

Object-Oriented Programming 2: Practical 0

Modalities

Benedikt Kantz with Tutor Team

Slido Q&A



Who has used Java?



How would you rate your Java expertise?



Resources

- Teach Center for slides and administrative matters: [link](#)
- Code examples: [gitlab](#)
- Gitlab-Teaching for code hand-ins: [gitlab-teaching](#)
- Mail tutors.oop2.le@mlist.tugraz.at: for organizational matters

Discord I

- Channel to ask questions
- We will announce small (non-grading-relevant) events: grading process, ...
- Quickest way to get an answer



Invite: discord.gg/SXdy6cafzu

Discord II

Yet another “Tutor” (Beta!)

- We added a bot based on a LM^a
- You can ask it questions about coding/... by tagging your question with AI or in the bot-arena forum.
- It should be able to answer basic questions using prior years of knowledge.

^a<https://huggingface.co/Qwen/Qwen2.5-Coder-7B-Instruct>

14:38 **Benedikt Kantz** Problem

What exactly do we have to return in Routing for the case that start node == end node?

What have you tried

I've tried returning

```
{  
  "length": 0,  
  "time": 0  
}
```

Platform

Ubuntu

Checklist:

Used the Discord Q&A template

Looked at other Discord threads/used Discord search

Looked at the FAQ

Added full name and matriculation number AND group number from TC

14:39 **APP** **OOP2 Bot** For the case where the start node is equal to the end node, you should return a route with a length and time of zero. This indicates that no travel is required as the start and end points are the same.

Practical Schedule

KW	Date	#	KU Topic
40	2.10.2025	00	Modalities
41	9.10.2025	01	Introduction to A0
42	16.10.2025	-	Q&A A0
43	23.10.2025	-	Q&A A0, Deadline A0, A1 Group Sign-Up
44	30.10.2025	02	Intro to A1, Deadline A1 Group Sign-Up
45	6.11.2025	03	Libraries Usage, Q&A A1
46	13.11.2025	-	Q&A A1
47	20.11.2025	-	Q&A A1
48	27.11.2025	-	Q&A A1
49	4.12.2025	-	Q&A A1
50	11.12.2025	04	Deadline A1, Introduction to A2
51	17.12.2025	-	Q&A A2
2	8.1.2026	-	Q&A A2
3	15.1.2025	-	Q&A A2, A2 Deadline
4	23.-29.1.2026	-	Assignment Interviews (AG)

Assignments I

- Assignment 0: 20P
 - Start: 2.10.2025 (today!)
 - End: 23.10.2025
 - Individual work, No point threshold
 - Introduction to Spring Boot + Java Objects

Assignments II

- Assignment 1: 50P
 - Start: 30.10.2025
 - End: 11.12.2025
 - Group work of 3 (sign-up via TC), you *will* get a grade after signing up for a team!
 - Networking and data loading concepts
 - Grading might take some time, just start the next assignment!

Assignments III

- Assignment 2: 30P
 - Start: 11.12.2025
 - End: 15.1.2026
 - Group work of 3 in the same group!
 - Algorithms and visualization in OOP

Assignments IV

- Bonus Assignment: 10P, only counts if already $>55\%$
 - Start: 11.12.2025
 - End: 15.1.2026
 - Group work of 3 in the same group!
 - OpenGL in Java

Assignments V

- Assignment Interviews
 - Start: 23.1.2026
 - End: 29.1.2026
 - Coding and comprehension questions - we will deduct points!
 - Bring your laptop (we can also provide one if you do not own one, please contact us beforehand!)

Rules I

- Teamwork is mandatory (A1 + A2)!
 - Everyone should work on a part of the project while still being aware of the work others do!
 - We will check using the tool gitinspector (everyone has to work on their machines, you can see the contribution in gitlab!)
- Code of conduct
 - Equal share of work and responsibilities among members of a team
 - No copying of large chunks from Internet sources, books (cite even small chunks of code!)

Rules II

- No duplication of code among teams (either intentional or careless)

Rules III

LM usage

- In general: treated as a “normal” source
 - Cite the chat/prompt (ChatGPT has this functionality built-in) you were using and mark the relevant snippet by citing it
 - Basically: same as copying from Stackoverflow, Github, ...
- If you try to generate everything:
 - We will notice (usually: does not compile, erroneous)
 - You will fail at the AG as you will not be able to understand what you did (goal of the course!)

Rules IV

- LM Bot on Discord
 - Do not copy the code - treated in the same way as other plagiarism (citation, ...)

