# UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

SCS 2209 - DATABASE II | SQL Indexes


**Instructions**

- Download the .sql file in the UGVLE and import the file to phpMyAdmin.
- Use the salescompany database to write SQL queries for each question.
- Save your SQL queries and results to a text document with the relevant question number. Make sure you have saved the text file using your index number.
- Then upload it to the UGVLE

A database **index** is a data structure that improves the speed of operations in a table. Indexes are also a type of table with a primary key or index field and a pointer to each record into the actual table. The users of the database cannot see the indexes. Indexes are just used to speed up queries.

Both INSERT and UPDATE statements take more time on tables with indexes. The reason is that while doing insert or update, a database needs to insert or update the index values as well. Hence, the SELECT statements become fast on those tables.

Indexes are used to find rows with specific column values quickly. Without an index, MySQL must begin with the first row and then read through the entire table to find the relevant rows. The larger the table, the more this cost. If the table has an index for the columns in question, MySQL can quickly determine the position to seek to in the middle of the data file without having to look at all the data. This is much faster than reading every row sequentially.

**Unique Index (Creating a unique index on a table)**

A unique index means that two rows cannot have the same index value. We can use one or more columns to create an index. To add an index for a column or a set of columns, use the CREATE INDEX statement as follows:

**Syntax:**

***mysql> CREATE UNIQUE INDEX index_name ON table_name ( column1, column2,...);***

**Simple Index (Creating a simple index on a table)**

A simple index allows duplicate values in a table. Omit the UNIQUE keyword from the query to create a simple index. If we need to index the values in a column in descending order, add the

keyword **DESC** after the column name. ASC and DESC are also not supported for multi-valued indexes.

**Syntax:**

***mysql> CREATE INDEX AUTHOR_INDEX ON table_name (column1 DESC);***

**ALTER command to add INDEX**

Below statements can be used to add an index to an existing table.

**Syntax:**

***mysql> ALTER TABLE tbl_name ADD UNIQUE index_name (column_list) ;***

This statement creates a unique index for which the values must be unique (except for the NULL values, which may appear multiple times).

**Syntax:**

***mysql> ALTER TABLE tbl_name ADD INDEX index_name (column_list)*** ;

This statement creates an ordinary index in which any value may appear more than once.

**ALTER command to drop the INDEX**

You can drop any INDEX by using the DROP clause along with the ALTER command.

