

L20 : Indexing

1-Tut : MCQ - 1

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An index helps to speed up which operation?

Options

This problem has only one correct answer

SELECT queries

WHERE clauses

Both A and B

UPDATE Query

Correct Answer : C

Solution Description

Indexing is a method that helps us to locate a record or data present in the memory faster. Indexing boosts the efficiency by minimizing the number of disk accesses required when we process a query. This will help to speed up operations with READ operations like- SELECT queries, WHERE clause etc.

2-Tut : MCQ - 2

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The index consists of

Options

This problem has only one correct answer

a. list of keys

b. pointers to the key in the table

c. both (a) and (b)

d. none

Correct Answer : C

Solution Description

The index is a data structure that we use to perform indexing. Indexes contain a few database columns:

1. The first column consists of a search key, which contains the copy of the primary key of the table so that the data access time could be reduced which means data can be accessed quickly. The order of the key may or may not be sorted.

2. The second column is the data reference. It contains pointers holding the address of the disk block where the value corresponding to the key is stored.

3-Tut : MCQ - 3

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Which of the following is true.

1. Sparse indices can be used only if the relation is stored in sorted order of the search key.

2. It is generally faster to locate a record if we have a dense index rather than a sparse index.

Options

This problem has only one correct answer

Only 1

Only 2

None

Both 1 and 2

Correct Answer : D

Solution Description

Indexing is a method that helps us to locate the data present in the memory efficiently. There are two types of primary indexing:

1. Sparse indexing
2. Dense indexing

In the above question, the main focus is on the sparse indexing technique, a variety of index columns stores an equivalent block address. When data is retrieved, the block address is going to be fetched. That is why sparse indices are smaller in size in comparison to dense Indices. That is why it is generally faster to locate a record if we have a dense index rather than a sparse index. Sparse indices can be used only if the relation is stored in the sorted order of the search key.

4-Tut : MCQ - 4

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Primary index is further divided into dense index and sparse index. Which of the following is true about both.

Options

This problem has only one correct answer

Dense index is not space friendly.

Sparse index is not space friendly.

Sparse index is faster than Dense index.

a and c

Correct Answer : A

Solution Description

The difference between dense index and sparse index is shown below:

Dense Index	Sparse Index
Space taken for the index table is large.	Space taken for the index table is smaller.
Time taken to locate the record is less in comparison	Time taken to locate the record is more.
The records in the data file are in specific order and need not be in any kind of cluster or chunk.	The records in the data file are in specific order but the data records are in a cluster or chunk. (i.e. pointers from the index table point to certain data records, and all records between those pointers are considered in one cluster or chunk.)

5-Tut : MCQ - 5 (Indexing Numerical)

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A block can hold either 6 records or 12 key pointers. A database contains 48 records, then how many blocks is required to hold the data file and the dense index?

Answer

[Type here](#)

Solution Description

Ans: 12

Explanation: We know, the database contains 48 records and a block can hold 6 records or hold 12 key pointers. Therefore, how many blocks can hold 48 records?

$$48/6 = 8$$

Similarly, how many blocks for 12 key pointers?

$$48/12 = 4$$

Hence, total blocks = $8+4=12$.

6-Tut : MCQ - 6 (Indexing Numerical)

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Suppose a block can hold either 5 records or 10 (key, pointer) pairs. If there are x number of records and dense indexing is used then how many blocks do we need to hold a data file and dense index?

Answer

[Type here](#)

Solution Description

Ans : $3*x/10$

Explanation: Total no. of records given = x.

A block can hold 5 records.

We know in dense indexing the number of rows in the index table is the same as those in the main table.

So, How many blocks to hold x records?

$$x/5$$

Similarly, a block can hold 10 key pointers. So,

How many blocks to hold x key pointers?

$$x/10$$

Therefore, Total blocks = $x/5 + x/10 = 3*x/10$

7-Tut : MCQ - 7

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Which of the following indexes is defined on an ordered data file and created on a non-key field?

Options

[This problem has only one correct answer](#)

[Primary index](#)

[Secondary index](#)

[B-trees](#)

[Clustering index](#)

Correct Answer : D

Solution Description

Clustering Index is the index that is created and ordered on the basis of the non-primary key attributes of the table. These attributes are not unique for each record. In Clustering index, to fetch a record we group two or more attributes together to get the unique values and create an index out of them. Clustering index is an ordered data file which is created on a non-key field.

8-Tut : MCQ - 8

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Which of the following will be considered as multi level indexing?

Options

This problem has only one correct answer

- Clustering indexing
- Secondary indexing
- Primary Indexing
- All of them

Correct Answer : B

Solution Description

Secondary index is taken into consideration when the size of datafile increases i.e. when the size of the table increases, sparse indexing starts to slow down. To overcome this we introduce another level of indexing that is known as secondary indexing. In this, we select a huge chunk of columns initially and put it up at the first level of indexing which is known as primary level indexing. The data of primary level indexing is stored in primary memory. After this, each chunk is divided into smaller ranges. This is known as the second level of indexing, this is stored in the secondary memory along with the actual data file. Secondary indexing is also known as multilevel indexing.

9-Tut : MCQ - 9

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Which of the following operations does indexing slows down.

1. DELETE
2. INSERT
3. SELECT
4. READ

Options

This problem has only one correct answer

- Only 1,3
- Only 2,4
- Only 1,2
- Only 1,2,4

Correct Answer : C

Solution Description

Indexing results in the reduction of the speed of execution of write operations in the memory. Major Write operations are INSERT, UPDATE and DELETE operations.

10-Tut : MCQ - 10

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When the records of the main table are sorted on the basis of search key which is also the primary key, and so is the order of the index table, it's called :

Options

This problem has only one correct answer

[Primary Indexing](#)

[Secondary Indexing with key](#)

[Clustered Indexing](#)

[Secondary Indexing with non-key](#)

[Correct Answer : A](#)

Solution Description

When the indexing is done on the basis of the primary key of the data file it is known as the primary indexing. During the primary indexing, the data file is already ordered to support the primary key. Primary Index is an ordered file whose records are of fixed length with two fields. The primary field of the index replicates the primary key of the information entered in an ordered manner, and therefore the second field of the ordered file contains a pointer that points to the data block where a record containing the keys is available.

11-Tut :