

# A Finitary Analogue of the Downward Löwenheim-Skolem Property

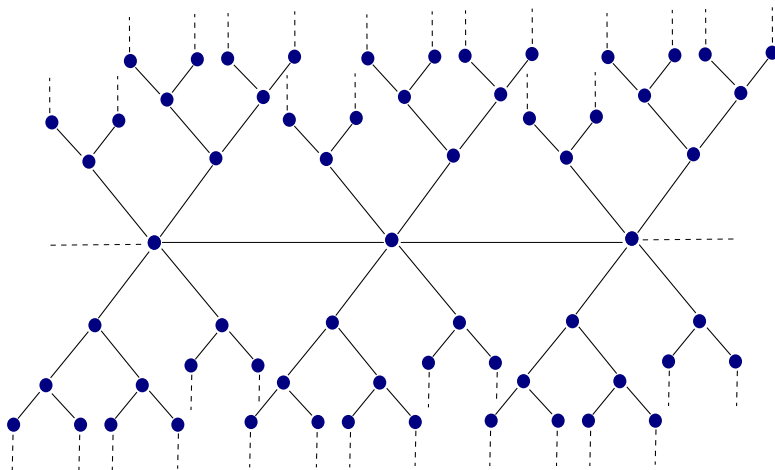
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Sprint thesis talk, RISC

