

# Unified Modeling Language (UML)

## 2110215 - Programming Methodology





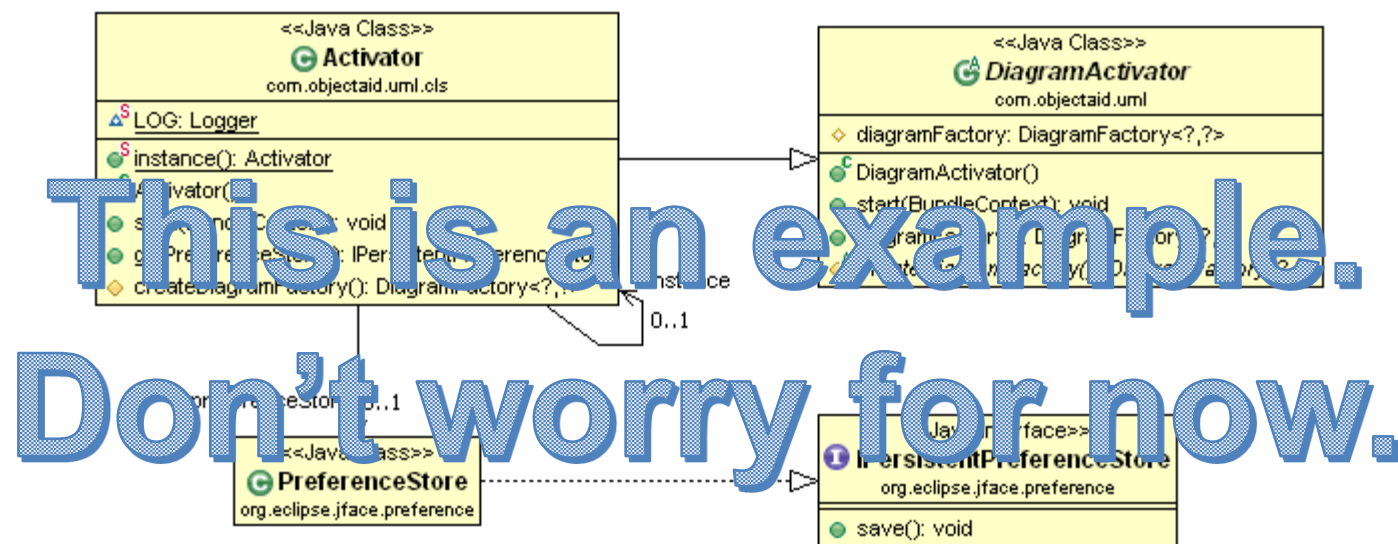
# What is UML?

- UML is a modeling language that was created to standardize ways to visualize the design of the system
- UML has many diagrams to represent various things in the system.
- **Class diagram** is a UML model that describes the structure of a system by showing the classes attributes and relation between classes or objects.



# Class Diagram

- UML provides mechanic to represent class members, such as attributes and methods, and additional information about them

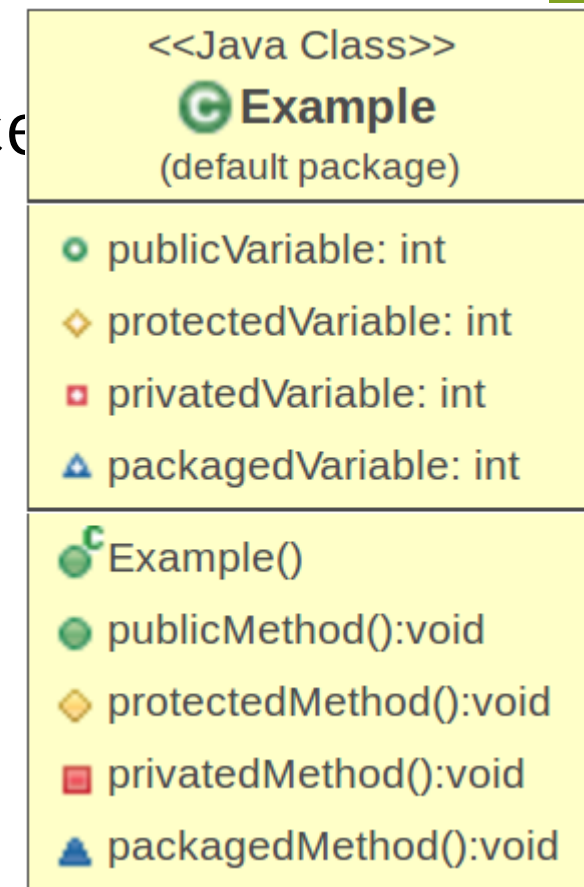




# Class Diagram

- Visibility - To specify the visibility of a class member (i.e. any attribute or method), these notations must be placed before the member's name

