

# Chapter 15 :



## Computer Science

**Class XI (As per  
CBSE Board)**

An illustration of a laptop computer with a white body and a black keyboard. The screen is tilted back and displays the text "Relational Database Concepts" in a bold, red, sans-serif font. The background of the screen is a light orange color. The laptop is set against a background of binary code (0s and 1s) in a light orange color.

**Relational  
Database  
Concepts**

A purple starburst graphic with a white outline, containing the text "New Syllabus 2019-20" in a blue, sans-serif font.

**New  
Syllabus  
2019-20**

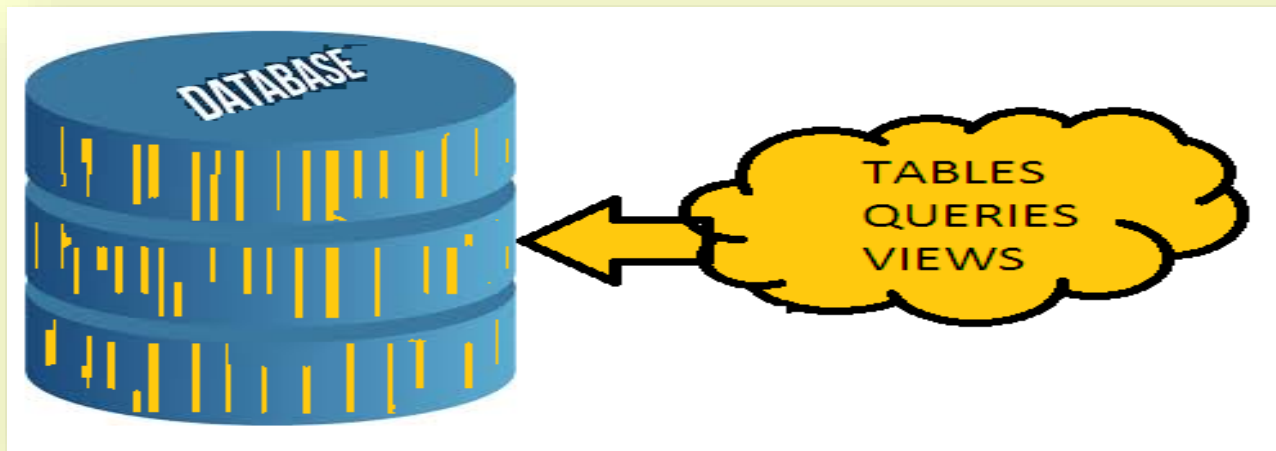
**Visit : [python.mykvs.in](http://python.mykvs.in) for regular updates**

# DATABASE CONCEPTS

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A **database** is a collection of DATA/INFORMATION that is organized so that it can be easily accessed, managed and updated.

In **Database** ,Data is organized into rows, columns and tables, and it is indexed to make it easier to find relevant information. It works like a container which contains the various object like Tables, Queries, Reports etc. in organized way.



# WHY DO WE NEED DATABASE

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- ❑ **To manage large chunks of data:** if size of data increases into thousands of records, it will simply create a problem to manage. Database can manage large amount of data.
- ❑ **Accuracy:** Through validation rule in database ,data accuracy can be maintained.
- ❑ **Ease of updating data:** With the database, we can flexibly update the data according to our convenience. Moreover, multiple people can also edit data at same time.
- ❑ **Security of data:** With databases we have security groups and privileges to restrict access.
- ❑ **Data integrity:** In databases, we can be assured of accuracy and consistency of data due to the built in integrity checks and access controls.

# DBMS

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## Database Management System(DBMS)

- A DBMS refers to a software that is responsible for storing, maintaining and utilizing database in an efficient way.
- A Database along with DBMS software is called Database System.
- Example of DBMS software are Oracle, MS SQL Server, MS Access, Paradox, DB2 and MySQL etc.
- MySQL is open source and freeware DBMS.

# DBMS

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## Advantages of Database System

### □ Databases reduces Redundancy

It removes duplication of data because data are kept at one place and all the application refers to the centrally maintained database.

### □ Database controls Inconsistency

When two copies of the same data do not agree to each other, then it is called Inconsistency. By controlling redundancy, the inconsistency is also controlled.

### □ Database facilitate Sharing of Data

Data stored in the database can be shared among several users.

### □ Database ensures Security

Data are protected against accidental or intentional disclosure to unauthorized person or unauthorized modification.

### □ Database maintains Integrity

It enforces certain integrity rules to insure the validity or correctness of data. For ex. A date can't be like 31/31/2000.

# DBMS

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## Data Model- Way of data representation

Data model is a model or presentation which shows How data is organized ? or stored in the database. A data is modeled by one of the following given-

### □ Relational Data Model

In this model data is organized into Relations or Tables (i.e. Rows and Columns). A row in a table represents a relationship of data to each other and also called a Tuple or Record. A column is called Attribute or Field.

### □ Network Data Model

In this model, data is represented by collection of records and relationship among data is shown by Links.

### □ Hierarchical Data Model

In this model, Records are organized as Trees. Records at top level is called Root record and this may contains multiple directly linked children records.

### □ Object Oriented Data Model

In this model, records are represented as a objects. The collection of similar types of object is called class.

