

Einführung in die Informatik 2 für Ingenieure

Zentralübung 1

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Agenda

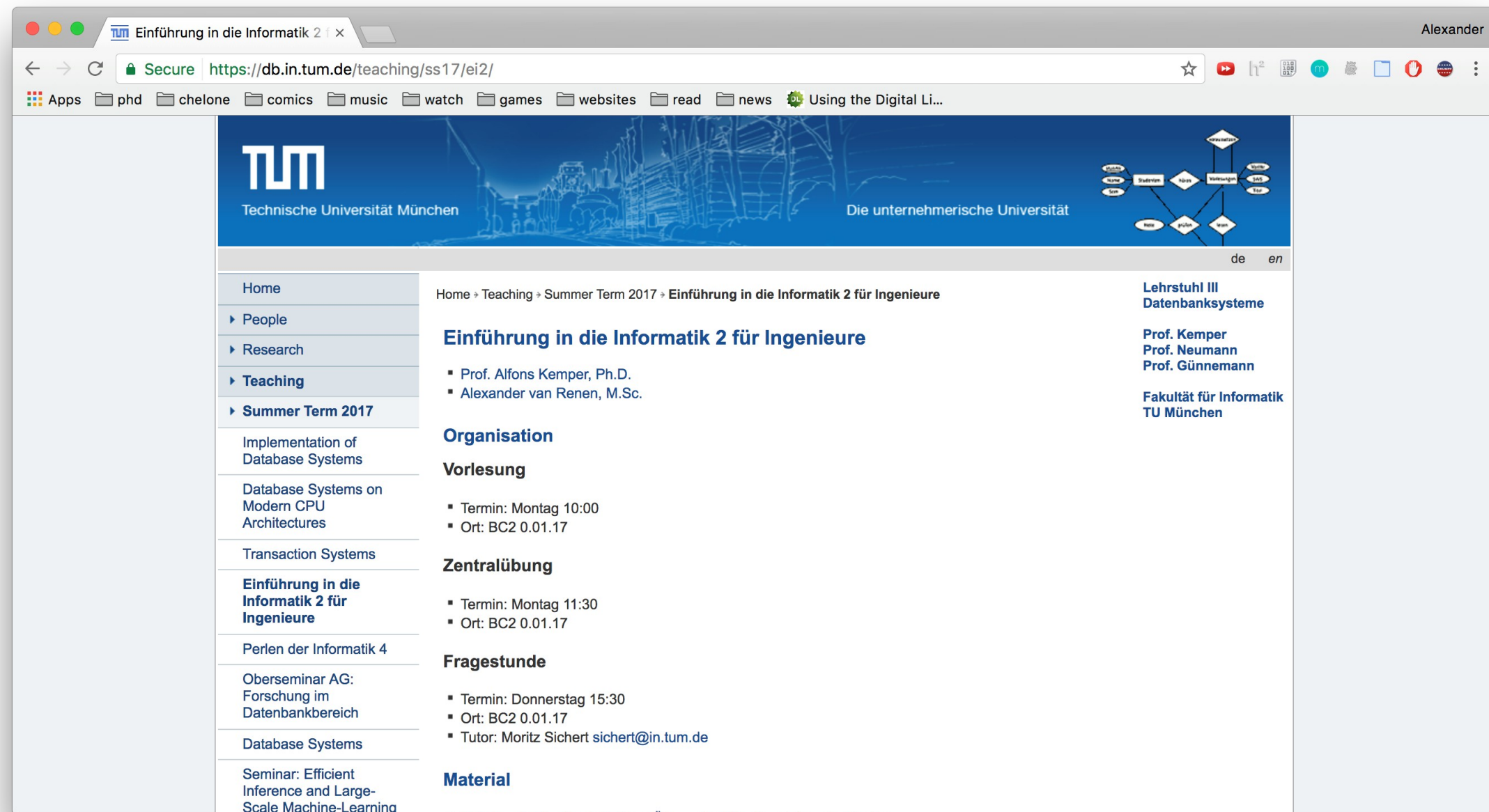
1. Organisation
2. Umfrage
3. Java
4. UML
5. Übungsblatt 1

Organisation

Termine

- **Vorlesung** (Prof. Alfons Kemper)
 - Dienstag 16:00 - 17:30
- **Zentralübung** (Simon Ellmann, Florian Drescher)
 - Dienstag 17:30 - 18:30
- **Fragestunde** (Sebastian Reichbauer)
 - Donnerstag 17:15 - 18:15

