Data Warehousing and Business Intelligence (DS3003)

Date: November 4th 2024

Course Instructor
M. Ishaq Raza

Sessional-II Exam

Total Time (Hrs.): 1
Total Marks: 25
Total Questions: 3

22L-7503
Roll No

BDS-5A
Section

Student Signature

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Note: Please ensure that you attempt all questions and their respective parts in the given order. You may use a calculator.

CLO # 1: Demonstrate an appreciation of the role that DW and BI play in enhancing the decision-making process.

Q. No 1: Give the appropriate answers to the following questions: [3+2]

a. When it is appropriate to use full data refresh loading strategy? Also suggest at least two practical steps that expedite the full data refresh loading process.
b. Briefly explain the two most efficient immediate data extraction techniques.

Consider the following description for the next Questions:
Consider the following tables and statistics which are part of a Library system:
Book (BookID, Title, Publisher, PublishYear, Author, ...);
BookLoan (BookID, BranchID, CardNo, DateOut, DueDate, ...);

Assume Book and BookLoan tables containing *100,000* and *2,000,000* rows respectively. Each table row and each index entry take *200 bytes* and *15 bytes of* space respectively. Data block size is *8KB* and available memory size is *100 blocks*. Suppose selectivity of publisher 'Wiley'= 10%, publishYear '2023'= 8%, author 'Inmon'= 4%, and author 'Kimball'=2%.

CLO # 1: Demonstrate an appreciation of the role that DW and BI play in enhancing the decision-making process.

Q. No 2: Calculate the total I/O cost for the Query using the following indexed access paths. Show all steps clearly. [10]

Query: *SELECT * FROM book*
WHERE publisher= 'Wiley' AND publishYear= '2023' AND author IN ('Inmon', 'Kimball');

a. Clustered Index access *(Assume clustered index exit on Author column)*
b. Static Bitmap Index access *(Assume static bitmap indexes exist on Publisher, PublishYear, and Author columns separately)*

CLO # 1: Demonstrate an appreciation of the role that DW and BI play in enhancing the decision-making process.

Q. No 3: Calculate the total I/O cost to execute this Query using the following joining techniques. Show all steps clearly. Assume static bitmap indexes exist on Publisher, PublishYear, and Author columns of Book table and there is no index on BookLoan table. [3+3+4= 10]

Query: *SELECT * FROM book JOIN BookLoan ON Book.BookID = BookLoan.BookID*
WHERE publisher= 'Wiley' AND publishYear= '2023' AND author IN ('Inmon', 'Kimball');

a. Sort Merge Join
b. Hash Join
c. Nested Loop Join *(Identify the most efficient variant of NLJ in this scenario, then compute the I/O cost of that variant only.)*