

Declarative Problem Solving Methods 2018

Information before the written exam

The exam will comprise 100 points.

Grading

Pass: ≥ 50 points

Pass with distinction: ≥ 75 points

The course comprises 7.5 points

Written exam: 4 points

Assignments and compulsory attendance: 3.5 points

The course gets the same grade as the written exam when the whole course is completed.

Course Plan

Goals

Regarding knowledge and understanding the student is, after the course, expected to be able to:

- Describe how declarative programming languages can be built-up and relate these to logic
- Explain and utilise the concepts in programming languages based on logic
- Describe how an interpreter for a logic-based language functions
- Describe different declarative problem solving methods

Regarding skills and abilities the student is, after the course, expected to be able to:

- Solve provided tasks in a logic programming language
- Apply different declarative problem solving methods to solve provided tasks

Regarding judgement and approach the student is, after the course, expected to be able to:

- Discuss and evaluate different declarative problem solving methods in relation to different types of assignments
- Relate declarative programming languages to other types of programming languages

Important concepts related to the more theoretical tasks in the written exam

Problem solving methods:

- Divide-and-conquer, generate-and-test (meta-programming)

Relate predicate calculus to logic programming

- Horn clauses in logic and in Prolog

Unification

Recursion

The execution of Prolog programs

- The form of proof

- The resolution rule

- How the resolution rule is used in Prolog

Alternative answers

- Backtracking

- Red and green cut

- Negation as failure

- Built-in predicates: setof, bagof, findall

Improving efficiency

- Avoid unnecessary backtracking using !

- Tail recursion and accumulator pairs

- Asserting derived facts

Declarative and procedural interpretation of programs