

*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)
  - Montag 10:00 - 11:30
- **Zentralübung** (Simon Ellmann, Christoph Anneser)
  - Montag 11:30 - 12:30
- **Fragestunde** (Sebastian Reichbauer)
  - 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](mailto:sichert@in.tum.de)

#### Material

<http://db.in.tum.de/teaching/ss24/ei2/>

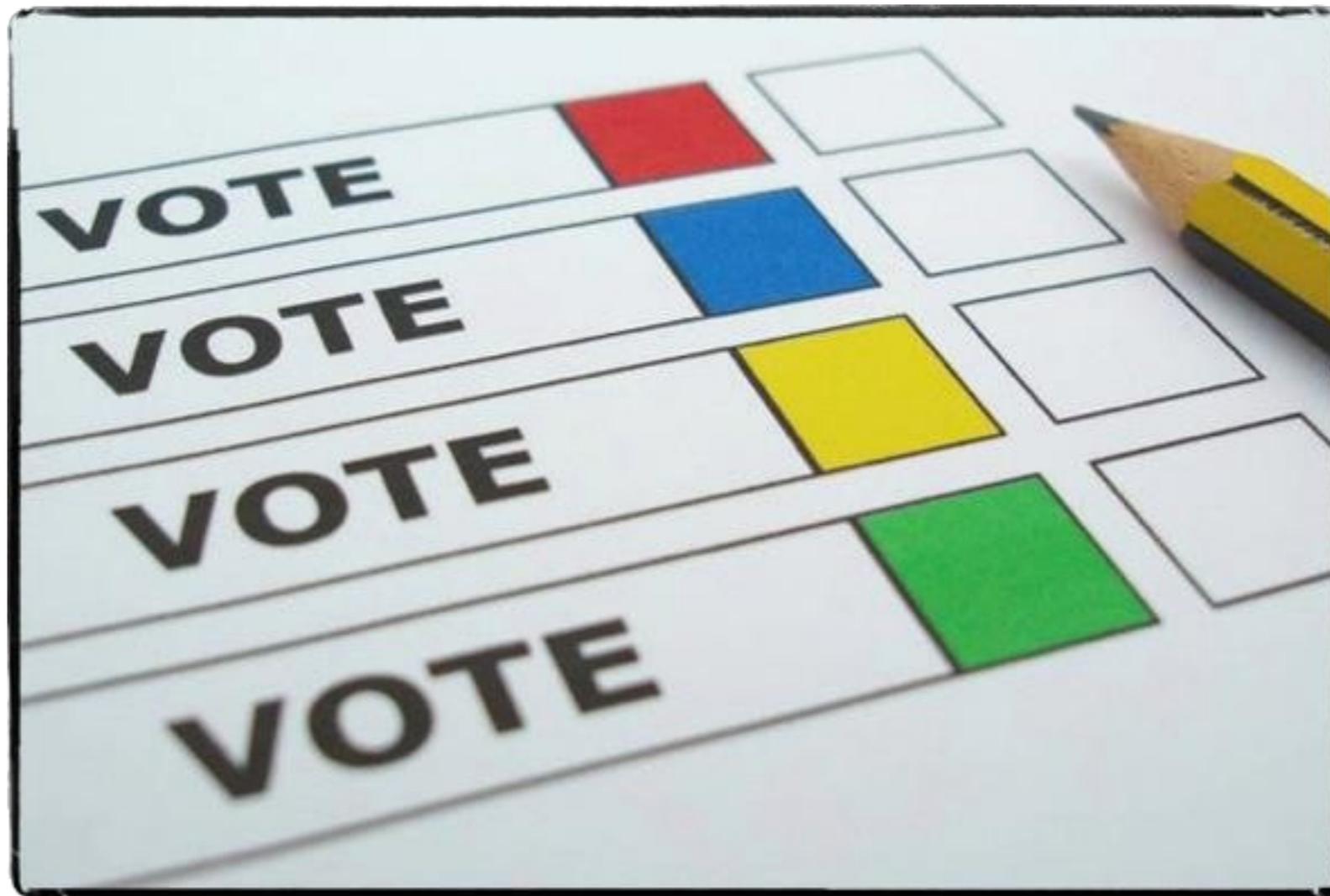
# Übungsblätter

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

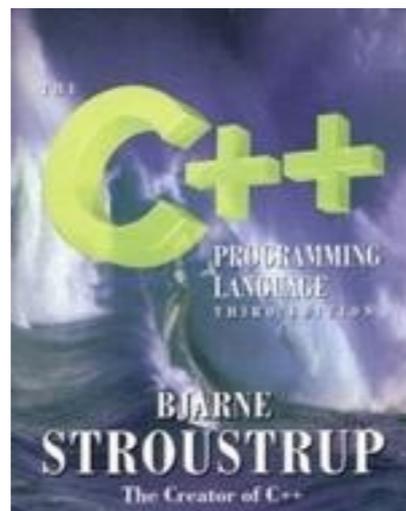
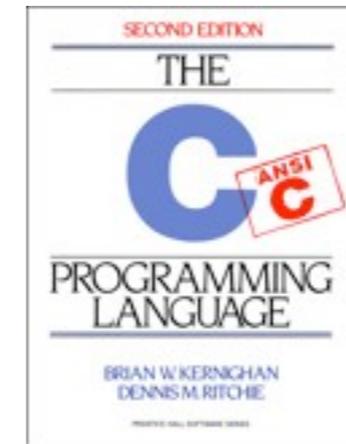


# Umfrage

<https://ars.particify.de/p/04470116>



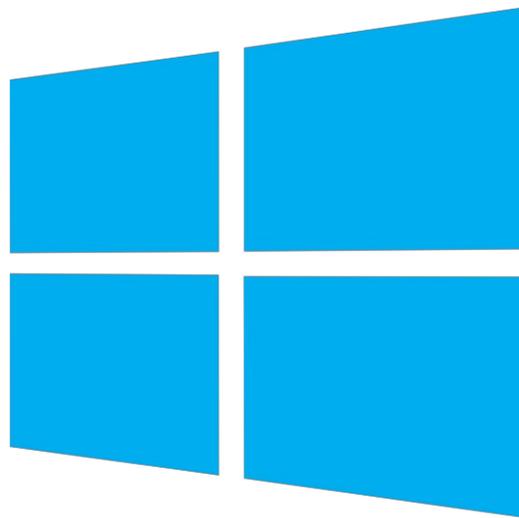
# Programmiersprachen?



