h_da	Fachbereich Elektrotechnik und Informationstechnik	Advanced Programming Techniques (APT) Module Exam WiSe2022 (PO2019) Prof. Dr. Lipp

Name	Matr.-Nr.	Computer	Signature

Rules:

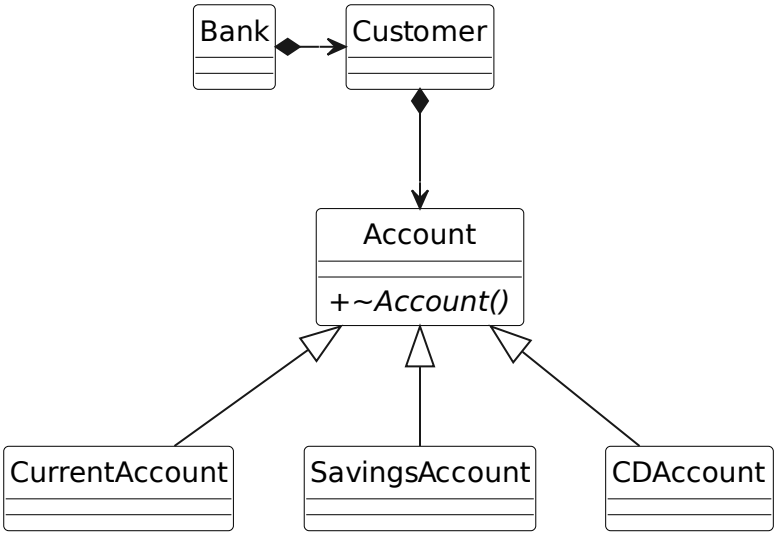
- Use the prepared project “Exam-2022WiSe”.
- In `main.cpp` replace the place holders with your name and matrikel number.
- Compile your project once and execute it. Check the output.
- The snapshot of cppreference.com that you have on the desktop does not have a search facility. However, it has a link “std Symbol Index” which comes close. Make sure that you have found the link on the index page.
- Create all classes in the folder „`myCode`“.
- “`using namespace`” statements in header files are forbidden.
- Code that implements methods (and functions) must be written in the proper *.cpp-file (no implementation code in *.h-files).
- Not using defined methods when appropriate (copying code instead) results in a reduction of points.
- Leaving automatically generated, not required code such as default constructors in the code results in a reduction of points.
- Code will only be graded up to the first compiler error.
- Code in comments will not be graded.
- Answers to questions will only be accepted when provided in the specified comments. Answers found elsewhere in your code will gain no points, even if they are correct.
- Keep the exams stapled together. Un-stapled exams will not be accepted and result in 0 points.

Allowed auxiliary means:

- The slides from the lecture (including print-outs of the uploaded code samples)
- Up to three books about C/C++ programming
- A dictionary.
- Print-outs of the code from your lab exercises.

Communication with other participants or using unauthorized auxiliary means, including but not limited to electronic devices such as smart phones, smart watches calculators, will result in immediate termination of the exam and a 0 point grading.

Topic of this exam is the modelling of some data related to customers of a bank (see picture below). A bank has customers who have one or more accounts. Accounts can be of different type. The current account (a.k.a. checking account, German: *Girokonto*), usually only used for transferring money. A savings account (German: *Sparkonto*) that earns interest on the money deposited in it. A certificate of deposit (CD) account (German: *Festgeldkonto*) that earns higher interest if you leave your money in the account for a fixed term.



The diagram shows only the classes and their relationships. You'll find the attributes and methods in the class definitions.

Exercise

Implement the classes and their methods as described in the header files.

Adding private methods in order to avoid redundant code is allowed. Adding to or modifying the classes' attributes is forbidden. Adding to or modifying the public or protected methods is forbidden as well.

Implement the tests outlined in file "test.cpp". Note that "assert that …" means that you have to write one or more `assertTrue(...)`-statements. Unless there is an error, running your tests must not produce any output on the console.