

Unified Modeling Language (UML)

2110215 - Programming Methodology





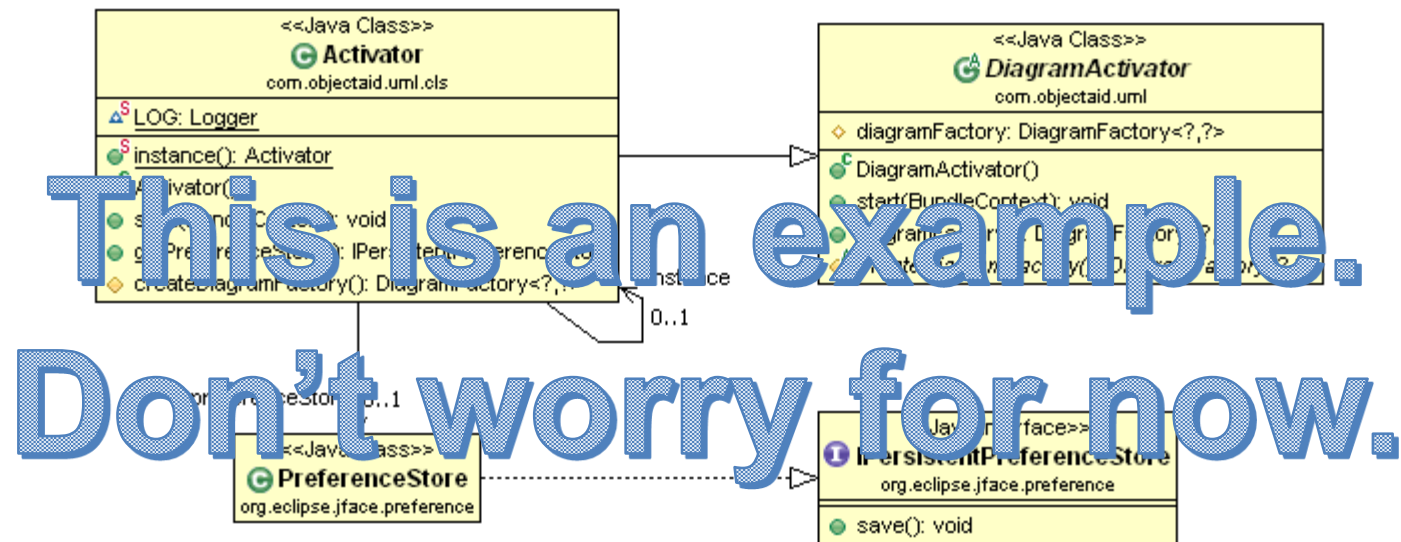
What is UML?

