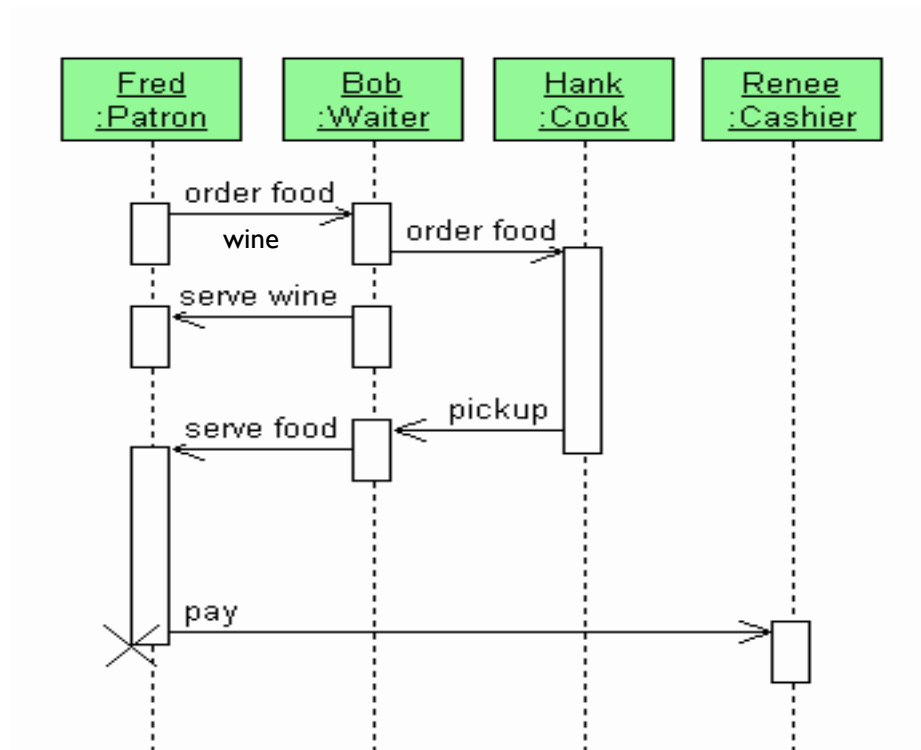
Interaction Diagram

Fun Example
Sequence diagram
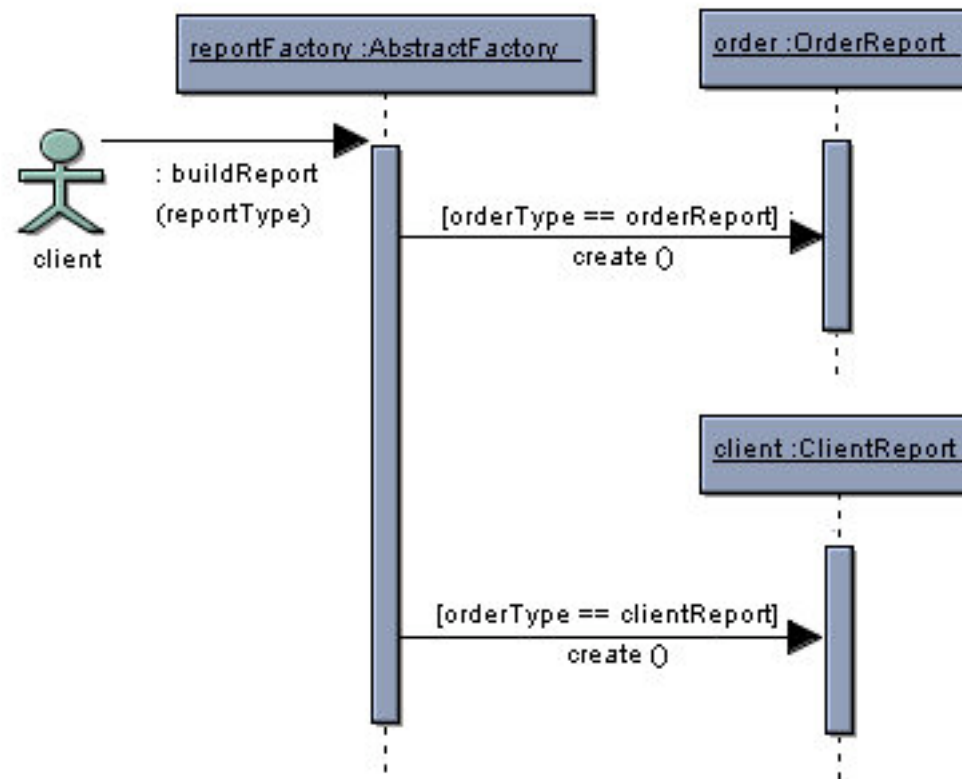
Fun Example
Collaboration diagram

