

Einführung in die Informatik 2 für Ingenieure (MSE)

Übung I

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(renen@in.tum.de)

Agenda

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

Organisation

Termine

- **Vorlesung** (Prof. Alfons Kemper)
 - Montag 10:00 - 11:30
- **Zentralübung** (Alexander van Renen)
 - Montag 11:30 - 12:30
- **Fragestunde** (Aaron Tacke und Florian Gebauer)
 - Donnerstag 15:30 - 16:30

Website

The screenshot shows a web browser window with the URL <https://db.in.tum.de/teaching/ss17/ei2/>. The page is for the course 'Einführung in die Informatik 2 für Ingenieure' (Introduction to Computer Science 2 for Engineers) in the Summer Term 2017. The page layout includes a navigation menu on the left, a main content area with course details, and a right sidebar with faculty information.

Navigation Menu:

- Home
- People
- Research
- Teaching
- Summer Term 2017
- Implementation of Database Systems
- Database Systems on Modern CPU Architectures
- Transaction Systems
- Einführung in die Informatik 2 für Ingenieure
- Perlen der Informatik 4
- Oberseminar AG: Forschung im Datenbankbereich
- Database Systems
- Seminar: Efficient Inference and Large-Scale Machine-Learning

Course Details:

Home » Teaching » Summer Term 2017 » Einführung in die Informatik 2 für Ingenieure

Einführung in die Informatik 2 für Ingenieure

- Prof. Alfons Kemper, Ph.D.
- Alexander van Renen, M.Sc.

Organisation

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

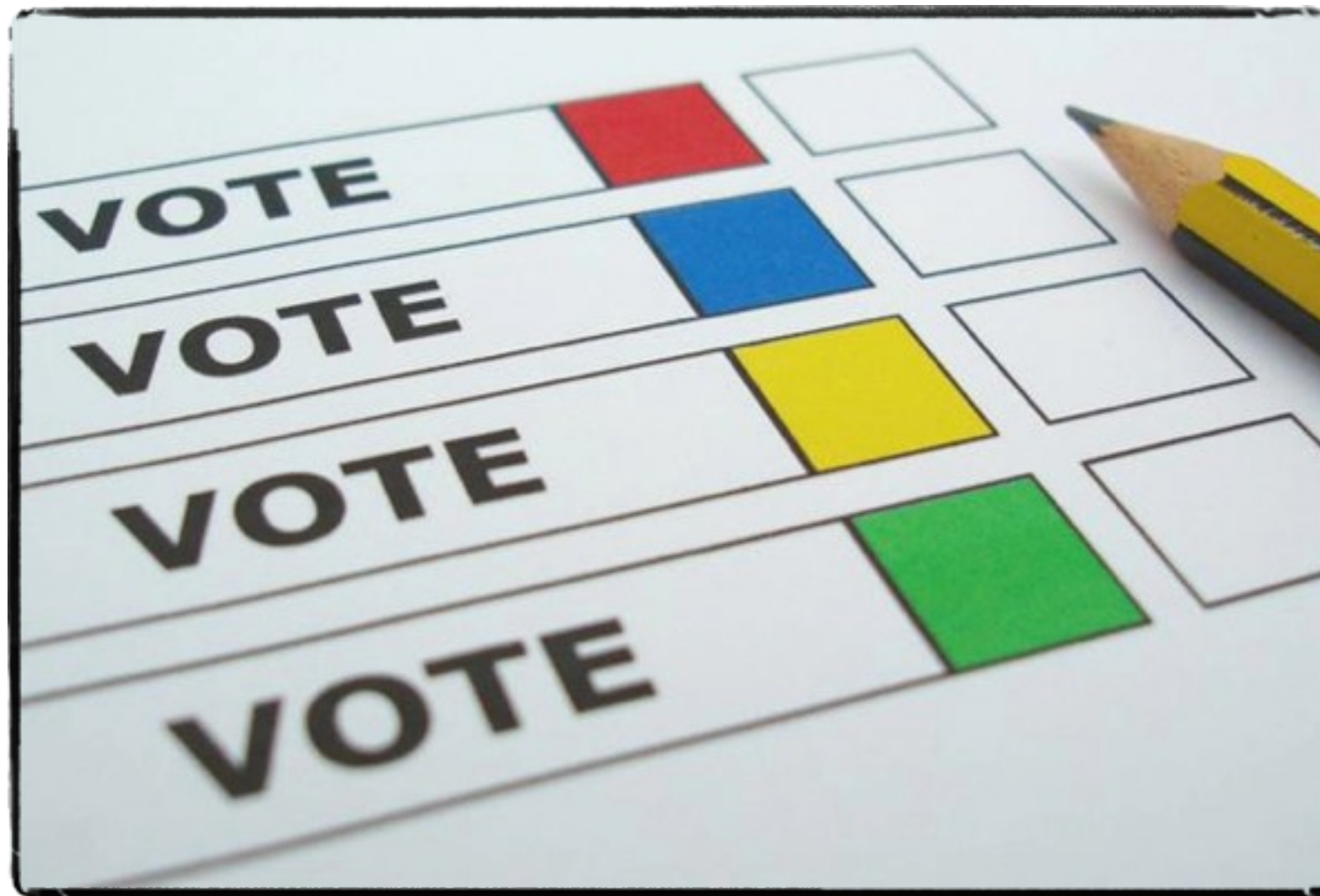
<http://db.in.tum.de/teaching/ss20/ei2/>

