# Session 14
# Strategy 2: Decrease-and-Conquer

## Lecture Summary

Again, no elaboration on definition and operation of the (by now) familiar insertion sort; focus instead on understanding performance and its consequences. Start with topological sorting to use momentum from previous graph material; use source removal to intro strategy

### Topological Sorting

1. Motivation: project management and degree plans
2. DFS review (focus digraphs): vertex adjacency, connectivity
3. Digraph model and general problem statement
4. Topological sort solution basis: diagraph must be DAG
5. Solution procedure, example run:
   - Algorithm 1: DFS-based
   - Algorithm 2: source-removal (next)

## Session Exercise

📖 **Exercise 4.1** • 7, 8, 10 🛠 3, 4

**Activity** • Replace edge (C3, C5) with (C5, C3) in digraph of 📖 4.2. Perform both topological sort algorithms on the resulting graph. Can we produce a course schedule in this case?

**Activity** • (Slide Exercise) In digraph of 📖 4.2, which of the two possible solutions is obtained from a DFS starting at C2 and C3? (Do the DFS).

## Reading List

📖 4.1–4.2

## Keywords

DAG, directed cycle, source [vertex], strongly connected, topological [sort], weakly connected