Source: docstoc.com/docs/4210293/Collaboration-Diagram

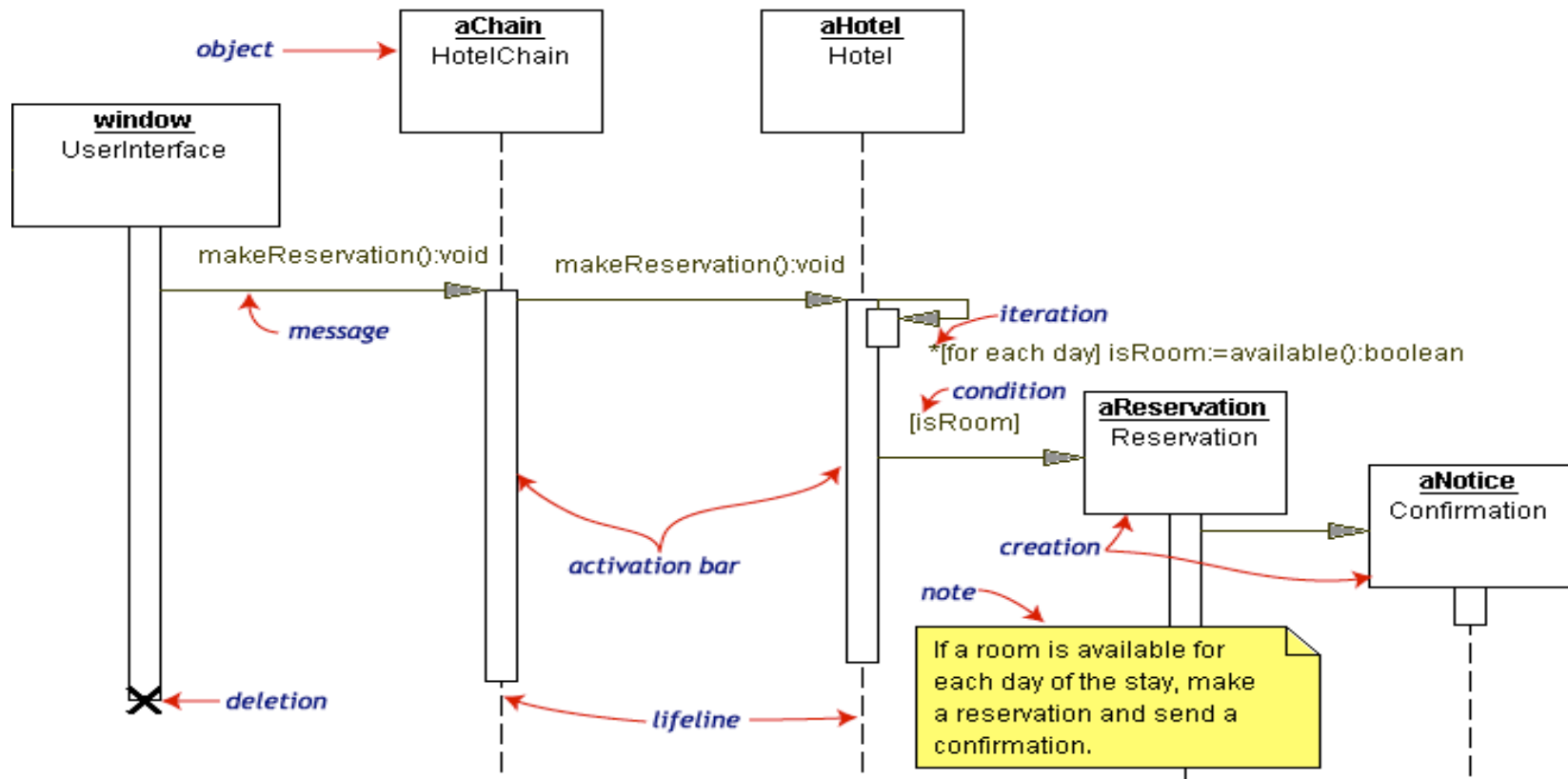# Sequence Diagram Example #1 Restaurant Model