Übungsblätter

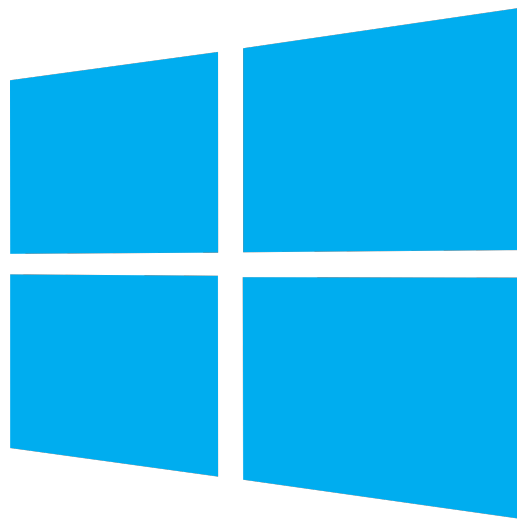
- Erscheinen immer zu Beginn der Woche
- Keine Hausaufgaben
- Stattdessen:
Ihr stellt eure Lösung vor
- Musterlösung danach auf der Webseite verfügbar



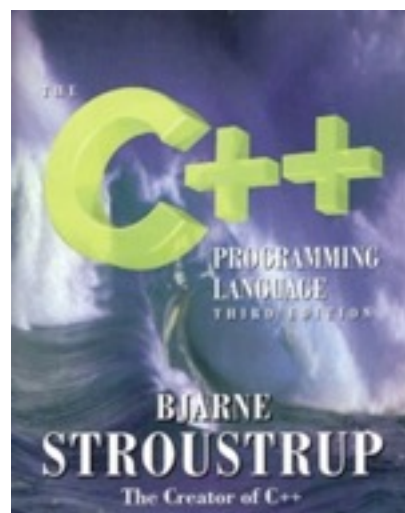
Umfrage



Betriebssysteme ?



Programmiersprachen ?



C#



Datenbanken ?