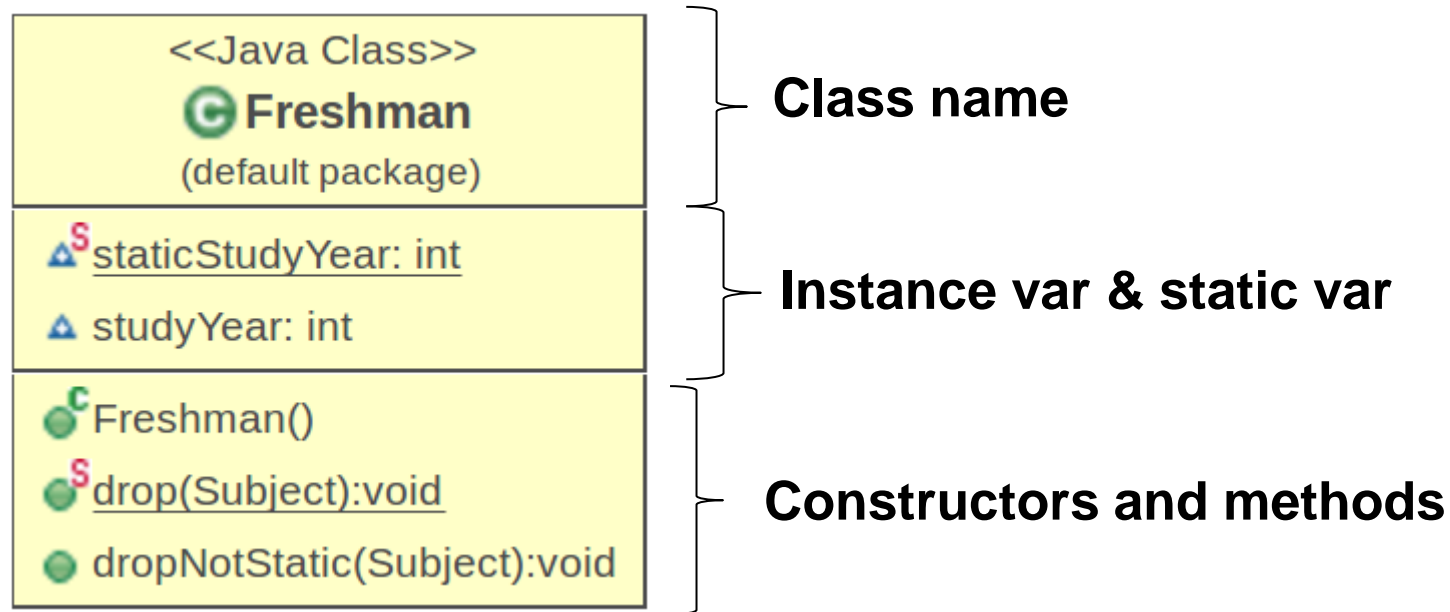
Visibility\Can be access by		Same Class	Same Package	Subclass	Different Package
public	●	Y	Y	Y	Y
protected	◆	Y	Y	Y	N
private	■	Y	N	N	N
package	▲	Y	Y	N	N





# Class Diagram

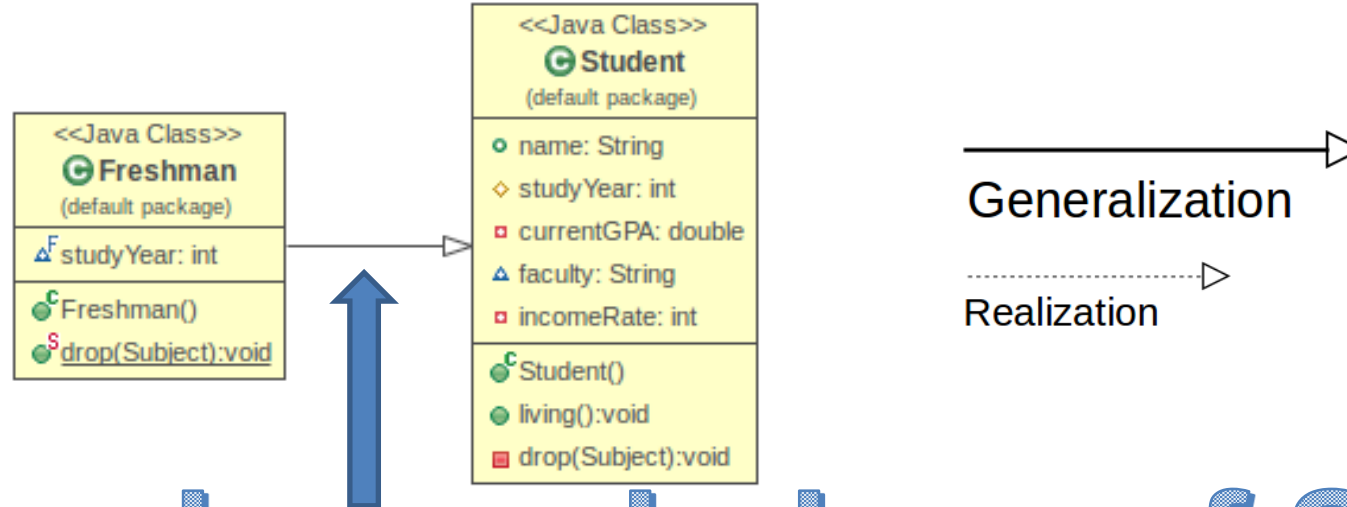
- Static is a keyword for variable or method. A static variable value will be shared through out all instance of the class. Static method can only access statics variable and call to other static methods only.