Source: Wikipedia

Sequence Diagram Example #2

Source:visualcase.com/kbase/sample_sequence_diagram.htm

Sequence Diagram
Example #3
Room Reservation

Source: http://edn.embarcadero.com/article/31863#sequence-diagrams
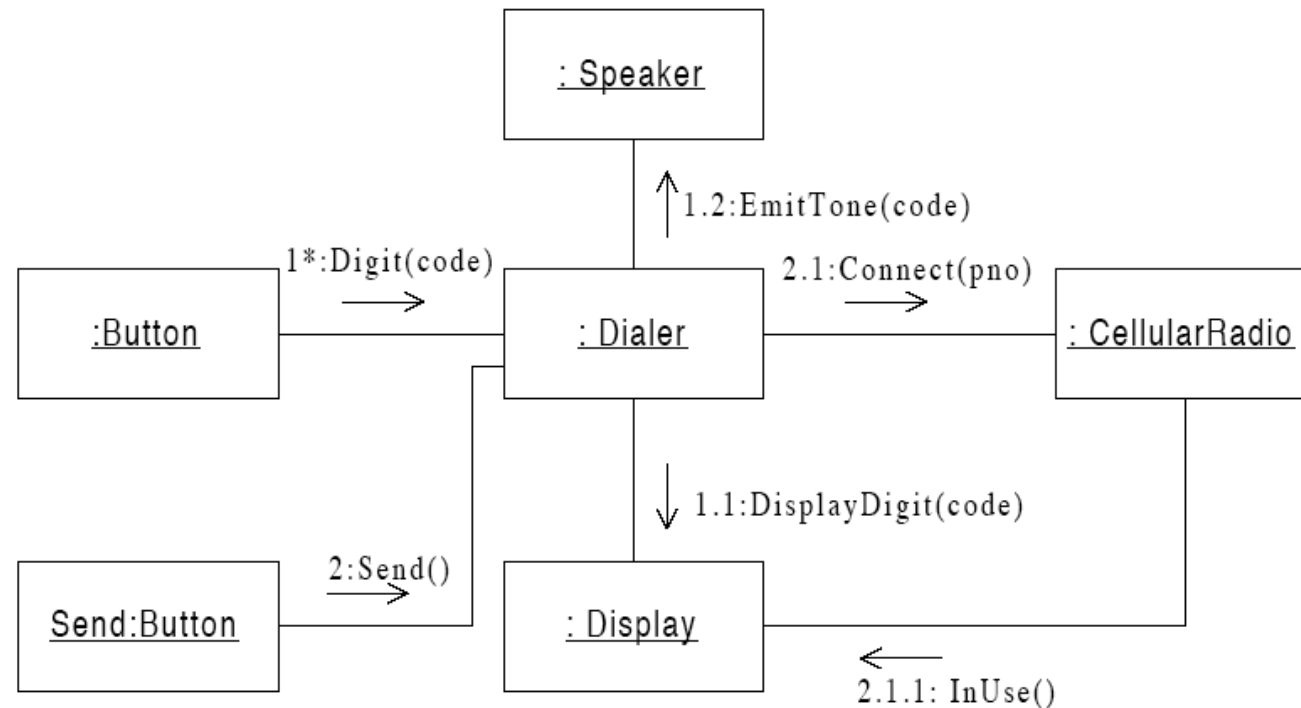
Collaboration Diagram Example #1

