Faculty Civil Engineering
Chair of Intelligent Technical Design
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Bauhaus-Universität Weimar

Object-oriented Modeling and Programming in Engineering (OOMPE)

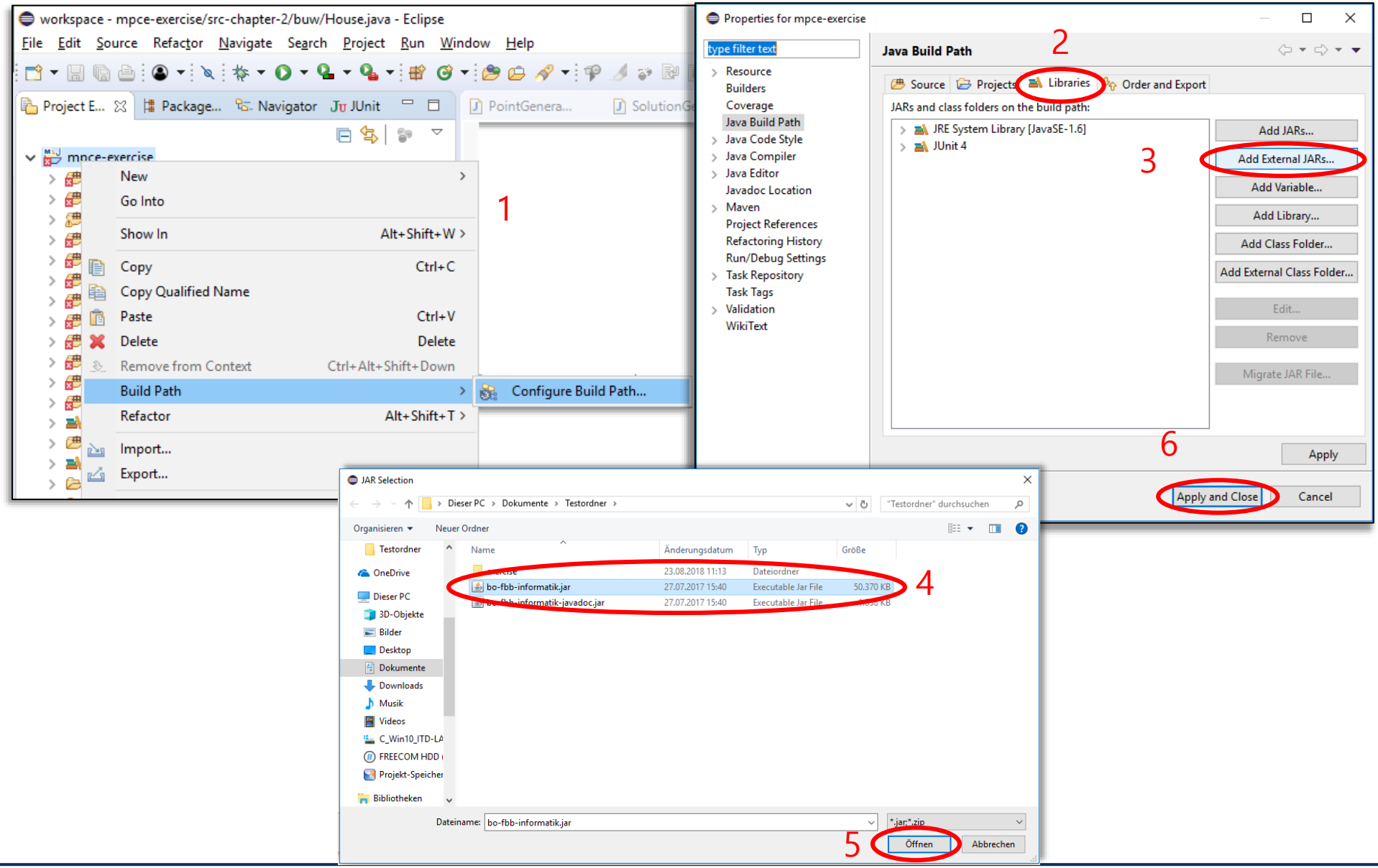
Winter semester 2018-19

02 – Objects

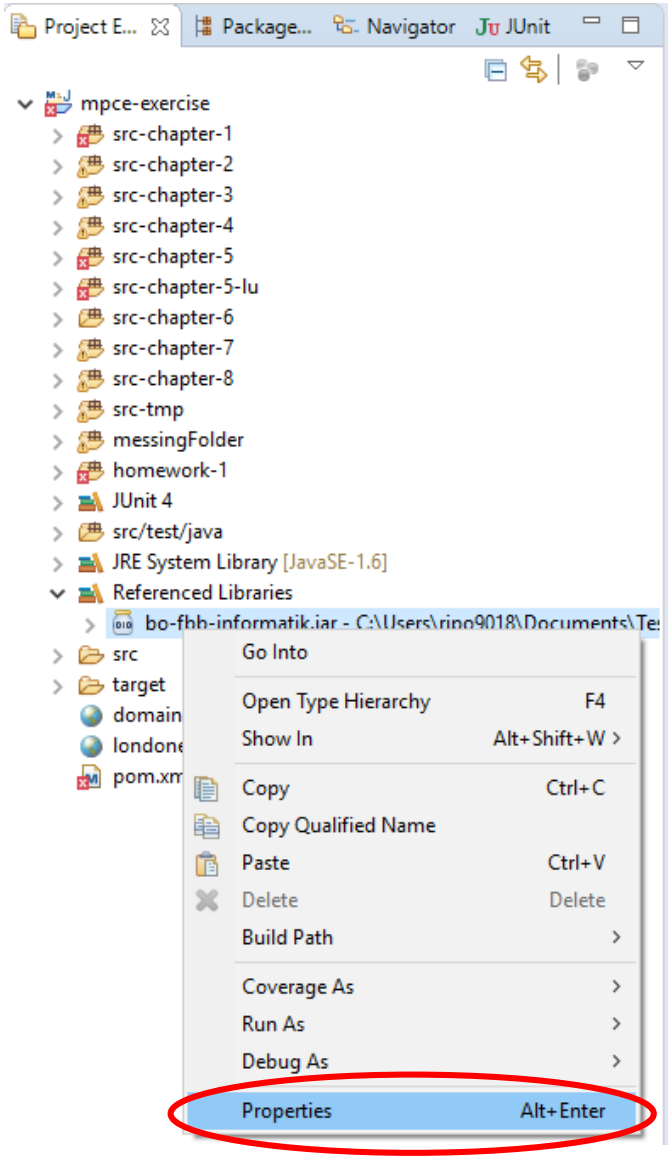
