

*Einführung in die
Informatik 2 für Ingenieure*
Übung 1

Christoph Anneser
(anneser@in.tum.de)

Agenda

1. Organisation
2. Umfrage
3. Java
4. UML
5. Übungsblatt 1

Organisation

Termine

- **Vorlesung** (Prof. Alfons Kemper)
 - Montag 10:00 - 11:30
- **Zentralübung** (Christoph Anneser)
 - Montag 11:30 - 12:30
- **Fragestunde** (Aaron Tacke und Maximilian Schallermayer)
 - Donnerstag 17:00 - 18:30

Website

The screenshot shows a web browser window with the following content:

- Browser Tab:** Einführung in die Informatik 2 f x
- Address Bar:** Secure <https://db.in.tum.de/teaching/ss17/ei2/>
- Navigation Bar:** Home, People, Research, Teaching, Summer Term 2017
- Header:** TUM Technische Universität München, Die unternehmerische Universität
- Breadcrumbs:** Home » Teaching » Summer Term 2017 » Einführung in die Informatik 2 für Ingenieure
- Section Header:** Einführung in die Informatik 2 für Ingenieure
- Faculty:** Prof. Alfons Kemper, Ph.D.; Alexander van Renen, M.Sc.
- Organisation:** Lehrstuhl III Datenbanksysteme; Prof. Kemper, Prof. Neumann, Prof. Günemann; Fakultät für Informatik TU München
- Vorlesung:** Termin: Montag 10:00; Ort: BC2 0.01.17
- Zentralübung:** Termin: Montag 11:30; Ort: BC2 0.01.17
- Fragestunde:** Termin: Donnerstag 15:30; Ort: BC2 0.01.17; Tutor: Moritz Sichert sichert@in.tum.de
- Material:** (partially visible)