# Generalization (Lecture 2)

- Generalization is a class relationship that has specialized forms or subclass. It is also known as inheritance relationship

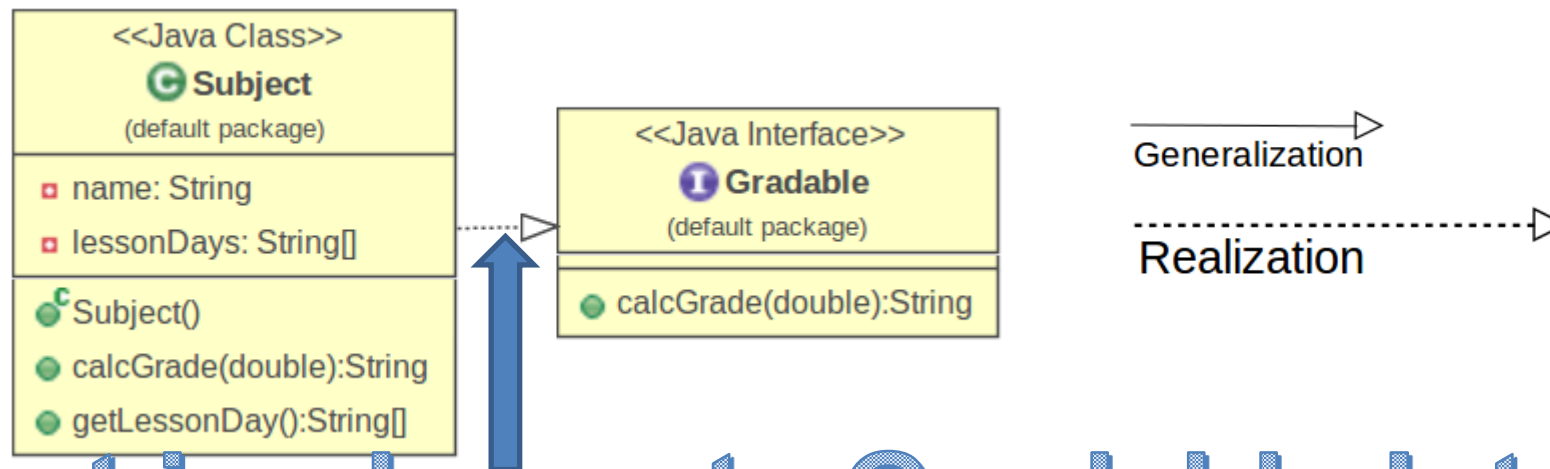


**Freshman is a subclass of Student**



# Realization (Lecture 3)

- Realization is a relationship between models or classes which has one class realized or implemented another class's behaviors or methods

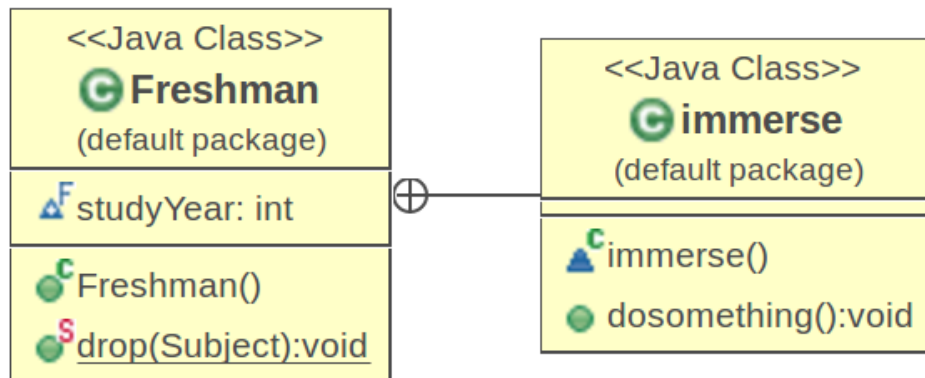


Subject implements Gradable Interface.  
We will study this later on.



