



Object-Oriented Language and Theory

Lab 6: Association, Aggregation and Composition



Lab's Objectives



■ **What is Astah?**

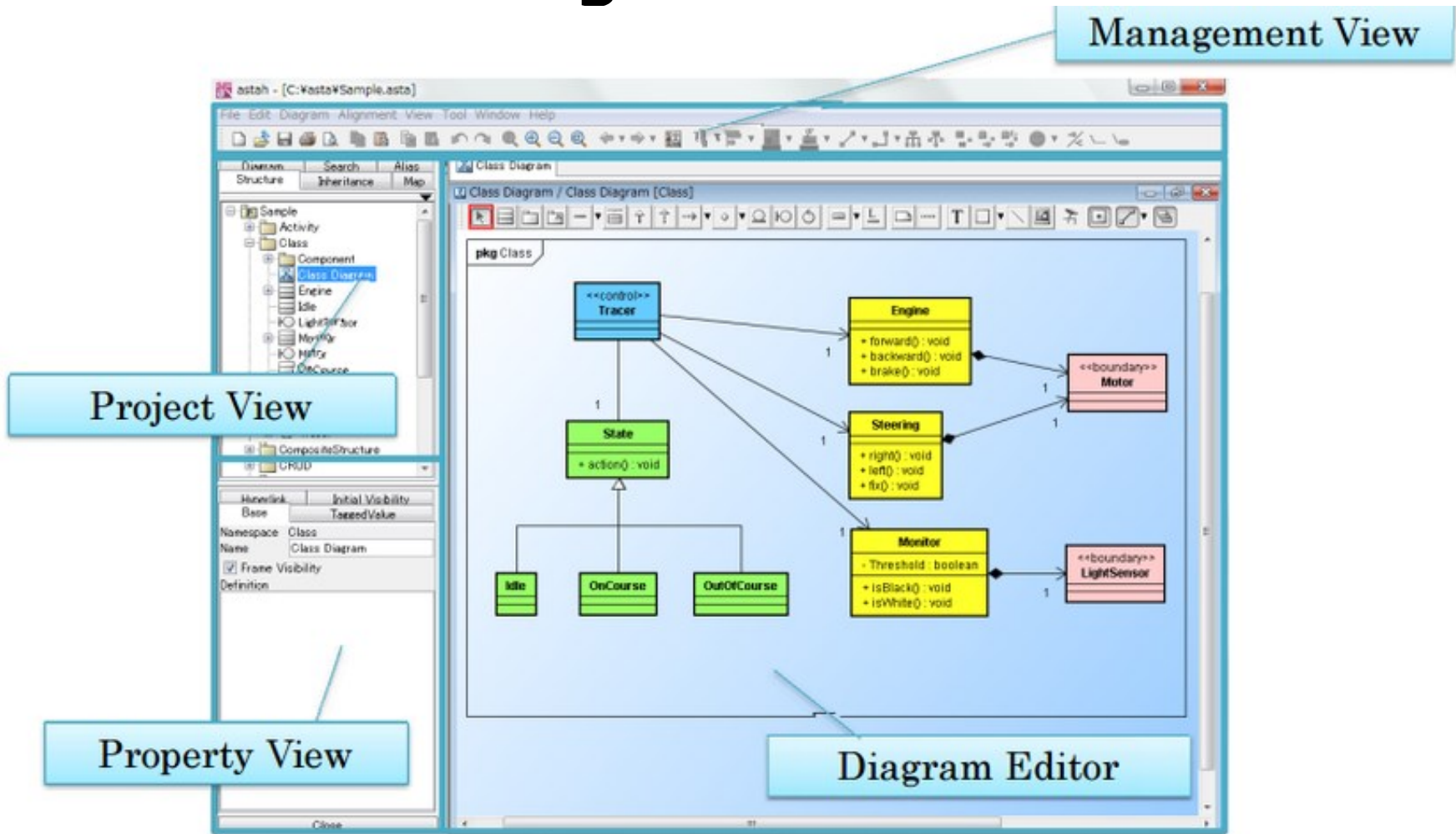
- Astah is an editor that integrates features for software development
- Build chart types in UML: class diagram, sequence diagram, activity chart, ...

■ **Install Astah**

- Visit <http://astah.net/download> and select the astah version that matches your device configuration.
- For linux, download the .deb file to your computer. After downloading, just run the file to install astah.