<http://db.in.tum.de/teaching/ss21/ei2/>

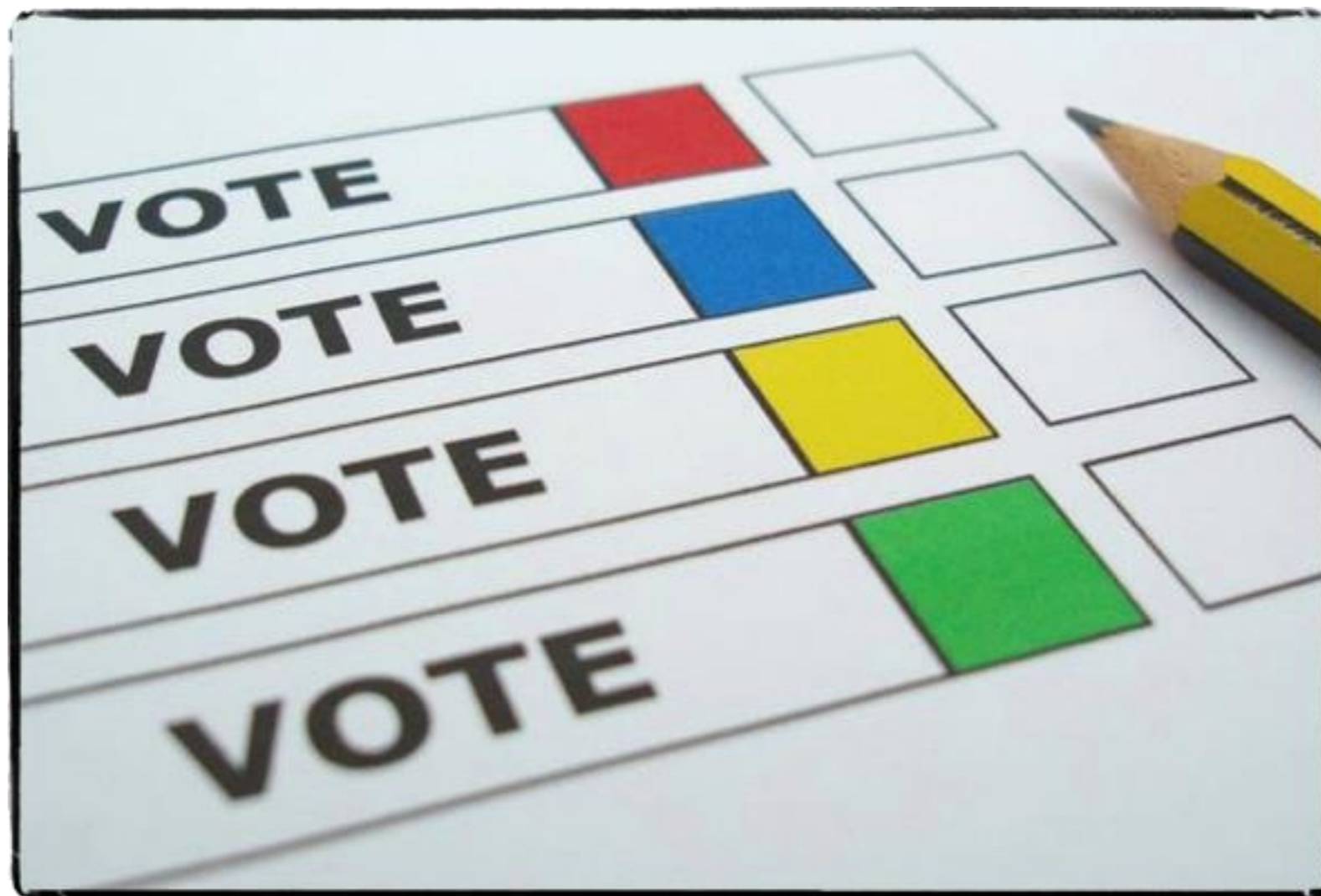
Übungsblätter

- Erscheinen immer zu Beginn der Woche
- Keine Hausaufgaben
- Stattdessen:
Ihr stellt eure Lösung vor
- Musterlösung danach auf der Webseite verfügbar

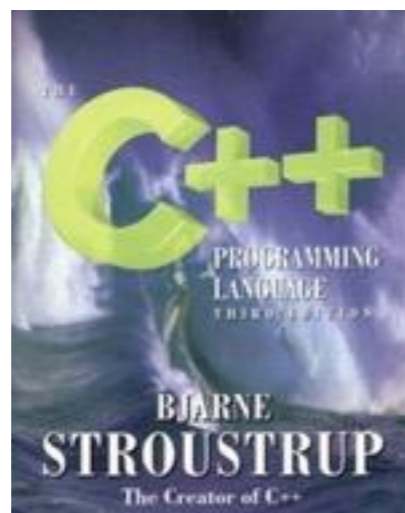


Umfrage

<https://ars.particify.de/participant/room/86026773>



Programmiersprachen ?



C#



Betriebssysteme ?



Datenbanken ?