# Nesting (Lecture 3)

- Nesting is a relationship where one class is created inside another class (Inner class)



```

public class Freshman extends Student{
    final int studyYear = 1;

    class immerse{
        public void dosomething(){}
    }

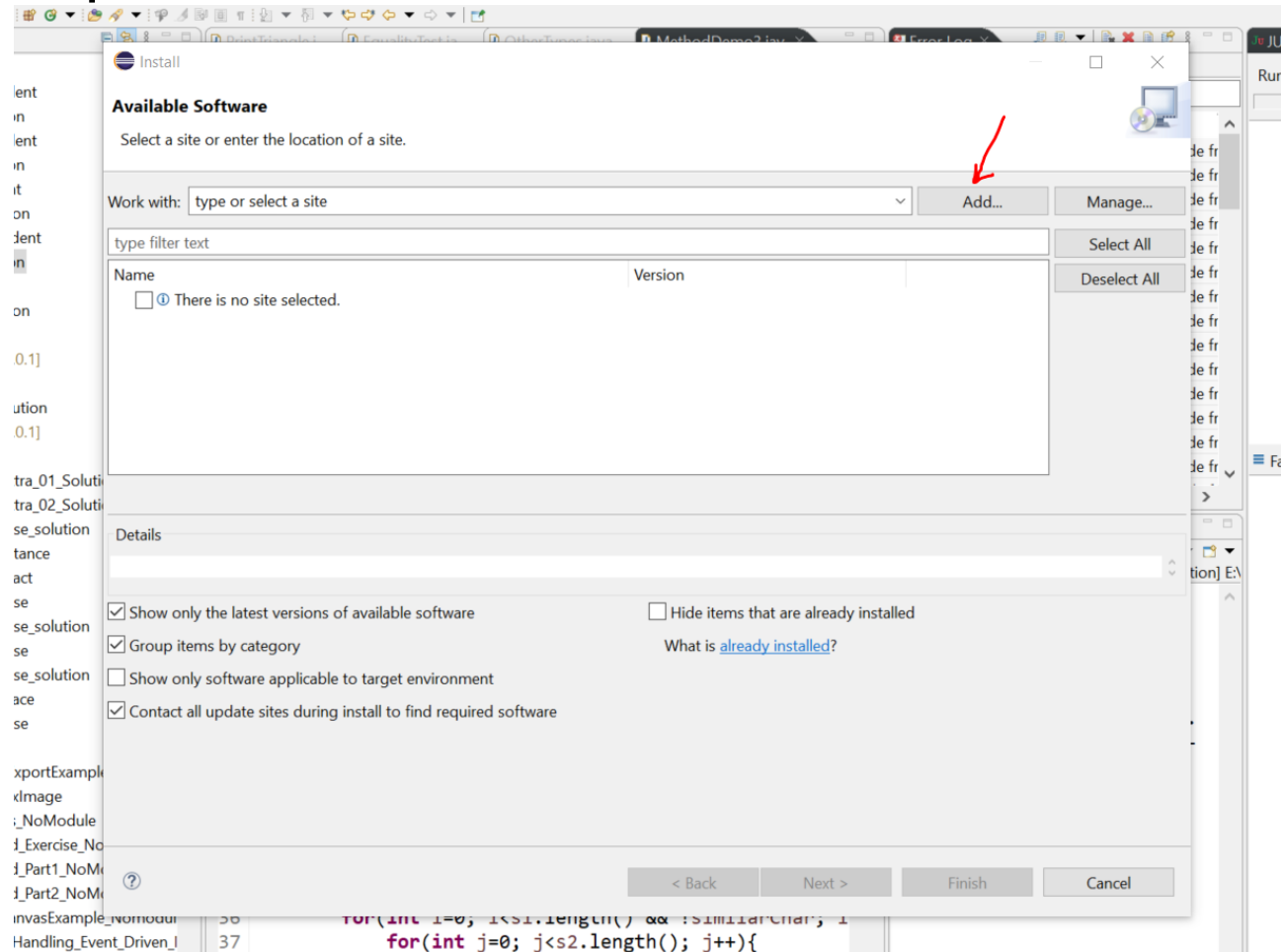
    public static void drop(SUBJECT a){
    }
}
  
