Algorithm Coding Club (Summer)

Module title:	**Credits:**	**Responsible person:**
Algorithm Coding Club (Summer)	3	Niedermeier, Rolf
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Learning Outcomes

Main topic: Algorithms for number and string problems

On successful completion, students know:
- advantages and disadvantages of different data structures in the context of strings, in particular adjacency tries.
- implementations of fundamental number and string algorithms, in particular based on dynamic programming.
- approaches to solve showcase problems like the knapsack problem, pattern matching, and string alignment.

Furthermore, students will be able to:
- model given tasks with strings in a mathematical and formal way.
- design efficient algorithms to solve the given computational number and string problems with adequate data structures and basic algorithms.
- work in teams.
- successfully participate in programming contests such as the ACM Programming Contest.

Content

The course
- gives an introduction to modeling problems especially focusing on strings,
- gives an overview on standard techniques in algorithm design for challenging computational problems on numbers and strings,
- teaches to design and implement algorithms, and
- teaches effective team work.

Module Components

Course Name	Type	Number	Cycle	SWS
Algorithm Coding Club	PJ		WS/SS	2

Workload and Credit Points

Algorithm Coding Club (Projekt)	Multiplier	Hours	Total
Attendance in discussions of solutions	5.0	2.0h	10.0h
Attendance in programming contests	5.0	4.0h	20.0h
Attendance in Lectures	5.0	2.0h	10.0h
Preparation for programming contests	5.0	10.0h	50.0h
			90.0h

The Workload of the module sums up to 90.0 Hours. Therefor the module contains 3 Credits.

Description of Teaching and Learning Methods

The course has the following 3-week pattern: First, a lecture provides the necessary algorithmic basics. Second, a programming contest takes place where the students solve programming tasks in small teams (2-3 students). Third, solutions and problems occurred in the implementation will be discussed.

Requirements for participation and examination

Desirable prerequisites for participation in the courses:

Basic knowledge in algorithms, data structures, and programming is helpful.
We do not recommend participation without basic programming skills in Java or C++.

Mandatory requirements for the module test application:

No information

Module completion

Grading:	**Type of exam:**		**Language:**
ungraded	Portfolio examination 100 points in total		English

Grading scale:

At least 50 points in total needed to pass.

Test description:

Programming contests: Each contest consists of at least 3 programming tasks of varying difficulty. The programming tasks need to be solved in teams (2-3 students) within the given time limit. Each solved task gives 10 points (at most 20 points per contest). It is automatically checked whether the submitted programs fulfill given specifications within given time limits.

Test elements	Categorie	Points	Duration/Extent
(Deliverable assessment) Programming Contest	practical	20	4h
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(Deliverable assessment) Programming Contest	practical	20	4h

Duration of the Module

This module can be completed in one semester.

Maximum Number of Participants

The maximum capacity of students is 40

Registration Procedures

Please register at QISPOS or directly at the examination office.

Recommended reading, Lecture notes

Lecture notes:
unavailable

Electronical lecture notes :
available

Assigned Degree Programs

This module is used in the following modulelists:

Informatik (Bachelor of Science)

StuPO 2015

Modullisten der Semester: SS 2018

Miscellaneous

Students of other degrees can participate in this module if there is enough capacity.