External library purposes

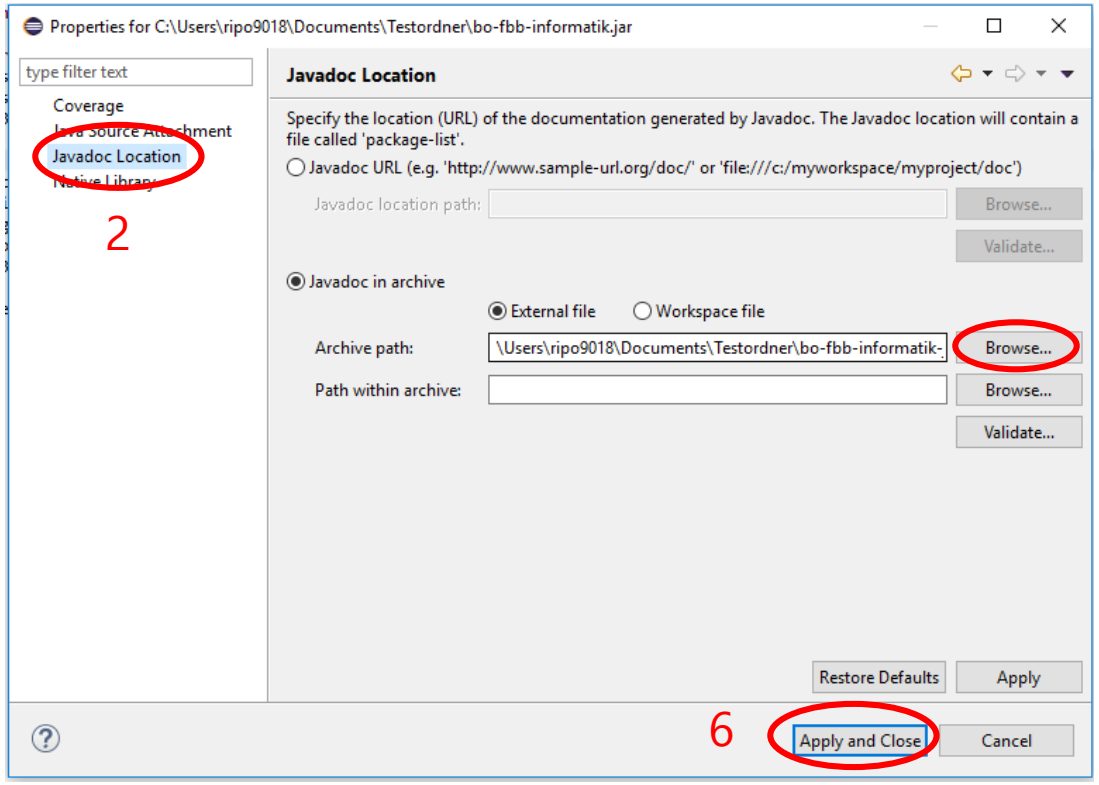
- Outsourcing of source code
- Reusable in different projects
- Hide implementation
- Abstraction of functionality
- OOMPE Graphical library from the Bochum University of Applied Science
- Moodle: **OOMPE → Exercises → Additional .jar files**