ORACLE®

IBM

 Microsoft®
SQL Server®

 SQLite


MySQL®



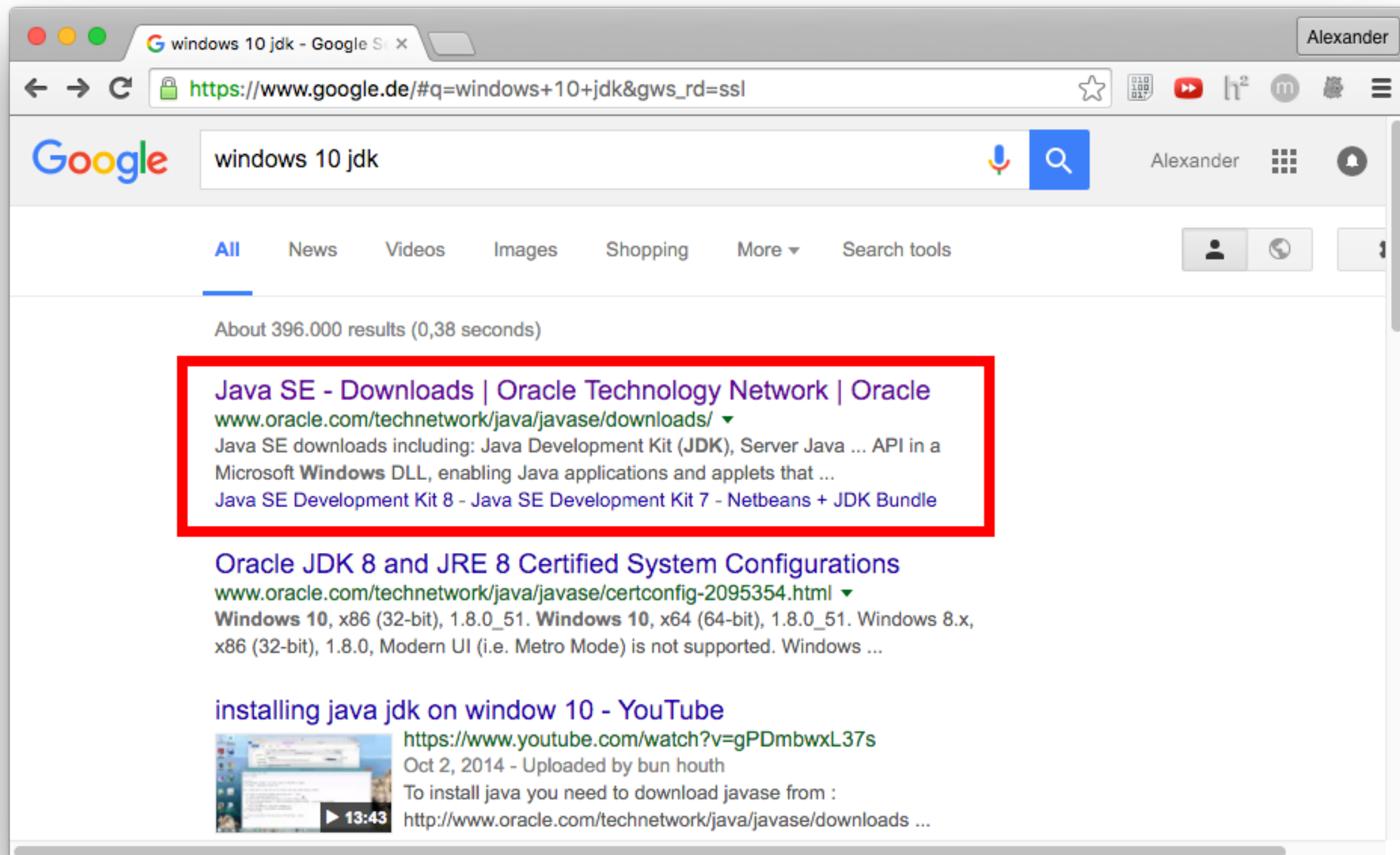
Einführung in



Java Setup

I. 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 page displays several results, with the top one highlighted by a red box. The browser's address bar shows the URL "https://www.google.de/#q=windows+10+jdk&gws_rd=ssl". The search bar contains the text "windows 10 jdk". The search results include:

- 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, there is a breadcrumb trail: Oracle Technology Network > Java > Java SE > Downloads. The main content area is titled "Java SE Downloads" and includes tabs for Overview, Downloads, Documentation, Community, Technologies, and Training. The "Downloads" tab is active, showing two download options: "Java Platform (JDK) 8u77" and "NetBeans with JDK 8". The "Java Platform (JDK) 8u77" option is highlighted with a red box. Below this, there is a section for "Java Platform, Standard Edition" with a sub-section for "Java SE 8u77" that includes a brief description and a "Learn more" link. On the right side, there are two vertical lists of links: "Java SDKs a" and "Java Reso". The browser's status bar at the bottom left shows "Resolving host...".