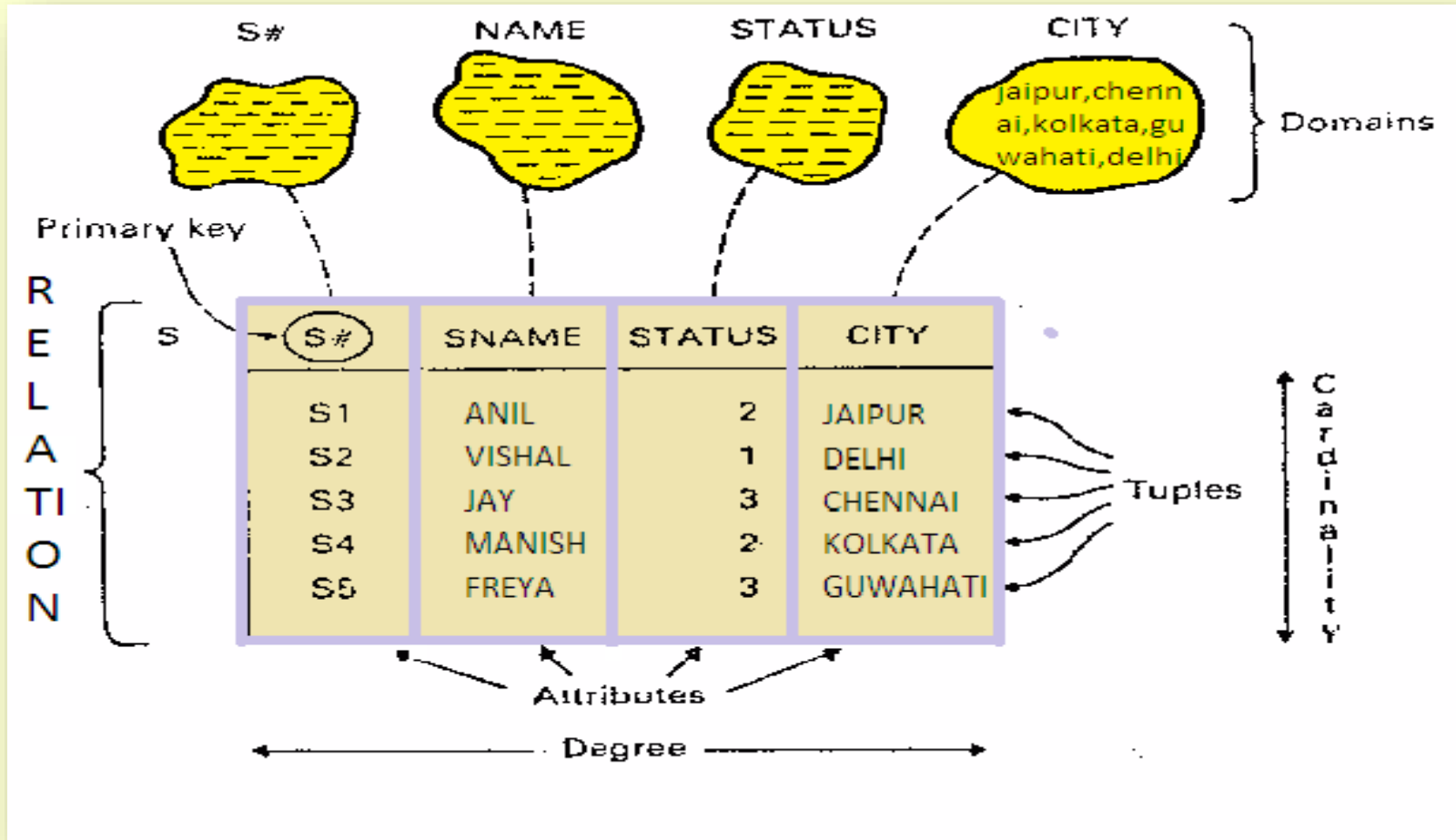
# RELATIONAL DATABASE

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A **relational database** is a collective set of multiple data sets organized by tables, records and columns. Relational database establish a well-defined relationship between database tables. Tables communicate and share information, which facilitates data searchability, organization and reporting.

A **Relational database** use Structured Query Language (SQL), which is a standard user application that provides an easy programming interface for database interaction.

# RELATIONAL DATABASE TERMS





# RELATIONAL DATABASE TERMS

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## ❖ Relation (Table)

A Relation or Table is Matrix like structure arranged in Rows and Columns. It has the following properties-

- ❑ **Atomicity** : Each column assigned a unique name and must have atomic(indivisible) value i.e. a value that can not be further subdivided.
- ❑ **No duplicity**: No two rows of relation will be identical i.e. in any two rows value in at least one column must be different.
- ❑ All items in a column are **homogeneous** i.e.same data type.
- ❑ **Ordering** of rows and column is **immaterial**.
- ❖ **Domain** :It is collection of values from which the value is derived for a column.
- ❖ **Tuple / Entity / Record** - Rows of a table is called Tuple or Record.
- ❖ **Attribute/ Field**- Column of a table is called Attribute or Field.
- ❖ **Degree** - Number of columns (attributes) in a table.
- ❖ **Cardinality** - Number of rows (Records) in a table.

# KEYS IN A DATABASE

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**Key** plays an important role in relational database; it is used for identifying unique rows from table & establishes relationship among tables on need.

## Types of keys in DBMS

**Primary Key** – A primary is a column or set of columns in a table that uniquely identifies tuples (rows) in that table.

**Candidate Key** – It is an attribute or a set of attributes or keys participating for Primary Key, to uniquely identify each record in that table.

**Alternate Key** – Out of all candidate keys, only one gets selected as primary key, remaining keys are known as alternate or secondary keys.

**Foreign Key** – Foreign keys are the columns of a table that points to the primary key of another table. They act as a cross-reference between tables.

# KEYS IN A DATABASE

