

Exercise Sheet 6

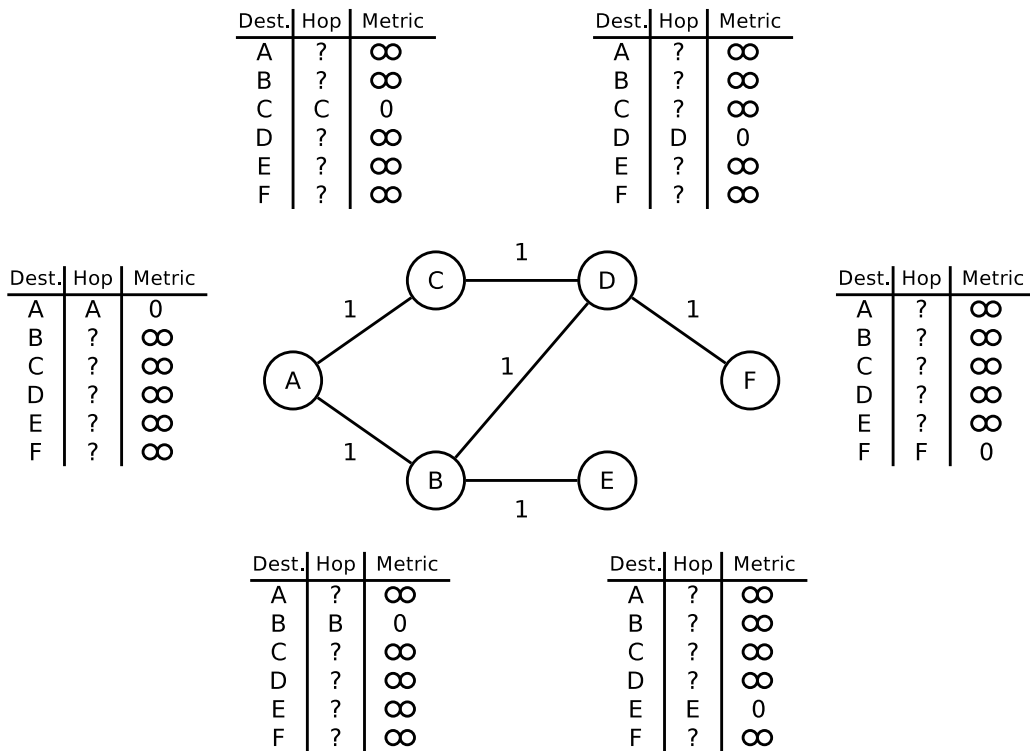
Exercise 1 (Forwarding and Path Calculation)

1. What is an **autonomous system**?
2. Which two major classes for **adaptive, dynamic routing protocols** exist?
3. Which **algorithms** are implemented by each of the routing protocol classes from subtask 2?
4. The **Border Gateway Protocol** (BGP) is a protocol for...
 Intra-AS routing Inter-AS routing
5. Which **routing protocol class** from subtask 2 implements the BGP?
6. **Open Shortest Path First** (OSPF) is a protocol for...
 Intra-AS routing Inter-AS routing
7. Which **routing protocol class** from subtask 2 implements OSPF?
8. The **Routing Information Protocol** (RIP) is a protocol for...
 Intra-AS routing Inter-AS routing
9. Which **routing protocol class** from subtask 2 implements the RIP?
10. When RIP is used, each Router communicates only with its **direct neighbors**. What are the **advantages** and **drawbacks** of method?
11. When RIP is used, the path cost (metric) depend only on the number of Routers (**hops**), which need to be passed on the way to the destination network. What is the **drawback** of this method?
12. When OSPF is used, **all Routers** communicate with each other. What are the **advantages** and **drawbacks** of method?