C#



# Betriebssysteme?



# Datenbanken?

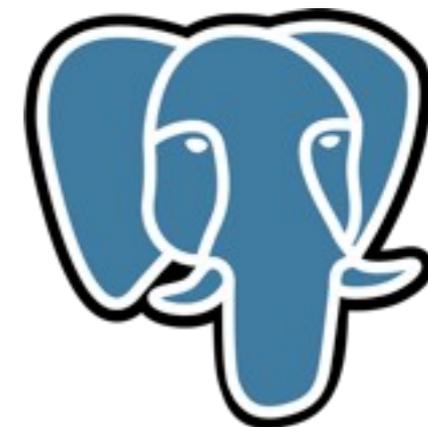
ORACLE®

IBM

 Microsoft®  
SQL Server®

 SQLite

  
MySQL®



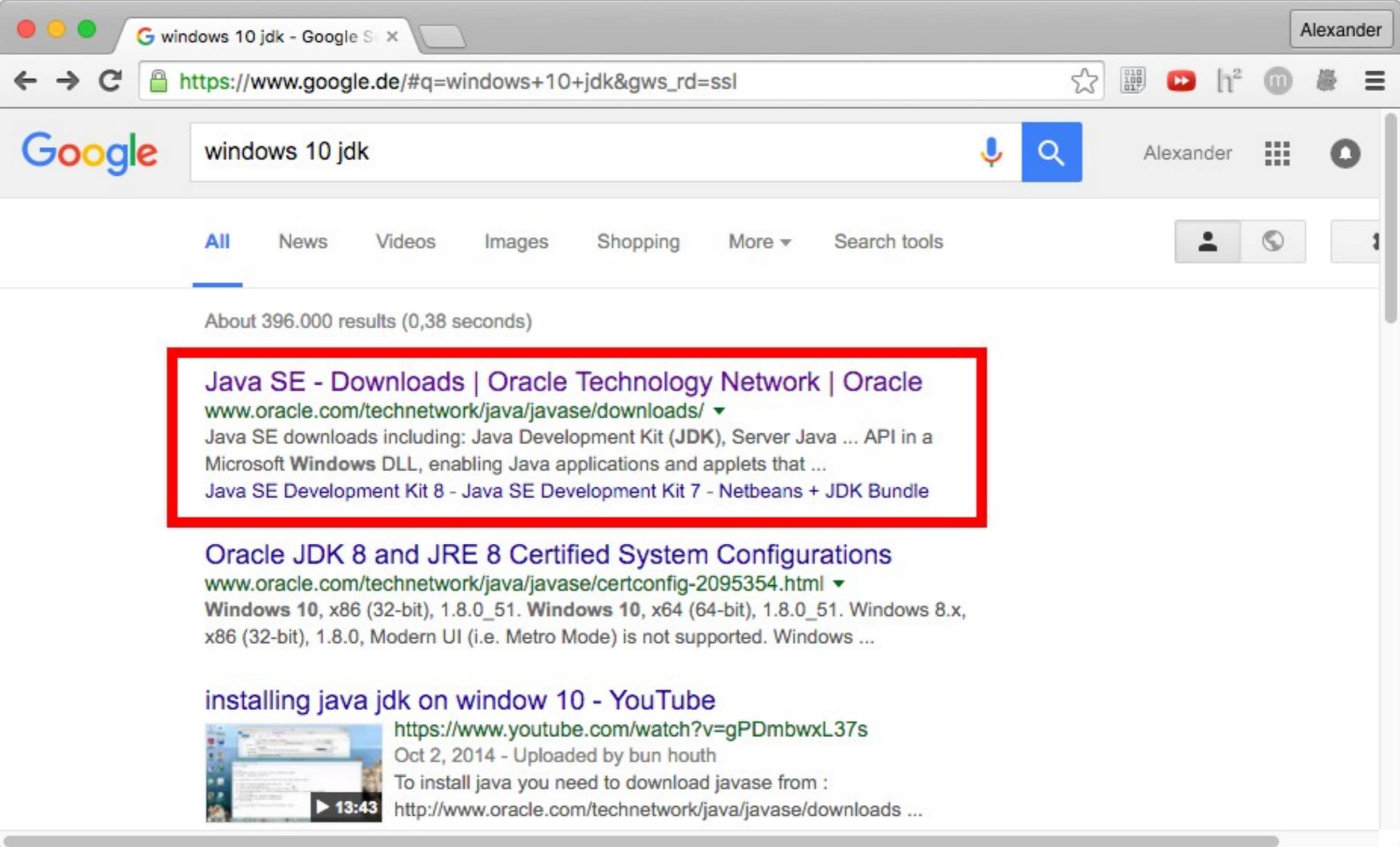
# Einführung in



# 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/](http://www.oracle.com/technetwork/java/javase/downloads/). The description below the title reads: "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". Below this, there is another result titled "Oracle JDK 8 and JRE 8 Certified System Configurations" with the URL [www.oracle.com/technetwork/java/javase/certconfig-2095354.html](http://www.oracle.com/technetwork/java/javase/certconfig-2095354.html). The description for this result mentions "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 ...". The third result is a YouTube video titled "installing java jdk on window 10 - YouTube" with the URL <https://www.youtube.com/watch?v=gPDmbwxL37s>. The video description says "Oct 2, 2014 - Uploaded by bun houth To install java you need to download javase from : http://www.oracle.com/technetwork/java/javase/downloads ...".

