CL203 - Database Systems Lab

Lab#14 – Indexes

Indexes

A database index is a data structure that improves the speed of operations in a table. Indexes can be created using one or more columns, providing the basis for both rapid random lookups and efficient ordering of access to records.

While creating index, the columns which will be used to make SQL queries should be considered and create one or more indexes on those columns. Practically, indexes are also type of tables, which keep primary key or index field and a pointer to each record into the actual table. The users cannot see the indexes, they are just used to speed up queries and will be used by Database Search Engine to locate records very fast.

INSERT and UPDATE statements take more time on tables having indexes whereas SELECT statements become fast on those tables. The reason is that while doing insert or update, database need to insert or update index values as well.

Simple and Unique Index

You can create a unique index on a table. A unique index means that two rows cannot have the same index value. Here is the syntax to create an Index on a table:

```
CREATE UNIQUE INDEX index_name
ON table_name ( column1, column2,...);
```

You can use one or more columns to create an index.

```
CREATE UNIQUE INDEX NIC_INDEX
ON student (nic_no)
```

You can create a simple index on a table. Just omit UNIQUE keyword from the query to create simple index. Simple index allows duplicate values in a table. If you want to index the values in a column in descending order, you can add the reserved word DESC after the column name.

```
CREATE UNIQUE INDEX NIC_INDEX
ON student (nic_no DESC)
```

ALTER command to add and drop INDEX

There are four types of statements for adding indexes to a table:

ALTER TABLE tbl_name ADD PRIMARY KEY columnlist: This statement adds a PRIMARY KEY, which means that indexed values must be unique and cannot be NULL.

ALTER TABLE tbl_name ADD UNIQUE index_name columnlist: This statement creates an index for which values must be unique with the exception of NULL values, which may appear multiple times.

ALTER TABLE tbl_name ADD INDEX index_name columnlist: This adds an ordinary index in which any value may appear more than once.

ALTER TABLE tbl_name ADD FULLTEXT index_name columnlist: This creates a special FULLTEXT index that is used for text-searching purposes.

Here is the example to add index in an existing table.

```
ALTER TABLE STUDENT ADD FULLTEXT INDEX (name)
```

To drop the index use the following command:

```
ALTER TABLE STUDENT DROP INDEX name
```

To drop an index that is not a PRIMARY KEY, you must specify the index name.

Displaying INDEX Information

You can use SHOW INDEX command to list out all the indexes associated with a table. Vertical format output specified by\G often is useful with this statement, to avoid long line wraparound:

Try out the following example:

```
SHOW INDEX FROM table_name\G
```