Figure 2: Collaboration Diagram of "Make Phone Call" use case.
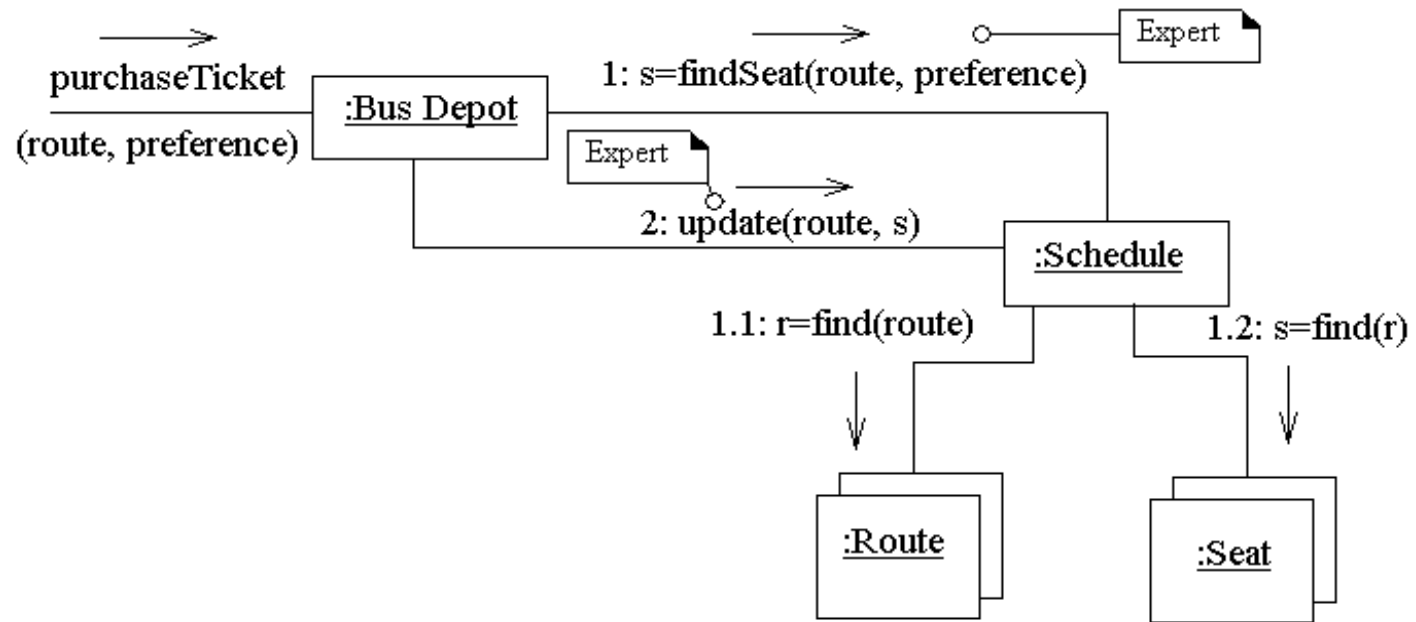
Source: objectmentor.com/resources/umlCollaborationDiagrams.pdf

Collaboration Diagram Example #2 Purchasing Ticket

**Collaboration Diagram for Purchasing Bus Ticket**

Source: comptechdoc.org/independent/uml/begin/umlcoldiagram.html

Data Flow Diagram

- **Process:** how inputs are transformed or changed into outputs.

- **Data Flow:** used to describe the movement of data or physical materials from one part of the system to another part. It represents data or physical materials in motion.

