

Introduction to object-oriented programming

- [Individual students' progress through an introductory programming course](#)

How do students build and develop mental models and misconceptions of concepts introduced throughout the course, and how does this affect their performance on the final exam and in later courses?

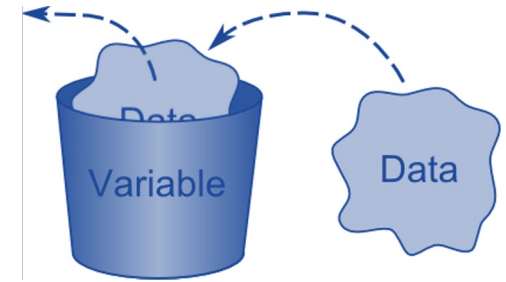
- [Automatically assessed tasks versus problem-solving tasks in programming courses](#)

How do different kinds of tests and assessed projects compare when it comes to assessment of achieved learning goals, impact on student motivation and opportunities for student learning?

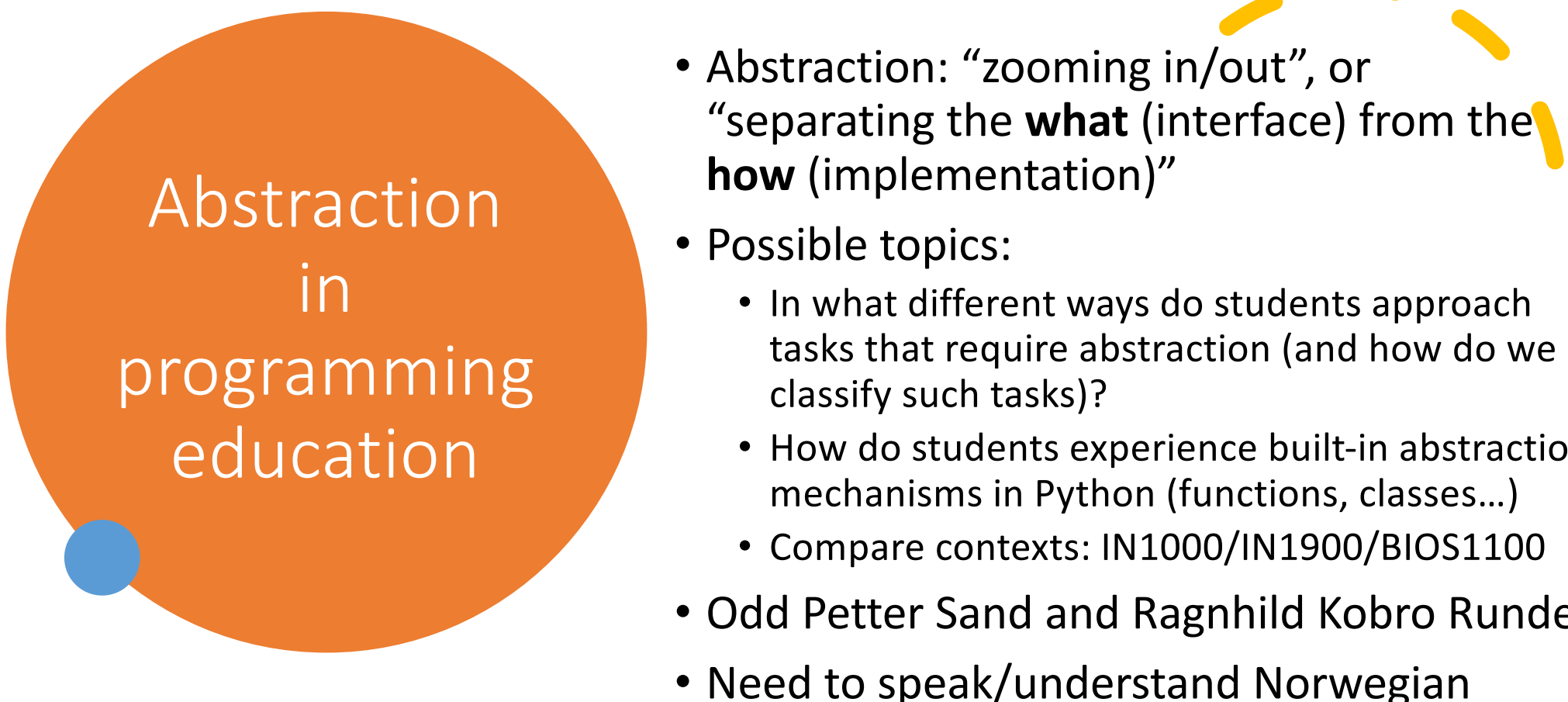
Both projects: Data from an ongoing study of IN1000 students will be combined with qualitative data obtained through observations and interviews, analyzed and discussed using methods and results from international computer science education research.