ORACLE®

IBM

Microsoft®
SQL Server®

SQLite

MySQL®



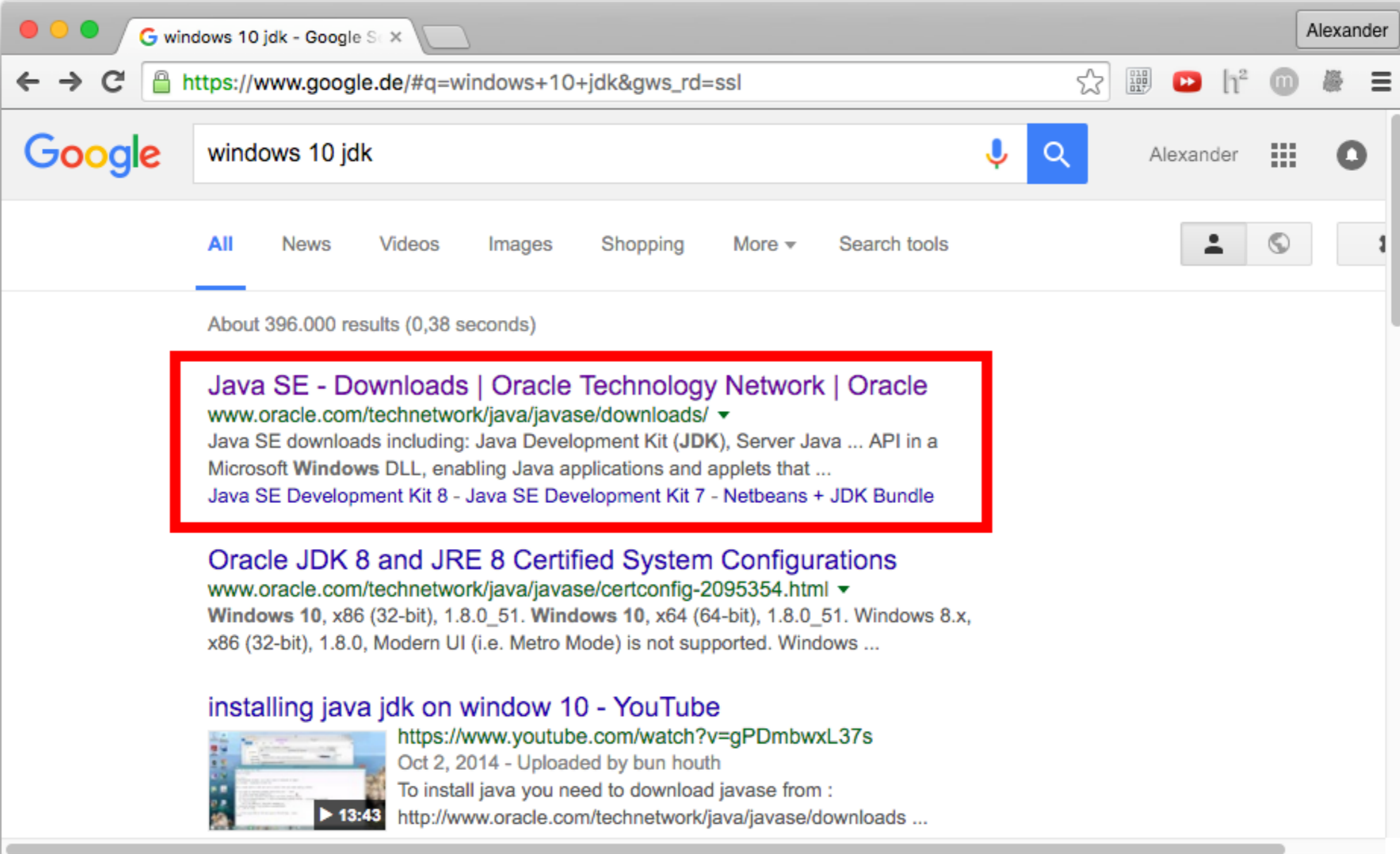
Einführung in



Java Setup

1. Java Development Kit (JDK)

Java Setup (Windows)



A screenshot of a web browser window showing a Google search for "windows 10 jdk". The search results are displayed on the Google search page. The first result is highlighted with a red box and is titled "Java SE - Downloads | Oracle Technology Network | Oracle". The URL is www.oracle.com/technetwork/java/javase/downloads/. The description of the result mentions "Java SE downloads including: Java Development Kit (JDK), Server Java ... API in a Microsoft Windows DLL, enabling Java applications and applets that ..." and lists "Java SE Development Kit 8 - Java SE Development Kit 7 - Netbeans + JDK Bundle". Below this, there are two other search results: "Oracle JDK 8 and JRE 8 Certified System Configurations" and "installing java jdk on window 10 - YouTube".

