COMP 3021(Lab 4) : UML modeling with Eclipse

Quan Li & Haipeng Zeng

Department of Computer Science & Engineering

{*qliba,hzengac*}*@connect.ust.hk*

March.4 2016

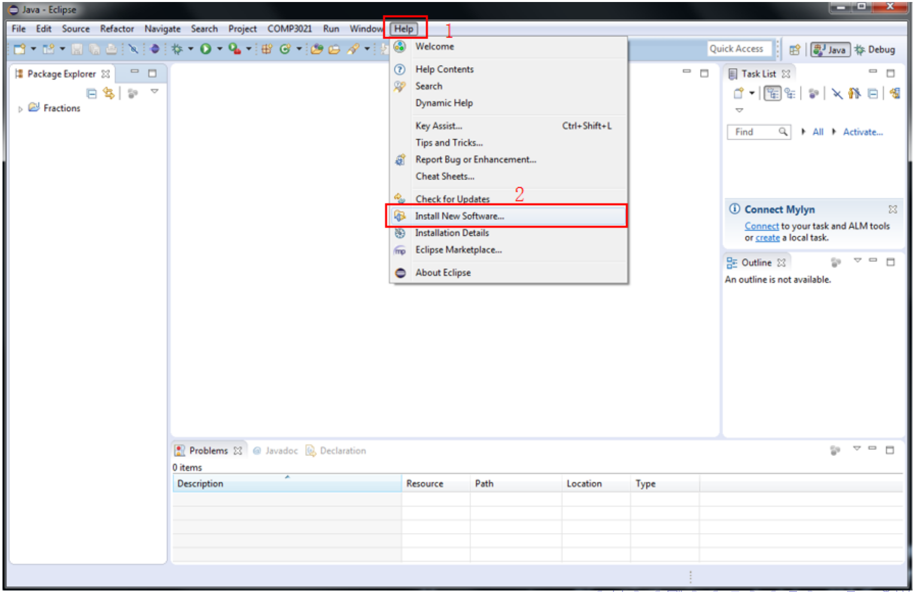
Overview

- UML definition
  The Unified Modeling Language (UML) is a visual language for capturing software designs and patterns. The first version of UML was defined 1994 and released by the Object Management Group (OMG) in 1997 as UML v.1.1. The syntax and a semantic of UML is defined by the OMG.
- UML profiles
  UML is intended to be extended. The formal way to extending a UML model is via a UML profile. A UML profile a collection of UML stereotypes and constraints on elements that map the generic UML to a specific problem domain or implementation. For example a UML profile can be used to support the modeling of J2EE software components.

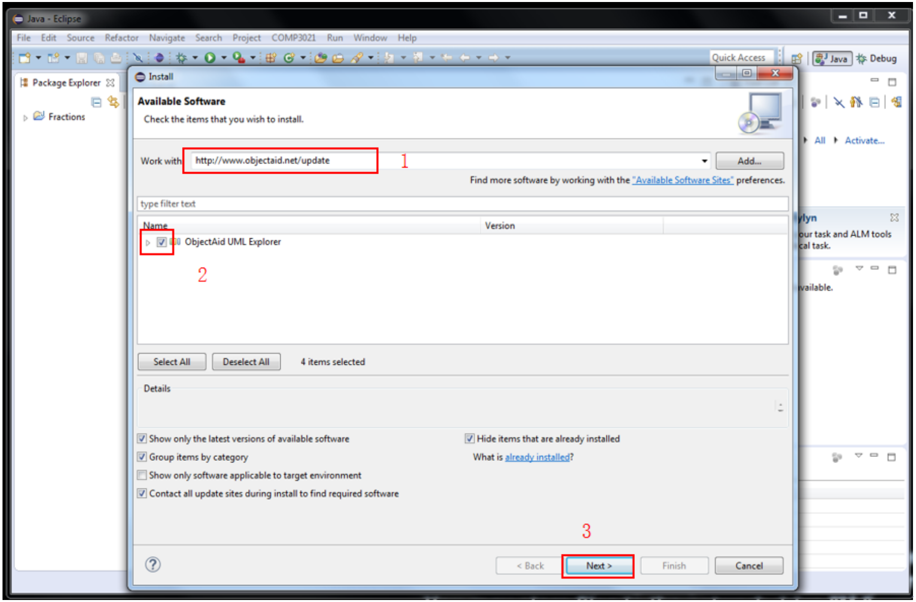
Install ObjectAid UML plugin for Eclipse

- This tutorial is based on the Video(ObjectAid UML plugin for Eclipse. Installation). For more details, you can refer to it.
  Link: `http://www.edu4java.com/en/java-for-beginners/java-for-beginners16.html`

Install ObjectAid UML plugin for Eclipse



Install ObjectAid UML plugin for Eclipse



Available Software

Check the items that you wish to install.