**Syntax:**

***mysql> ALTER TABLE tbl_name DROP index_name (c);***

**Displaying INDEX Information**

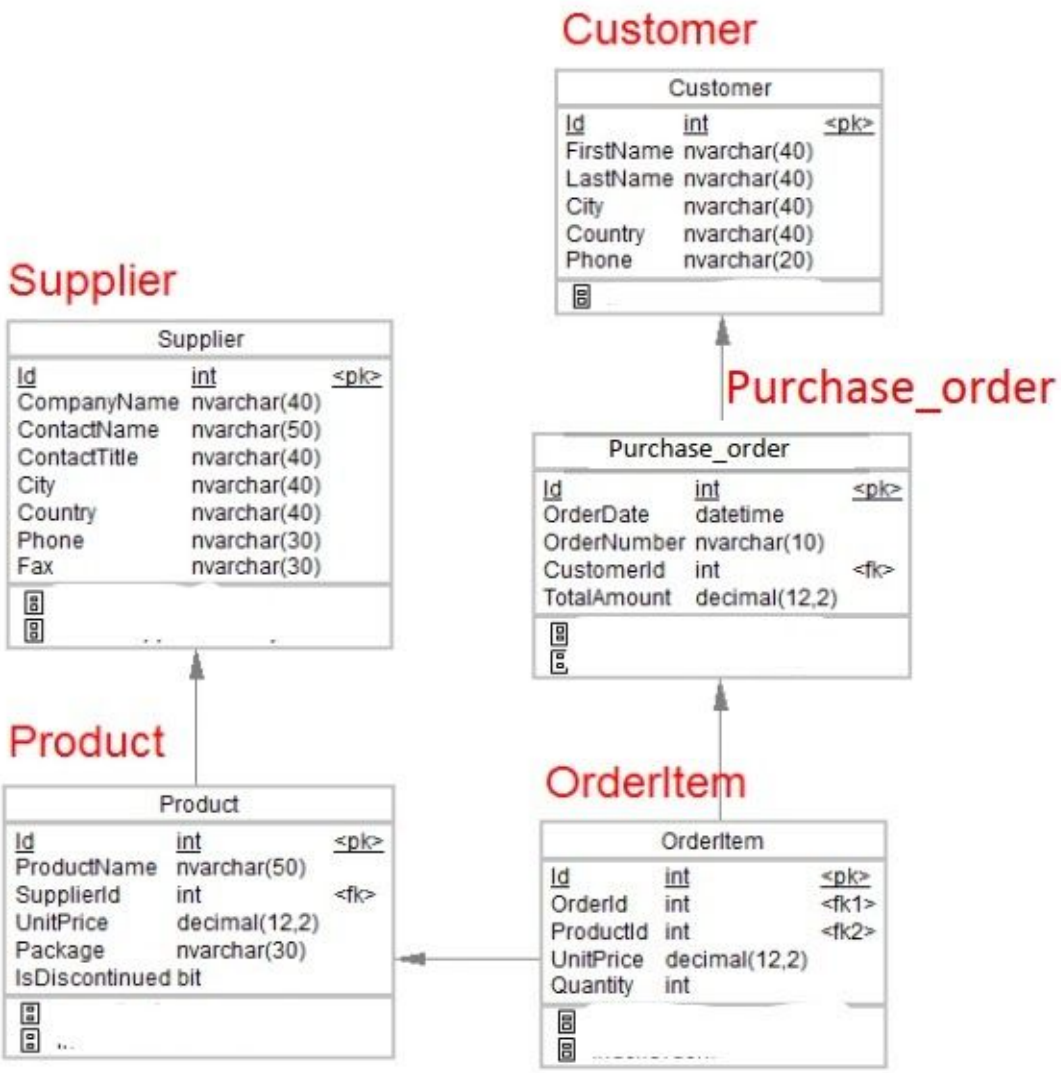
You can use the SHOW INDEX command to list out all the indexes associated with a table. The vertical-format output (specified by \G) often is useful with this statement, to avoid a long line wraparound

**Syntax:**

***mysql> SHOW INDEXES FROM tbl_name ;***

**Exercise**

Consider the relational database for the XYZ Sales Company which contains details regarding their customers, suppliers, products, orders, and items included in orders. The below ERD displays tables, columns, data types, relationships, primary keys, and foreign keys in the relational database.




1. Management of the XYZ Sales Company has decided to give a special promotion to the customers in their next purchase order if they have brought more than 3 items in any of their previous purchase orders. Write a SQL query to get the list of eligible customers for this special promotion. The list should include the details of the customer and the purchase order number(s) which made them eligible for the promotion.

2. Create an index for the column *Country* in the *customer* table by using the CREATE INDEX statement. (view the result in structure tab)

3. Create an index for the *UnitPrice* column in the *Product* table so that the unit prices will be arranged as the highest unit prices item first.

4. Show the indexes in the customer table.

5. Find how many customers are there whose country is "Spain" , using EXPLAIN SELECT statement.

6. Remove the index created in question 02.

7. Identify a candidate key for the customer table and create a unique index for the column.

8. Jenny Mendel is the daughter of Roland Mendel, whose Id is 20 in the customer table and both of them are using the same phone number. Try to insert the following details to the customer table and show that you cannot insert duplicate values for a unique index.

| Id | FirstName | LastName | City | Country | Phone |
|---|---|---|---|---|---|
| 100 | Jenny | Mendel | Graz | Austria | 7675-3425 |

9. Try inserting a simple index to the same column you identified in (7) above and check whether you are able to create multiple indexes for the same column.

10. Drop all the indexes in the Customer table except the Primary key from a single SQL statement.