Windows 10 jdk - Google S x Alexander

[https://www.google.de/#q=windows+10+jdk&gws\\_rd=ssl](https://www.google.de/#q=windows+10+jdk&gws_rd=ssl)

Google windows 10 jdk Alexander

All News Videos Images Shopping More Search tools

About 396.000 results (0,38 seconds)

**Java SE - Downloads | Oracle Technology Network | Oracle**  
[www.oracle.com/technetwork/java/javase/downloads/](http://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](http://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 and a navigation menu with links for Products, Solutions, Downloads, Store, Support, Training, Partners, and About. A search bar is also present. The main content area is titled "Java SE Downloads" and includes a "Downloads" tab. Two download options are highlighted with red boxes: "Java Platform (JDK) 8u77" and "NetBeans with JDK 8". Below these, a section titled "Java Platform, Standard Edition" provides information about Java SE 8u77, including a note that it includes important security fixes and a link to "Learn more". A sidebar on the left contains a list of navigation links, and a sidebar on the right lists "Java SDKs" and "Java Resources".

Oracle Technology Network > Java > Java SE > Downloads

Overview Downloads Documentation Community Technologies Training

**Java SE Downloads**

**Java Platform (JDK) 8u77**

**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](#)

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](http://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 license agreement section with 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	<a href="#">jdk-8u77-linux-arm32-vfp-hflt.tar.gz</a>
Linux ARM 64 Soft Float ABI	74.68 MB	<a href="#">jdk-8u77-linux-arm64-vfp-hflt.tar.gz</a>
Linux x86	154.74 MB	<a href="#">jdk-8u77-linux-i586.rpm</a>
Linux x86	174.92 MB	<a href="#">jdk-8u77-linux-i586.tar.gz</a>
Linux x64	152.76 MB	<a href="#">jdk-8u77-linux-x64.rpm</a>
Linux x64	172.96 MB	<a href="#">jdk-8u77-linux-x64.tar.gz</a>
Mac OS X	227.27 MB	<a href="#">jdk-8u77-macosx-x64.dmg</a>
Solaris SPARC 64-bit (SVR4 package)	139.77 MB	<a href="#">jdk-8u77-solaris-sparcv9.tar.Z</a>
Solaris SPARC 64-bit	99.06 MB	<a href="#">jdk-8u77-solaris-sparcv9.tar.gz</a>
Solaris x64 (SVR4 package)	140.01 MB	<a href="#">jdk-8u77-solaris-x64.tar.Z</a>
Solaris x64	96.18 MB	<a href="#">jdk-8u77-solaris-x64.tar.gz</a>
Windows x64	187.31 MB	<a href="#">jdk-8u77-windows-x64.exe</a>