- 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



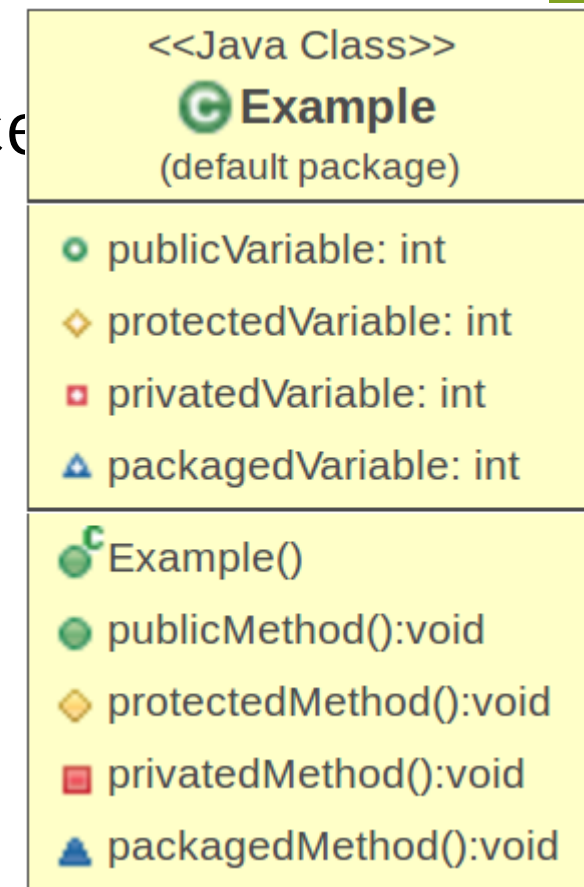


Class Diagram

- 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

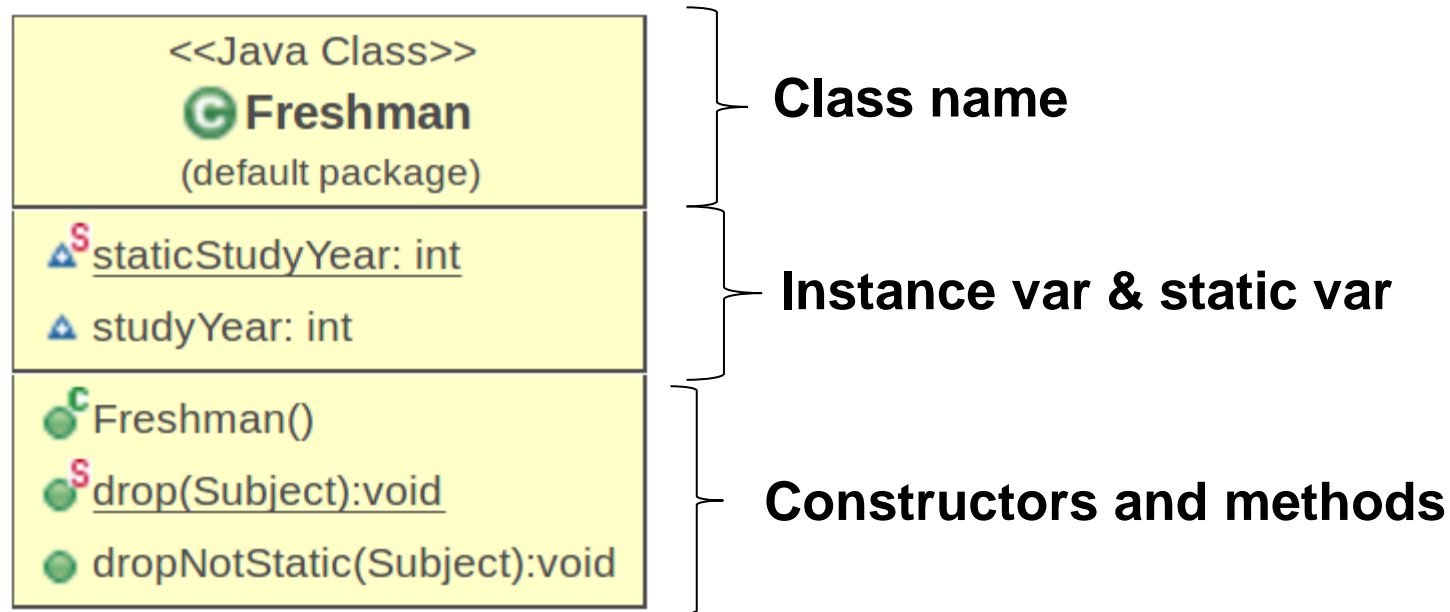
Tool might not display fully.





Class Diagram

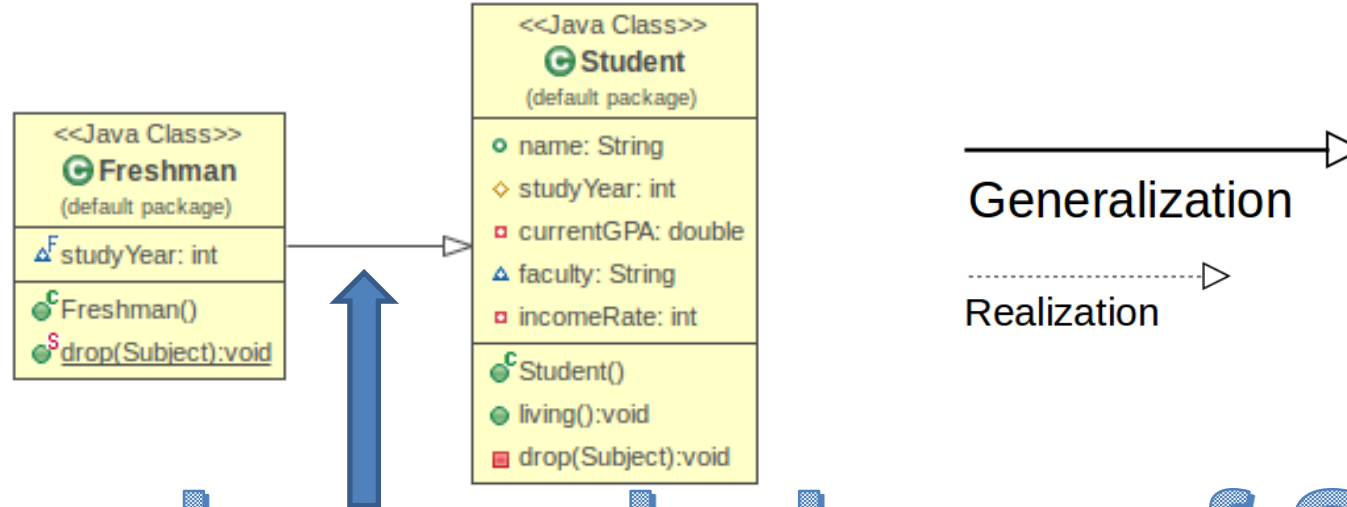
- Static is a keyword for variable or method. A static variable value will be shared through out all instance of the class. Static method can only access statics variable and call to other static methods only.





