16.8

Summary
Take away Points

1. **DAGs**

2. Topological orderings.

3. **DFS**: pre/post numbering.

4. Given a directed graph $G$, its **SCC**s and the associated acyclic meta-graph $G^{SCC}$ give a structural decomposition of $G$ that should be kept in mind.

5. There is a **DFS** based linear time algorithm to compute all the **SCC**s and the meta-graph. Properties of **DFS** crucial for the algorithm.

6. **DAGs** arise in many application and topological sort is a key property in algorithm design. Linear time algorithms to compute a topological sort (there can be many possible orderings so not unique).
An example of DFS forests
Example: Undirected **DFS** forest

The input graph (disconnected in this case):

The resulting **DFS** forest:
Example: Directed **DFS** forest

The input graph:

![Input Graph](image)

The resulting **DFS** forest (numbers indicate the order of **DFS**):

![DFS Forest](image)