Work with: http://www.objectaid.net/update

Find more software by working with the "Available Software Sites" preferences.

type filter text

Name	Version
☑ ObjectAid UML Explorer	

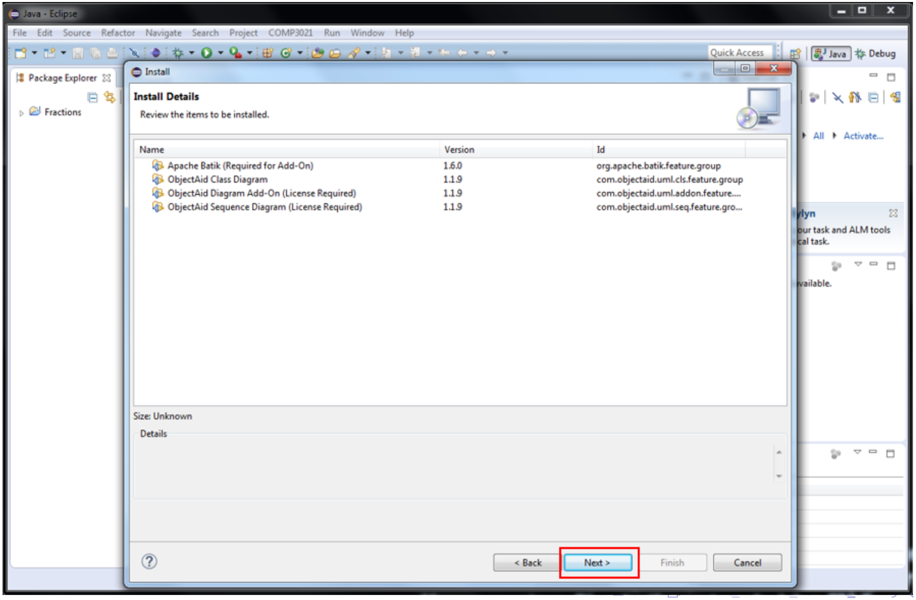
4 items selected

Details

- ☑ Show only the latest versions of available software
- ☑ Group items by category
- ☐ Show only software applicable to target environment
- ☑ Contact all update sites during install to find required software
- ☑ Hide items that are already installed

What is already installed?

Install ObjectAid UML plugin for Eclipse



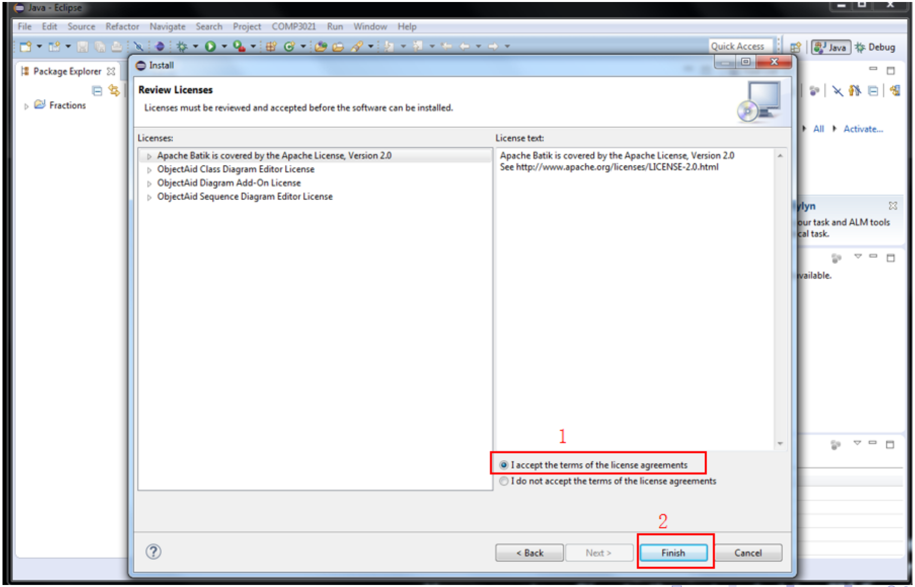
Install Details

Review the items to be installed.