- **Data Store:** it is used to model a collection of data packets at rest. (files, tapes, punched cards, etc.)

- **External Entity (Terminator):** Entities external to the system, with which the system communicates.
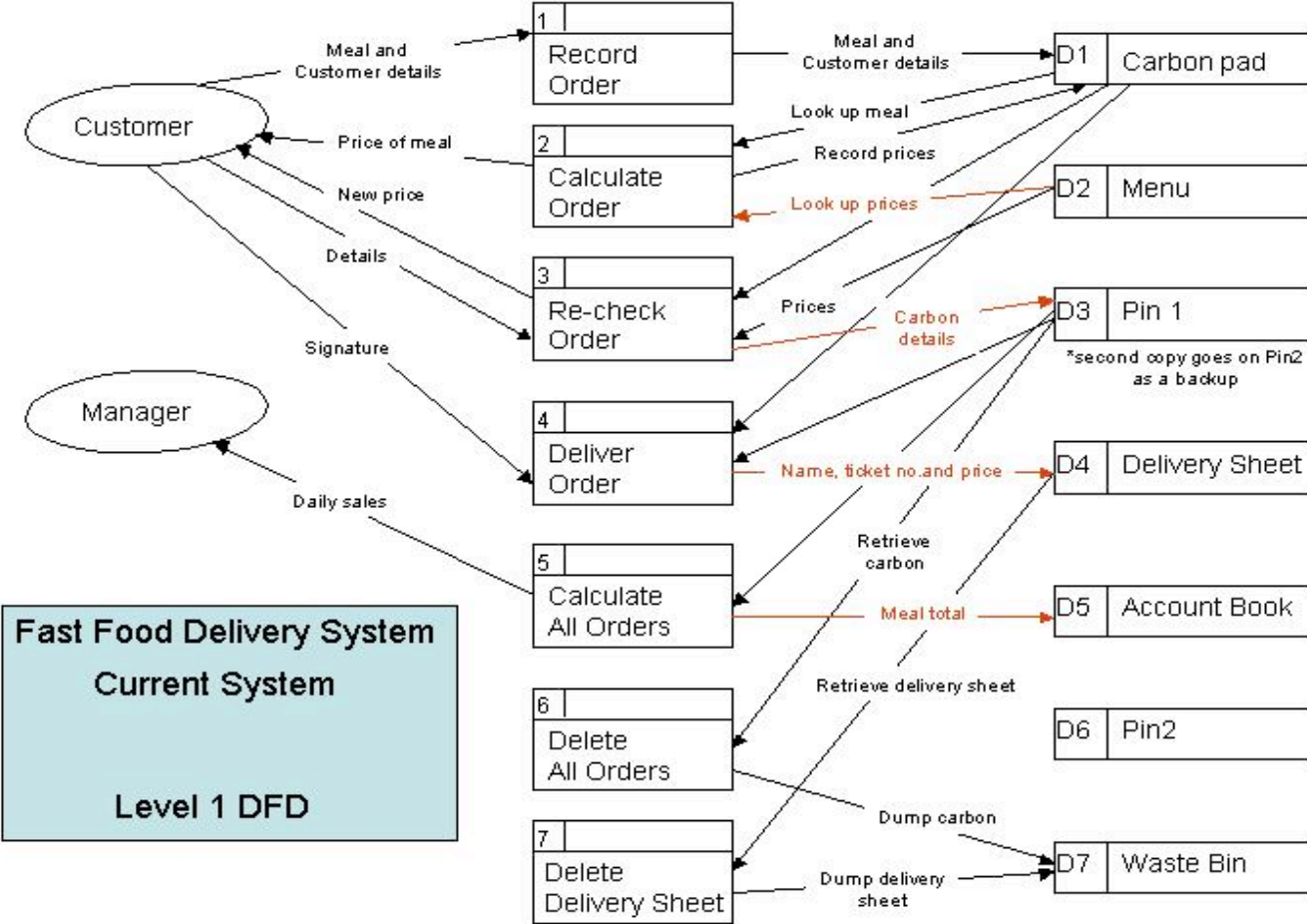