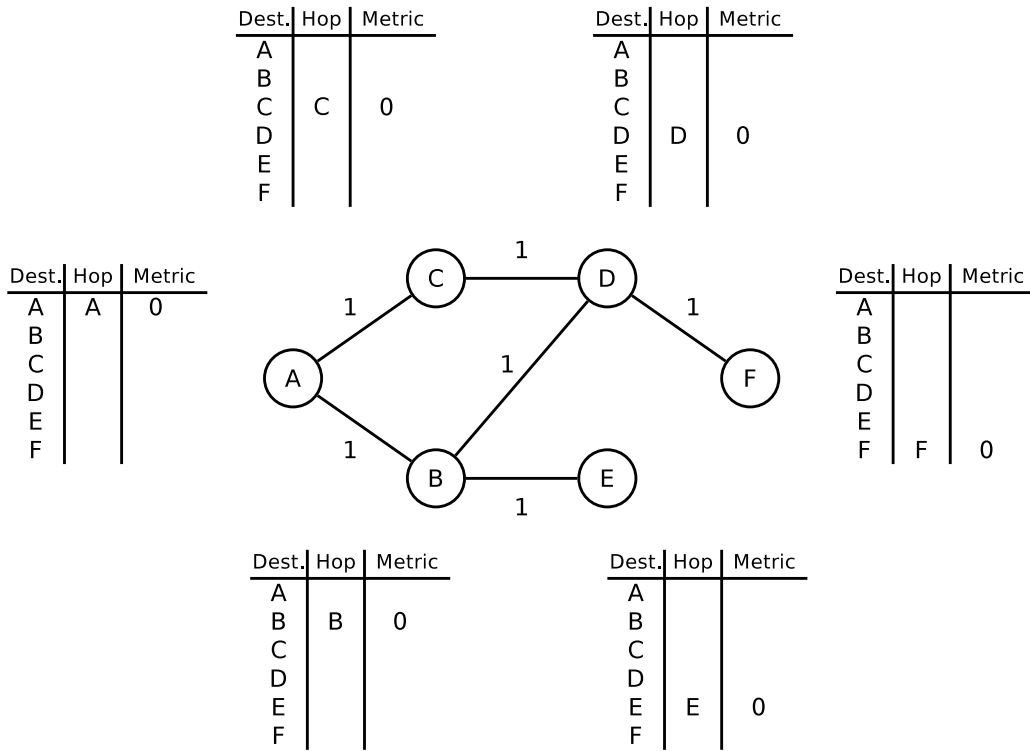
Exercise 2 (Bellman-Ford Algorithm)

1. **Calculate** the entries of the routing tables for each advertisement round of the Routing Information Protocol (RIP).
 (The hop metric is used.)