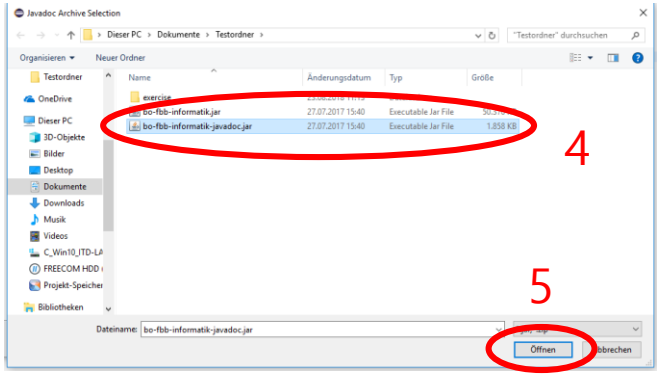
Add external libraries



Add external Javadoc







Browse Javadoc jar file

- Jar-files are archive files (like .zip)
  - Create a copy of the jar
  - Rename it to a zip-file (i.e. bo-fbb-informatik-javadoc.zip)
  - Extract it to a folder
  - Open Overview-summary.html

Installing necessary libraries

- Additional libraries for view3D needed
- If you use your **own laptop** please mention the following steps
  - view3D from Prof. Matthias Baitsch from the University of Applied Science in Bochum
  - Open https://webuser.uni-weimar.de/~wagner/uni-intern/ITD-Java+nativeDLL.zip
  - Extract the archive
  - Execute the .cmd
  - If an Error like „UnsatisfiedLinkError“ occurs, Java cannot find these libraries or there is a problem with them

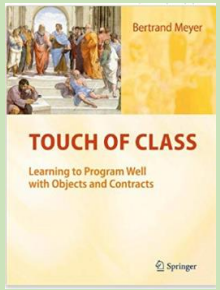
Class and Object (Model)

Class

Book
+ Name: String + Publisher: String + Published: int + Pages: int

Object

b1 : Book
Name = "Touch of class: learning to program well with objects and contracts" Publisher = "Springer" Published = 2013 Pages = 876



b2 : Book
Name = "Java ist auch eine Insel" Publisher = Rheinwerk Computing Published = 2016 Pages = 1312

