

Exercise Session

Week 10

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Overview

▶ polybox for session material

▶ mail to TA

Today's Topics

Introduction

Self-Assessment

Classes and Structs

Overloading

Intro

- I'm in the process of getting a new internet connection, so if I suddenly disappear that might be the reason

Follow-up

- **”Red icon even if on submission was on time”**: The `[code]` expert team knows about it and is working on it. Don't worry about your bonus, if you solved the exercise well you will get your grade increase.

Comments on last [code]expert Exercises

- Don't bother cheating. They *will* catch you

Questions or Comments re: Exercises?

Learning Objectives Checklist

Now I...

- can define classes
- can overload operators for the classes I've written

Self-Assessment

- log into Moodle
- on my command, start the self assessment
- should take around 20 minutes
- we'll have a quick break and then discuss the Self-Assessment after the break

Post-Self-Assessment Discussion

- what did you find particularly hard?
- which tasks should we go over again?
- what was easy?
- how is exam-prepp going?

Questions?

Struct **VS** Class

Difference

The only difference between them is their default *visibility*.

```
Struct    public ("visible")
Class     private ("invisible")
```

You can change the visibility of your members in both classes and structs by specifying it with the keywords `private:` or `public:` respectively.

When should you use what?

Doesn't really matter, as long as you get the visibility right. Recommendation: use `class` for "complicated stuff" and `struct` for "bundles of data".

Questions?

Function overloading

This part covers the question "How does the computer know which function I want to call, if two functions have the same name?"

It *is* possible for two functions to have the same name, as long as the compiler has another way to differentiate between them with the help of the following criteria.

Viabale Criteria

- number of function parameters
- type of function parameters

Not Viabale Criteria

- name of the function parameter
- return-type of the function

Function overloading

Why do we even care if two functions can have the same name?

Because we can then use "operator overloading" much more smoothly. Operators (such as `*`, `+`, `=`) are basically fancy looking functions. The operator `*` for example can then have multiple meanings depending on what is given as an input argument. So it can perform "normal" multiplication when given two `int` variables but does something else when we give it a certain `class`.

Exercise "Tribool"

Tribool: a bool, but with three values (false, unknown, true).
Here are the logic tables for the operators on tribools.

NOT(A)		AND(A,B)				OR(A,B)					
A	$\neg A$	$A \wedge B$		B			$A \vee B$		B		
F	T			F	U	T			F	U	T
U	U	A	F	F	F	F	A	F	F	U	T
T	F		U	F	U	U		U	U	U	T
			T	F	U	T		T	T	T	T

F = FALSE, U = UNKNOWN, T = TRUE

Exercise "Tribool"

This implementation stores the truth value in a class called "Tribool" as a private unsigned int.

- why is this a good idea?
- how could we store the information (truth value)?
- we're going to solve this exercise together

Exercise "Tribool" Concepts

We're going to see all of these concepts in action when doing this exercise:

- classes
- visibility
- operator overloading
- declaration vs definition
- out-of-class definitions
- `const` functions
- constructors

Exercise "Tribool"

- **Step 1:** We're going to implement the first constructor together and you will try to implement the second one on your own
- **Step 2:** try the second step by yourself too
- **Step 3:** we're first going to discuss how to implement this in a very clever way and then you are going to write it on your own

Questions?