Website



<http://db.in.tum.de/teaching/ss25/ei2/>

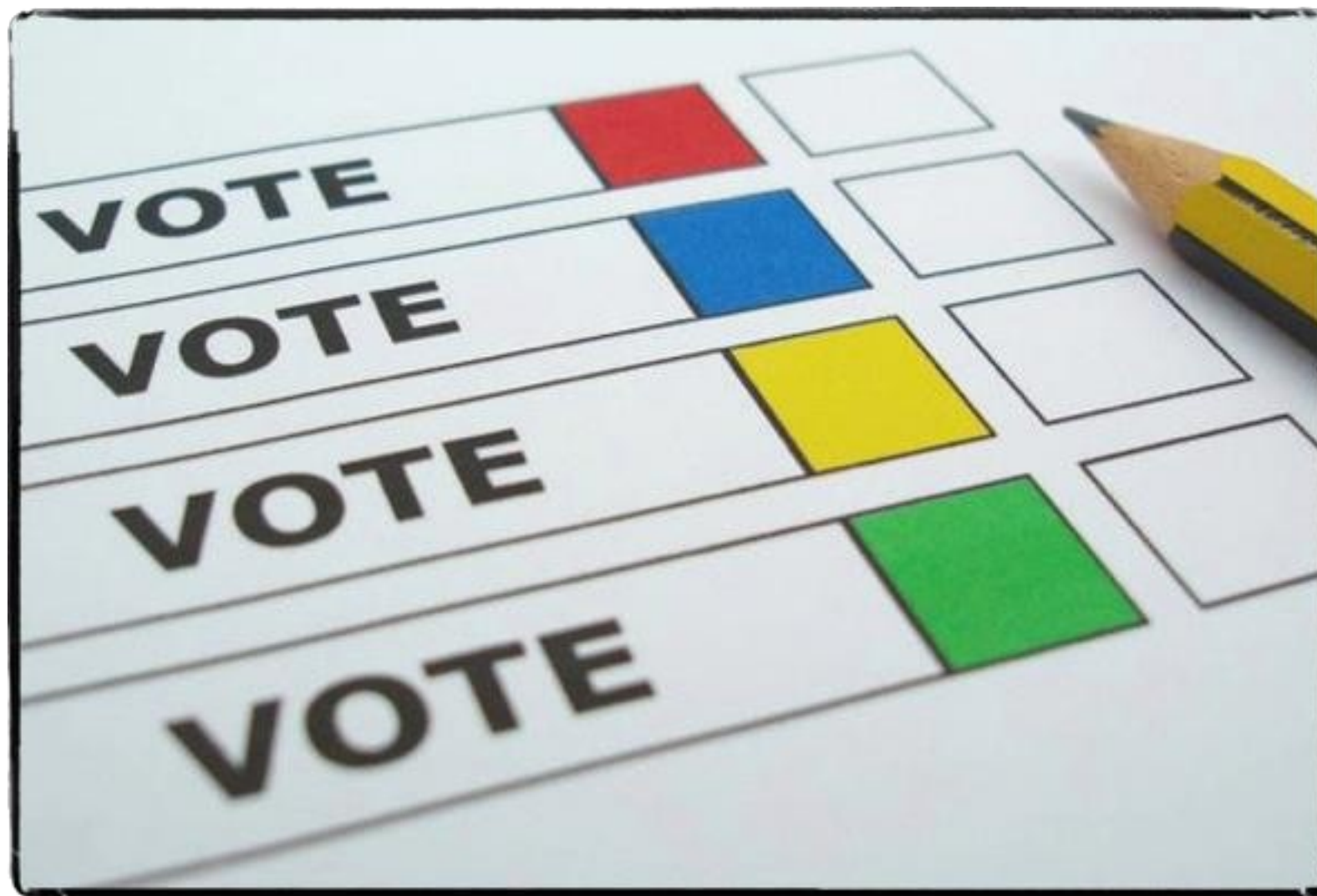
Übungsblätter

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

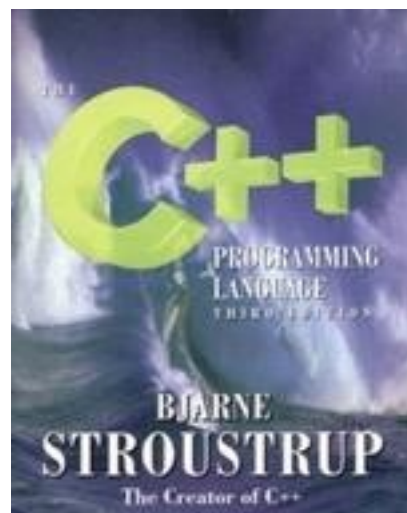


Umfrage

<https://ars.particify.de/p/45066597>



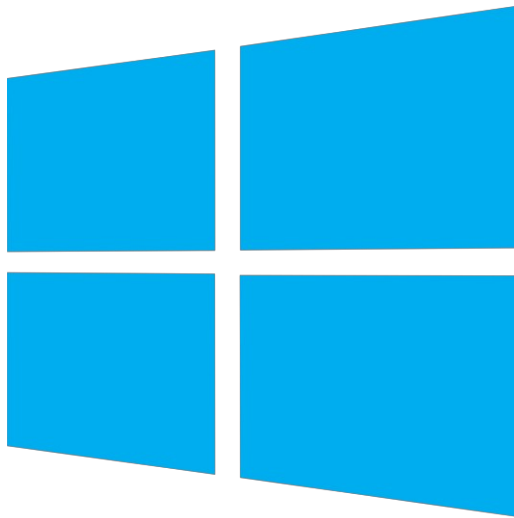
Programmiersprachen?



C#



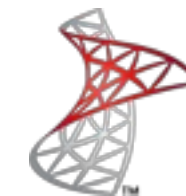
Betriebssysteme?



Datenbanken?

