 A [database index](http://en.wikipedia.org/wiki/Database_index) is a data structure that improves the **speed of data retrieval operations on a database table**

There are two types of indexing in SQL.

1. **Clustered index(Dictionary)**
2. **Non-clustered index(Textbook)**

Clustered index is the type of indexing that established a physical sorting order of rows. Suppose you have a table *Student\_info* which contains *ROLL\_NO* as a primary key than Clustered index which is self created on that primary key will sort the *Student\_info* table as per *ROLL\_NO*. **Clustered index is like Dictionary, in the dictionary sorting order is alphabetical there is no separate index page.**

**Examples:  
Input:**

CREATE TABLE Student\_info

(

ROLL\_NO int(10) **primary key**,

NAME varchar(20),

DEPARTMENT varchar(20),

);

insert into Student\_info values(1410110405, 'H Agarwal', 'CSE')

insert into Student\_info values(1410110404, 'S Samadder', 'CSE')

insert into Student\_info values(1410110403, 'MD Irfan', 'CSE')

SELECT \* FROM Student\_info;

**Output:**

|  |  |  |
| --- | --- | --- |
| **ROLL\_NO** | **NAME** | **DEPARTMENT** |
| 1410110403 | MD Irfan | CSE |
| 1410110404 | S Samadder | CSE |
| 1410110405 | H Agarwal | CSE |

**If we want to create Clustered index on other column then first we have to remove the primary key after that we can remove the previous index.**

**Note that defining a column as a primary key makes that column the Clustered Index of that table. To make any other column, clustered index first we have to remove the previous one as follows below procedure.**

**Note: We can create only one clustered index in a table.**

**2.Non-clustered(textbook)**  
The Non-Clustered index is an index structure separate from the data stored in a table that reorders one or more selected columns. The non-clustered index is created to improve the performance of frequently used queries not covered by clustered index. It’s like a textbook, the index page is created separately at the beginning of that book.

**Examples:**

**Input:**

CREATE TABLE Student\_info

(

ROLL\_NO int(10),

NAME varchar(20),

DEPARTMENT varchar(20),

);

insert into Student\_info values(1410110405, 'H Agarwal', 'CSE')

insert into Student\_info values(1410110404, 'S Samadder', 'CSE')

insert into Student\_info values(1410110403, 'MD Irfan', 'CSE')

SELECT \* FROM Student\_info

**Output:**

|  |  |  |
| --- | --- | --- |
| **ROLL\_NO** | **NAME** | **DEPARTMENT** |
| 1410110405 | H Agarwal | CSE |
| 1410110404 | S Samadder | CSE |
| 1410110403 | MD Irfan | CSE |
|  |  |  |

**Note: We can create one or more Non\_Clustered index in a table.**

**Clustered vs Non-Clustered index:**

* In a table there can be only one clustered index or one or more than one non clustered index.
* In Clustered index there is no separate index storage but in Non\_Clustered index there is separate index storage for the index.
* Clustered index is slower than Non Clustered index.

By default, MySQL creates the B-Tree index if you don’t specify the index type.

For detail: see must <https://www.mysqltutorial.org/mysql-index/mysql-create-index/>