Name	Version	Id
Apache Batik (Required for Add-On)	1.6.0	org.apache.batik.feature.group
ObjectAid Class Diagram	1.1.9	com.objectaid.uml.cls.feature.group
ObjectAid Diagram Add-On (License Required)	1.1.9	com.objectaid.uml.addon.feature....
ObjectAid Sequence Diagram (License Required)	1.1.9	com.objectaid.uml.seq.feature.gro...

Size: Unknown

Install ObjectAid UML plugin for Eclipse



Review Licenses

Licenses must be reviewed and accepted before the software can be installed.

Licenses:

- Apache Batik is covered by the Apache License, Version 2.0
- ObjectAid Class Diagram Editor License
- ObjectAid Diagram Add-On License
- ObjectAid Sequence Diagram Editor License

License text:

Apache Batik is covered by the Apache License, Version 2.0
See http://www.apache.org/licenses/LICENSE-2.0.html

1

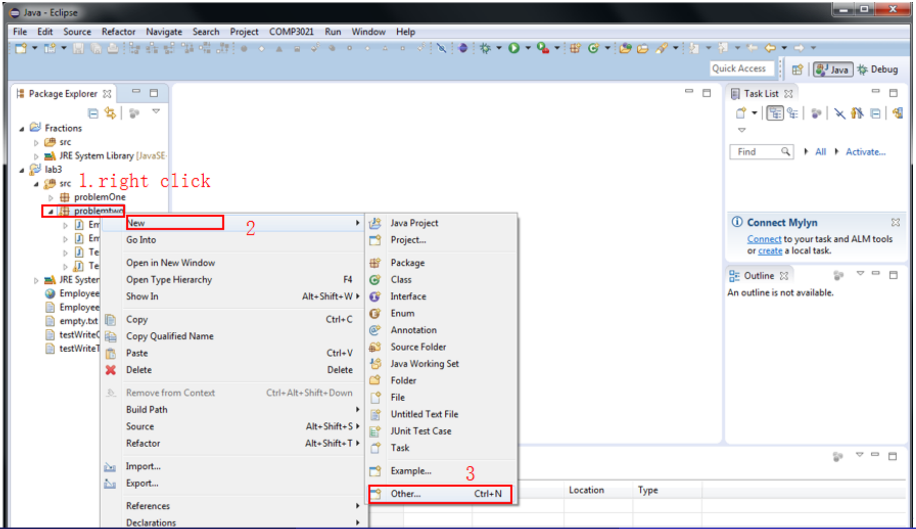
[✓ I accept the terms of the license agreements]