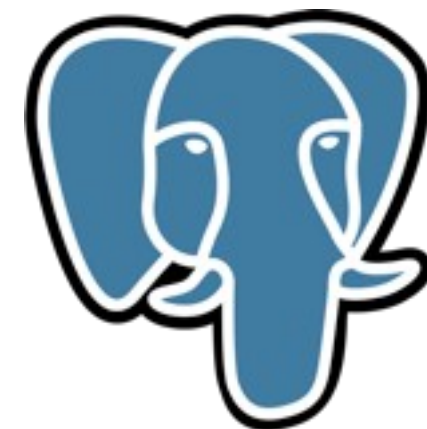
ORACLE®

IBM

 Microsoft®
SQL Server®

 SQLite

 MySQL®



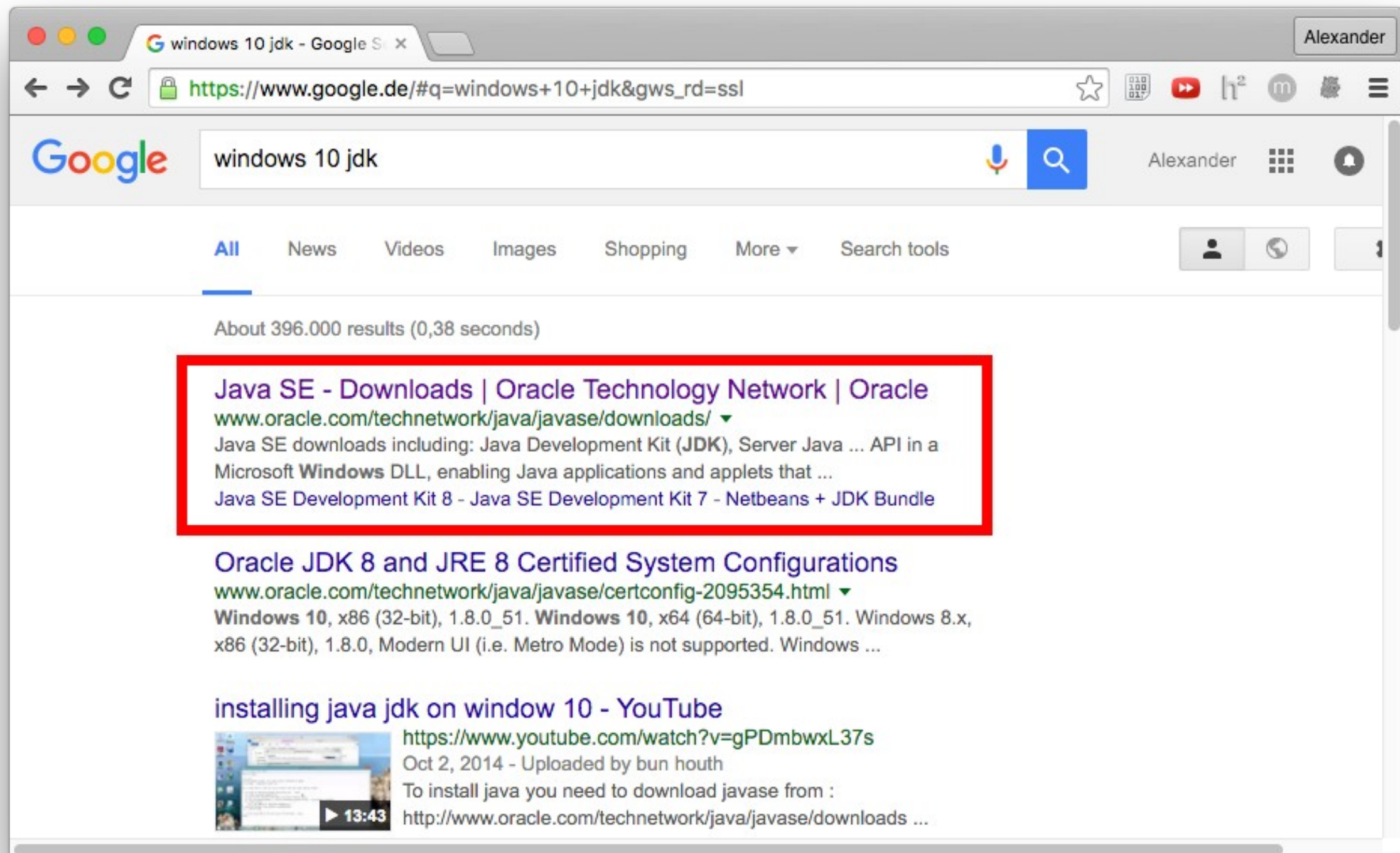
Einführung in



Java Setup

1. Java Development Kit (JDK)

Java Setup (Windows)



Java Setup (Windows)

The screenshot shows a web browser window with the URL `www.oracle.com/technetwork/java/javase/downloads/index.html`. The page features the Oracle logo and a navigation menu with links like Products, Solutions, Downloads, Store, Support, Training, Partners, and About. A breadcrumb trail indicates the current location: Oracle Technology Network > Java > Java SE > Downloads. On the left, a sidebar lists various Java products. The main content area, titled 'Java SE Downloads', contains two download cards: 'Java Platform (JDK) 8u77' and 'NetBeans with JDK 8'. The 'Java Platform (JDK) 8u77' card is highlighted with a red rectangle. Below this card, a section titled 'Java Platform, Standard Edition' provides information about the 'Java SE 8u77' release, noting that it includes important security fixes and is recommended for all Java SE 8 users to upgrade to. A 'Learn more' link is provided. On the right, there are additional links for 'Java SDKs' and 'Java Resources'.

Java SE - Downloads | Oracle

www.oracle.com/technetwork/java/javase/downloads/index.html

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Oracle Technology Network > Java > Java SE > Downloads

Java SE
Java EE
Java ME
Java SE Support
Java SE Advanced & Suite
Java Embedded
Java DB
Web Tier
Java Card
Java TV
New to Java
Community
Java Magazine

Overview Downloads Documentation Community Technologies Training

Java SE Downloads

 **DOWNLOAD**

Java Platform (JDK) 8u77

 **NetBeans** **DOWNLOAD**

NetBeans with JDK 8

Java Platform, Standard Edition

Java SE 8u77
Java SE 8u77 includes important security fixes. Oracle strongly recommends that all Java SE 8 users upgrade to this release.
[Learn more](#)

Java SDKs and Tools
[Java SE](#)
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[NetBeans IDE](#)
[Java Mission Critical Edition](#)

Java Resources
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[Technical Articles](#)
[Demos and Videos](#)
[Forums](#)
[Java Magazine](#)
[Java.net](#)

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".

On the left, there is a sidebar with links: Java Card, Java TV, New to Java, Community, and Java Magazine.

On the right, there is a sidebar titled "Java Resources" with links: Java APIs, Technical Articles, Demos and Videos, Forums, Java Magazine, Java.net, Developer Training, Tutorials, and Java.com.