Rules V

- One mandatory final assignment review interview per team (A1 + A2)
 - Presence of all team members required
 - Each team member is required to understand the entire codebase
 - Students agree upon presentation slot with their tutor (TC timeslots)
- Scope
 - Demonstrate your implementation
 - Comprehension questions

Rules VI

- Everyone should be able to implement (or sketch an implementation) in any part of the project
- Grading is finalized after exercise interview

Assignment Overview I

- *Goal:* apply OOP principles to a practical application
 - Usage of modern libraries (Spring Boot, gRPC, ...)
 - Utilize modern Java principles (Streams, ...)

Assignment Overview II

- *Context:* Geographic Information System (GIS) as a RESTful API
 - Your task: build a system that is able to provide geographic information through a standardized API from a XML-resource on the backend
 - Three assignments, focusing on different aspects of the system
 - A0: basic objects, parameter parsing
 - A1: API implementation, networking, parsing
 - A2: algorithms in Java, libraries in-depth
- Grading: $20+50+30=100$ points

Assignment Overview III

```
public static Grade getGrade(float ass0, float ass1, float ass2, float bonus) {
    float total = ass0 + ass1 + ass2;
    // WARNING: Bonus points ONLY COUNT if you have a positive grade      (over 55 points)!

    if (total > 55) {
        total += bonus
        if (total > 90) {
            return Grade.SEHR_GUT;      // 1
        }
        if (total > 78) {
            return Grade.GUT;          // 2
        }
        if (total > 66) {
            return Grade.BEFRIEDIGEND; // 3
        }
        return Grade.GENUEGEND;       // 4
    }
    return Grade.NICHT_GENUEGEND;    // 5
}
```

Listing: Grading Function

Who has used OpenStreetMap?



Data Source: OpenStreetMap (OSM)

- OSM is a crowdsourced database of geospatial data^a
- Highly structured (you will learn more about it!)
- Can be used for geospatial research/applications
- There are also apps for you phone!

^ahttps://wiki.openstreetmap.org/wiki/About_OpenStreetMap



Open Street Map

Demo Time!

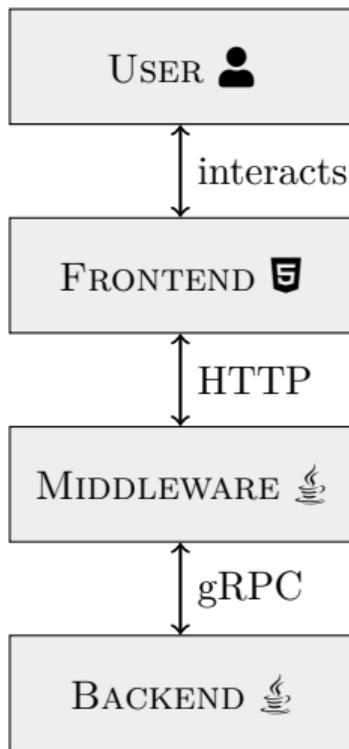
Link: oop2-demo.tugraz.at/demo

Notes:

- The system is only reachable within the TU network (eduroam/VPN)
- The middleware is reachable under oop2-demo.tugraz.at/middleware - the /middleware is only for routing purposes, you should *not* add it in your system!

Architecture

- Standard Web Architecture
- Frontend: Provided
- Middleware: Spring Boot Server, your task!
- Backend: gRPC Server, your task!



Assignment 0 Introduction I

- Mock responses (10P)
 - return data in the correct format - no actual data required for now
 - no error handling (accept the correct parameters though!)
 - just get started with Spring Boot and the REST framework
- Environment arguments (5P)
 - this is required as we will test using these!
 - please make sure to properly parse and use them!
 - hint: `System.getenv().getOrDefault()`

Assignment 0 Introduction II

- Error handling of arguments (5P)
 - Important: check you inputs!
 - What can you expect? (Strings, out-of-bounds, ...)
- No need to start today (you can if you want though), we will discuss the details next time!

Assignment 0: Getting started I

- You will get the repositories (ideally) *today*
- No need to start right away
- Resources: [Overview PDF](#)
- Instructions: [Assignment](#)

Assignment 0: Getting started II

- What we recommend you to do until next week:
 - Install IntelliJ/IDE
 - Check out you repository & Start the code
 - Install Insomnia
 - Check out the example code on [gitlab](#)

BEST OF LUCK!

BEST OF LUCK!
(TO ALL OF US!)