I do not accept the terms of the license agreements

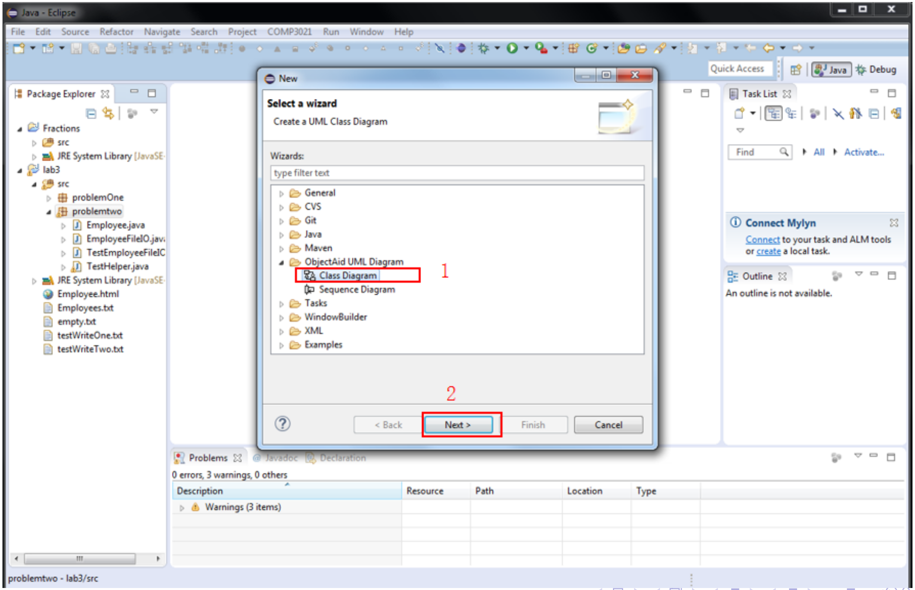
2

How to use ObjectAid UML plugin in Eclipse

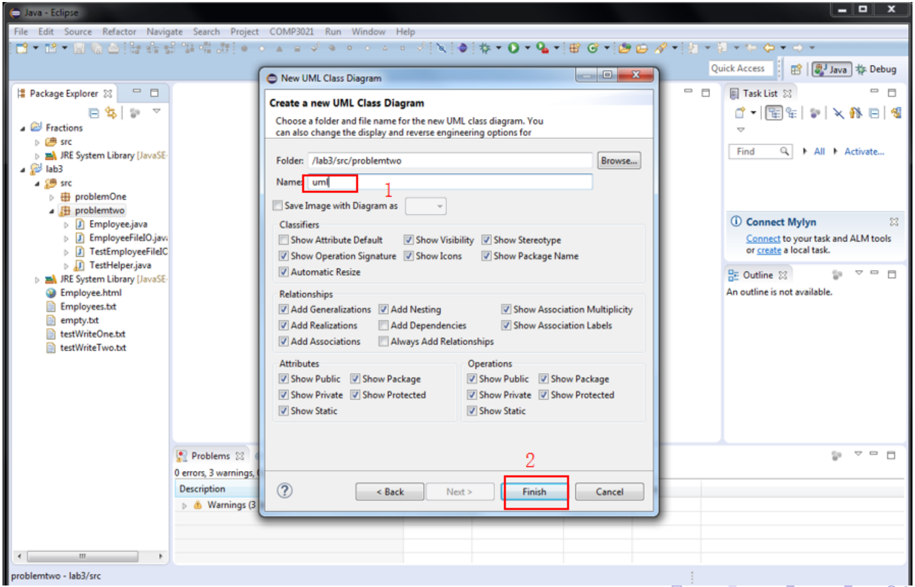
Finally, you install ObjectAid UML plugin successfully. Now here give you an example of how to use it.



How to use ObjectAid UML plugin in Eclipse



How to use ObjectAid UML plugin in Eclipse



New UML Class Diagram

Create a new UML Class Diagram

Choose a folder and file name for the new UML class diagram. You can also change the display and reverse engineering options for

Folder: /lab3/src/problemtwo Browse...

Name: uml

[ ] Save Image with Diagram as

Classifiers
- [ ] Show Attribute Default
- [✓] Show Visibility
- [✓] Show Stereotype
- [✓] Show Operation Signature
- [✓] Show Icons
- [✓] Show Package Name
- [✓] Automatic Resize

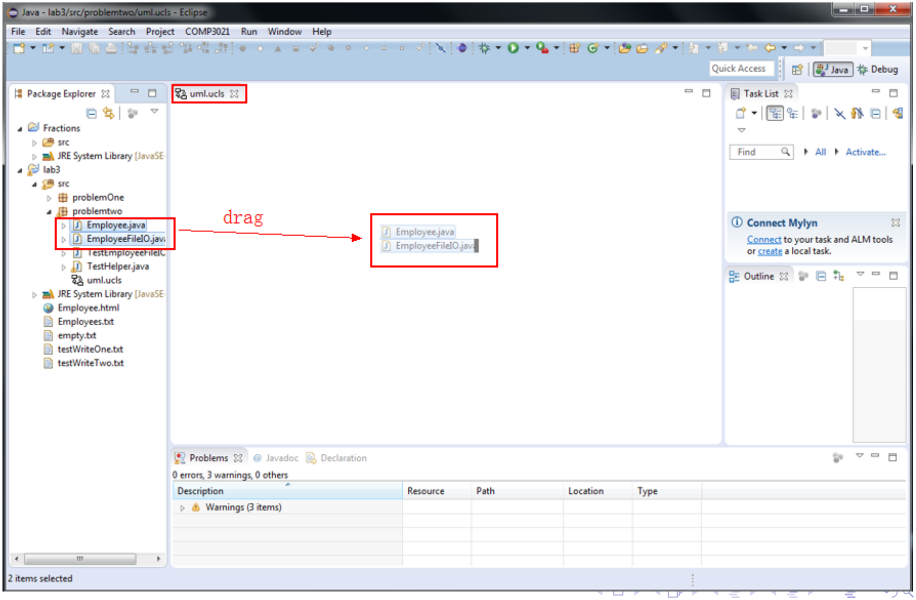
Relationships
- [✓] Add Generalizations
- [✓] Add Nesting
- [✓] Show Association Multiplicity
- [✓] Add Realizations
- [ ] Add Dependencies
- [✓] Show Association Labels
- [✓] Add Associations
- [ ] Always Add Relationships