Windows 10 jdk - Google Search

https://www.google.de/#q=windows+10+jdk&gws_rd=ssl

Google windows 10 jdk

About 396.000 results (0,38 seconds)

Java SE - Downloads | Oracle Technology Network | Oracle
www.oracle.com/technetwork/java/javase/downloads/
Java SE downloads including: Java Development Kit (JDK), Server Java ... API in a Microsoft Windows DLL, enabling Java applications and applets that ...
Java SE Development Kit 8 - Java SE Development Kit 7 - Netbeans + JDK Bundle

Oracle JDK 8 and JRE 8 Certified System Configurations
www.oracle.com/technetwork/java/javase/certconfig-2095354.html
Windows 10, x86 (32-bit), 1.8.0_51. Windows 10, x64 (64-bit), 1.8.0_51. Windows 8.x, x86 (32-bit), 1.8.0, Modern UI (i.e. Metro Mode) is not supported. Windows ...

installing java jdk on window 10 - YouTube
<https://www.youtube.com/watch?v=gPDmbwxL37s>
Oct 2, 2014 - Uploaded by bun houth
To install java you need to download javase from :
<http://www.oracle.com/technetwork/java/javase/downloads> ...

Java Setup (Windows)

The screenshot shows a web browser window displaying the Oracle Java SE Downloads page. The browser's address bar shows the URL `www.oracle.com/technetwork/java/javase/downloads/index.html`. The page features the Oracle logo on the left and a navigation menu with links for Products, Solutions, Downloads, Store, Support, Training, Partners, and About. Below the navigation, a breadcrumb trail reads "Oracle Technology Network > Java > Java SE > Downloads".

The main content area is titled "Java SE Downloads" and includes a "Downloads" tab. Two download options are visible: "Java Platform (JDK) 8u77" and "NetBeans with JDK 8". The "Java Platform (JDK) 8u77" option is highlighted with a red box. Below this, a section titled "Java Platform, Standard Edition" provides information about the "Java SE 8u77" release, stating that it includes important security fixes and that Oracle strongly recommends upgrading all Java SE 8 users to this release. A "Learn more" link is provided.

On the right side of the page, there are two vertical lists of links: "Java SDKs a" and "Java Reso". The "Java SDKs a" list includes links for Java SE, Java EE and Gl, Java ME, Java Card, NetBeans IDE, and Java Mission C. The "Java Reso" list includes links for Java APIs, Technical Article, Demos and Vid, Forums, Java Magazine, and Java.net.

The browser's status bar at the bottom left shows "Resolving host..."

Java Setup (Windows)

The screenshot shows the Oracle Java SE Development Kit 8u77 download page. The browser address bar shows the URL: www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html. The page title is "Java SE Development Kit 8u77".

Below the title, there is a warning: "You must accept the Oracle Binary Code License Agreement for Java SE to download this software." Below this warning, there are two radio buttons: "Accept License Agreement" (which is selected and highlighted with a red box) and "Decline License Agreement".

Below the license agreement, there is a table of download links for various operating systems and architectures. The "Windows x64" row is highlighted with a red box.

Product / File Description	File Size	Download
Linux ARM 32 Soft Float ABI	77.7 MB	jdk-8u77-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Soft Float ABI	74.68 MB	jdk-8u77-linux-arm64-vfp-hflt.tar.gz
Linux x86	154.74 MB	jdk-8u77-linux-i586.rpm
Linux x86	174.92 MB	jdk-8u77-linux-i586.tar.gz
Linux x64	152.76 MB	jdk-8u77-linux-x64.rpm
Linux x64	172.96 MB	jdk-8u77-linux-x64.tar.gz
Mac OS X	227.27 MB	jdk-8u77-macosx-x64.dmg
Solaris SPARC 64-bit (SVR4 package)	139.77 MB	jdk-8u77-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	99.06 MB	jdk-8u77-solaris-sparcv9.tar.gz
Solaris x64 (SVR4 package)	140.01 MB	jdk-8u77-solaris-x64.tar.Z
Solaris x64	96.18 MB	jdk-8u77-solaris-x64.tar.gz
Windows x64	187.31 MB	jdk-8u77-windows-x64.exe

Below the table, there is a section titled "Java SE Development Kit 8u77 Demos and Samples Downloads".

