

# Finite Model Theory, Fall 2018

## Practical information:

- Lecturer: Juha Kontinen
- Lectures: Monday 14-16 in B222 and Thursday 10-12 in B121.
- Exercise class: Tuesday 12-14 in C122.
- Exams: final exam in December; extra points (max 4-6) can be earned by actively participating the exercises.
- Material: The material of the course is well covered by books, e.g., Finite model theory of Ebbinghaus&Flum, and by the lecture notes of Kerkko Luosto (in Finnish, available online).

## Tentative contents of the course:

### Models and games:

- Finite structures
- Basics of first-order logic and infinitary logic FVL
- The Ehrenfeucht-Fraïssé game and the pebble game
- Game characterizations for first-order logic and infinitary logic
- Locality of first-order logic

### Descriptive complexity theory:

- Regular languages
- Finite automata and (monadic) second-order logic
- Fixed point logics
- Turing machines and the logical characterizations of PTIME and NP

### The 1-0 law of FO and FVL

- Extension axioms
- The 0-1 law of first-order logic and infinitary logic