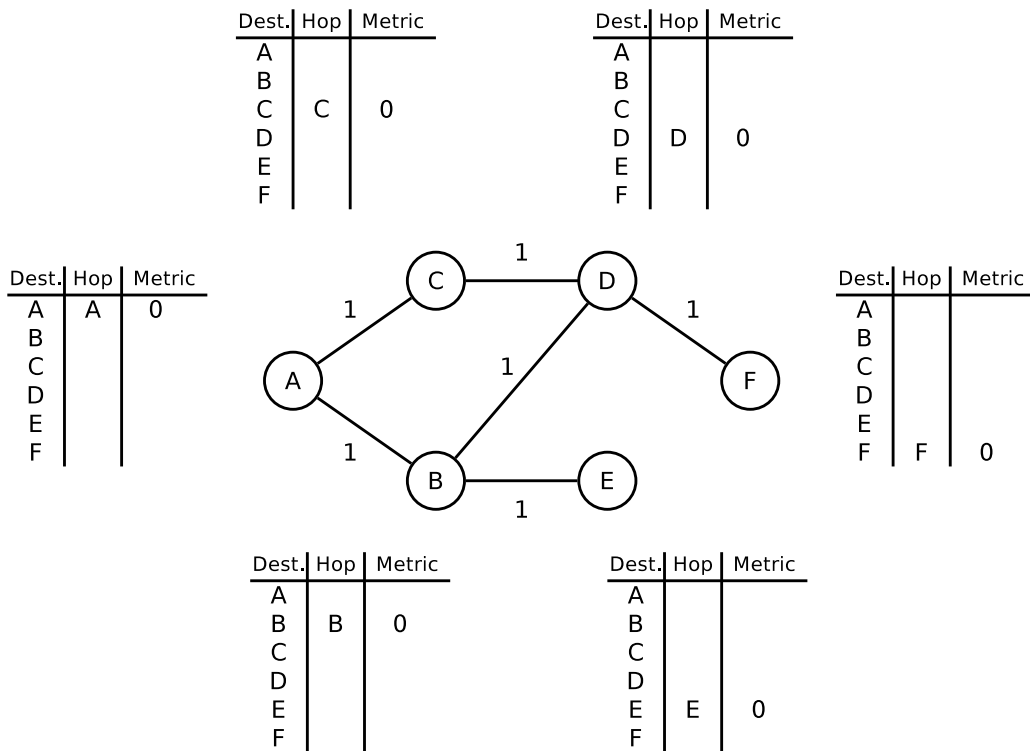
Step 1



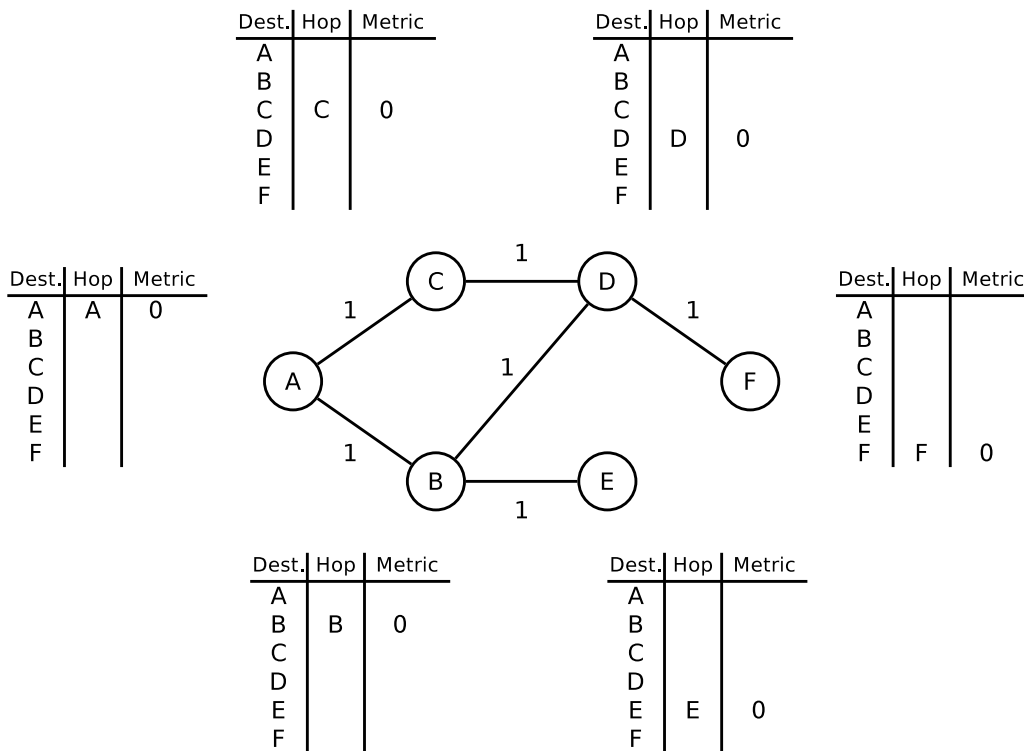
Step 2



Step 3



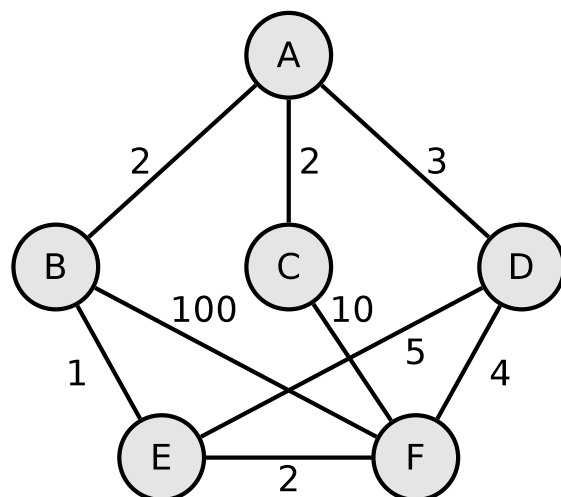
Step 4



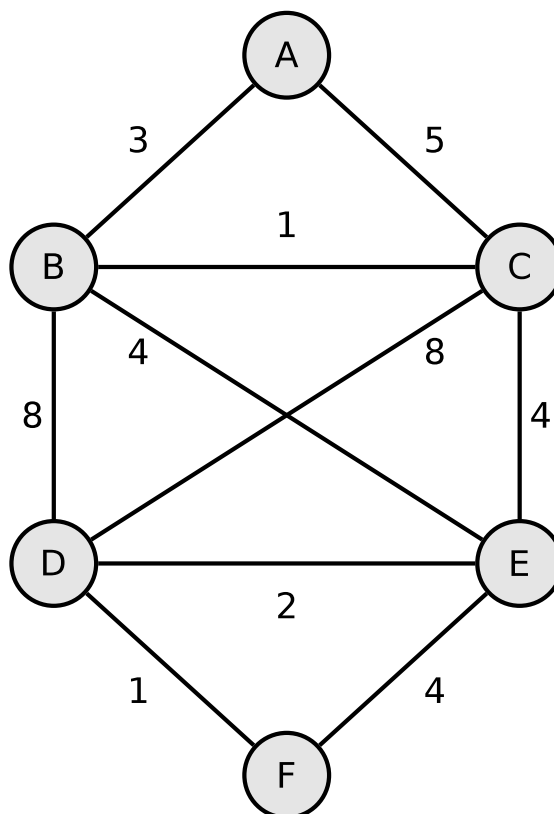
Exercise 3 (Dijkstra's Algorithm)

1. Calculate the shortest path from node A to all other nodes using Dijkstra's algorithm.

Source: Jörg Roth. Prüfungstrainer Rechnernetze. Vieweg (2010)



2. Calculate the shortest path from node A to all other nodes using Dijkstra's algorithm.



Exercise 4 (Do some research)

1. Which protocol is used in **OSPF** for establishing and maintaining relationships to neighboring routers?
2. According to Andrew Tanenbaum **Autonomous Systems** can be grouped into three categories. Which ones?
3. Explain what **BGP hijacking** is and list two popular incidents where it was used and why.
4. What is the **ASN** our university's network reside in?