Generalization (Lecture 2)

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

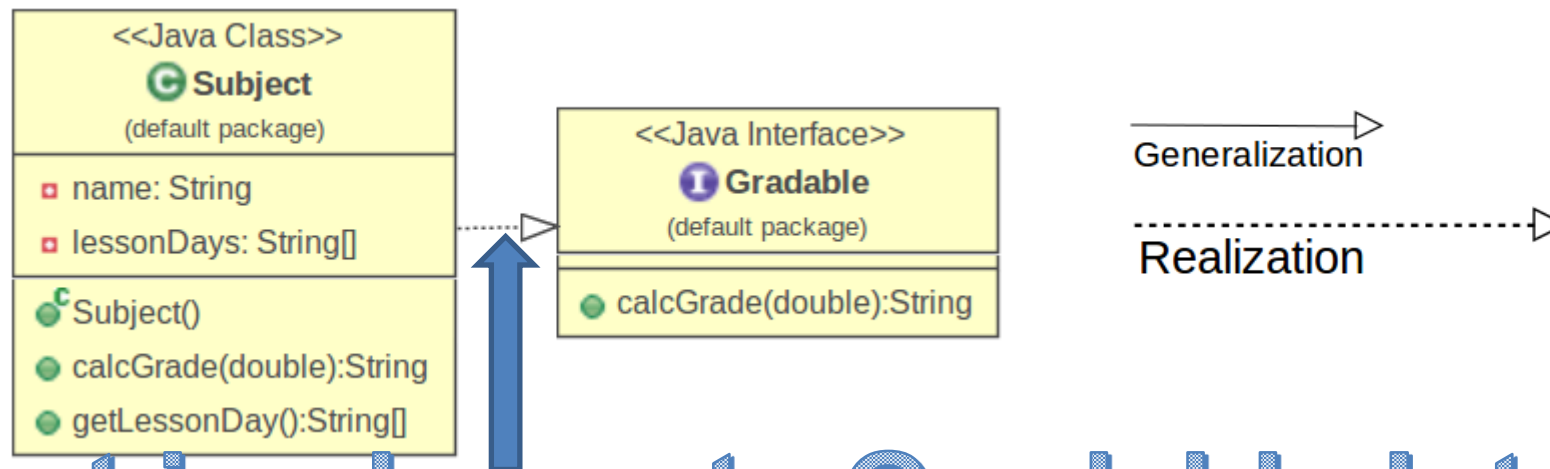


Freshman is a subclass of Student



Realization (Lecture 3-4)

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

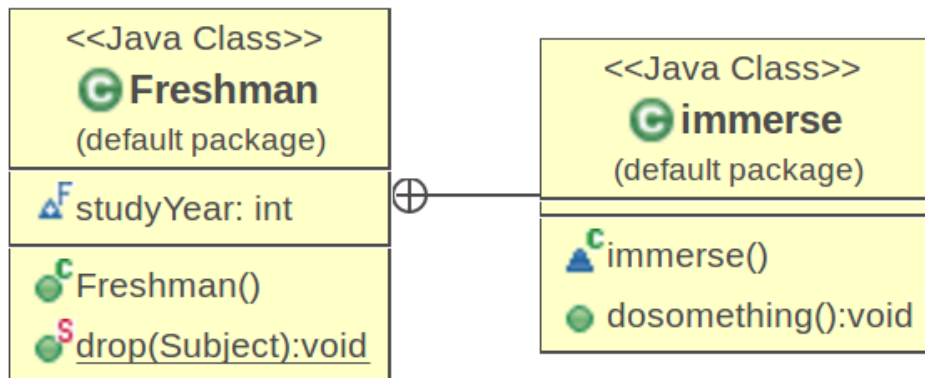


Subject implements Gradable Interface.
We will study this later on.