The main content area has a section titled "See also:" with links to the Java Developer Newsletter, Java Developer Day workshops, and Java Magazine.

Below this is a section titled "JDK 8u77 Checksum".

The main content area features a large section titled "Java SE Development Kit 8u77" with a warning: "You must accept the Oracle Binary Code License Agreement for Java SE to download this software." Below this warning are two radio buttons: "Accept License Agreement" (which is selected and highlighted with a red box) and "Decline License Agreement".

Below the license agreement section is a table with three columns: "Product / File Description", "File Size", and "Download". The table lists 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 is a section titled "Java SE Development Kit 8u77 Demos and Samples Downloads".

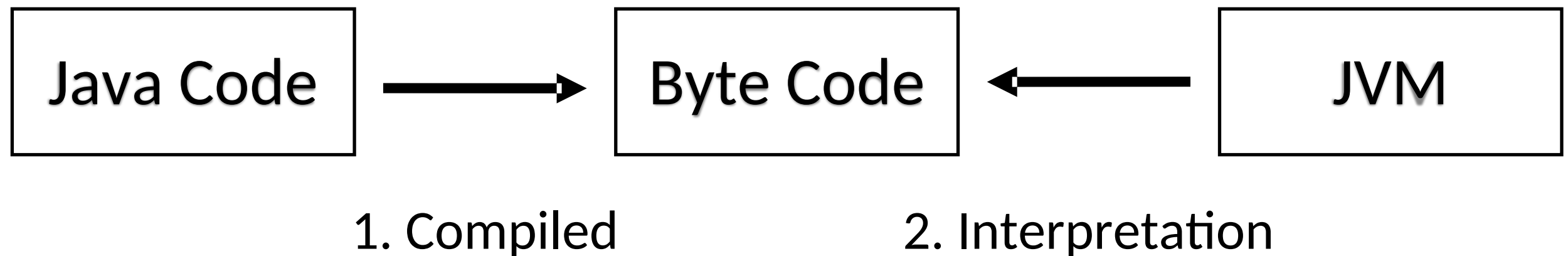
Java Setup

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

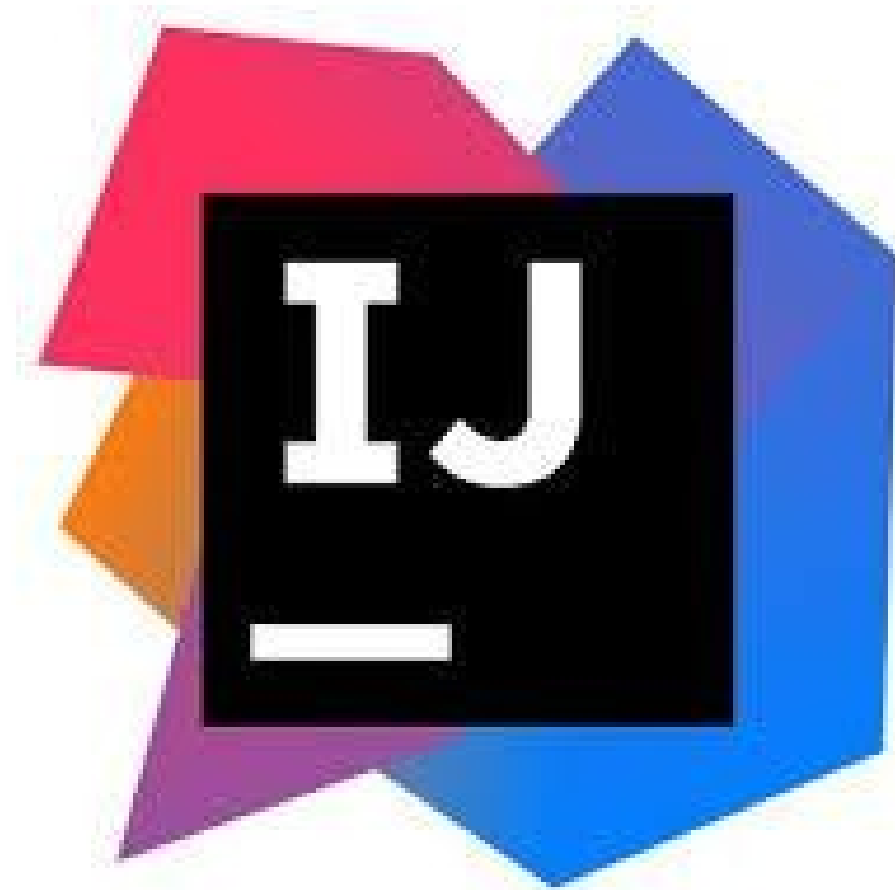
Java Setup

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

IDE Overview

- IntelliJ IDEA CE
- Eclipse
- Netbeans
- Visual Studio Code

IntelliJ IDEA



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

Files & Packages

- Eine Klasse pro File
- Packages entsprechen der Ordner-Struktur

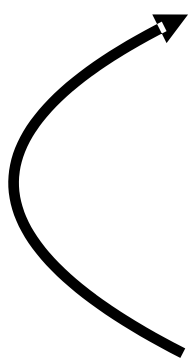
```
package source;
```

```
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

- 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 ... z. B.: 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;
```

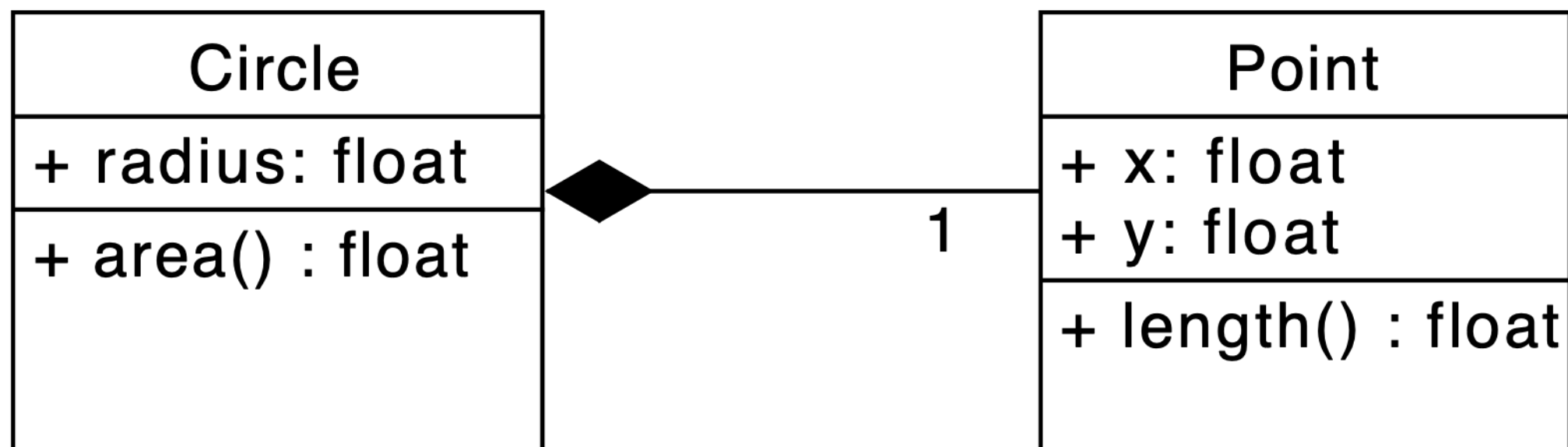
```
// By value  
int a = 3;  
int b = a;
```