Attributes
- [✓] Show Public
- [✓] Show Package
- [✓] Show Private
- [✓] Show Protected
- [✓] Show Static

Operations
- [✓] Show Public
- [✓] Show Package
- [✓] Show Private
- [✓] Show Protected
- [✓] Show Static

< Back Next > Finish Cancel

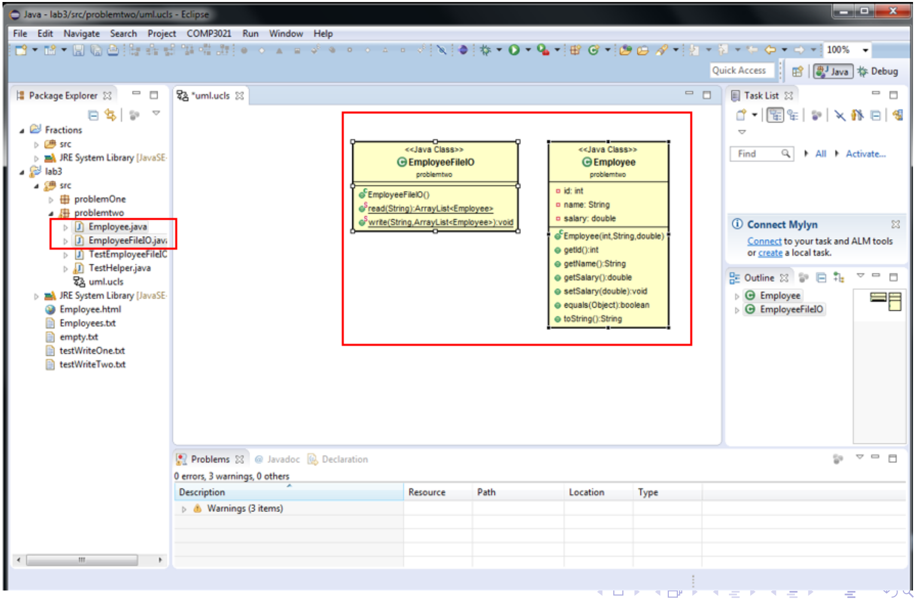
Install ObjectAid UML plugin for Eclipse



0 errors, 3 warnings, 0 others

Description	Resource	Path	Location	Type
Warnings (3 items)				

Install ObjectAid UML plugin for Eclipse



Description	Resource	Path	Location	Type
Warnings (3 items)				

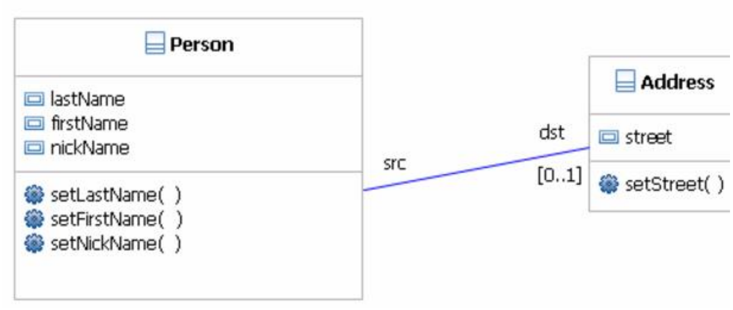
Class diagrams

Here introduce some basic knowledge of class diagrams.

- Overview
- Classes
- Attributes
- Interfaces
- Relationships

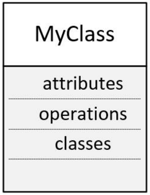
Class diagrams-Overview

A class diagram captures the static relationships of your software.