Data Flow Diagram Example #1
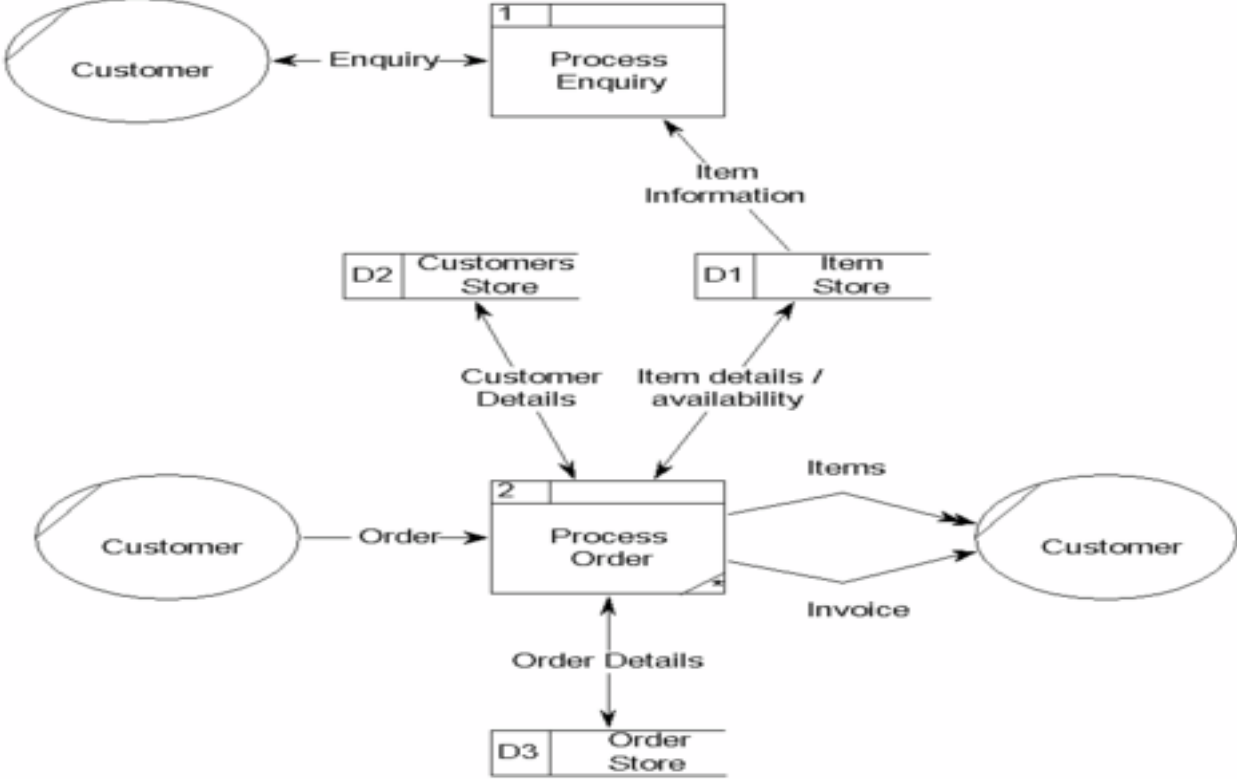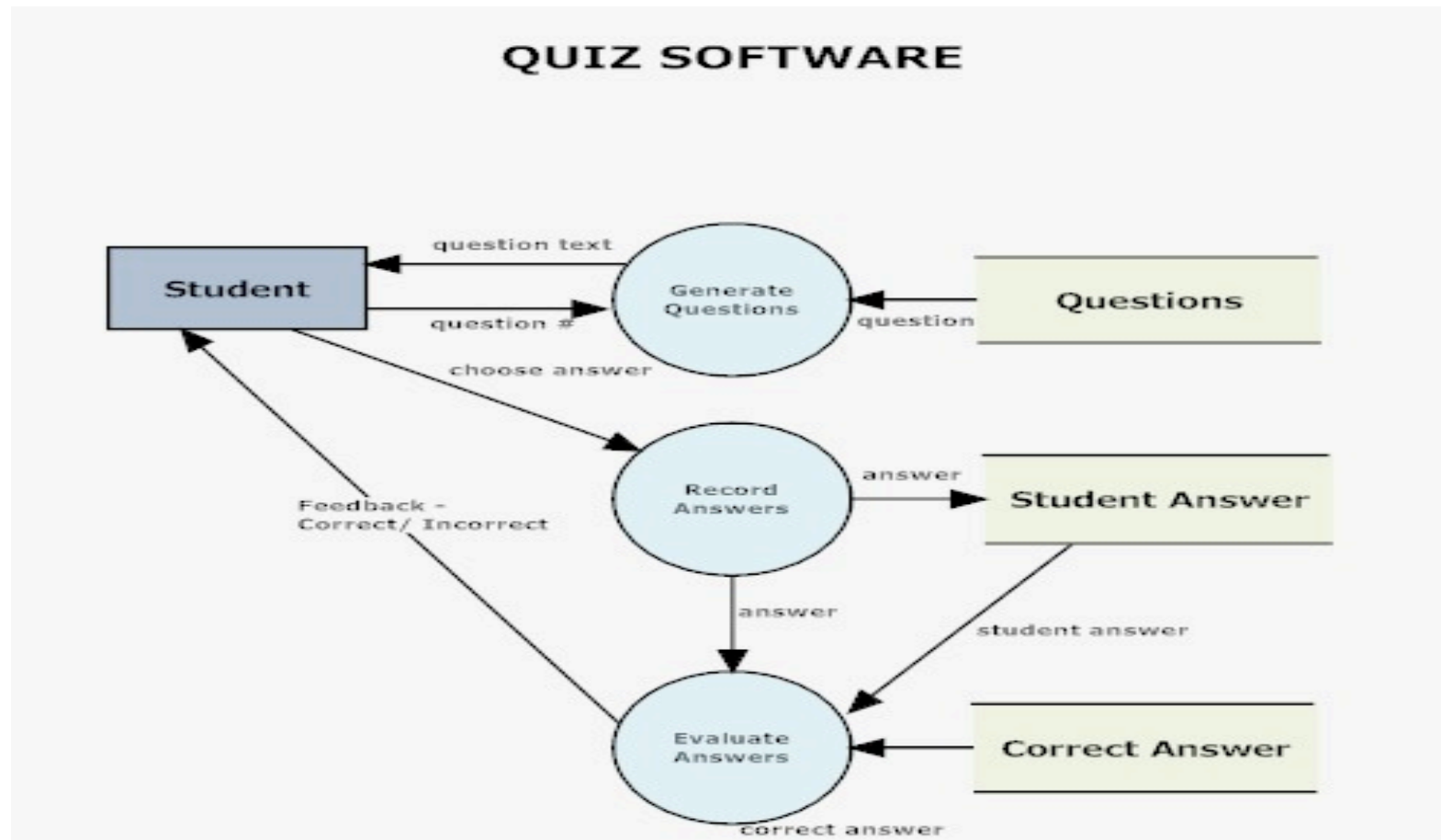