Supervisors: Siri Moe Jensen and Ragnhild Kobro Runde

Students' understanding in different introductory programming courses



- How does the academic context influence students' learning and understanding of programming?
 - How are programming taught in different courses?
 - What kind of examples are used, and what programming concepts are emphasized?
- Possible frameworks for analysis:
 - The block model
 - Variable roles
- Supervisors: Ragnhild Kobro Runde and Siri Moe Jensen
- Language requirement: Norwegian

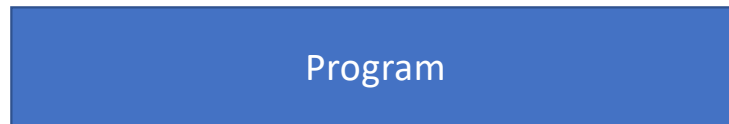


Abstraction in programming education

- Abstraction: “zooming in/out”, or “separating the **what** (interface) from the **how** (implementation)”
- Possible topics:
 - In what different ways do students approach tasks that require abstraction (and how do we classify such tasks)?
 - How do students experience built-in abstraction mechanisms in Python (functions, classes...)
 - Compare contexts: IN1000/IN1900/BIOS1100
- Odd Petter Sand and Ragnhild Kobro Runde
- Need to speak/understand Norwegian

Programming students struggling to understand the machine side

Functional level – what is the real-life problem the program attempts to solve?



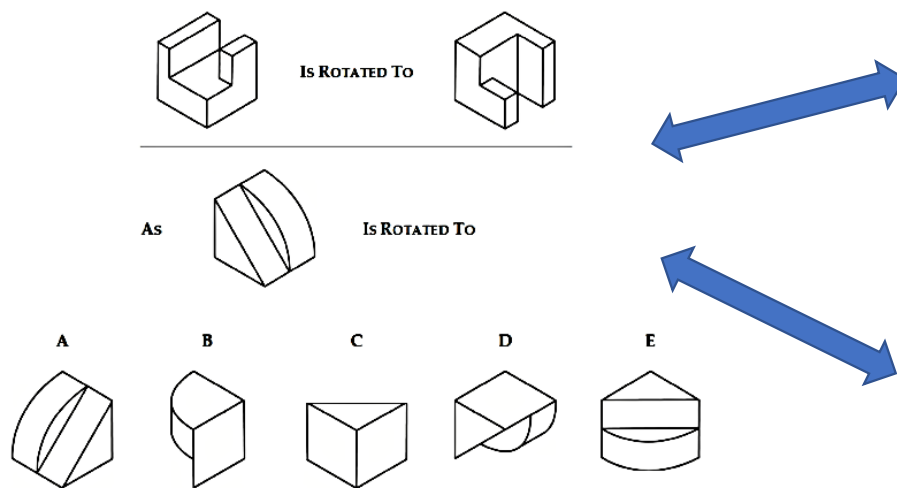
Text Surface level – syntax, structure of program



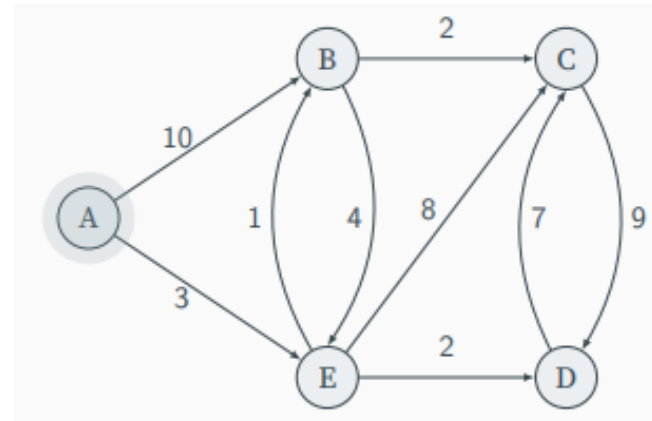
Machine level – what happens in memory when the computer runs the program?

- Hypothesis: Some students have NO machine understanding
- Possible questions:
 - How to identify students with no machine understanding?
 - What are the thought processes of these students?
 - How to help the students get an understanding of the machine side?
- Supervisors: Odd Petter Sand and Ragnhild Kobro Runde
- Language requirement: Norwegian and English

What is the relationship between spatial skills and programming?



```
ordre = input("Ordre: ")
while ordre != "Avslutt":
    # utfoer ordre, gjerne kalle metode(r)
    ordre = input("Ordre: ")
```



- Possible topics:
 - How do we imagine CS concepts and structures?
 - What do students think of spatial skills and spatial skills training?
 - Can skills in algorithms and data structures be developed via spatial skills training?
- Supervisors: Quintin Cutts and Ragnhild Kobro Runde