Quiz 6: Time and Events

Due Jun 22 at 11:59pm **Points** 100 **Questions** 4
Available Jun 16 at 8am - Jun 22 at 11:59pm 7 days **Time Limit** 60 Minutes
Allowed Attempts 2

Instructions

You can take this quiz up to 2 times, giving you a chance to correct simple arithmetic errors.

This quiz was locked Jun 22 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	36 minutes	6.25 out of 100

Score for this attempt: **6.25** out of 100
Submitted Jun 22 at 12:34pm
This attempt took 36 minutes.

Question 1 — 0 / 25 pts

What is the definition of the Lamport happened-before relation?

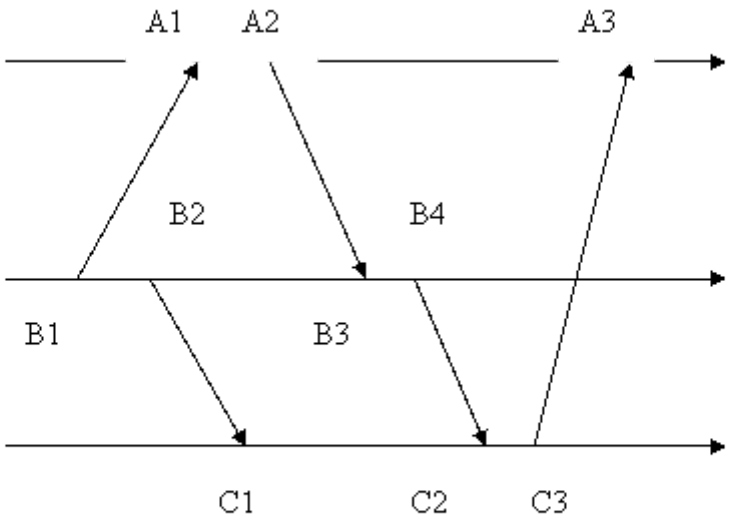
Your Answer:

Lamport happened-before relations orders events based on the causal relationship of the pair. If event A happens before B, the time of A is before the time of B.

1. (Local) If e1 happens before e2 in the same process, then e1 -> e2 2. (Communication) If e1 is sending of message m and e2 is receipt of message m, then e1 -> e2. 3. (Transitivity) If e1 -> e2 and e2 -> e3, then e1 -> e3.

Question 2

0 / 25 pts



Provide the logical timestamps for the events in the timeline above, *assuming **both** send and receive events are counted*, and logical time starts at 0 at each process.

LT(A1)= 1

LT(A2)= 2

LT(A3)= 7

LT(B1)= 0

LT(B2)= 1

LT(B3)= 3

LT(B4)= 4

LT(C1)= 2

LT(C2)= 5

LT(C3)= 6

Answer 1:

ou Answered 1

orrect Answer 2

Answer 2:

ou Answered 2

orrect Answer 3

Answer 3:

ou Answered 7

orrect Answer 8

Answer 4:

ou Answered 0

orrect Answer 1

Answer 5:

ou Answered 1

orrect Answer 2

Answer 6:

ou Answered 3

orrect Answer 4

Answer 7:

ou Answered 4

orrect Answer 5

Answer 8:

ou Answered 2

orrect Answer 3

Answer 9:

ou Answered 5

orrect Answer 6

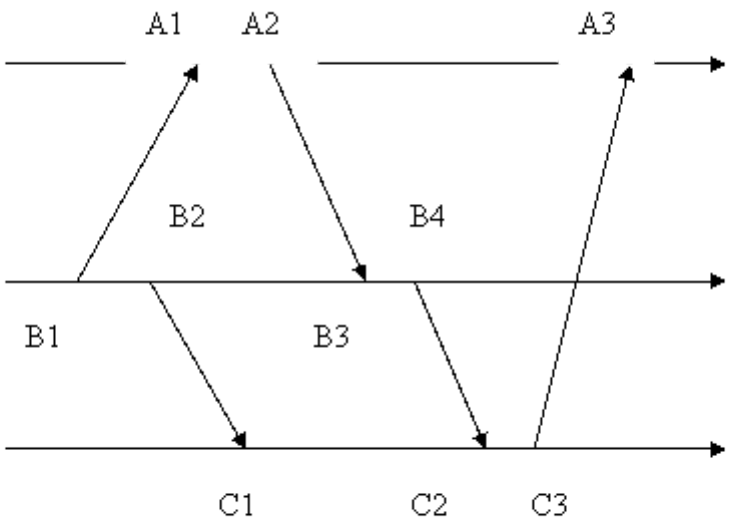
Answer 10:

ou Answered 6

orrect Answer 7

Question 3

0 / 25 pts



Provide the vector timestamps for the events in the timeline above, *assuming **both** send and receive events are counted*, and vector time starts at 000 at each process.

VT(A1)= 000

VT(A2)= 100

VT(A3)= 111

VT(B1)= 000

VT(B2)= 010

VT(B3)= 100

VT(B4)= 110

VT(C1)= 010

VT(C2)= 110

VT(C3)= 111

Answer 1:

ou Answered 000

orrect Answer 110

Answer 2:

ou Answered 100

orrect Answer 210

Answer 3:

ou Answered 111

orrect Answer 343

Answer 4:

ou Answered 000

orrect Answer 010

Answer 5:

ou Answered 010

orrect Answer 020

Answer 6:

ou Answered 100

orrect Answer 230

Answer 7:

ou Answered 110

orrect Answer 240

Answer 8:

ou Answered 010

orrect Answer 021

Answer 9:

ou Answered 110

orrect Answer 242

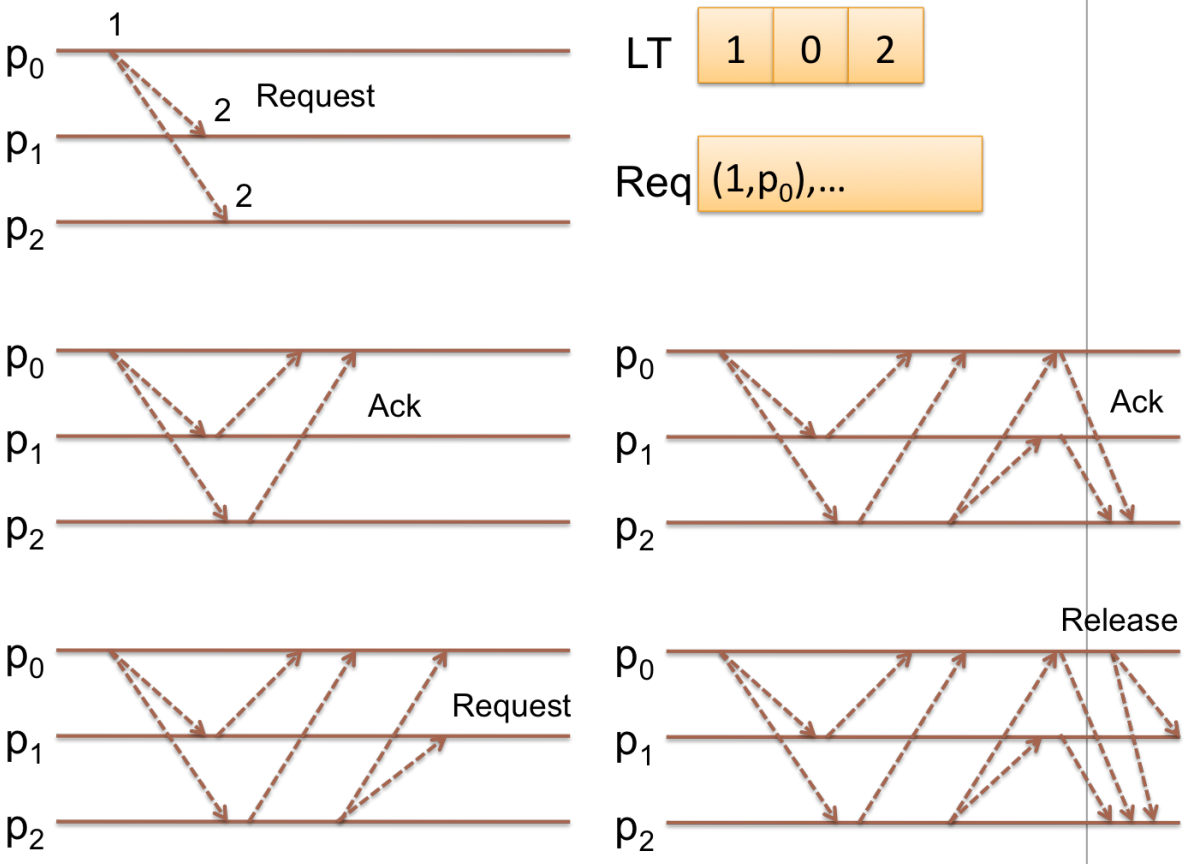
Answer 10:

ou Answered 111

orrect Answer 243

Question 4

6.25 / 25 pts



Here is a series of timelines for the execution of the distributed mutual exclusion algorithm, where we assume that all logical clocks start at zero. Show the following data structures **for process p_2** after each step: LT, the timestamps of the last messages received by p_2 from each process (and its own logical clock), and REQUESTS, the list of active requests that p_2 knows about, ordered by timestamp and process id.

1. First process p_0 broadcasts a request to the other resources.
   LT(0)=1, LT(1)=0, LT(2)=2
   REQUESTS=(1, p_0)
2. Each of the other two processes acknowledges the request.
   LT(0)= 5 , LT(1)= 3 , LT(2)=
   3
   REQUESTS= (3,p1), (3,p2), (5,p0)
3. Then process p_2 broadcasts a request.
   LT(0)= 6 , LT(1)= 4 , LT(2)=

4

REQUESTS= (4,p1), (4,p2), (6,p0)

4. Each of the other two processes acknowledges the request (p_1's ack is received first).

LT(0)= 7 , LT(1)= 5 , LT(2)= 7

REQUESTS= (5,p1), (7,p2), (7,p0)

5. Finally process p_0 releases the resource.

LT(0)= 8 , LT(1)= 8 , LT(2)= 8

REQUESTS= (8,p1), (8,p2), (8,p0)

Answer 1:

ou Answered 5

orrect Answer 1

Answer 2:

ou Answered 3

orrect Answer 0

Answer 3:

Correct! 3

Answer 4:

ou Answered (3,p1), (3,p2), (5,p0)

orrect Answer (1,p0)

Answer 5:

ou Answered 6

orrect Answer 1

Answer 6:

ou Answered 4

orrect Answer 0

Answer 7:

Correct! 4

Answer 8:

ou Answered (4,p1), (4,p2), (6,p0)

orrect Answer (1,p0),(4,p2)

Answer 9:

Correct! 7

Answer 10:

ou Answered 5

orrect Answer 6

Answer 11:

ou Answered 7

orrect Answer 8

Answer 12:

ou Answered (5,p1), (7,p2), (7,p0)

orrect Answer (1,p0),(4,p2)

Answer 13:

Correct!

8

Answer 14:

ou Answered

8

orrect Answer

6

Answer 15:

ou Answered

8

orrect Answer

9

Answer 16:

ou Answered

(8,p1), (8,p2), (8,p0)

orrect Answer

(4,p2)

Quiz Score: **6.25** out of 100