Java Setup

1. Java Development Kit (JDK) 
2. Code schreiben

Hello World ...

```
public class Test {  
    public static void main(String[] args) {  
        System.out.println("hello my world !");  
    }  
}
```

Hello World ...



1. Java Code wird vom java compiler (javac) in Java Byte Code übersetzt.
2. Der Java Byte Code wird dann von der Java Virtual Machine (JVM) ausgeführt.

Java Setup

1. Java Development Kit (JDK) ✓
2. Code schreiben ✓
3. Integrated Development Environment (IDE)

IDE Overview

- IntelliJ IDEA CE
- Eclipse
- Netbeans

IntelliJ IDEA



<https://www.jetbrains.com/idea/>

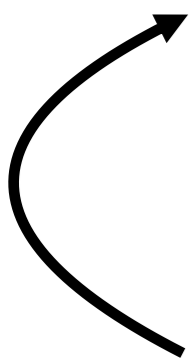
Files & Packages

- Eine Klasse pro File
- Packages entsprechen der Ordner Struktur

```
package source;  
  
public class Blub {  
  
    public static void main(String[] args) {  
        System.out.println("hello my world !");  
    }  
}
```

Java Setup

1. Java Development Kit (JDK) ✓
2. Code schreiben ✓
3. IntelliJ IDEA installieren ✓
4. Code schreiben
5. Debuggen
6. Goto 4



Ein paar Links

- Google (google.com) !!!!!
- IDE: IntelliJ IDEA:
<https://www.jetbrains.com/idea/>
- Online IDE:
http://www.tutorialspoint.com/compile_java_online.php
- Zusätzliche Übungsaufgaben:
<https://www.hackerrank.com/>
- Java Reference:
<https://docs.oracle.com/javase/8/docs/api/overview-summary.html>

Java Objekte



Klassen & Objekte

- Eine Klasse ... zB: Punkt
 - ... beschreibt einen Daten-Typen.
 - ... ist sowas wie ein 'struct' in C.
- Ein Objekt ... zB: (1;3)
 - ... ist eine Ausprägung eines Daten-Typen.
 - ... ist sowas wie eine Instanz von einer 'struct' in C.

Klassen & Objekte

- Objekt Attribute/Methoden gehören zu einem Objekt.

```
public class Point {  
    float x; // Objekt Attribut  
    float y; // Objekt Attribut  
    float length() { /* .. */ } // Objekt Methode  
}
```

Objekt Methoden

- Nachgebaut in C

```
struct Point {  
    float x;  
    float y;  
};  
float pointGetLength(Point* this) { /* .. */ }
```

- Java

```
public class Point {  
    float x;  
    float y;  
    float length() { /* .. */ }  
}
```


Copy-by-reference vs -by-value

- C: By-value

```
// The pointer itself by value  
Point* a = malloc(sizeof(Point));  
Point* b = a;
```

```
// By value  
Point a;  
Point b = a;
```

- Java: Objects by-reference, primitive Typen by-value

```
// By reference  
Point a = new Point();  
Point b = a;
```