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;

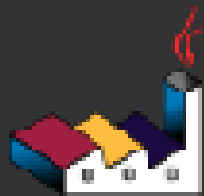
    class immerse{
        public void dosomething(){}
    }

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




UML Generation

Just install these plug-in:



PlantUML Integration 

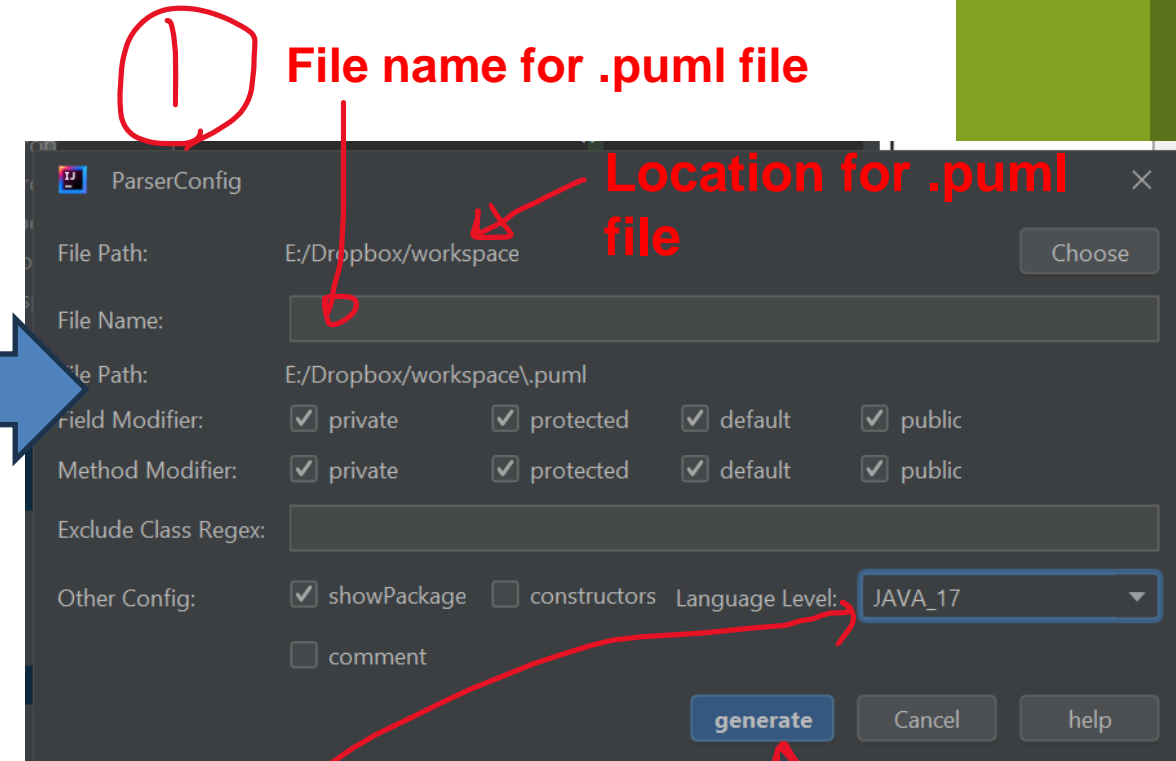
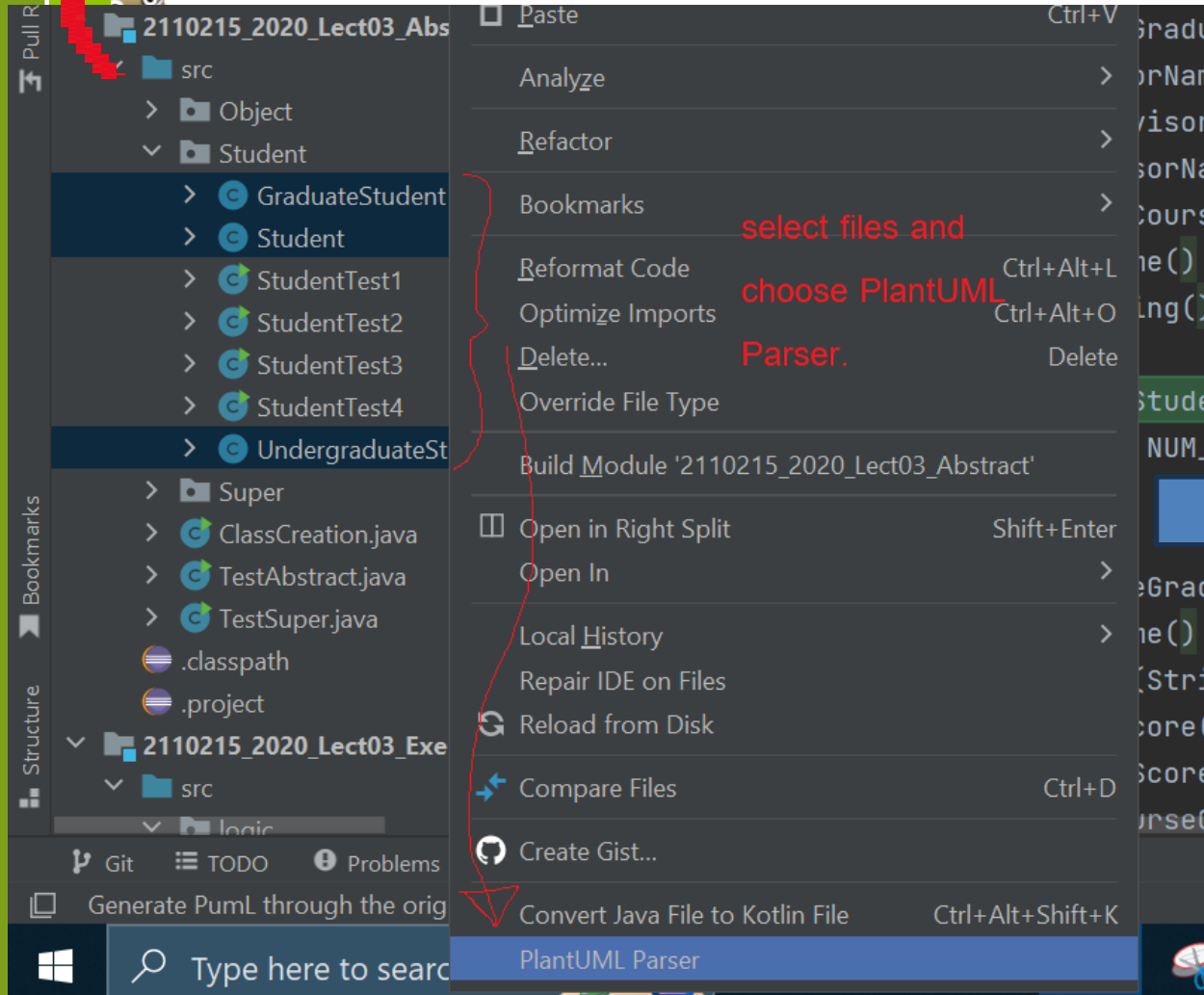
6.3.0-IJ2022.2 Eugene Steinberg, Vojtech Kras