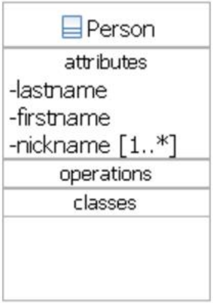
Class diagrams-Classes

- A class is represented by a rectangular box divided into compartments. A Compartment is an area in the box to write information. The first compartment holds the **name**, the second holds the **attributes** and the third is used for the **operations**.
- Any compartment can be hidden to improve readability of the diagram.
- UML suggests that a class name:
  1. Starts with a capital letter
  2. is centered in the top compartment
  3. is written in a boldface font
  4. is written in italics if the class is abstract

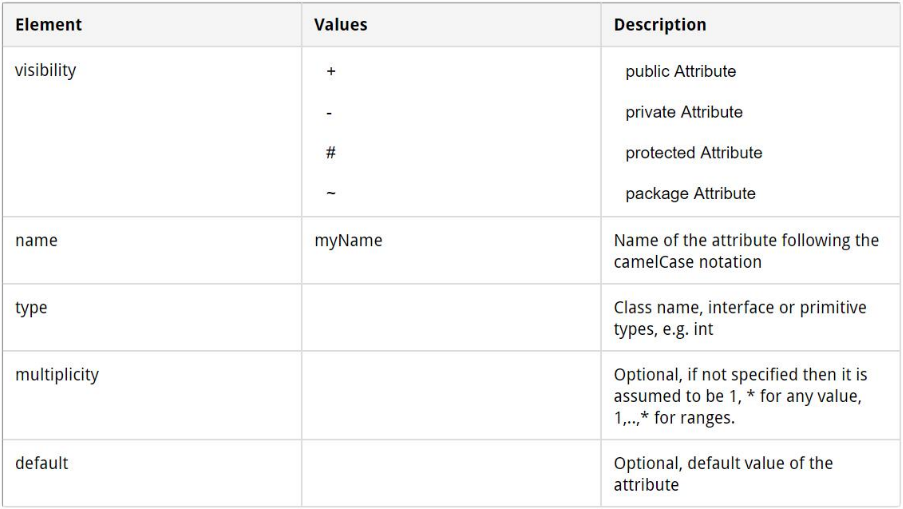


Class diagrams-Attributes(Inlined Attributes)

- Attributes specifies details of a class and can be simple types or objects.
- Attributes can be defined inlined (as part second compartment of the diagram of the class) or as relationship.
- Inlined Attributes: Inlined attributes are placed in the second compartment of the class. The notation for inline attribute is: **visibility name: type multiplicity {=default}**



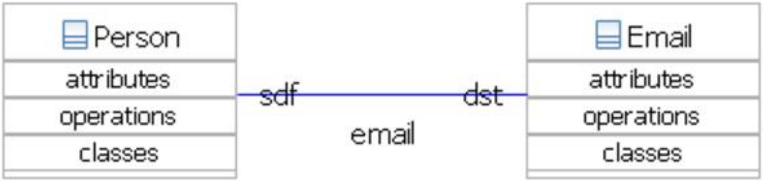
Class diagrams-Attributes(Inlined Attributes)



Element	Values	Description
visibility	+	public Attribute
	-	private Attribute
	#	protected Attribute
	~	package Attribute
name	myName	Name of the attribute following the camelCase notation
type		Class name, interface or primitive types, e.g. int
multiplicity		Optional, if not specified then it is assumed to be 1, * for any value, 1,..,* for ranges.
default		Optional, default value of the attribute

Class diagrams-Attributes(Attributes by Relationship)

To model attributes by relationship you use an association relationship between the class which represents the attribute and the class containing the attribute.

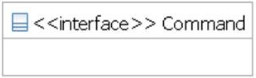


Class diagrams-Attributes(Static Attributes)

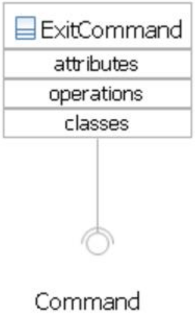
Static attributes (attributes that are part of the class and not part of the instance of the class) are displayed via underlining the name of the relationship.

Class diagrams-Interfaces

- Interfaces are indicated via the stereotype $\ll$ *interface* $\gg$.

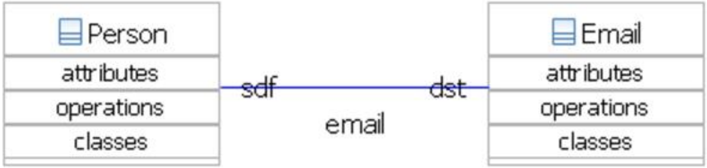


- Relationships can be expressed via the ball-and-socket notation.