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

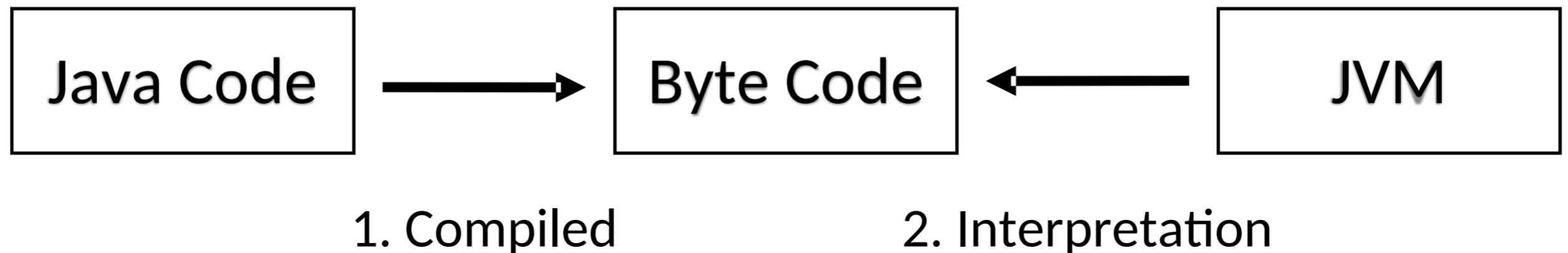
# Java Setup

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

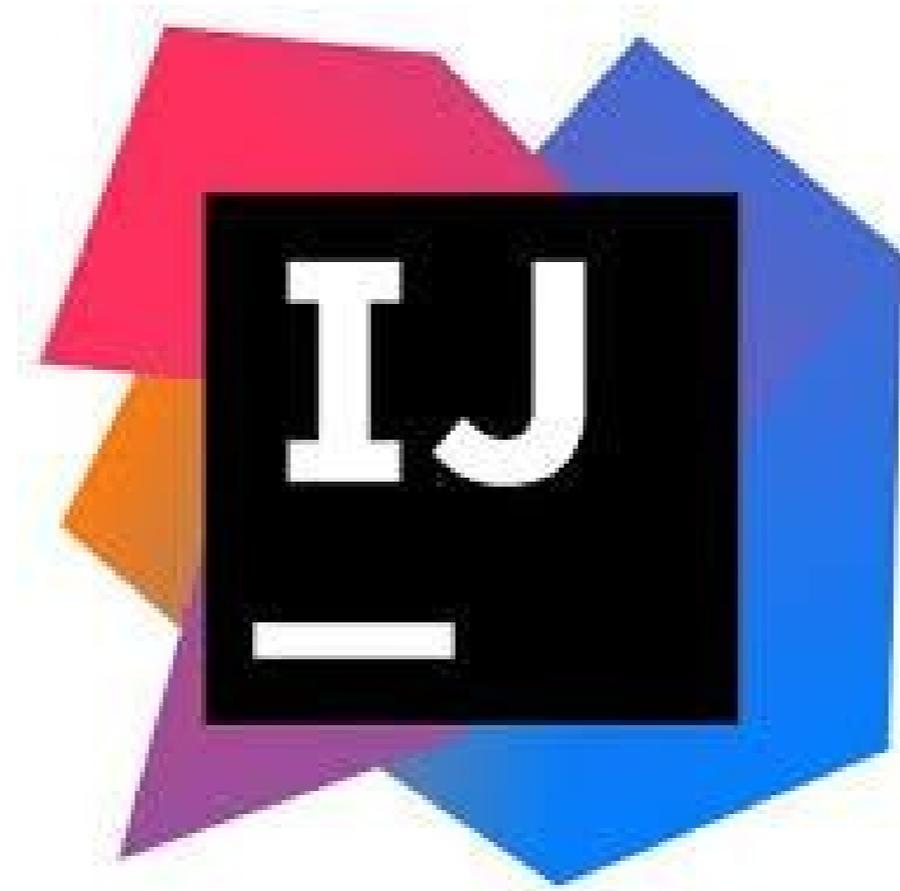
# Java Setup

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

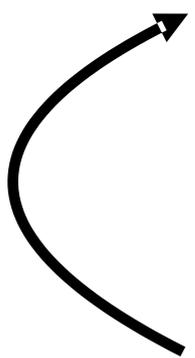
```
package source;
```

```
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

- IDE: IntelliJ IDEA:  
<https://www.jetbrains.com/idea/>
- Online IDE:  
[http://www.tutorialspoint.com/compile\\_java\\_online.php](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;
```