Modellierungsbeispiel



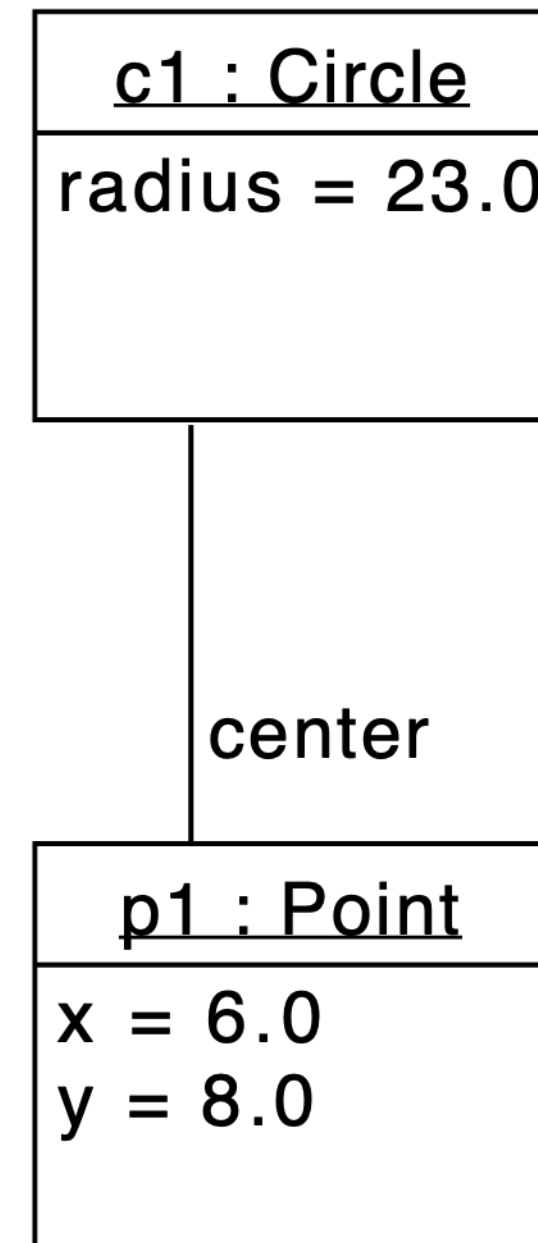
Klassendiagramm

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



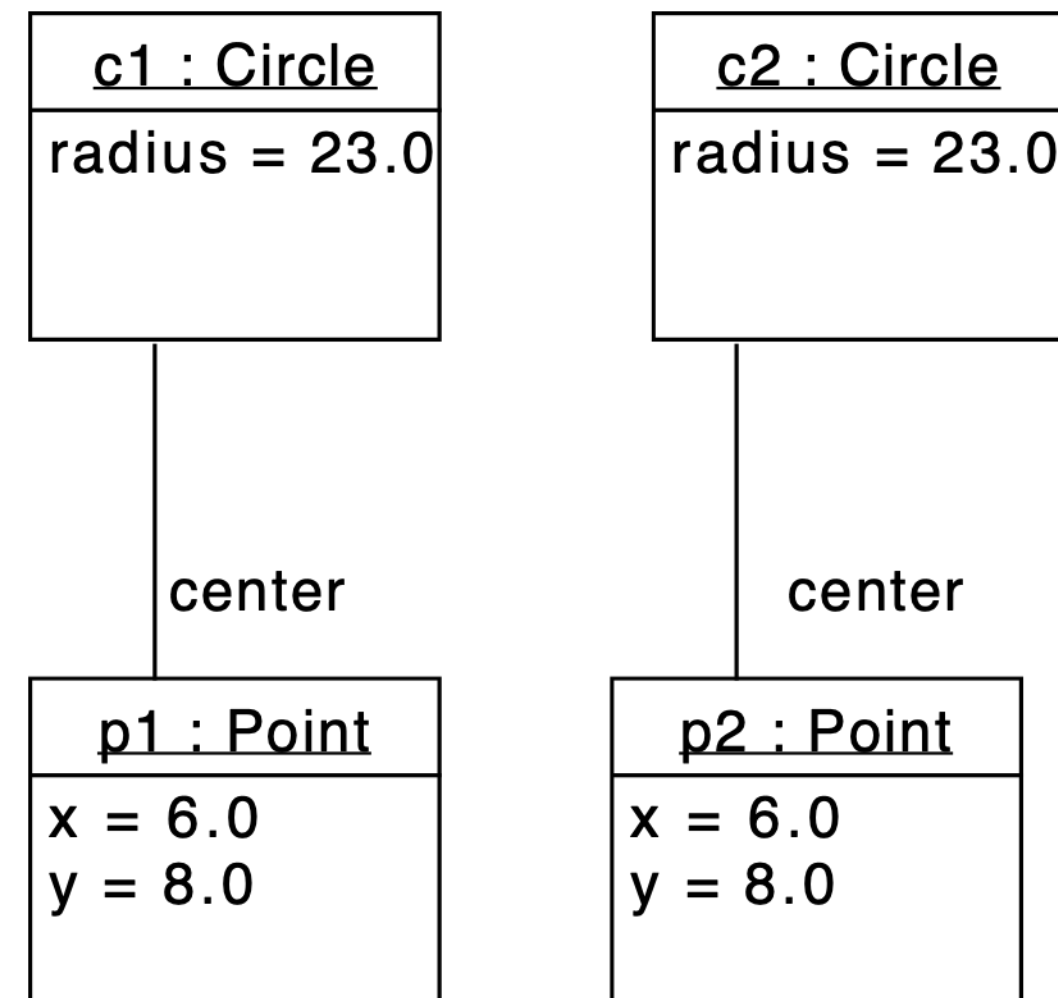
Objektdiagramm

