

## **CS344 :Databases and CS345: Database Lab**

Instructors

Pre-Mid Semester: **S Ranbir Singh**

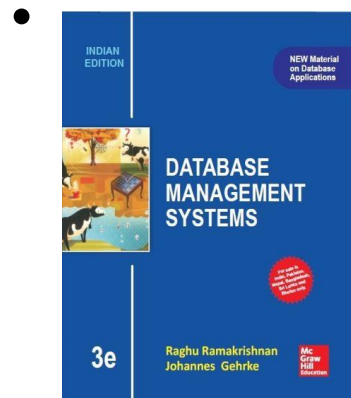
Post-Mid Semester: Amit Awekar

Mid: 30 Marks

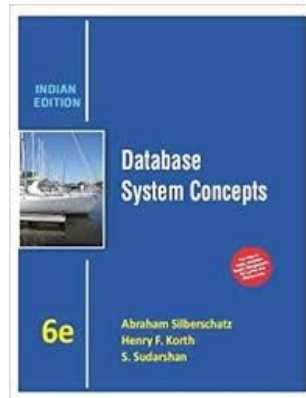
Quiz 1: 10 Marks

End: ?

- Books:



**Database Management System, 3<sup>rd</sup> Ed. By Ramakrishnan & Gehrke**



**Database System Concept, 6<sup>th</sup> Ed. Silberschatz, Korth, Sudarshan**

# Introduction to MySQL

Sanasam Ranbir Singh

CS344@IITG

# Database Management System

- Database is simply a collection of data.
- Types of Databases
  - Hierarchical databases
  - Network databases
  - **Relational databases**
  - Object-oriented databases
  - Graph databases
  - ER model databases
  - Document databases
  - NoSQL databases

# Database Management System ...

- In relational Database, data is organized as **Tables**.

## Students

Roll Number	Name	Branch	Program	Gender	Year of Joining
CSE201801001	Rahul Kr Nath	CSE	BTECH	M	2018
CSE201801002	Roshan Singh	CSE	BTECH	M	2018
CSE201802001	John	CSE	MTECH	M	2019
CSE201901001	Sweta Devi	CSE	BTech	F	2019

## Grades

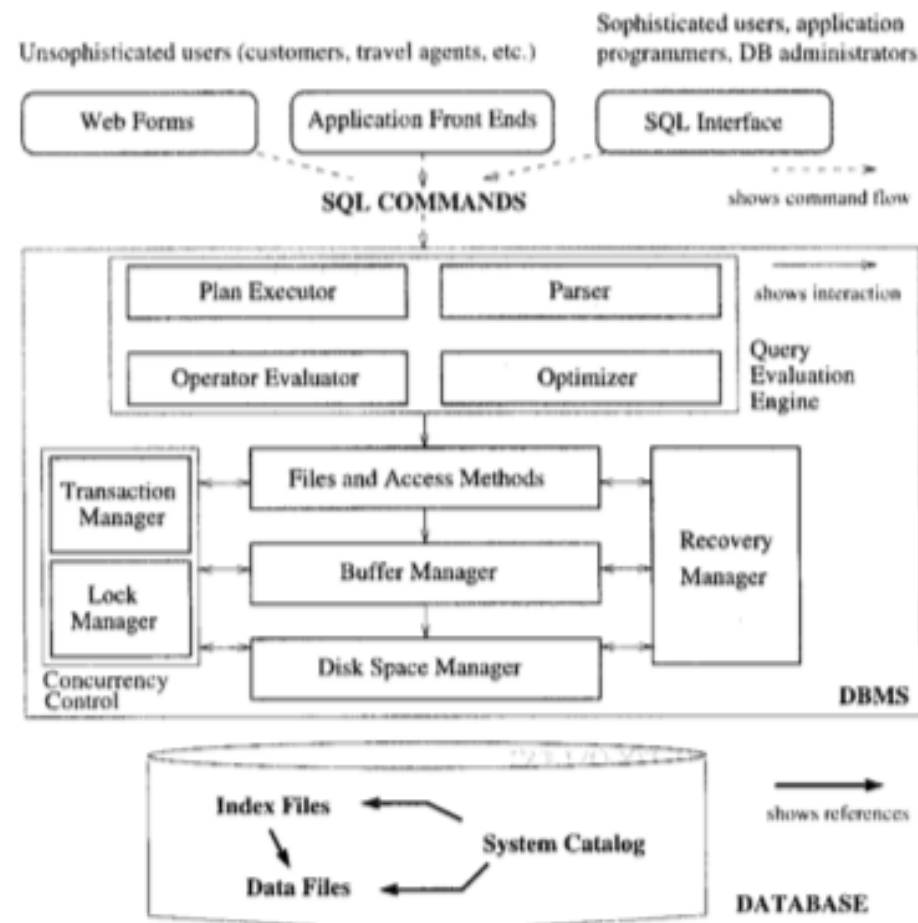
Roll Number	CGPI
CSE201801001	8.1
CSE201801002	9.2
CSE201802001	7.7
CSE201901001	8.4