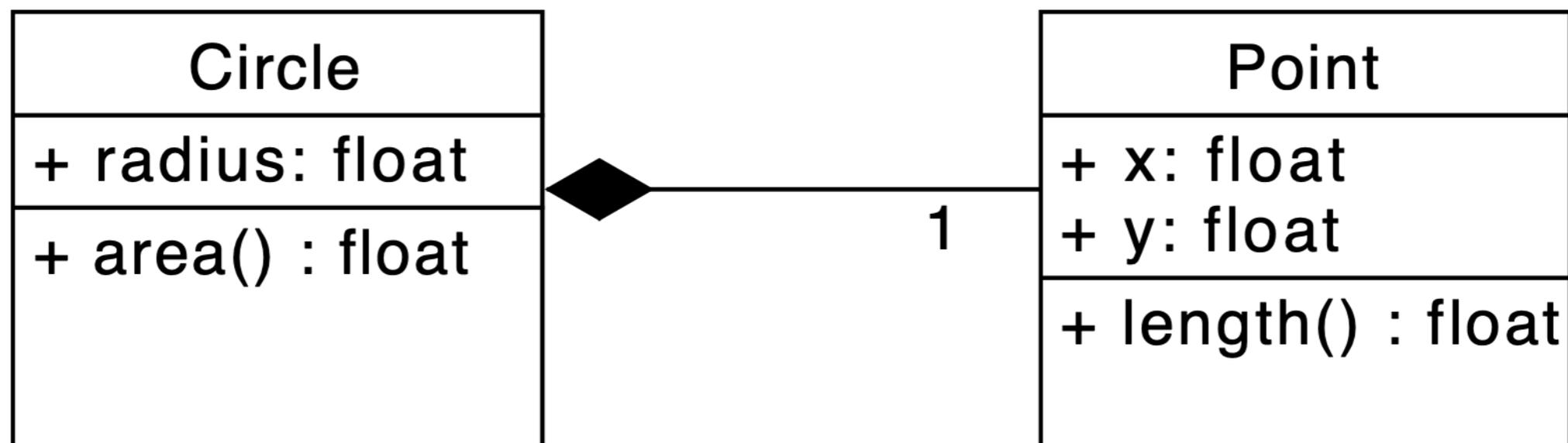
```
// By value  
int a = 3;  
int b = a;
```