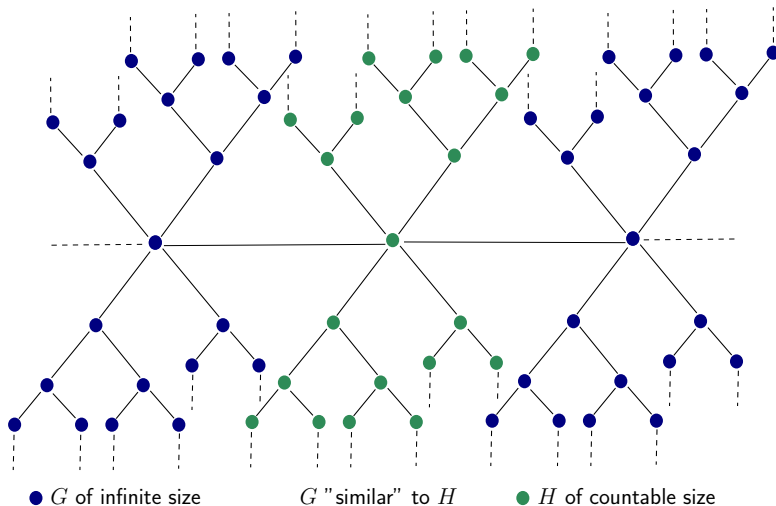
April 2, 2016

# The Downward Löwenheim-Skolem Property (DLSP)

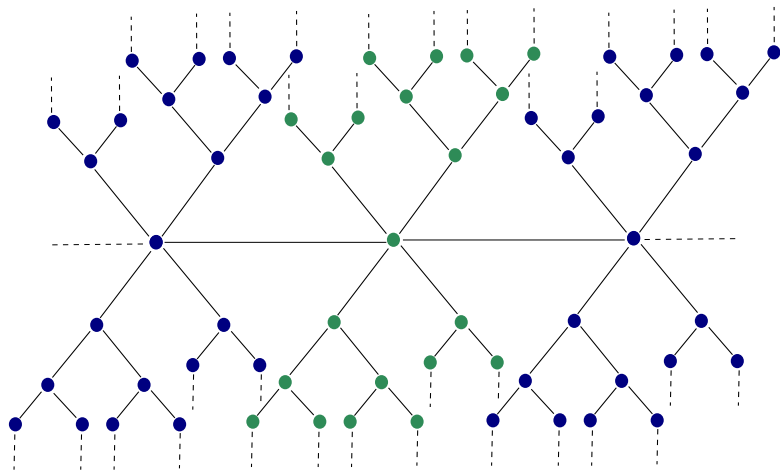


●  $G$  of infinite size

# The Downward Löwenheim-Skolem Property (DLSP)

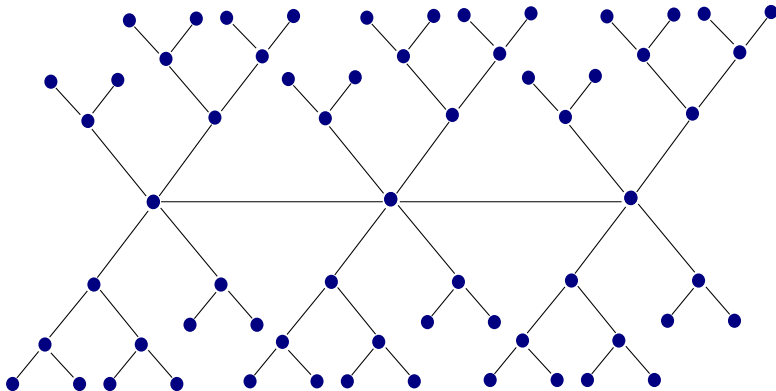


# The Downward Löwenheim-Skolem Property (DLSP)



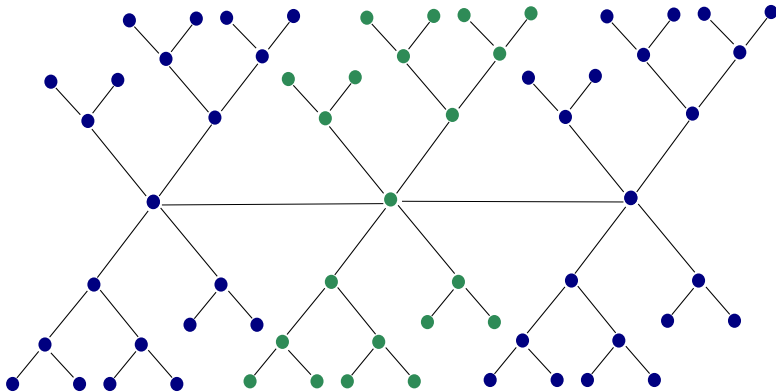
"A large (infinite) structure contains a similar small (infinite) substructure"

# A finitary analogue of DLSP



●  $G$  of finite size

# A finitary analogue of DLSP

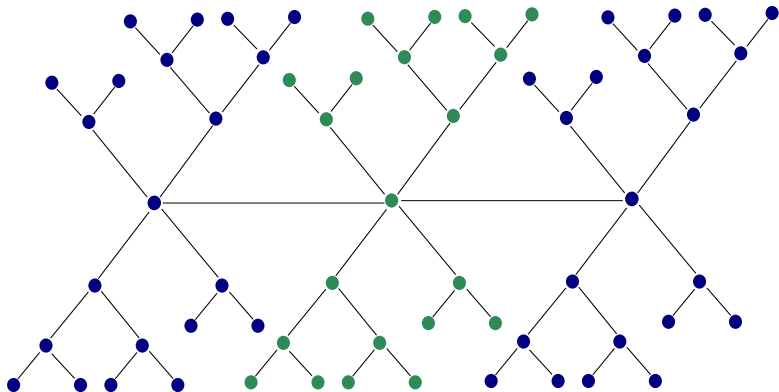


●  $G$  of finite size

$G$  "similar" to  $H$

●  $H$  of bounded size

## A finitary analogue of DLSP



"A large (finite) structure contains a similar small (finite) substructure"

# Relevance to computer science

- Classical math. structures used in CS: words/strings, trees (unordered, ordered, ranked), grids
- Graph theory: cliques,  $n$ -partite graphs, cographs, hamming graphs, graphs of bounded tree-depth
- Compilers: nested words
- Databases: DATALOG, CSPs, conjunctive queries
- Poset theory: well-quasi-ordering

## Philosophical import:

A finitary analogue of a beautiful “infinitary” idea can be widely useful in the finite world!