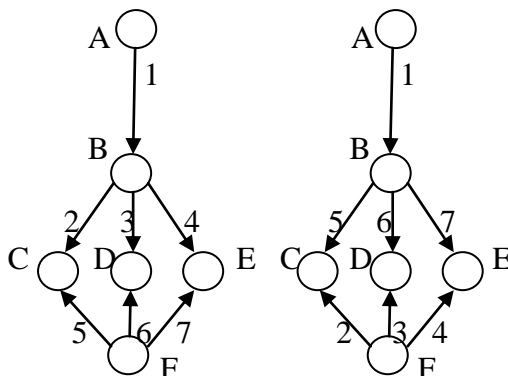# Tutorial 7

Solutions should be given till 10th December 2007, 16:00

Exercise 1   Topological edge ordering (15 points)

a) [5 pts.] Which of the following edge orderings is a topological edge ordering?

b) [5 pts.] How can you describe what a topological edge ordering means?
c) [5 pts.] Why is the topological edge ordering an important concept? What is it useful for?

Exercise 2   Inference (15 points)

a) [5 pts.] What does inference mean?
b) [5 pts.] What is the difference between "forward" inference and "backward" inference?
c) [5 pts.] Why are inference mechanisms important? Why do we not make inference directly based on the JDP?

Exercise 3   Some basic concept of exact inference (20 points)

The following short questions are related to some of the basic concepts of exact inferencing.
a) [4 pts.] What is the amount of edges in a tree, if the amount of vertexes is n?
b) [4 pts.] Consider we are given a topological ordering of vertexes of a DAG. We need a level map of the same DAG. What is the easiest way to get a level map?
c) [4 pts.] Is the level map unique in general? (Is there any graph, which has several level maps?)
d) [4 pts.] Is the level map unique in all special cases? (Is there any graph, which has only one level map?)
e) [4 pts.] Is there a polytree where some vertex v has several fathers, and v is not a <u>*direct ancestor*</u> (=child) of the roots.