

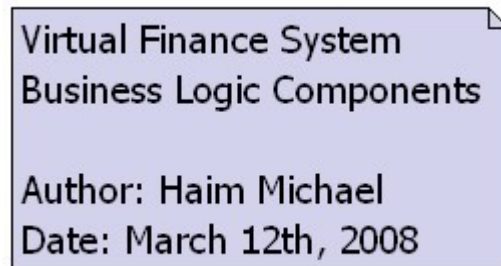
# UML Basic Elements

# Introduction

- UML has common modeling elements across different UML diagrams.
- This module covers the following UML basic elements:
  - UML Notes
  - UML Stereotypes
  - UML Frames

# UML Note

- A UML note is a modeling construct for adding textual information (e.g. comment, constraint definition...).
- A UML note is depicted as a small rectangle with top right corner folded over.



# UML Note

- A UML note can be used to describe a diagram.
  - It can provide more information about it (name of the system, purpose of the diagram, last update date, its owners and contact information).
  - Placing a UML note in the same location on each one of the diagrams will increase their usability as it would always be easy to find them.
  - A UML note that describes a diagram is usually placed on one of the diagram corners or on the bottom center of the diagram.
  - It is common to have all UML notes' texts be justified in the same direction to the left.

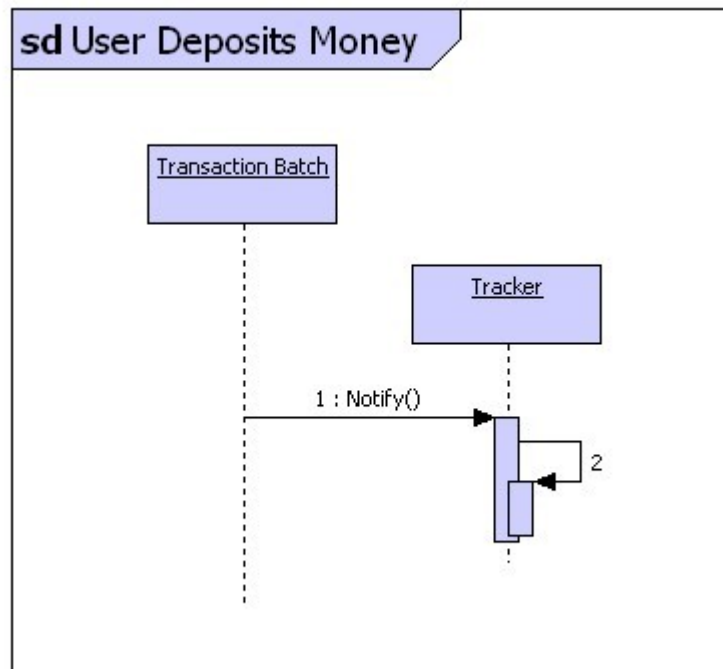
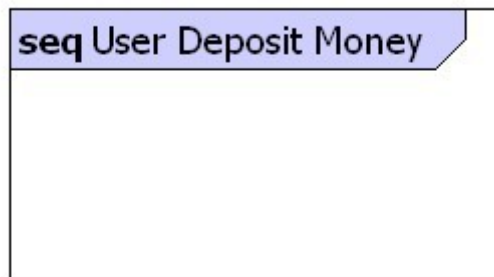
# UML Note

- A UML note can be used to present the diagram legends.
  - Placing a UML note to present the diagram legends in the same location on each one of the diagrams will increase their usability as it would always be easy to find them.
  - It is common to have all UML notes' texts be justified in the same direction (usually the text is justified to the left).
- A UML note can be used to present information about a specific constraint.
  - The UML note can include the constraint as a simple sentence that explains the constraint.

# UML Frame

- A UML frame encapsulates a collection of collaborating instances or refers to another representation of such.

[Diagram Type] Diagram Name [Parameters]



# UML Frame

- The UML frame is depicted as a rectangle with notched descriptor boxes in the top left corner.
- Within this notched descriptor we should write the diagram name.
- We add a label that shall tell the diagram type and we can append parameters. Possible labels include the following:
  - “Component” – when the frame depicts the internal design of a component.
  - “Package” - when the frame depicts the internal organization of a package.
  - “sd” - when the frame contains an interaction diagram.
  - “Use Case” - when the frame depicts the logic of a use case.
  - “Class” - When the frame depicts class diagram\.