# Modellierungsbeispiel



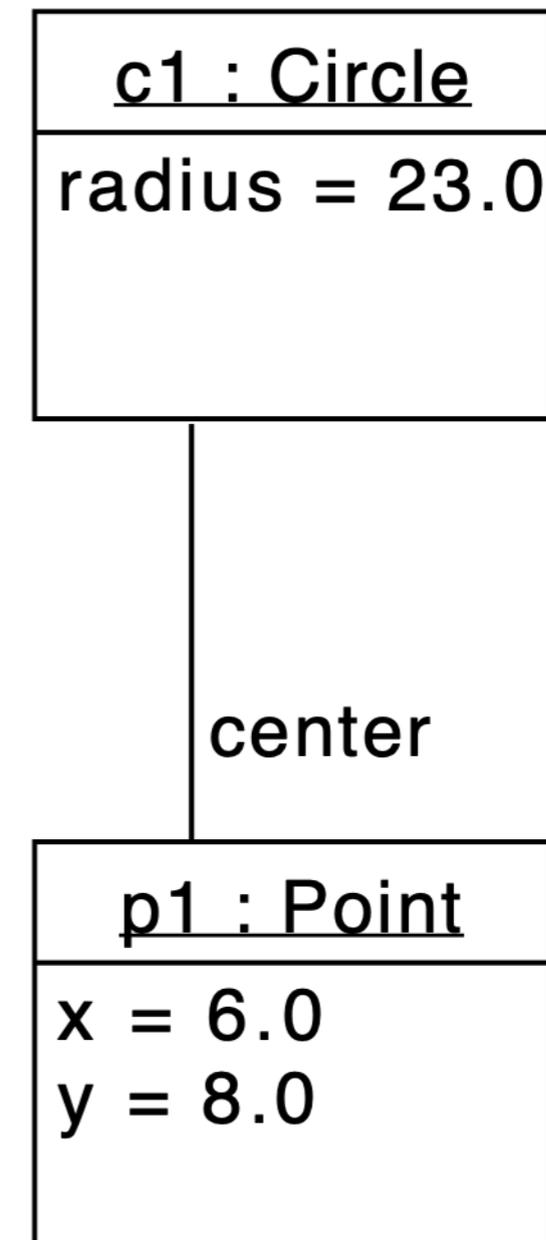
# Klassendiagramm

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



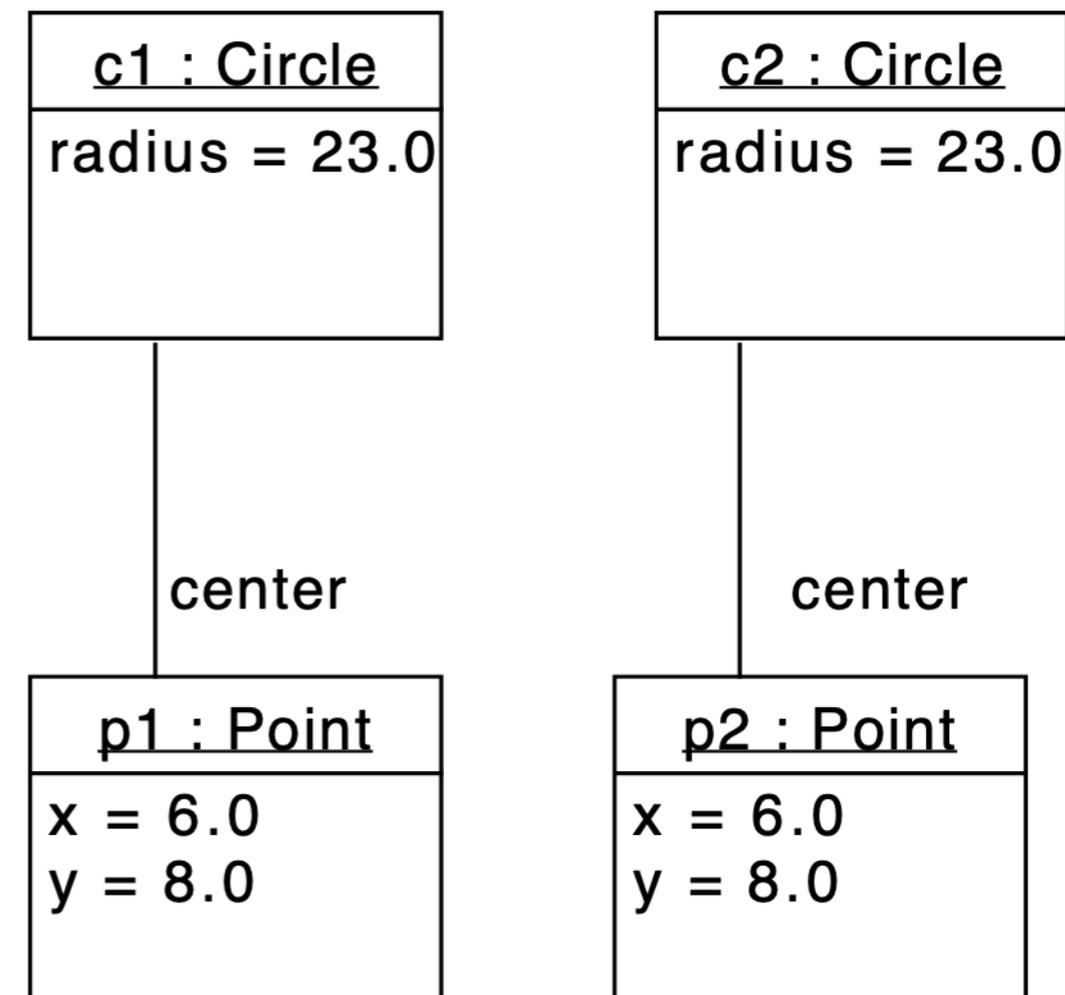