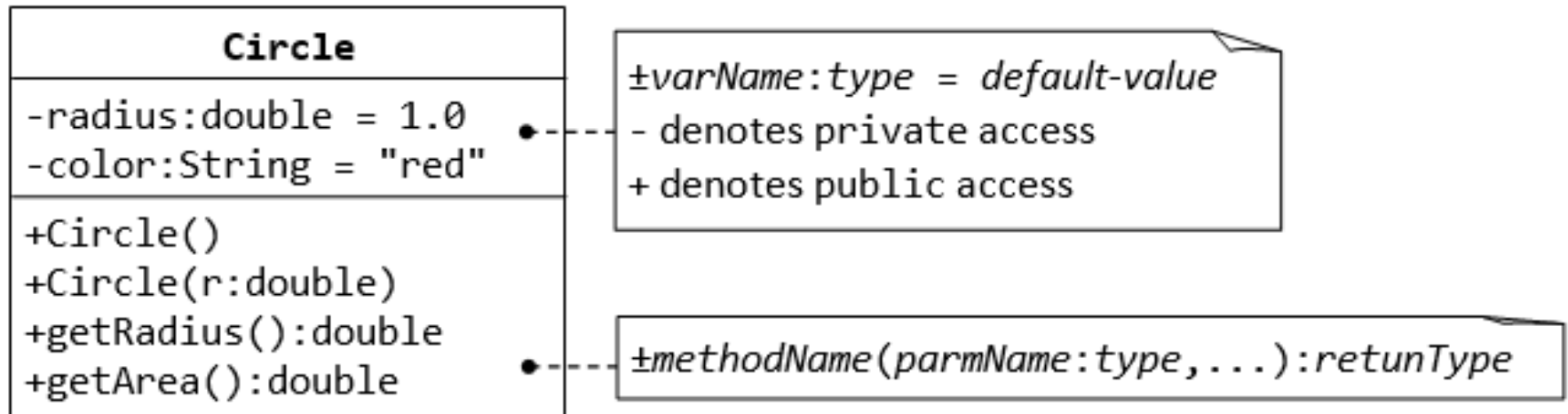
Lab's Objectives

- **Astah's working screen**



Lab's Objectives

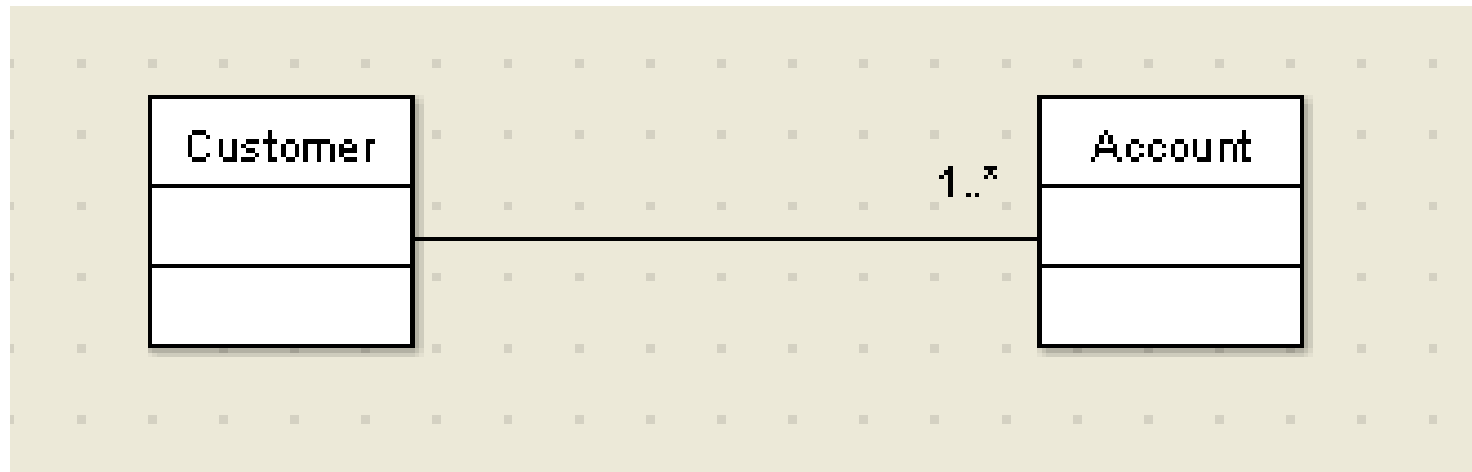
- Draw UML Class Diagram and export as an image



