Programming: Everyday Decision-Making Algorithms

Kühne Logistics University - Fall 2024

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Course Description

This course explores the intersection of computer science and everyday life by examining how algorithms can be applied to improve decision-making in various contexts. Based on the book "Algorithms to Live By" by Brian Christian and Tom Griffiths, the course will cover topics such as optimal stopping, scheduling, caching, and game theory, providing both theoretical foundations and practical programming exercises. The course consists of lectures and exercises.

Learning Outcomes

Our broad goal is to equip students with the ability to get to grips with algorithmic thinking. We want to enable students, to indepently apply methods and concepts from algorithms to solve their everyday practical problems while also providing a brief introduction into programming with python.

Upon completion of the course, students … • … will understand fundamental algorithms and their applications to everyday problems • … develop the ability to model real-world scenarios using algorithmic thinking • … implement simple algorithms in python to solve practical problems • … analyze the efficiency and effectiveness of different algorithms in various contexts

Please note that this course is **specifically designed for business students**. That is, it is **not required to have any advanced knowledge or experience in programming** to attend this course. The teaching format will make it possible to account for different levels of programming skills such that every student can take the most out of the course.

Course Blocks

Course Structure

The course is based on a hands-on approach with a two-fold structure:

1. **Lectures**: In the lectures, we will introduce and discuss concepts and illustrate them in reproducible examples.
2. **Hands-on Tutorials**: Students will apply the concepts from the lecture in jupyter notebooks, while simultaneously learning the basics of python.

The evaluation of the course will be based on the following two components: 1. **Assignment**: Students will solve one programming exercise in groups of up to three students that they will have to hand in. 2. **Presentation**: Students will give a short presentation on a topic of their choice.

You can find more information on the course contents in the syllabus.

How to see the slides

- This course is based on Quarto
- It uses revealjs to render the slides
- You find the slides for each lecture in the corresponding lecture
- To see the slides, click on `RevealJS` in the top right corner

Questions

If you have any questions regarding the course, please contact me under vlcek@beyondsimulations.com.