PlantUML Parser 

0.0.5 shuzijun

When you want to generate UML:



Select Java version



A UML Panel will emerge! Showing the diagram

The screenshot shows an IDE with a project named 'StudentsClasses.puml'. The left sidebar displays a file explorer with a 'Student' package containing 'GraduateStudent', 'Student', 'StudentTest1', 'StudentTest2', 'StudentTest3', 'StudentTest4', and 'UndergraduateStudent'. The main editor shows the 'Student' class hierarchy diagram. The 'Student' class is the superclass, with 'UndergraduateStudent' and 'GraduateStudent' as subclasses. The 'Student' class has attributes: 'NUM_OF_TESTS' (int), 'name' (String), 'test' (int[]), and 'courseGrade' (String). It has methods: 'getName()', 'setName(String)', 'getTestScore(int)', 'setTestScore(int,int)', 'getCourseGrade()', 'setCourseGrade(String)', 'printName()', and 'toString()'. The 'UndergraduateStudent' class has methods: 'computeCourseGrade()', 'printName()', and 'toString()'. The 'GraduateStudent' class has an attribute 'advisorName' (String) and methods: 'getAdvisorName()', 'setAdvisorName(String)', 'computeCourseGrade()', 'printName()', and 'toString()'. A red text overlay on the right side of the diagram says: 'Must right click to save as picture.'