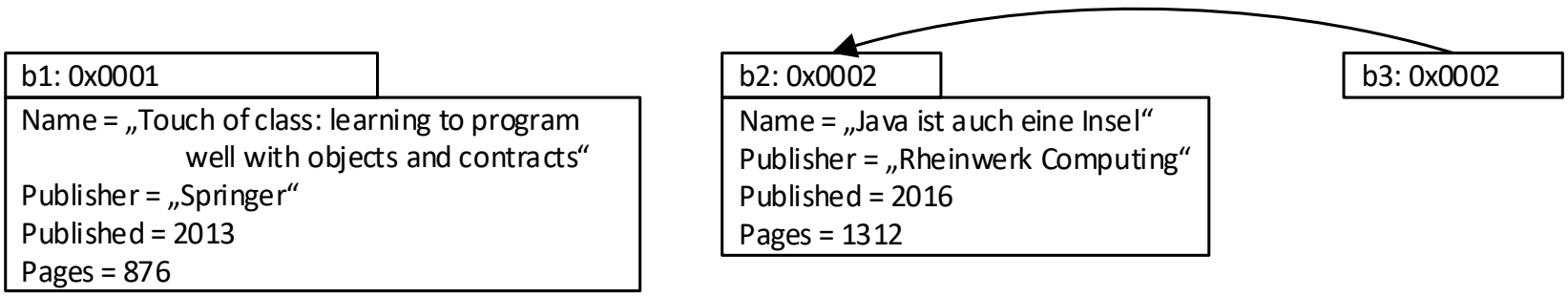
Class and Object (Code)


```java
public class Book {
    public String Name;
    public String Publisher;
    public int Published;
    public int Pages;

}
```

```java
public static void main(String[] args) {

    Book b1 = new Book();
    b1.Name = "Touch of class: learning to program well with objects and contracts";
    b1.Publisher = "Springer";
    b1.Published = 2013;
    b1.Pages = 876;

    Book b2 = new Book();
    b2.Name = "Java ist auch eine Insel";
    b2.Publisher = "Rheinwerk Computing";
    b2.Published = 2016;
    b2.Pages = 1312;

}
```

References


```
public static void main(String[] args) {

    Book b1 = new Book();
    b1.Name = "Touch of class: learning to program well with objects and contracts";
    b1.Publisher = "Springer";
    b1.Published = 2013;
    b1.Pages = 876;

    Book b2 = new Book();
    b2.Name = "Java ist auch eine Insel";
    b2.Publisher = "Rheinwerk Computing";
    b2.Published = 2016;
    b2.Pages = 1312;

    Book b3 = b2;
    b3.Pages = 1337;
    System.out.println(b2.Pages);

}
```

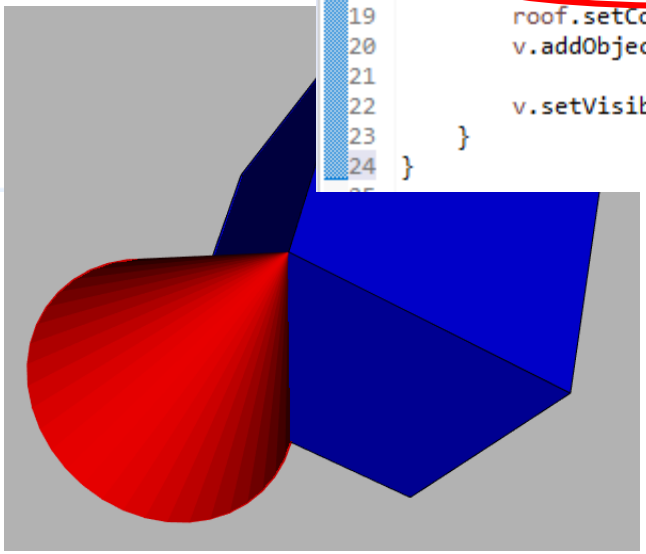


House building select elements

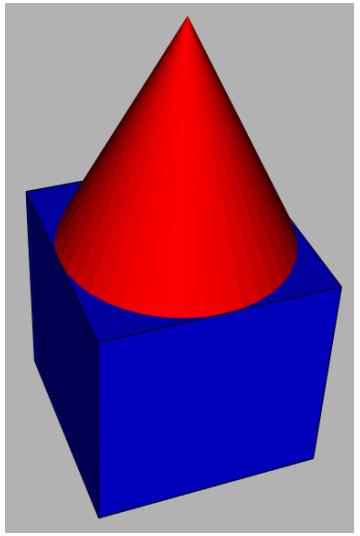
- Using basic 3D-Elements
  - Library: look into the package inf.v3d.obj
  - 3D-Objects
  - Box + Cone