Java SE - Downloads | Oracle

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

ORACLE


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Products Solutions Downloads Store Support Training Partners About


Oracle Technology Network > Java > Java SE > Downloads

Overview Downloads Documentation Community Technologies Training

Java SE Downloads

 **DOWNLOAD** ▾

Java Platform (JDK) 8u77

 **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 a

- Java SE
- Java EE and GL
- Java ME
- Java Card
- NetBeans IDE
- Java Mission C

Java Reso

- Java APIs
- Technical Article
- Demos and Vid
- 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".

Under the heading "See also:", there are links to the Java Developer Newsletter, Java Developer Day workshops, and Java Magazine.

The "JDK 8u77 Checksum" section is visible.

The main content area features a 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, there are two radio buttons: "Accept License Agreement" (which is selected and highlighted with a red box) and "Decline License Agreement".

A table lists various download options for different operating systems and architectures. The "Windows x64" row is highlighted with a red box, showing a file size of 187.31 MB and a download link of [jdk-8u77-windows-x64.exe](#).

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

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

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.

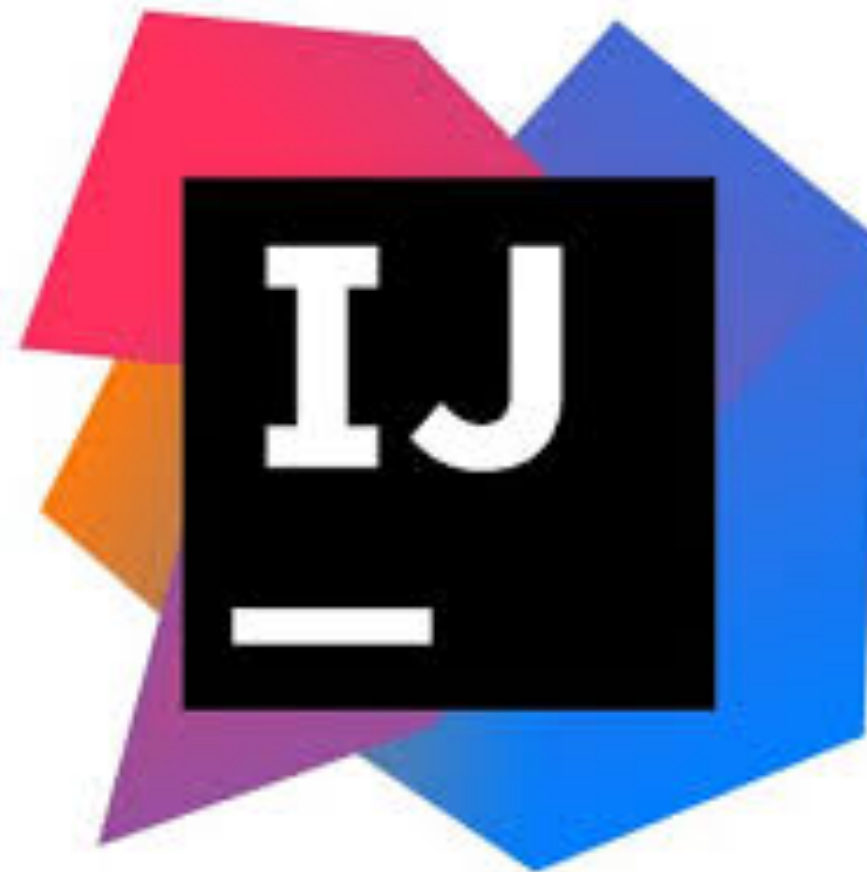
Java Setup

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

IDE Overview

- IntelliJ IDEA CE
- Eclipse
- Netbeans
- ~~(Notepad-style)~~

Intelij IDEA



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

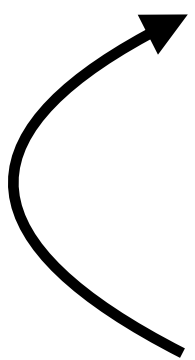
Files & Packages