## Address

Roll Number	House No	City	State
CSE201801001	A-2019	Guwahati	Assam
CSE201801002	A-3001	Kolkatta	West Bengal
CSE201802001	B-001	Delhi	Delhi
CSE201901001	B-2001	Guwahati	Assam

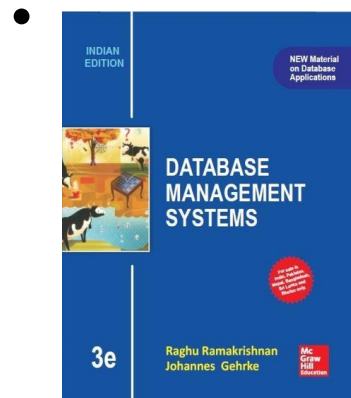
# Database Management System ...

- Database Management System (DBMS) is software to maintain and utilize the collections of data (Oracle, DB2, **MySQL**, Postgresql)

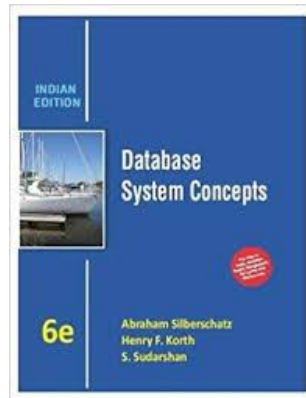


# Database Management System ...

- Books:



**Database Management System, 3<sup>rd</sup> Ed. By Ramakrishnan & Gehrke**  
**Chapter 3:**



**Database System Concept, Silberschatz, Korth, Sudarshan**  
**Chapter 2:**

# MySql:

- MySQL is a database management system
- SQL stands for the **Structured Query Language**. It defines how to insert, retrieve, modify and delete data
- URL: [www.mysql.com](http://www.mysql.com)
- Used at [Google](#), [Facebook](#), [Nokia](#), [YouTube](#), [Yahoo!](#), [Alcatel-Lucent](#), [Zappos.com](#), etc



# My First Experience with MySql:

- Creating Database
- Creating Table
- Inserting data into Table
- Retrieving data from Table

# SQL: Structured Query Language

- Catalog
  - A set of schemas that constitute the description of a database
- Schema
  - The structure that contains descriptions of objects created by a user (base tables, views, constraints)
- Data Definition Language (DDL)
  - Commands that define a database, including creating, altering, and dropping tables and establishing constraints
- Data Manipulation Language (DML)
  - Commands that maintain and query a database
- Data Control Language (DCL)
  - Commands that control a database, including administering privileges and committing data

phpMyAdmin:



phpMyAdmin:



# What you should use?

```
mysql -h hostname -u username -p [password]
```

## Example

```
% mysql -u username -p
```

```
Enter password: passowrd
```

```
Welcome to the MySQL monitor.  Commands end with ; or \g. Your MySQL connection id  
is 23 to server version: 3.23.41.
```

```
Type 'help;' or '\h' for help. Type '\c' to clear the buffer.
```

```
mysql>
```