Lab's Objectives

■ Associations

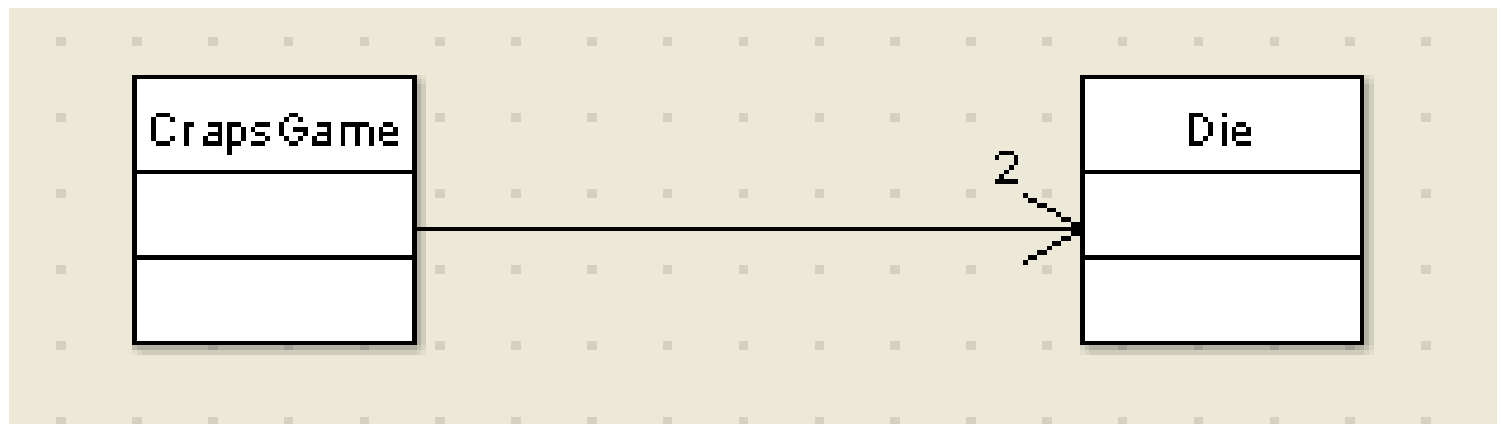
- Associations are **structural relationships** between classes and represent connections between objects.
- Associations are used to indicate that an object of one class is linked to an object of the other class.



Lab's Objectives

■ Navigability

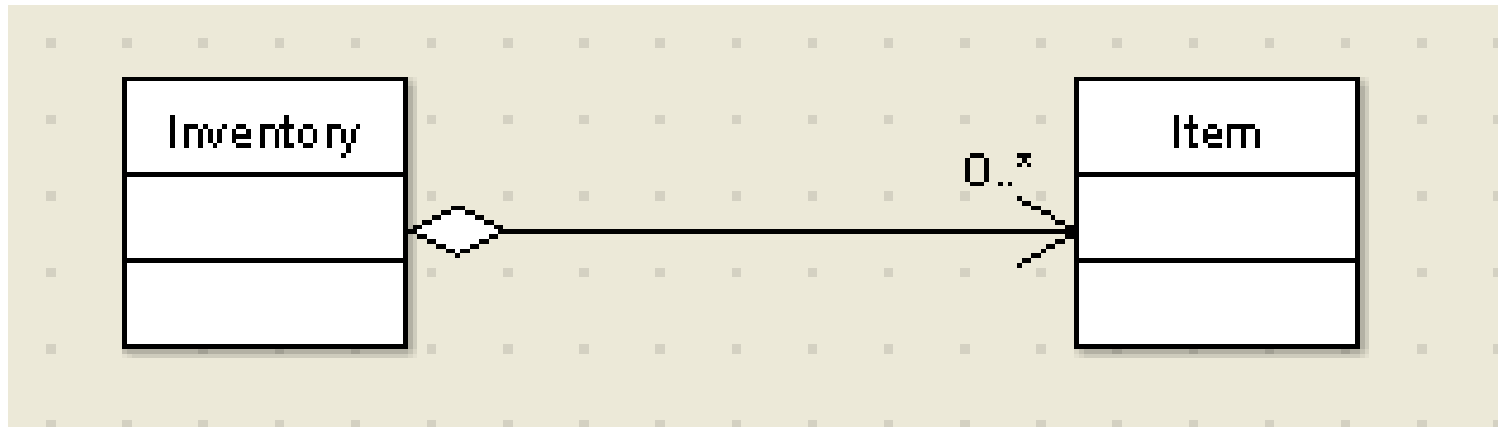
- Arrows can be applied to an association to indicate the direction of a relationship.
- The direction of the arrow tells us which class has knowledge of the other.



