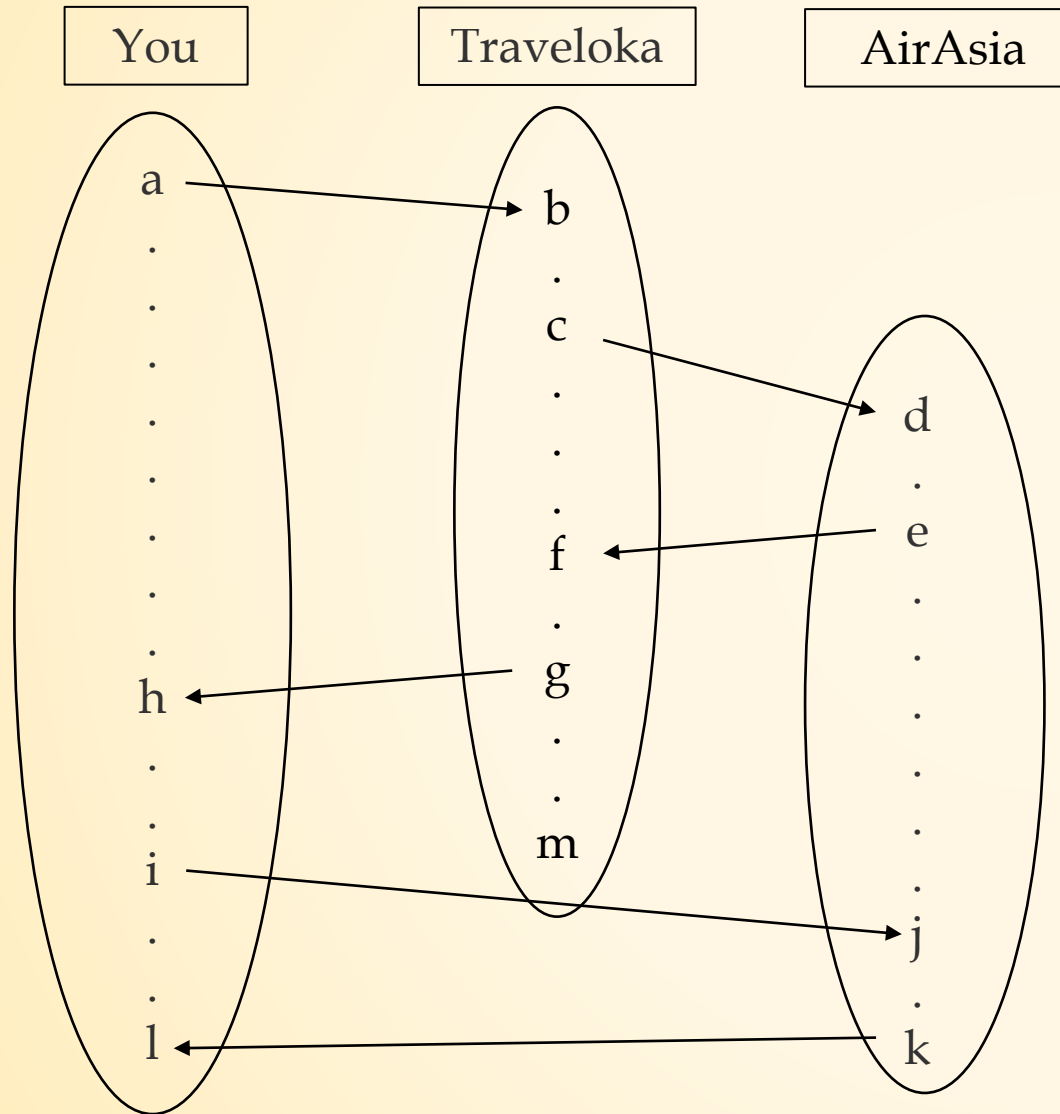


COS3043

System Fundamentals

Tutorial 1

Question 1



Identify the events by → and ||

Question 2

1. Illustrate the events of the three processes, P_0 , P_1 , and P_2 , using a timeline diagram along with their Lamport logical clock timestamps based on the following scenario.

Assume that initial logical clock values for all processes are all initialized to 0.

P_0	P_1	P_2
a. Execute a local event.	f. Execute a local event.	j. Send a message M1 to P_0 .
b. Receive a message M1 from P_2 .	g. Receive a message M2 from P_0 .	k. Execute a local event.
c. Send a message M2 to P_1 .	h. Execute a local event.	l. Receive a message M3 from P_0 .
d. Execute a local event.	i. Send a message M4 to P_2 .	m. Execute a local event.
e. Send a message M3 to P_2 .		n. Receive a message M4 from P_1 .

Question 2 (continue)

2. Identify all the happened-before relationships in the following diagram using \rightarrow .

3. What is the total order using process ID to break the tie (where lower process ID win)?