

# Unit 6 - Week 4

## Course outline

How does an NPTEL online course work?

Week 0 Assignment 0

Week 1

Week 2

Week 3

Week 4

Time and Clock  
Synchronization in Cloud Data Centers

Global State and Snapshot Recording Algorithms

Distributed Mutual Exclusion

Week 4: Lecture Material

Quiz : Assignment-4

Week 4 - FEEDBACK

Assignment-4 Solution

Week 5

Week 6

Week 7

Week 8

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## Assignment-4

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-02-26, 23:59 IST.**

1) The Ricart-Agrawala algorithm requires \_\_\_\_\_ messages per critical section invocation for N processes and the Synchronization delay in the algorithm is \_\_\_\_\_ 1 point

- $3(N - 1), T$
- $2(N - 1), T$
- $(N - 1), 2T$
- $(N - 1), T$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $2(N - 1), T$

2) \_\_\_\_\_ is a relative difference in clock values of two processes and

\_\_\_\_\_ is a relative difference in clock frequencies (rates) of two processes.

- Clock skew and Clock drift
- Clock drift and Eventual skew
- UTC (Universal Coordinated Time) and Clock skew
- Maximum drift rate and skew rate

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Clock skew and Clock drift

3) Which event is concurrent with the vector clock (2, 8, 4)? 1 point

- (3, 9, 5)
- (3, 8, 4)
- (1, 7, 3)
- (4, 8, 2)

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
(4, 8, 2)

4) A client gets a timestamp of 6:12:30.500 from a time server. The elapsed time between the request and response was 20 msec (0.020 sec). The current time on the client is 6:12:30.510. Using Cristian's algorithm i.e. server time +  $\frac{1}{2}$ (elapsed time), what is the time set on the client? 1 point

- 6:12:30.480
- 6:12:30.490
- 6:12:30.510
- 6:12:30.520

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
6:12:30.510

5) A client's clock reads 4:20:00. The server's clock reads 4:10:00 when they synchronize using the Berkeley algorithm. Assume message delays are negligible. What is the time at the client after synchronization? 1 point

- 4:20:00
- 4:10:00
- 7:30:00
- 4:15:00

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
4:15:00

6) True or False ? 1 point

DTP (Datacenter Time Protocol) uses the application layer of network devices to implement a decentralized clock synchronization protocol.

- True
- False

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
False

7) True or False ? 1 point

The Chandy-Lamport global snapshot algorithm works correctly for FIFO channels.

- True
- False

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
True

8) \_\_\_\_\_ provides Advisory locks only and doesn't guarantee mutual exclusion unless every client checks lock before accessing resource. 1 point

- Paxos
- Google's Chubby
- Cassandra
- Microsoft Azure

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Google's Chubby

9) Find out the correct property to solve mutual exclusion in distributed system: 1 point

Property 1: At most one process executes in critical section at any time

Property 2: Every request for a critical section is granted eventually

Property 3: Requests are granted in the order they were made

- Property 1: Liveness, Property 2: Fairness, Property 3: Safety
- Property 1: Safety, Property 2: Fairness, Property 3: Liveness
- Property 1: Fairness, Property 2: Safety, Property 3: Liveness
- Property 1: Safety, Property 2: Liveness, Property 3: Fairness

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Property 1: Safety, Property 2: Liveness, Property 3: Fairness

10) Consider the following statements: 1 point

Statement 1: Lamport's algorithm achieves mutual exclusion.

Statement 2: Lamport's algorithm doesn't provide fairness.

- Only statement 1 is true
- Only statement 2 is true
- Both statements are true
- Both statements are false

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
Only statement 1 is true