```





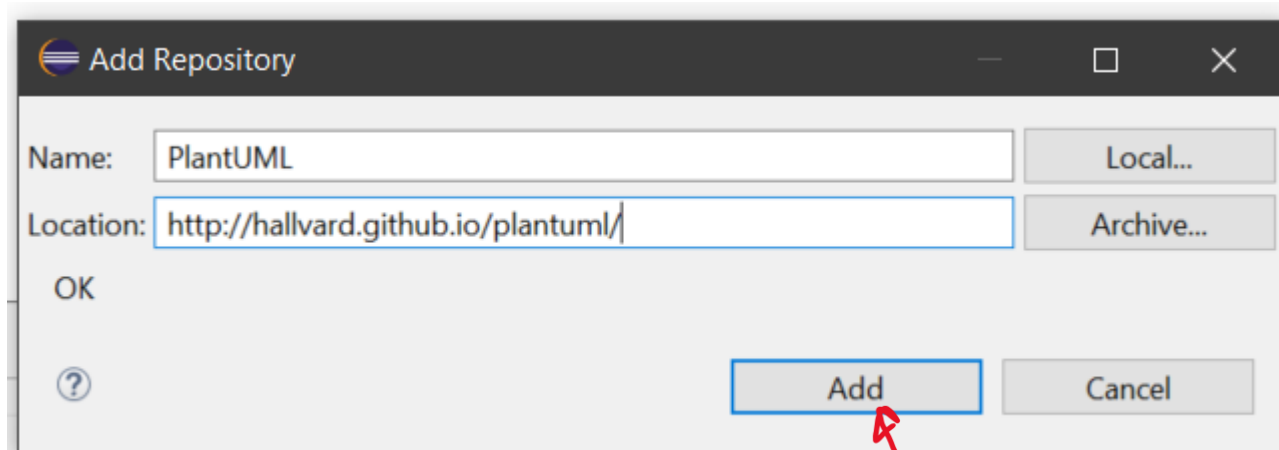
# How to **install** PlantUML

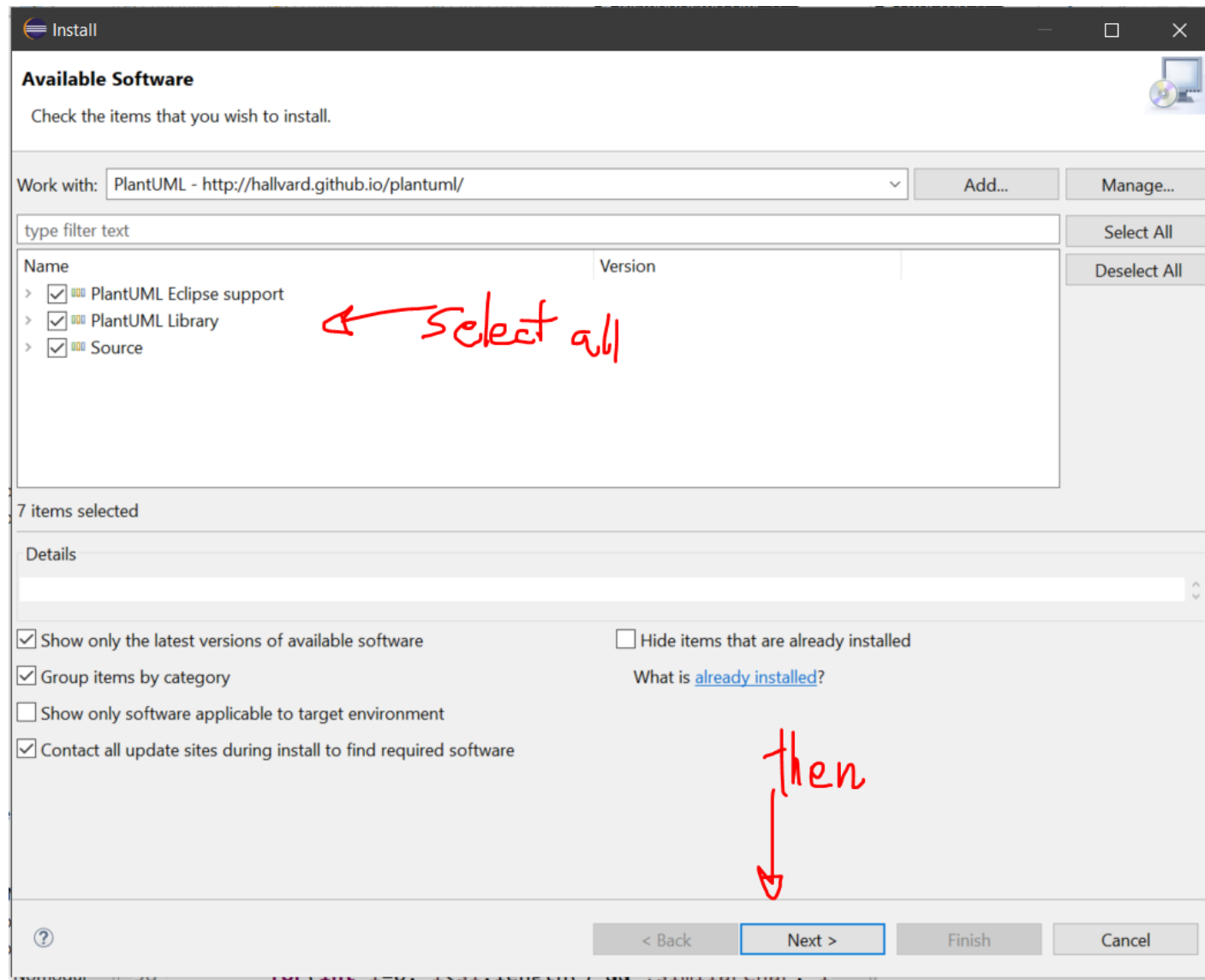
- Help -> Install new software