Lab's Objectives

■ Aggregations

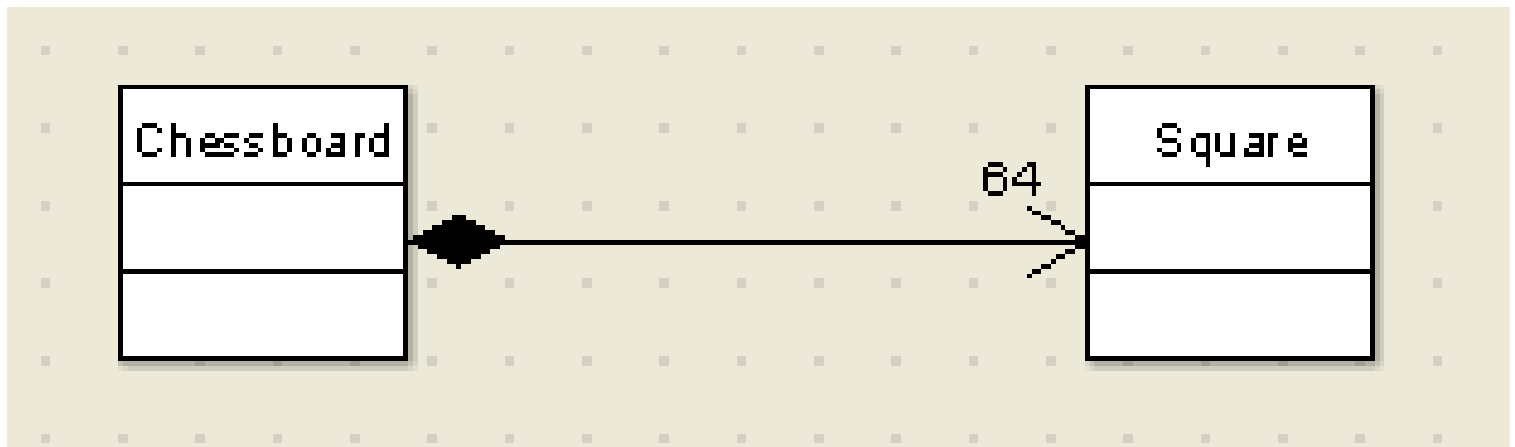
- An aggregation is a special kind of association that is used to denote a whole-part relationship between classes.



Lab's Objectives

■ Composition

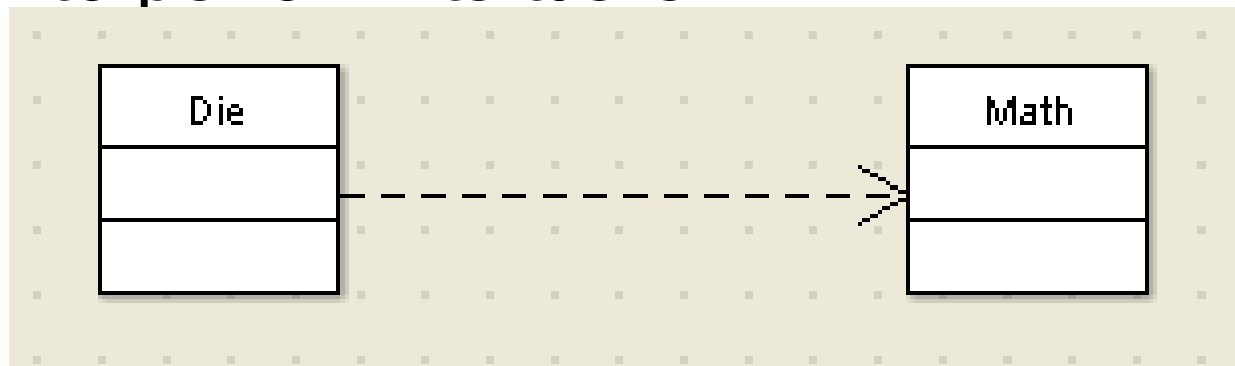
- A composition is a special type of aggregation in which the lifetime of the whole and the parts is linked.
- When the whole is destroyed, the parts are necessarily destroyed.