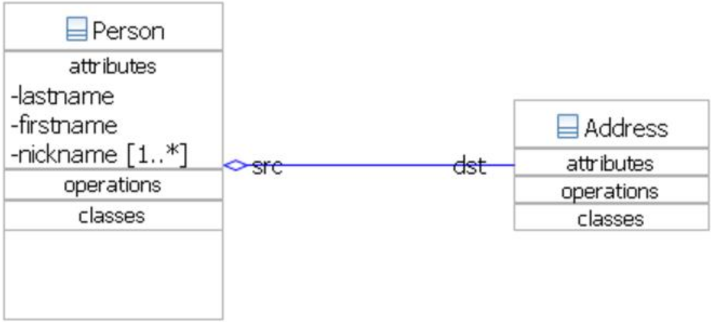
Class diagrams-Relationships(Association)

- UML defines several ways of representing relationships between classes.
- Association
  Read as "..has a.." association between classes. Drawn as a straight line between the two classes. Does not mean that the classes are owned by one, other classes may use the connected class too.



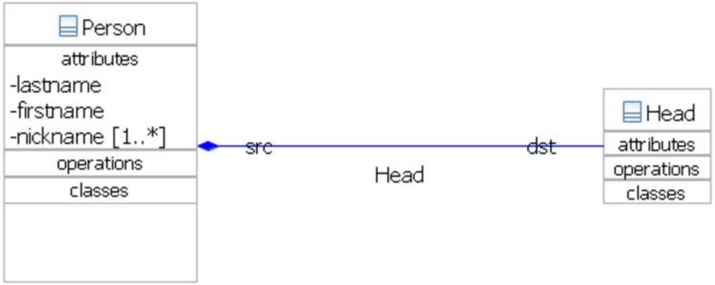
Class diagrams-Relationships(Aggregation)

- Read as "..owns a ..". Not as strong as a composite.



Class diagrams-Relationships(Composition)

- Strong relationship between classes to the point of containment. Read as "..is part of..". If the owning instance is destroyed then normally (not necessarily) the linked object is destroyed too.

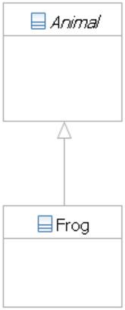


Class diagrams-Relationships(Generalisation)

- Read as ".. is a..". Use to express inheritance. Represented by a solid line and a hollow triangular arrow. For example the following code could be expressed with the following diagram.

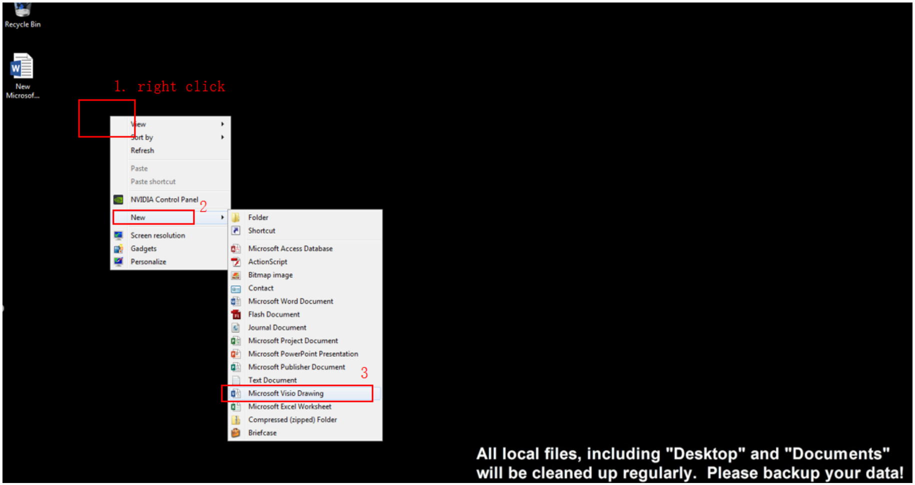
```
package animals;

public abstract class Animal {

}
```

```
package animals;

public class Frog extends Animal {

}
```