Build the house


```java
package buw;

import java.awt.Color;

import inf.v3d.obj.*;
import inf.v3d.view.*;

public class House {

    public static void main(String[] args) {
        Viewer v = new Viewer();

        Box houseCorps = new Box();
        houseCorps.setColor(Color.blue);
        v.addObject3D(houseCorps);

        Cone roof = new Cone();
        roof.setColor(Color.RED);
        v.addObject3D(roof);

        v.setVisible(true);
    }

}
```



```java
package buw;

import java.awt.Color;

import inf.v3d.obj.*;
import inf.v3d.view.*;

public class House {

    public static void main(String[] args) {
        Viewer v = new Viewer();

        Box houseCorps = new Box();
        houseCorps.setColor(Color.blue);
        v.addObject3D(houseCorps);

        Cone roof = new Cone();
        roof.setCenter(0.5, 1, 0.5);
        roof.setColor(Color.RED);
        v.addObject3D(roof);

        v.setVisible(true);
    }
}
```



Tasks

- What are the following lines doing:

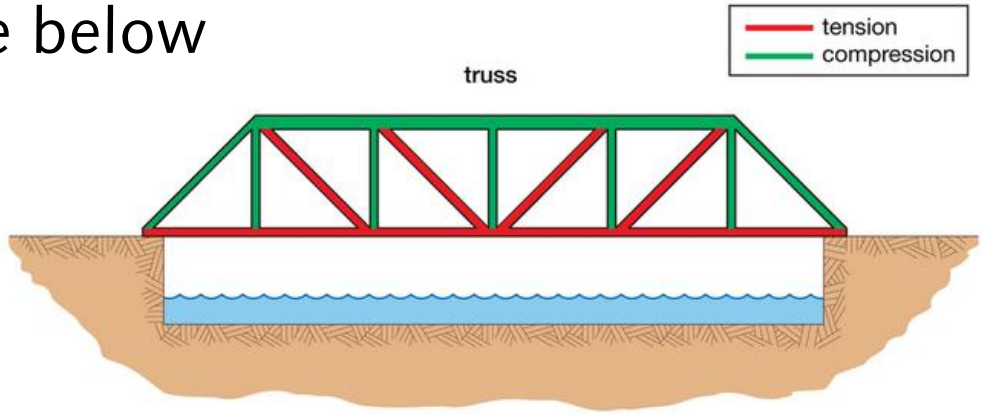
```
22          Box b2 = houseCorps;
23          b2.setColor(Color.MAGENTA);
```

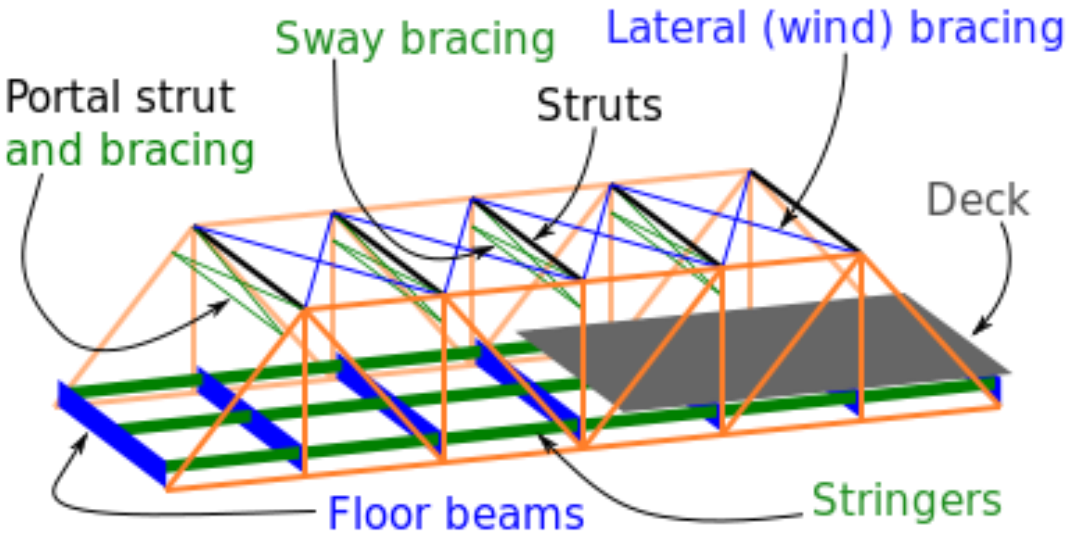
- Build terraced houses (at least two shifted copies of the first one)
- Christmas is near and we need a christmas tree. Please build one for us (first search which elements can be used)

- Next week free programming (bring questions or go on working on the tasks)

Additional Task

- Create a truss bridge like below





https://en.wikipedia.org