Lab's Objectives

■ Dependency

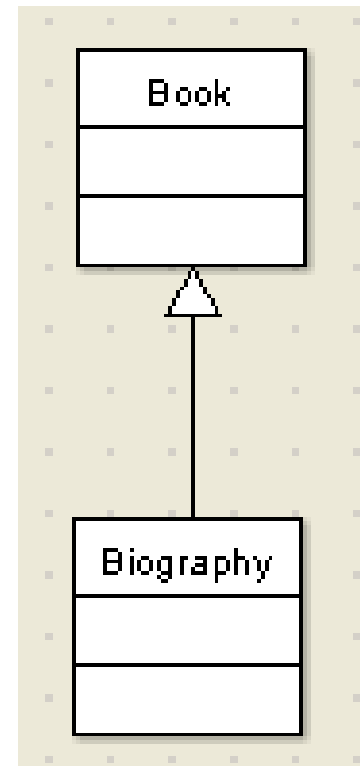
- A dependency between two classes indicates that the functionality of one class depends on that of the other.
- This relationship is NOT structural like an association is, but it indicates that one class USES one or more instances of the other class in order to perform its tasks.



Lab's Objectives

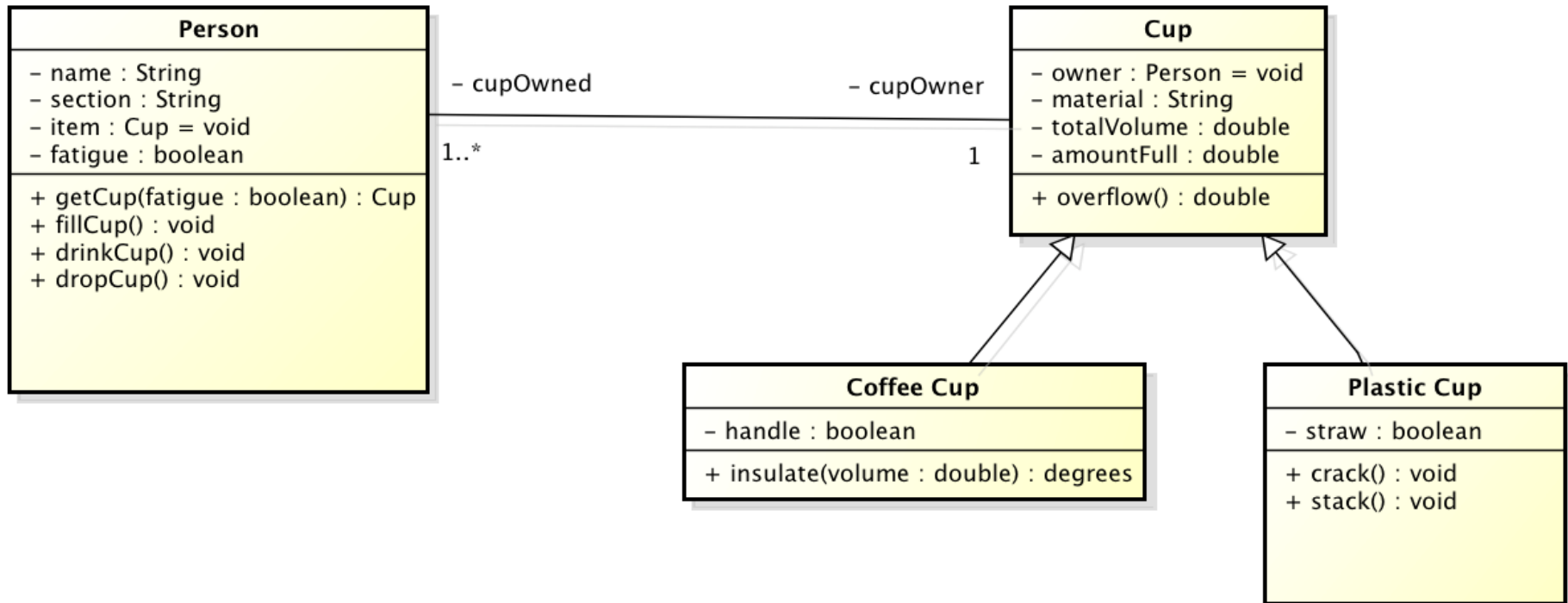
■ Generalization

- Generalizations are used to show that one class is a more specialized type of another class.
- They are used to illustrate inheritance relationships.