- 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

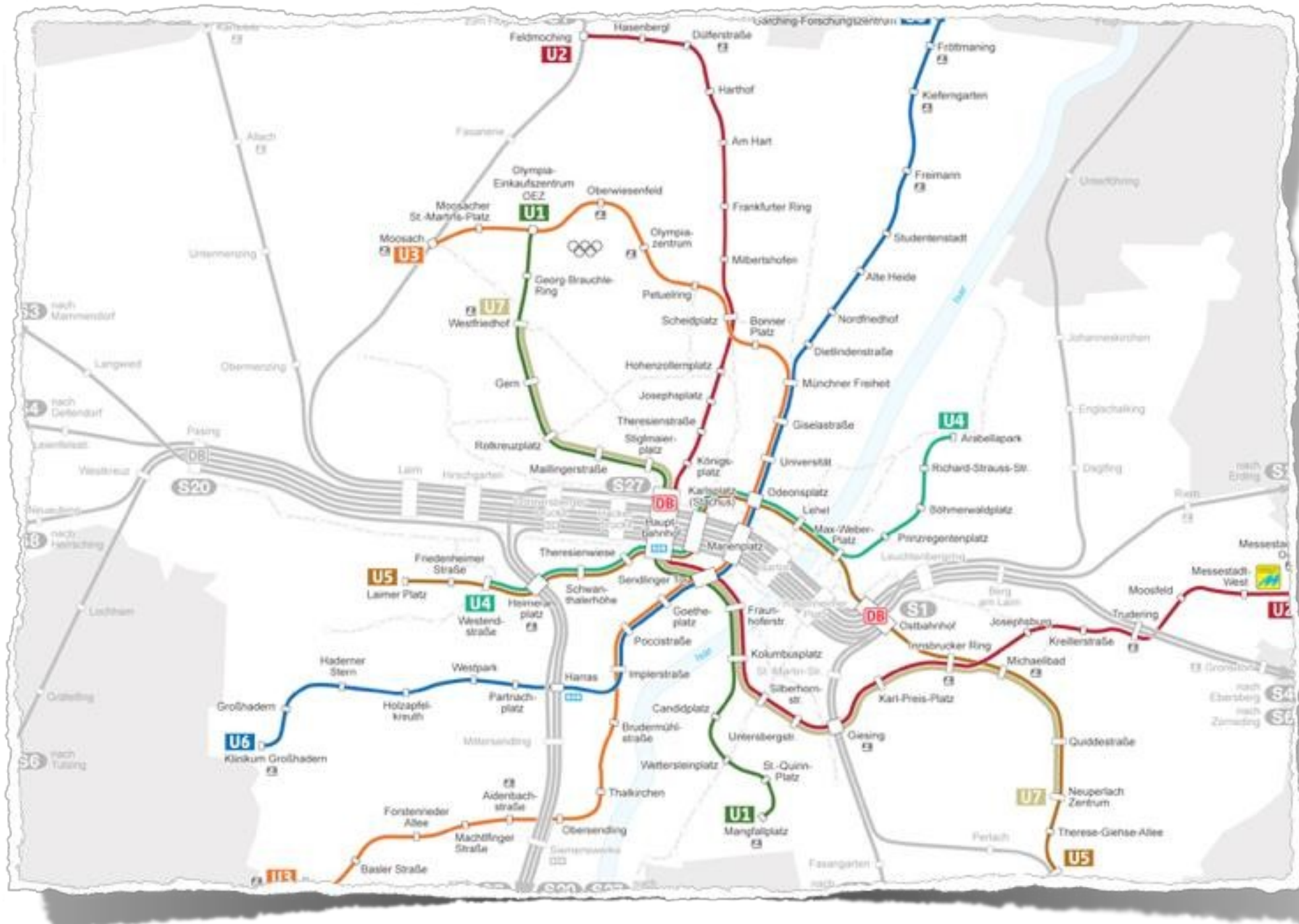


Übungsblatt 1

- Verfügbar auf der Webseite
- Benötigt Java Compiler und Laufzeitumgebung



Aufgabe 1



Aufgabe 2