<http://hallvard.github.io/plantuml/>

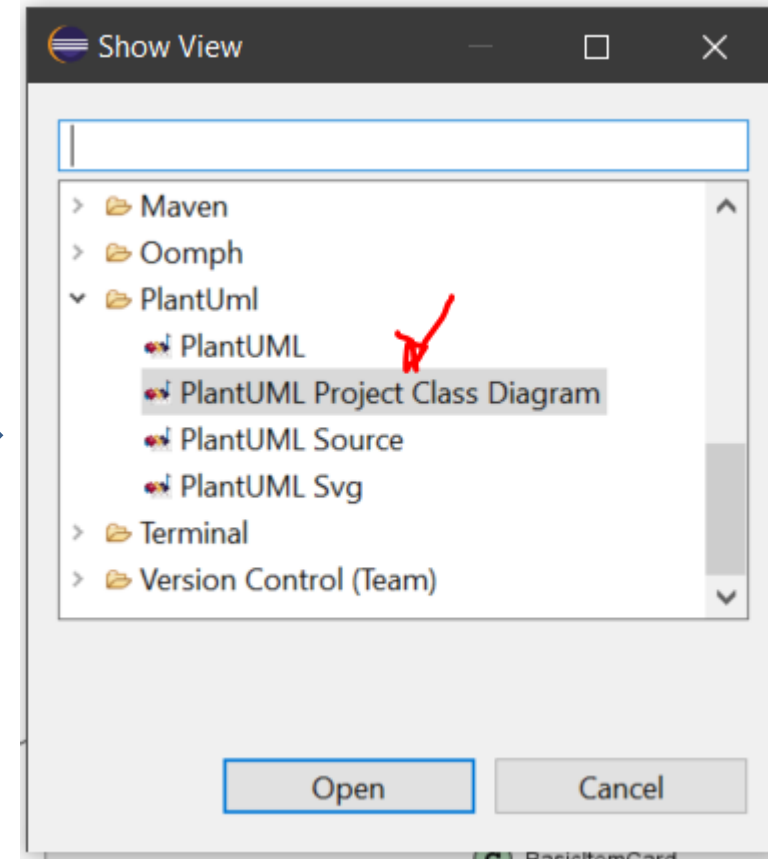
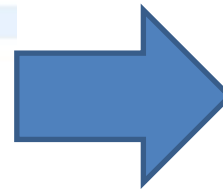
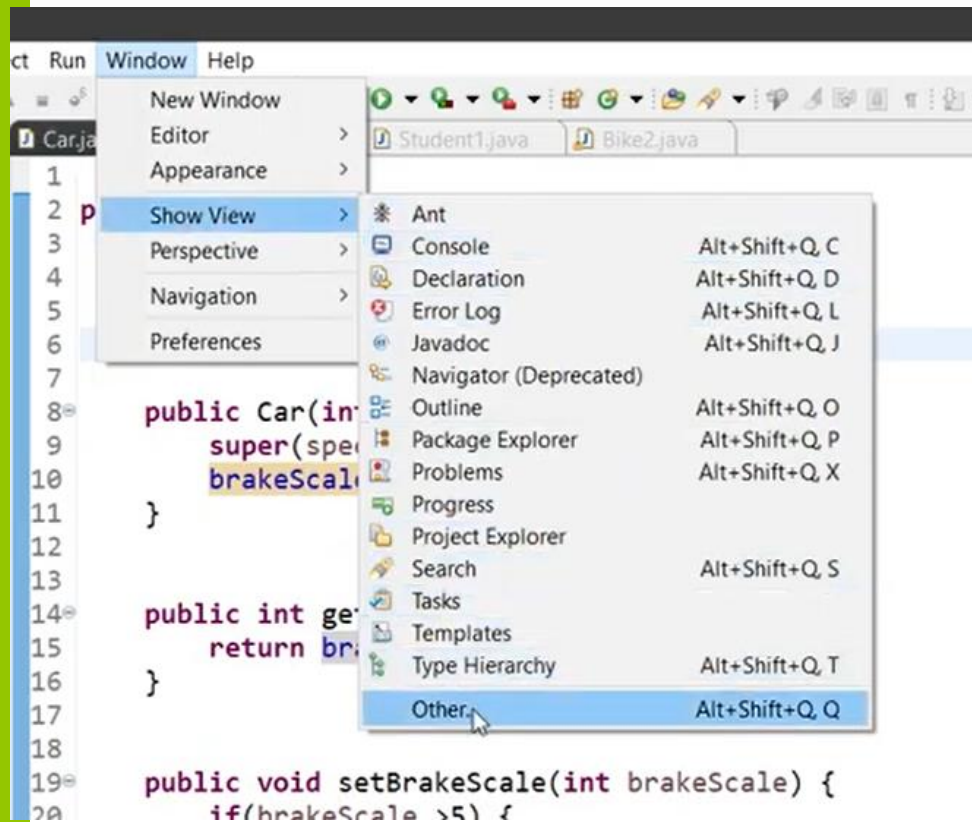