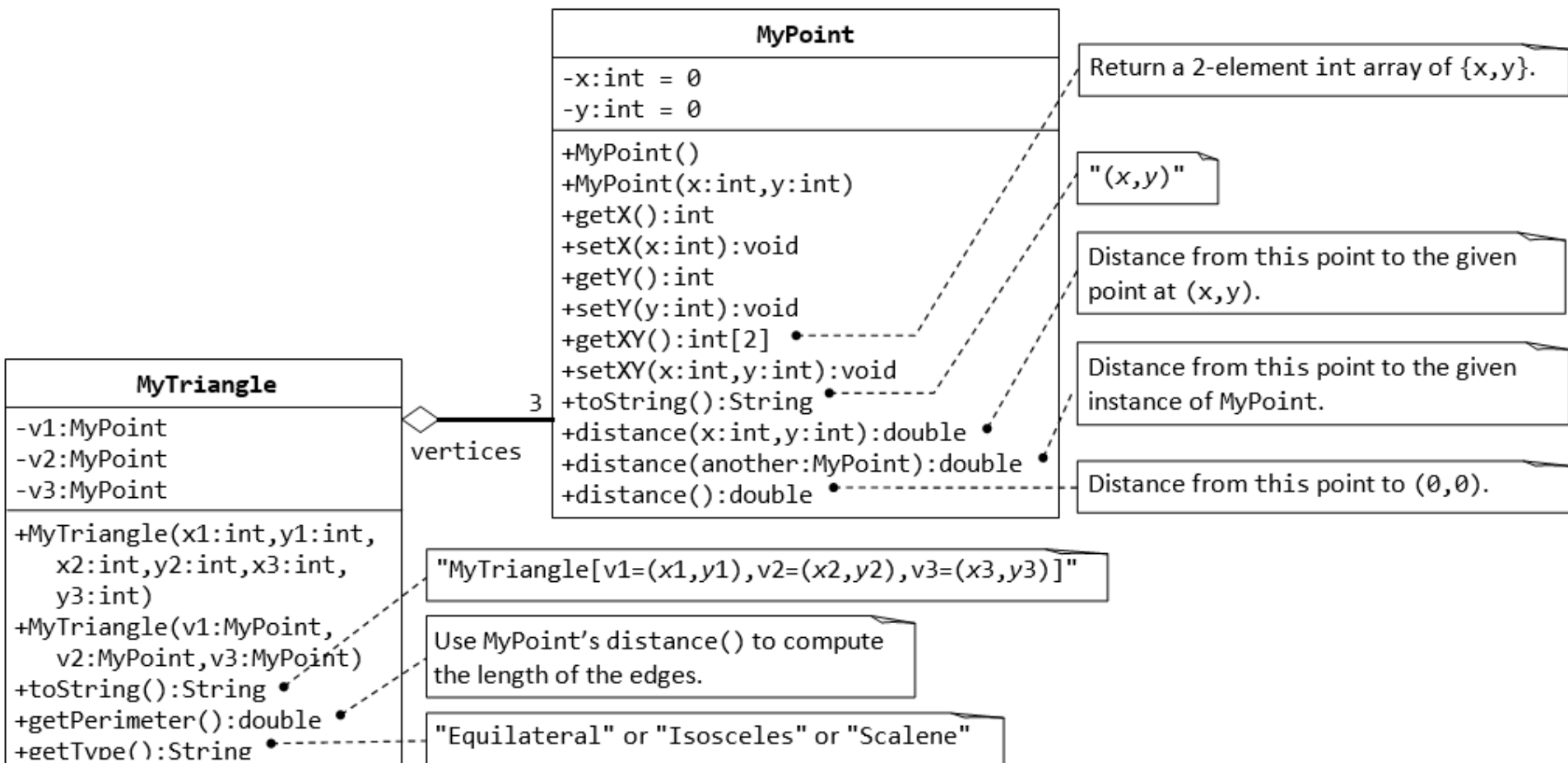


Lab's Objectives

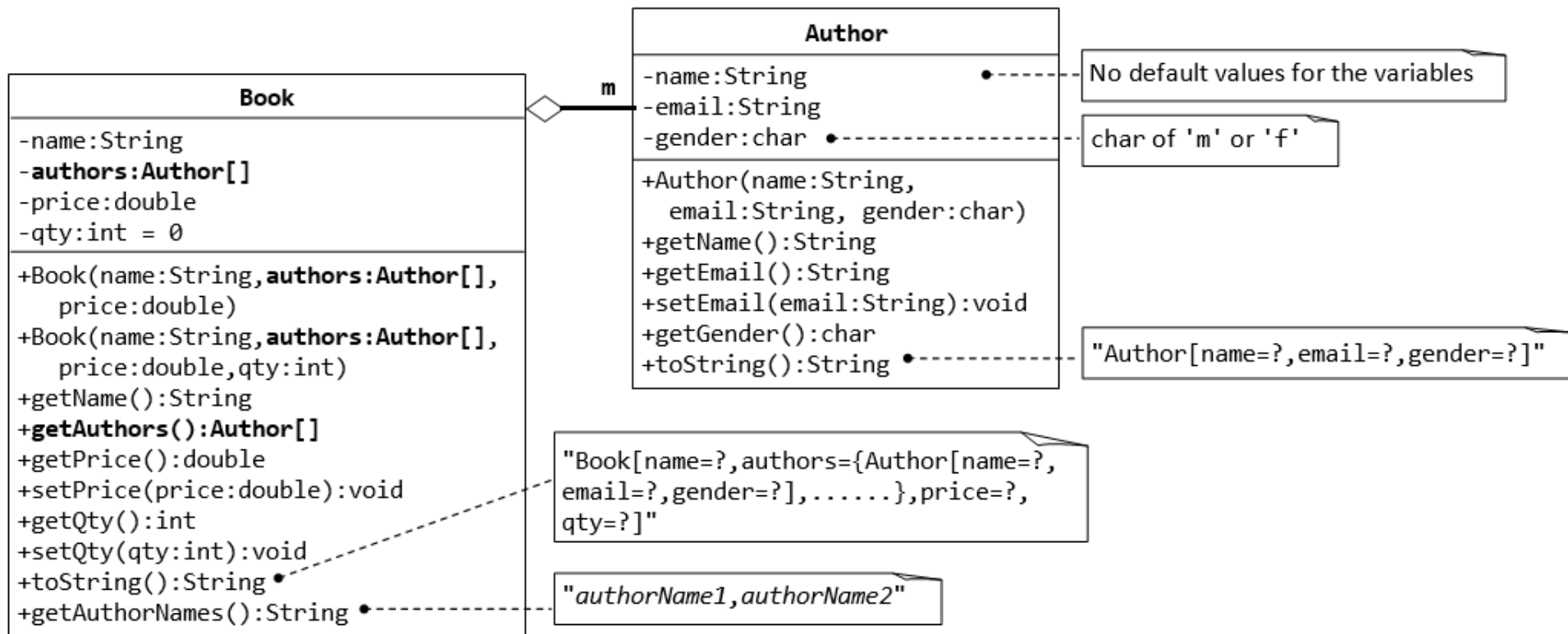
- 1. Use Astah Draw the class diagram as follows and export it to an image



- 2. Use Astah Draw the class diagram as follows and export it to an image, then write the source code in java language



- 3. Use Astah Draw the class diagram as follows and export it to an image file, then write the source code in java language





Submission

- Due: **24h 24/03/2019**
- Compress your lab files into a **ZIP** file
- Name the zip file according with the following template:
 - *OOLT20182_StudentID_lab6.zip*
 - Example: *OOLT20182_20091004_lab6.zip*
- Submit the file to lecturer
 - Email address: **tuannm@soict.hust.edu.vn**
 - Subject: "OOLT20182_StudentID _lab6"
 - Example: OOLT20182_20091004_lab6