- 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;
```

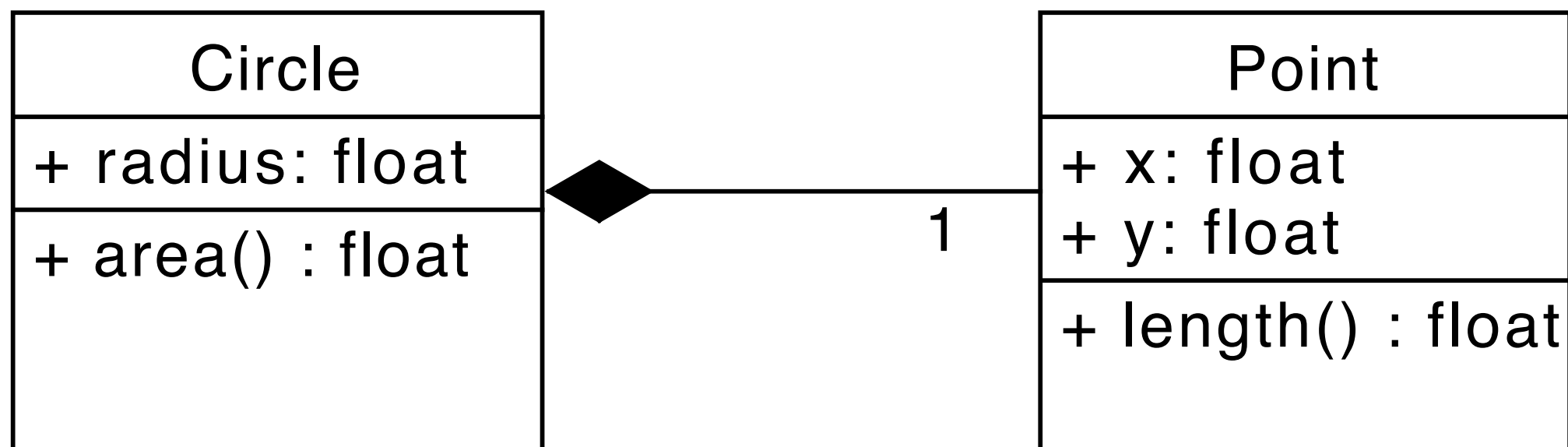
```
// By value
int a = 3;
int b = a;
```

Modellierungsbeispiel



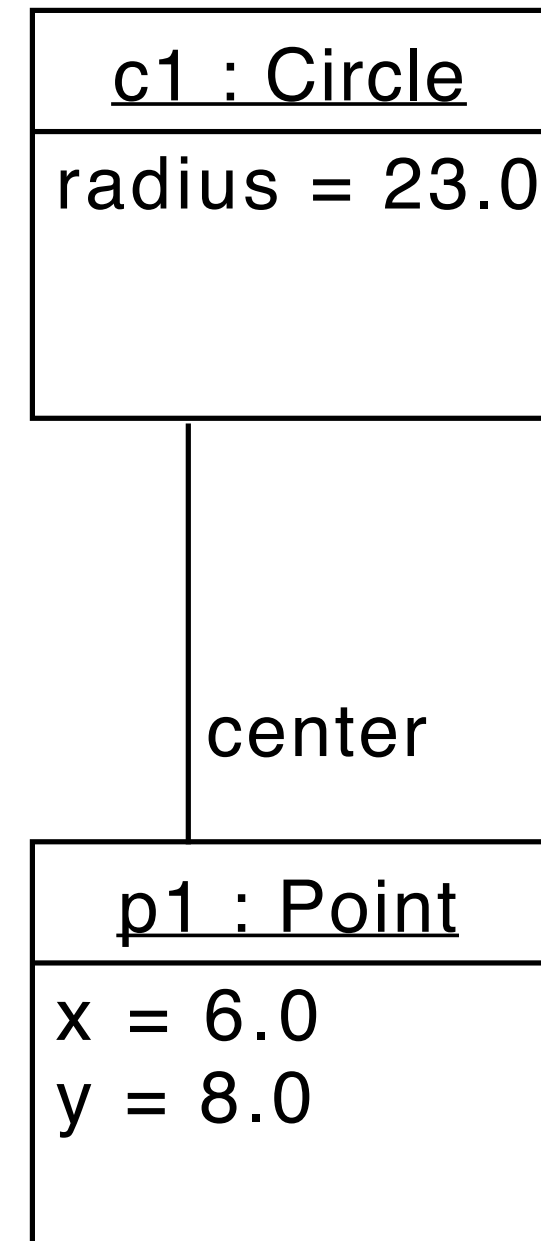
Klassendiagramm

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



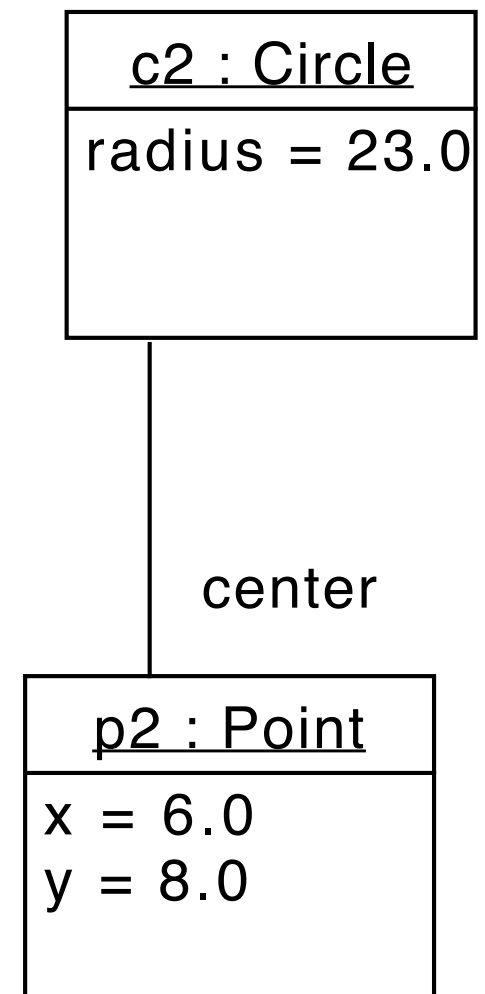
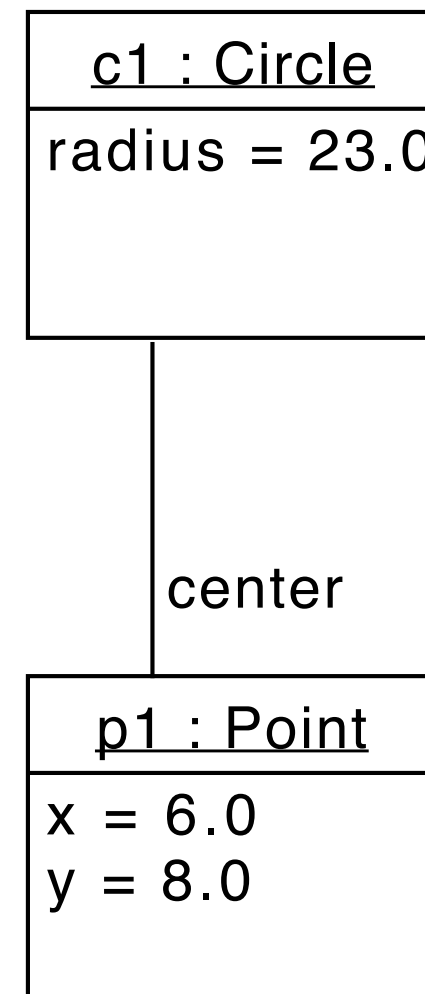
Objektdiagramm

- 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

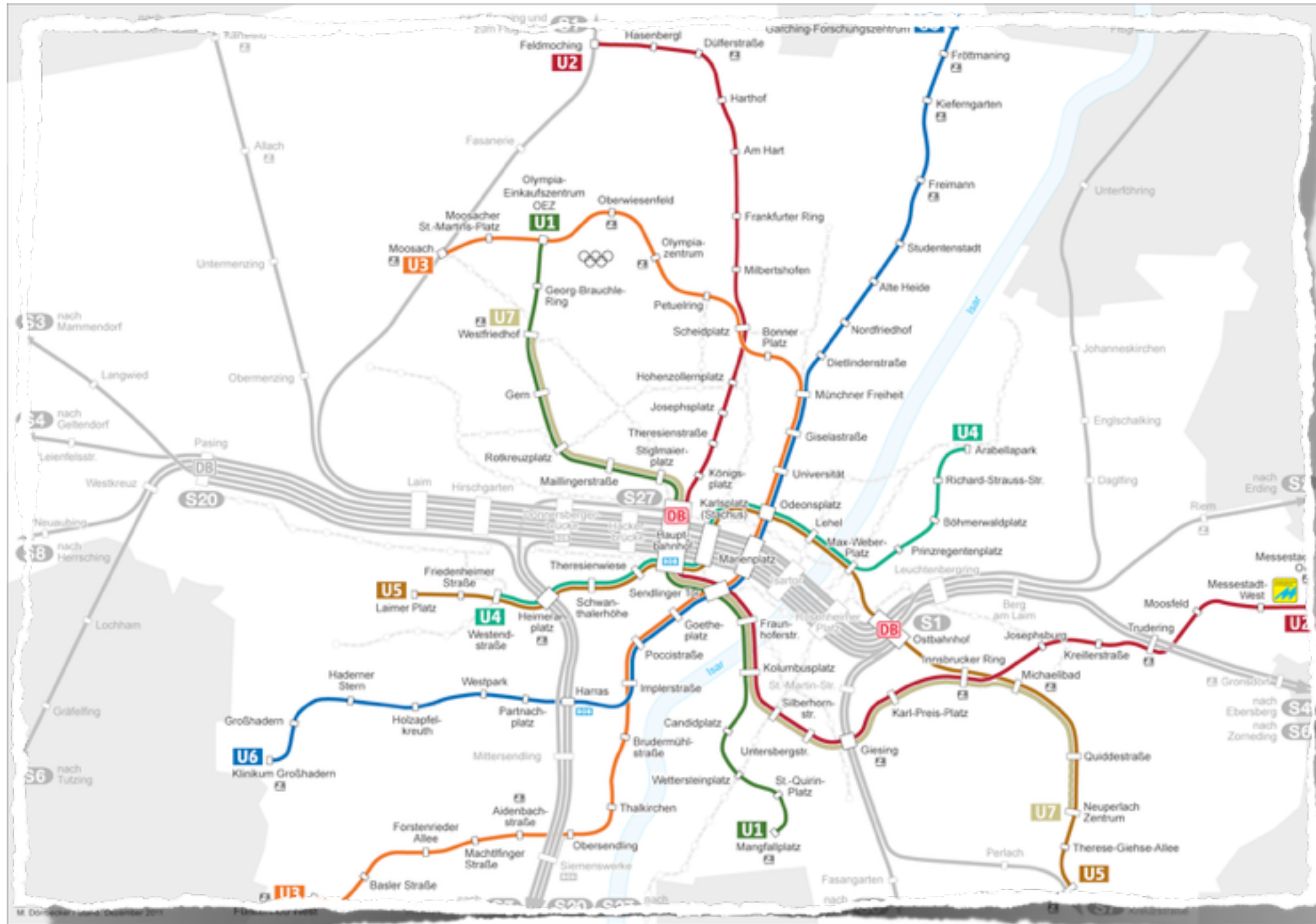


Übungsblatt I

- Verfügbar auf der Webseite
- Benötigt Java Compiler und Laufzeitumgebung



Aufgabe I



Aufgabe 2

