LISTA DE EXERCICIOS 3

Bancos de dados Distribuídos

Disciplina Bancos de Dados II (INE 5613 – 2006-1)
Curso de Sistemas de Informação

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Exercícios adaptados de:

Ramakrishnan, R. *Database management systems*, McGraw-Hill, 3rd edition, 2003.

Chapter 21: Parallel and Distributed Databases

1. Defina os termos fragmentação e replicação de dados.

2. Qual a diferença entre replicação síncrona e assíncrona?

3. O que é independência de localização em um sistema de banco de dados distribuído?

Fonte:

Elmasri, R.; Navathe, S.B. *Fundamentals of database Systems*. 3 ed., Addisson-Wesley, 2000.

Chapter 24: Distributed Databases

24.20 Consider the following relations:
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BOOKS (Book#, Primary_author, Topic, Total_stock, $price)

BOOKSTORE (Store#, City, State, Zip, Inventory_value)

STOCK (Store#, Book#, Qty)

Total_stock is the total number of books in stock, and inventory_value is the total inventory value for the store in dollars.

a. Give an example of two simple predicates that would be meaningful for the BOOKSTORE relation for horizontal partitioning.
b. How would a derived horizontal partitioning of STOCK be defined based on the partitioning of BOOKSTORE?
c. Show predicates by which BOOKS may be horizontally partitioned by topic.

d. Show how the STOCK may be further partitioned from the partitions in (b) by adding the predicates in (c).

24.21 Consider a distributed database for a bookstore chain called National Books with
. 3 sites called EAST, MIDDLE, and WEST. The relation schemas are given in question 24.20. Consider that BOOKS are fragmented by $price amounts into:

B_1: BOOK1: up to $20.
B_2: BOOK2: from $20.01 to $50.
B_3: BOOK3: from $50.01 to $100.
B_4: BOOK4: $100.01 and above.

Similarly, BOOKSTORES are divided by Zipcodes into:

S_1: EAST: Zipcodes up to 35000.
S_2: MIDDLE: Zipcodes 35001 to 70000.
S_3: WEST: Zipcodes 70001 to 99999.

Assume that STOCK is a derived fragment based on BOOKSTORE only.

    a. Consider the query:

SELECT Book#, Total_stock

FROM Books

WHERE $price > 15 and $price < 55;

Assume that fragments of BOOKSTORE are non-replicated and assigned based on region. Assume further that BOOKS are allocated as:

EAST: B_1, B_4
MIDDLE: B_1, B_2
WEST: B_1, B_2, B_3, B_4

Assuming the query was submitted in EAST, what remote subqueries does it generate? (write in SQL).

    b. If the bookprice of Book#= 1234 is updated from $45 to $55 at site MIDDLE, what updates does that generate? Write in English and then in SQL.

    c. Given an example query issued at WEST that will generate a subquery for MIDDLE.

    d. Write a query involving selection and projection on the above relations and show two possible query trees that denote different ways of execution.