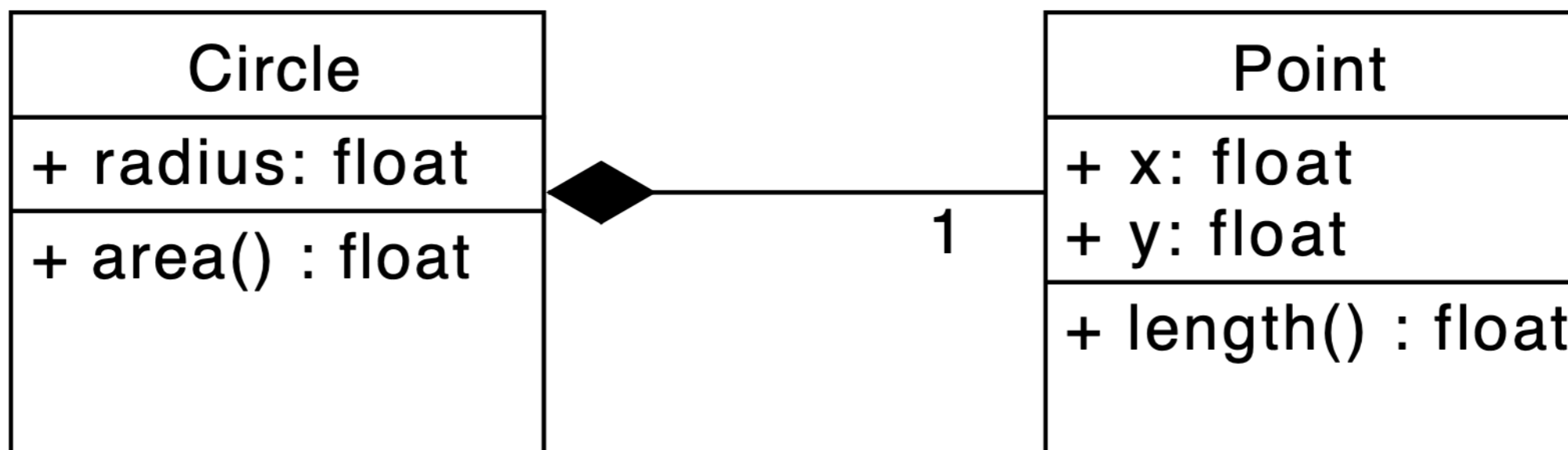
```
// By value  
int a = 3;  
int b = a;
```

Modellierungsbeispiel



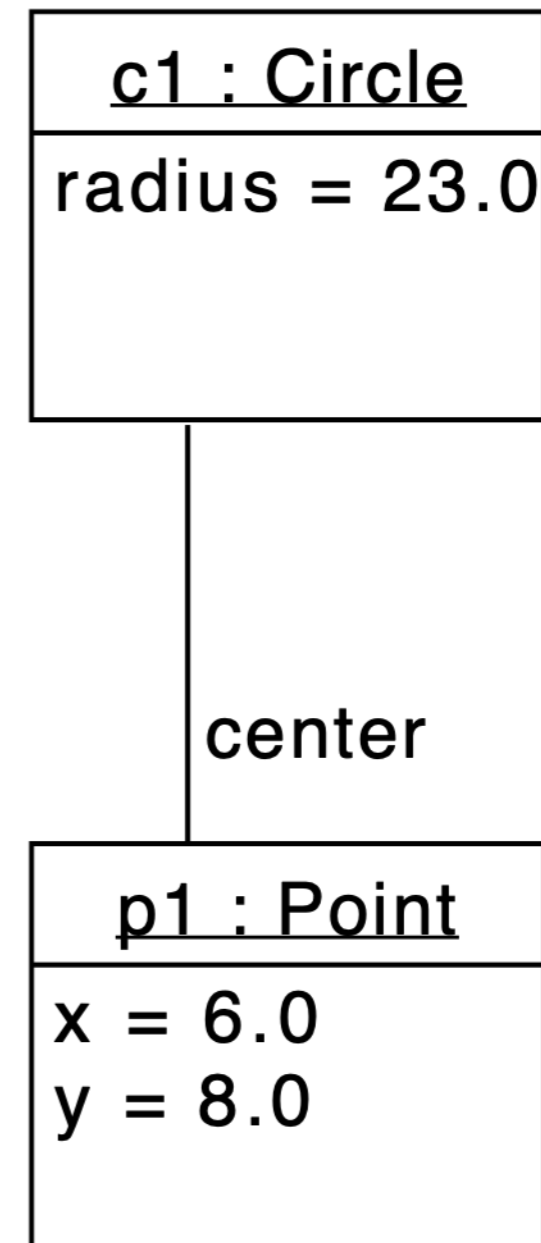
Klassendiagramm

- Zeigt die Struktur des modellierten Systems
- Beschreibt Klassen mit Attributen und Operationen
- Zeigt Beziehungen zwischen Klassen