# UML Data Types

- **Primitive Data Type**

A simple data type without a structure. UML includes the definition of the following primitive data types:

## Integer

UML defines this data type as an infinite set of integers (...-2,-1,0,1,2,3,4,5...)

## Boolean

UML defines this data type as a final set that includes two values: true & false.

## UnlimitedNatural

UML defines this data type as an infinite set of natural numbers (0,1,2,3... ). One of the usages of this data type is defining multiplicities in the meta model. The symbol used for infinite is '\*'.



# UML Data Types

- **Simple Data Types**

A type with values but without any identity... so that two separated instances of that type with the same attributes values... will be considered as different ones.

- **Enumeration Types**

Simple data types with values that originate from a limited set of enumeration literals.

Examples for using this data type can be: month, day in the week, season etc.

# The Classifier

- The Meta Model defines the UML elements.
- Classifier is a super class on top of the hierarchy from which all other classes extend. Among these classes we can find the DataTaype class, from which both PrimitiveType and Enumeration extend.

# UML Stereotype

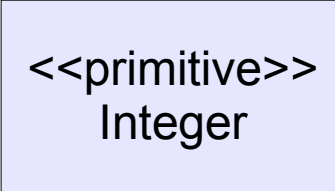
- A UML stereotype denotes a variation on existing modeling element with the same form but with a modified intent. (1)
- A UML stereotype is depicted textually in the following formats `<<user interface>>` and `<<UI>>`.
  - Upper case are used for stereotypes that are abbreviations (e.g. `<<HTTP>>`, `<<URL>>`).
- Be consistent with the stereotypes usage in your diagram.
  - If you choose to use `<<user interface>>` continue to use it and avoid the alternative `<<UI>>`.

# UML Stereotype

- Stereotypes are a formal extension of existing model elements within the UML meta model. Instead of defining a new model element in the UML meta model, a stereotype adds semantics to an existing model element.
- The stereotypes actually classify the possible uses of a given model element.
- We can add to a the same element more than one stereotype.

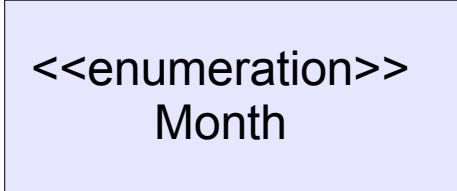
# UML Stereotype

- Pay attention to the fact that there are few predefined key words that use the '<<' and '>>' as well... in these cases we are not dealing with stereotypes. One example is the data types definition.



<<primitive>>  
Integer

A light blue rectangular box with a thin black border. Inside, the text '<<primitive>>' is on the top line and 'Integer' is on the bottom line, both centered.



<<enumeration>>  
Month

A light blue rectangular box with a thin black border. Inside, the text '<<enumeration>>' is on the top line and 'Month' is on the bottom line, both centered.

# UML Standard Stereotype

- UML includes a huge number of predefined standard stereotypes.

Few examples for these predefined standard stereotypes include:

Stereotype	UML Element	Description
<<framework>>	Package	Package that contains a frame work
<<utility>>	Class	Class that contains utility methods and variables

# UML Basic Elements

06/20/10

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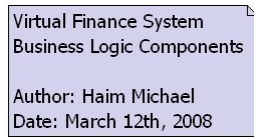
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Virtual Finance System  
Business Logic Components  
Author: Haim Michael  
Date: March 12th, 2008

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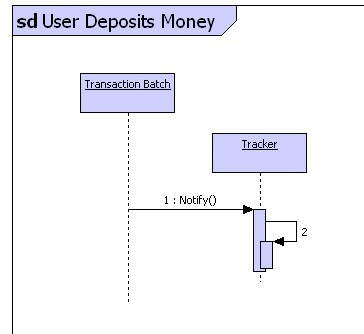
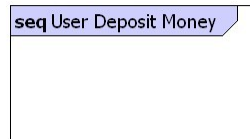
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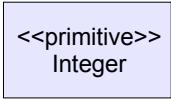
(1) Rumbaugh, J. Jacobson, I., and Booch, G. (2004). The Unified Modeling Language Manual Second Edition. Reading, MA: Addison-Wesley Longman.

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