Source: Wikipedia

Data Flow Diagram Example #2

Source: essex.sch.uk/yates/data_flow_diagram_%28dfd%29.htm
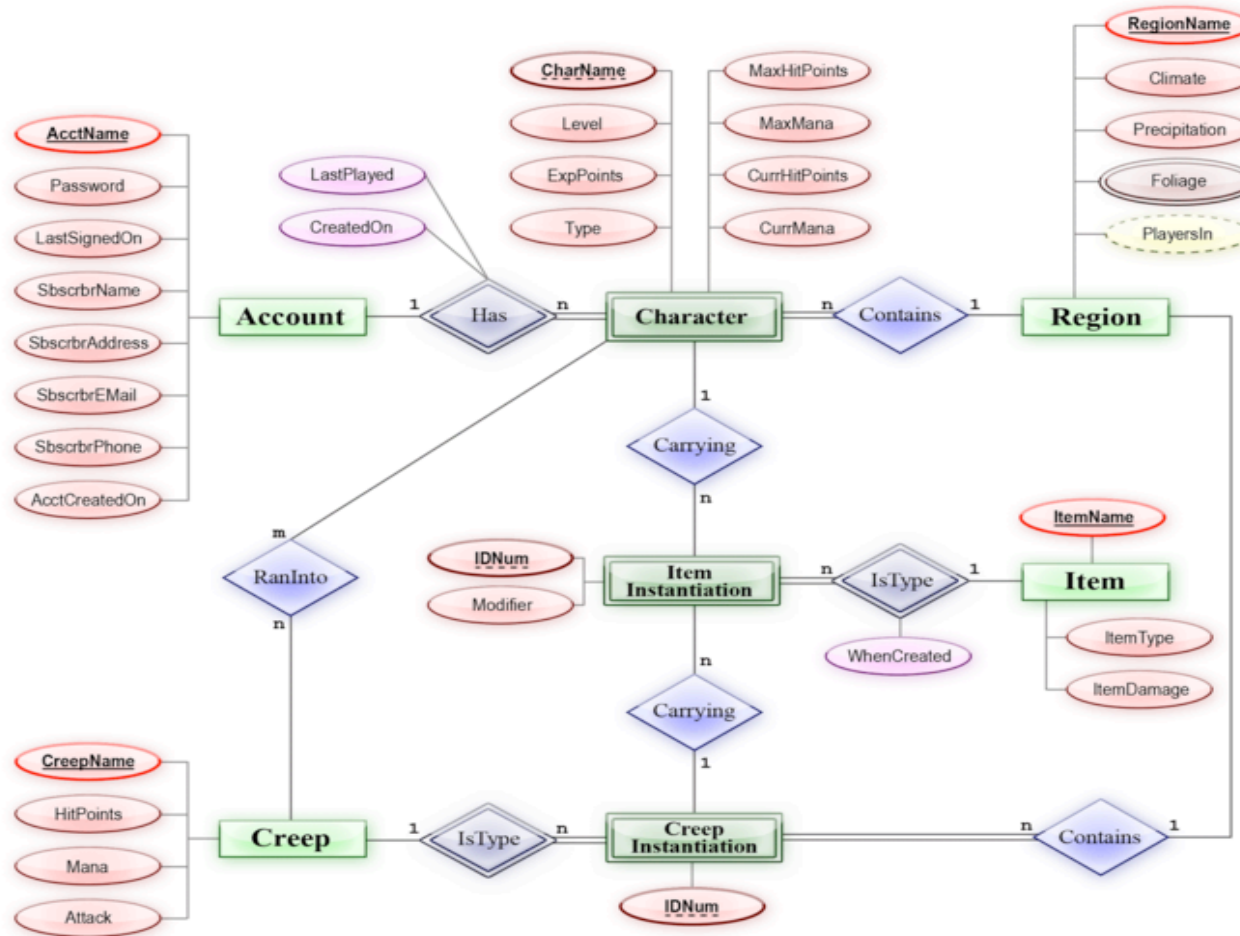
Data Flow Diagram
Example #3

Source: mckinnonsc.vic.edu.au/vceit/SDLC/02-design/designtools/dfd/index.htm

Entity-Relation Diagram

- An *entity is a business object that represents a group, or category of data*

- An *attribute is a sub-group of information within an entity*

- Entity Relationship Models
  - Mandatory Relationships
  - Optional Relationships
  - Many-to-Many Relationships
  - One-to-Many Relationships
  - One-to-One Relationships
  - Recursive Relationships

Entity-Relation Diagram Example #1

Source: Wikipedia