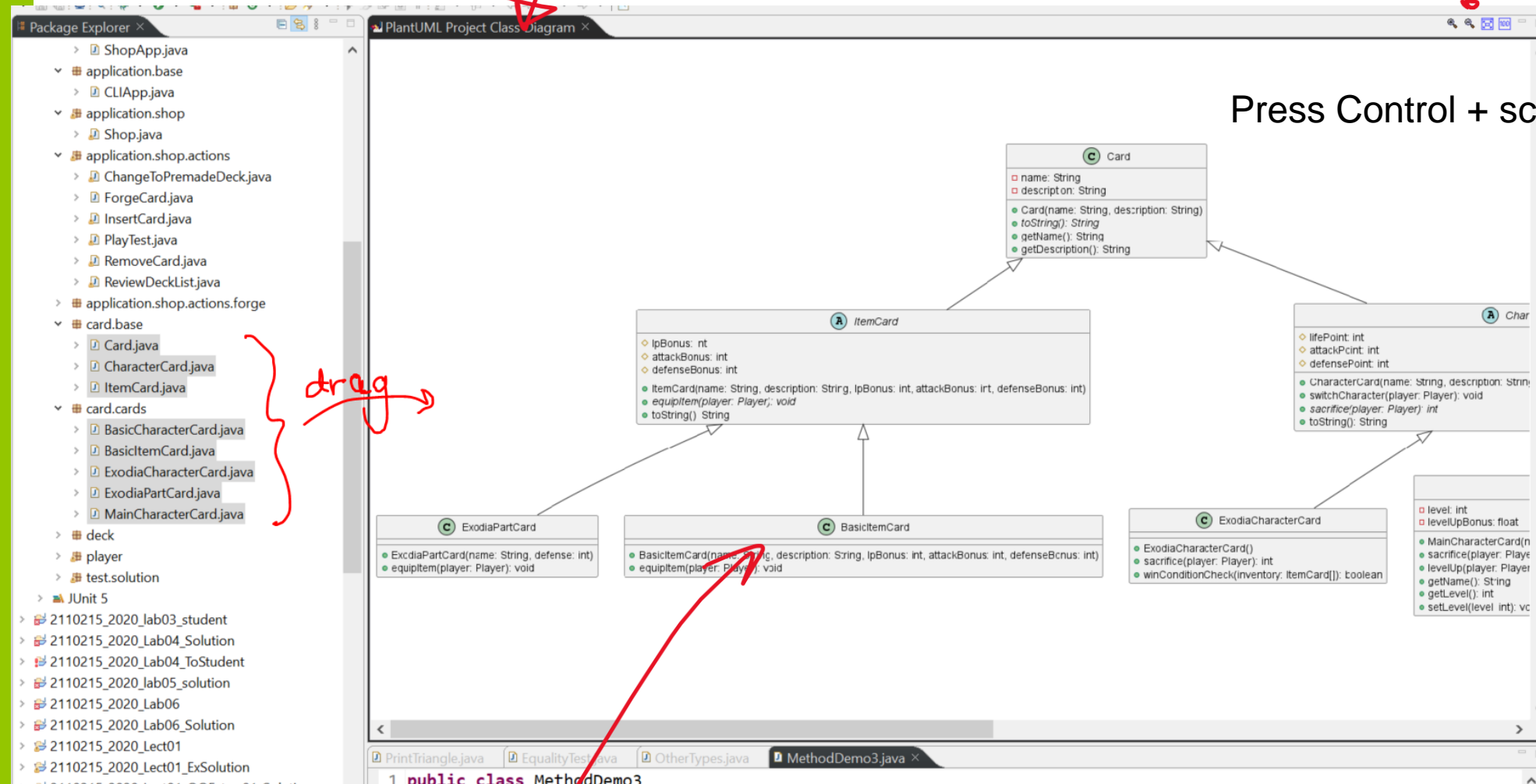


Accept everything and restart Eclipse when prompted.



# How to create UML Class diagram





Right click in window to open picture export menu. In Linux, you can use print and print as a pdf file. Edit pdf file with LibreOffice. (some Linux cannot export as picture, so must print as pdf) Select A3 paper In page setup if the uml does not come out right.

UML Printing.