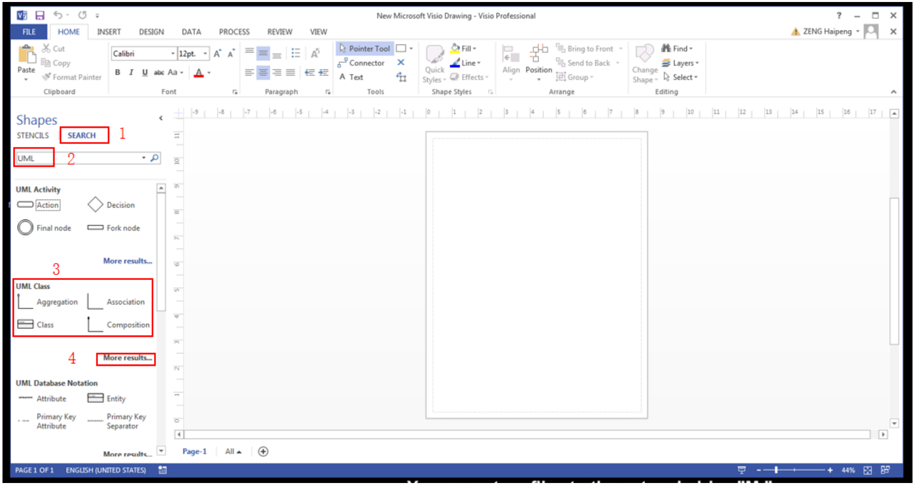
Use Visio to draw UML diagrams

There are many different softwares to draw UML diagrams, here we show how to use Visio in Rm4210.

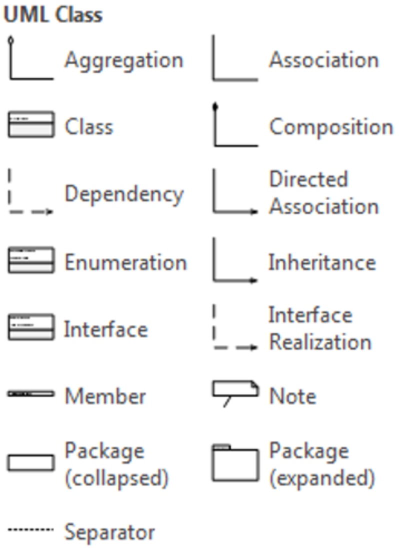


All local files, including "Desktop" and "Documents" will be cleaned up regularly. Please backup your data!

Use Visio to draw UML diagrams

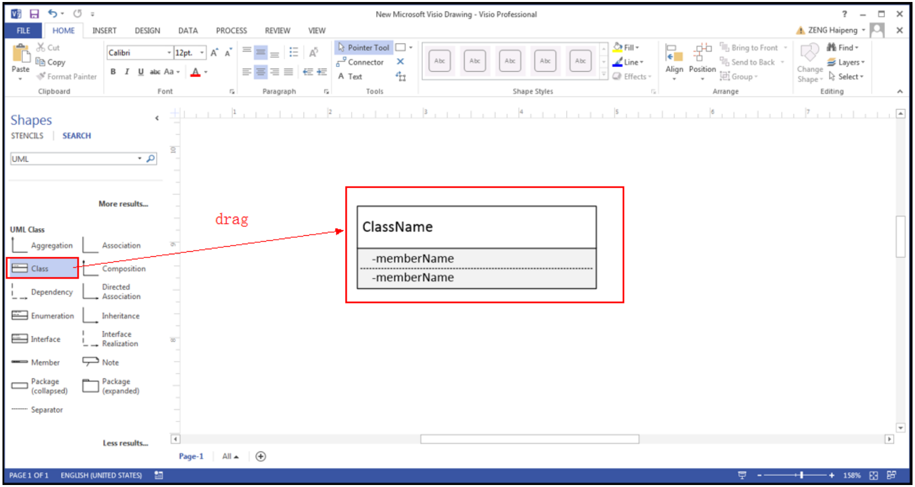


Use Visio to draw UML diagrams


UML Class

Aggregation	Association
Class	Composition
Dependency	Directed Association
Enumeration	Inheritance
Interface	Interface Realization
Member	Note
Package (collapsed)	Package (expanded)
Separator	

Use Visio to draw UML diagrams



some useful tutorials

- some useful tutorials:
  1. Using the Eclipse Debugger for Beginning Programmers
  `http://www.vogella.com/tutorials/UML/article.html`
  2. Eclipse And Java: Free Video Tutorials(Using the Debugger)
  `http://www.edu4java.com/en/java-for-beginners/java-for-beginners16.html`
  3. The ObjectAid UML Explorer for Eclipse
  `http://www.objectaid.com/`

The End