# Create new Database

What are the current databases at the server?

```
mysql> show databases;
```

```
+-----+  
| Database |  
+-----+  
| mysql    |  
| test     |  
+-----+
```

Create a database (make a directory) whose name is MyDB

```
mysql> create database MyDB;
```

# Table new Database

Select database to use

```
mysql> use MyDB;
```

Database changed

What tables are currently stored in the MyDB database?

```
mysql> show tables;
```

Empty set (0.00 sec)

# Table new Database

- **CREATE TABLE** `Table_Name` (`column_specifications`)

- Example

```
mysql> CREATE TABLE student
```

```
-> (
```

```
-> student_ID INT UNSIGNED NOT NULL,
```

```
-> name VARCHAR(20) NOT NULL,
```

```
-> major VARCHAR(50),
```

```
-> grade VARCHAR(5)
```

```
-> );
```

```
Query OK, 0 rows affected (0.00 sec)
```

Student_ID	Name	Major	Grade
------------	------	-------	-------



# Table new Database

- **CREATE TABLE** Table\_Name (column\_specifications)

- Example

```
mysql> CREATE TABLE student
```

```
-> (
```

```
-> student_ID INT UNSIGNED NOT NULL,
```

```
-> name VARCHAR(20) NOT NULL,
```

```
-> major VARCHAR(50),
```

```
-> grade VARCHAR(5)
```

```
-> );
```

```
Query OK, 0 rows affected (0.00 sec)
```

Data types

Data  
Constraints

Student_ID	Name	Major	Grade
------------	------	-------	-------

# Table new Database

```
mysql> show tables;
```

```
+-----+  
| Tables_in_MyDB |  
+-----+  
| student        |  
+-----+
```

```
1 row in set (0.00 sec)
```

```
mysql> describe student;
```

```
+-----+-----+-----+-----+-----+-----+  
| Field      | Type          | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
| student_ID | int(10) unsigned |      |     | 0        |       |  
| name       | varchar(20)     |      |     |          |       |  
| major      | varchar(50)     | YES  |     | NULL     |       |  
| grade      | varchar(5)      | YES  |     | NULL     |       |  
+-----+-----+-----+-----+-----+-----+
```

```
4 rows in set (0.00 sec)
```

# Insert Data into Table

```
INSERT INTO <table_name> (col_name1, col_name2, col_name3, ...) VALUES (value1, value2, value3, ...);
```

## Example

```
mysql> INSERT INTO student (student_ID, name, major, grade) VALUES (101, "Shannon", "BCB", "A");
```

Query OK, 1 row affected (0.00 sec)

Student_ID	Name	Major	Grade
101	Shannon	BCB	A

# Retrieved Data From Table

- **SELECT** what\_columns  
**FROM** table or tables  
**WHERE** condition
- Example

```
mysql> SELECT major, grade FROM student  
WHERE name='Shannon';
```

```
+-----+-----+  
| major | grade |  
+-----+-----+  
| BCB  | A     |  
+-----+-----+
```

1 row in set (0.00 sec)

```
mysql> SELECT * FROM student;
```

Student_ID	Name	Major	Grade
101	Shannon	BCB	A
102	Mike	BBMB	A
103	Wang	MCDB	A
	...	...	...

# Delete Data From Table

- DELETE FROM table\_name WHERE condition
- Example

```
mysql> DELETE FROM student WHERE name='Shannon';
```

Query OK, 1 row affected (0.00 sec)

```
Mysql> DELETE FROM student;
```

**Will delete ALL student records!**

# Delete Table

- DROP TABLE `table_name`

- Example

```
mysql> drop table student;
```

Query OK, 0 rows affected (0.00 sec)

- Logout MySQL

```
mysql> quit;
```

# Delete Database

```
DROP DATABASE databasename;
```

Example:

```
mysql> drop database MyDB;
```