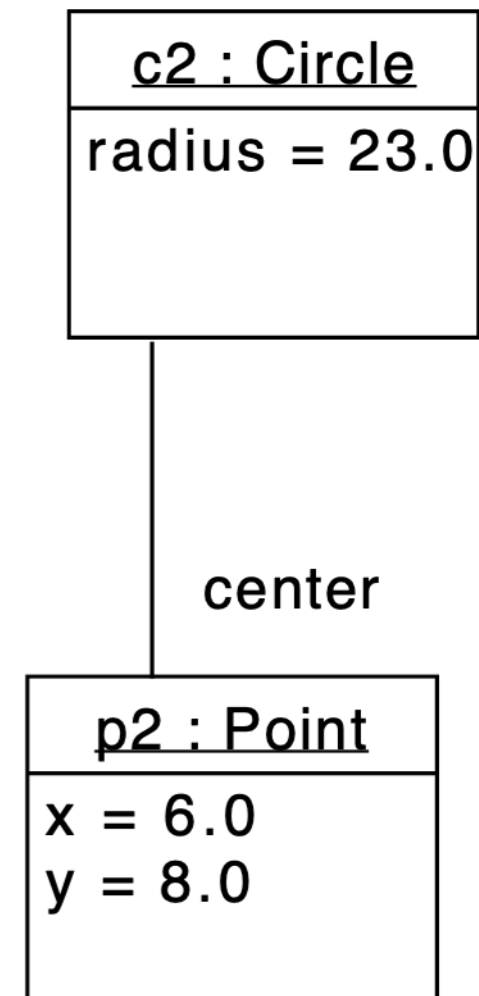
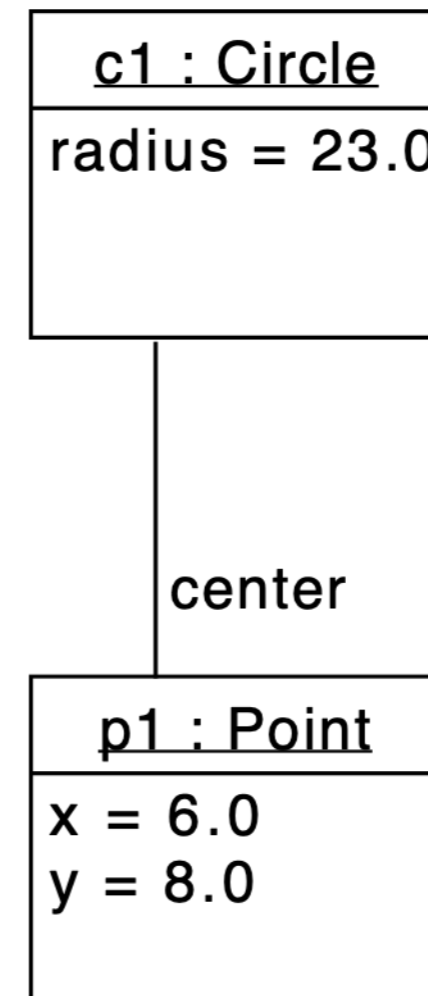
Objektdiagramm

- Zeigt das modellierte System zu einem Zeitpunkt
- Enthält Instanzen von Klassen und Assoziationen



Objektdiagramm

- Zeigt das modellierte System zu einem Zeitpunkt
- Enthält Instanzen von Klassen und Assoziationen

