



# Exercise Session W14

Computer Science (CSE & CBB & Statistics) – AS 23

# Overview

## Today's Agenda

Objectives

Smart Pointers

Simplify `if`-clauses

Old Exams

Riddle

Q&A

Outro



`n.ethz.ch/~agavranovic`

# 1. Objectives

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# Objectives

- Know where to find old exams (to practice with)
- Clarify remaining questions

Questions?

## 2. Smart Pointers

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# What?

Smart Pointers are a (memory) safer alternative to ("raw") pointers

# How?

```
| #import <memory> // to enable smart pointers
```

Now instead of raw pointers

```
| int* scptr = new int(5);
```

You can just use (e.g. a unique) smart pointer

```
| std::unique_ptr<int> scUptr = std::make_unique<int>(5);
```

The rest of the usage is almost the same

- Unique pointers don't allow copying!



# What for?

- They manage the memory for you!
- Leads to fewer memory leaks and other memory-related issues

Questions?

## 3. Simplify `if`-clauses

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# Simpler ifs I

We noticed that many students write code similar to this

```
if (grid != nullptr) {
    if (grid->is_filled(row, col)) {
        if (col == 8) {
            if (fillValidNumber(grid, row + 1, 0)) {
                return true;
            }
        } else {
            if(fillValidNumber(grid, row, col + 1)) {
                return true;
            }
        }
        return false;
    }
}
```

## Simpler ifs II

Since the function `fillValidNumber` returns a boolean and we also want to return a boolean, we can remove the most nested `if` statements and the last return statement

```
if (grid != nullptr) {
    if (grid->is_filled(row, col)) {
        if (col == 8) {
            return fillValidNumber(grid, row + 1, 0);
        } else {
            return fillValidNumber(grid, row, col + 1);
        }
    }
}
```

## Simpler ifs III

We can also use the fact that `&&` is short-circuiting to merge the two outer `if` statements

```
if (grid != nullptr && grid->is_filled(row, col)) {  
    if (col == 8) {  
        return fillValidNumber(grid, row + 1, 0);  
    } else {  
        return fillValidNumber(grid, row, col + 1);  
    }  
}
```

Questions?

## 4. Old Exams

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# Practicing with old exams

- There are tons of old exams that can be found on the course website
- They can be a good way to practice for the real thing
- Make sure to select the correct ones: *Informatik I für MPCSE*



`lec.inf.ethz.ch/past_exams/`

## 5. Riddle

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# Riddle

Riddle me this code example on **code** expert ...

## 6. Q&A

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# Q&A

Anything unclear?

## 7. Outro

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# General Questions?

See you at the exam!

Cheers!