# Objektdiagramm

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



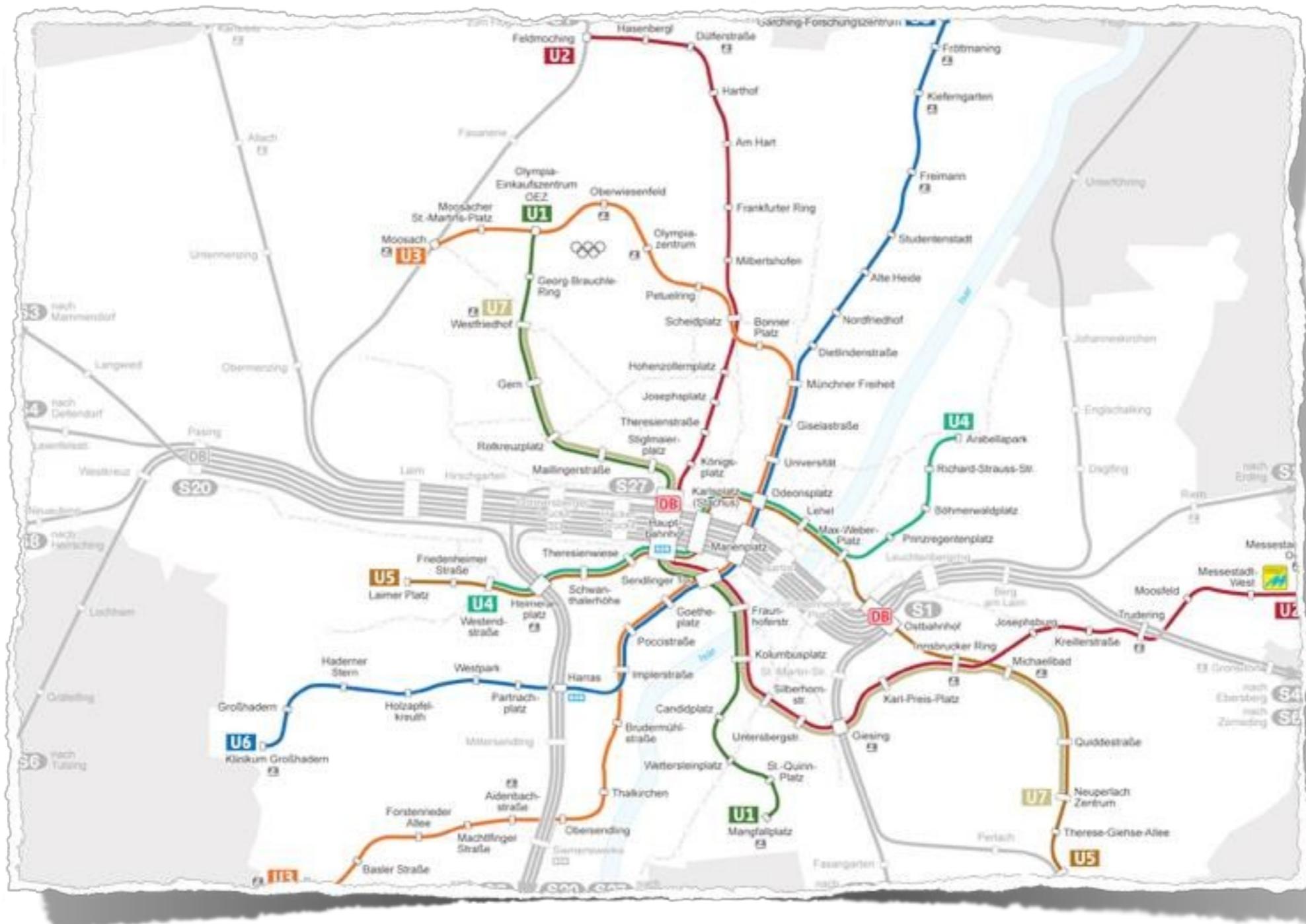
# Objektdiagramm

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





# Aufgabe 1



# Aufgabe 2