General Page Setup

**Layout**

Two-sided: Not available

Pages per side: 1

Page ordering: Not available

Only print: All sheets

Scale: 100.0 — + %

**Paper**

Paper type: Not available

Paper source: Not available

Output tray: Not available

Paper size: A3

Orientation: Landscape

297.0 mm

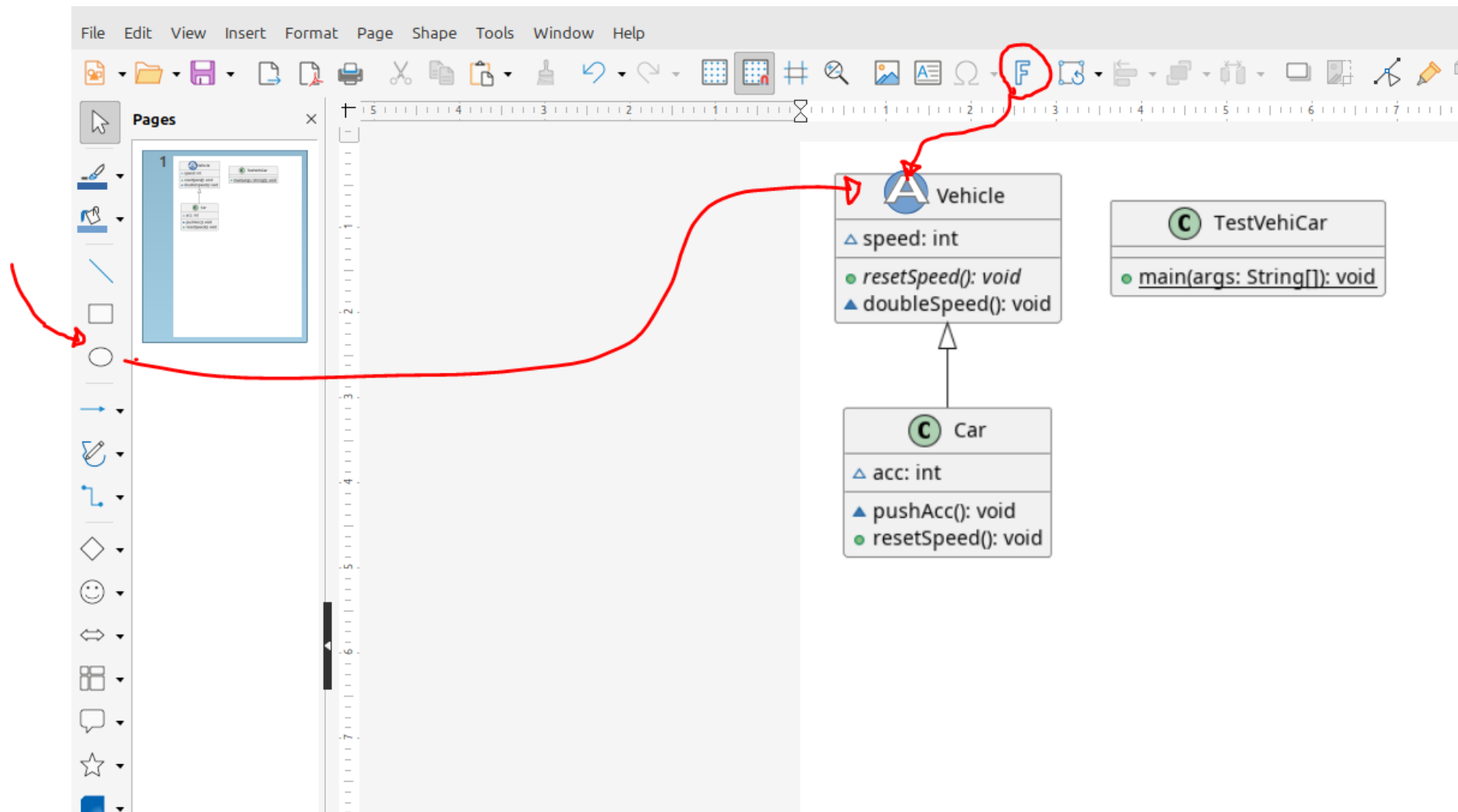
420.0 mm

1

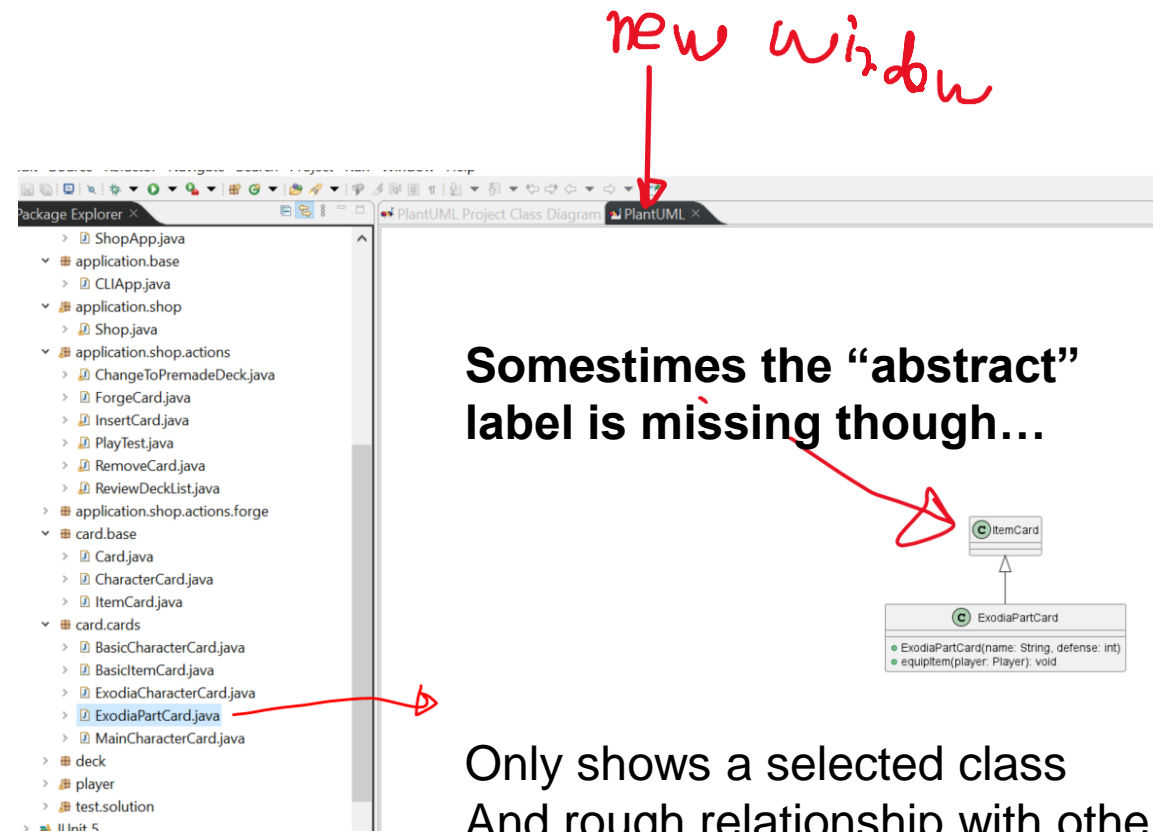
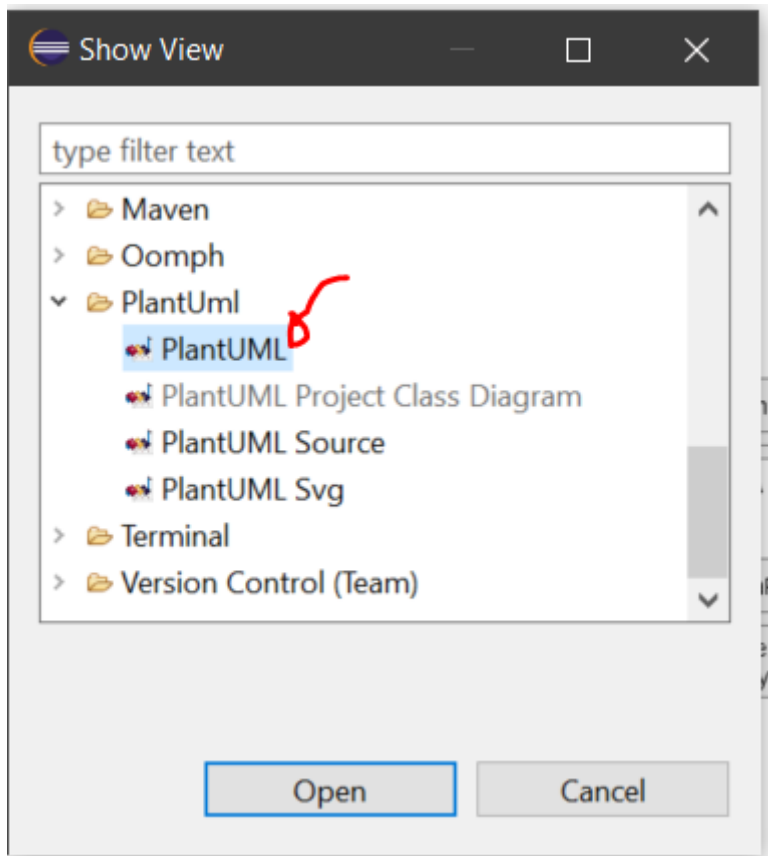
Cancel Print

Printing UML out in Linux (may need to try different settings)

# LibreOffice Example



If you want to only look at one class only



We can click on another class to change the diagram right away.