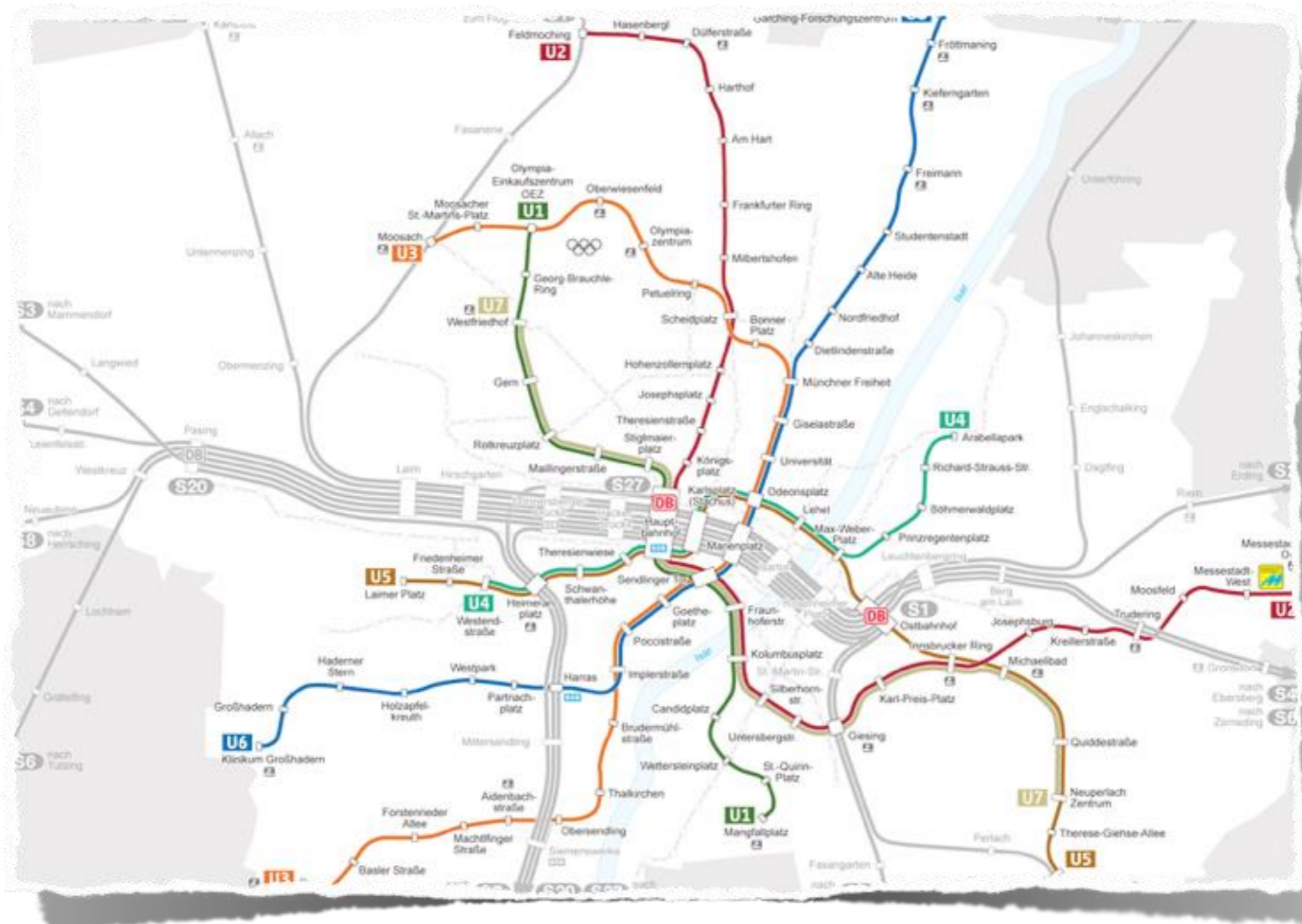


Übungsblatt 1

- Verfügbar auf der Webseite
- Benötigt Java Compiler und Laufzeitumgebung



Aufgabe 1



Aufgabe 2

