Welcome

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Know Python Bytes

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UNIT 3

For XII CSc:

Database Management

UNIT 2

For XII IP:

Database Query using SQL

UNIT 4

For XI IP:

Database concepts and the Structured Query Language

DATABASE CONCEPTS AND RELATIONAL DATA MODEL (Part -1)

Let's Learn Together.....

CONTENTS

(Learning Outcomes) ☺

- Understanding Database and DBMS
- Some applications of DBMS
- Advantages of DBMS
- Disadvantages of DBMS
- Different Data Models
- Understanding Relational Data Model
- Relational Data Terminologies
- Referential Integrity Constraints

DATABASE MANAGEMENT SYSTEM (DBMS)

What is a database?

→ Database is a set of inter-related and persistent data.

OR

→ Collection of logically related data along with its description is termed as database.

What is DBMS ?

A set of application programs used to access, update and manage the inter-related and persistent data.

COMPUTER BASED RECORD KEEPING SYSTEM

DATABASE APPLICATIONS Examples....

1. STUDENT RECORD KEEPING SYSTEM
2. INVENTORY CONTROL MANAGEMENT
3. PERSONNEL MANAGEMENT SYSTEM
4. FINANCIAL ACCOUNTING SYSTEM
5. BANKING SYSTEM
6. AIRLINE RESERVATION SYSTEM
7. HOSPITAL MANAGEMENT SYSTEM
8. HOTEL MANAGEMENT SYSTEM

Why Database????

ADVANTAGES OF DATABASE

- Database systems **reduce data redundancy** to a large extent. *(redundancy meaning duplication)*
- Database systems control data inconsistency to a large extent.
- Database facilitate sharing of data.
- Databases enforce standards laid by organization or company
- Centralized databases can ensure data security.
- Integrity can be maintained through databases. (Eg. Invalid date)

DISADVANTAGES OF DATABASE

- Without good controls a database may be compromised over security and integrity issues
- Database systems may require extra hardware.
- Performance overhead may be significant.
- System is likely to be complex.

DIFFERENT DATA MODELS

A data model refers to a set of concepts to describe the structure of a database, and certain constraints that the database should obey.

(i) **Relational data models**, ←

(ii) Network data model,

(iii) Hierarchical data model,

(iv) Object oriented data model.

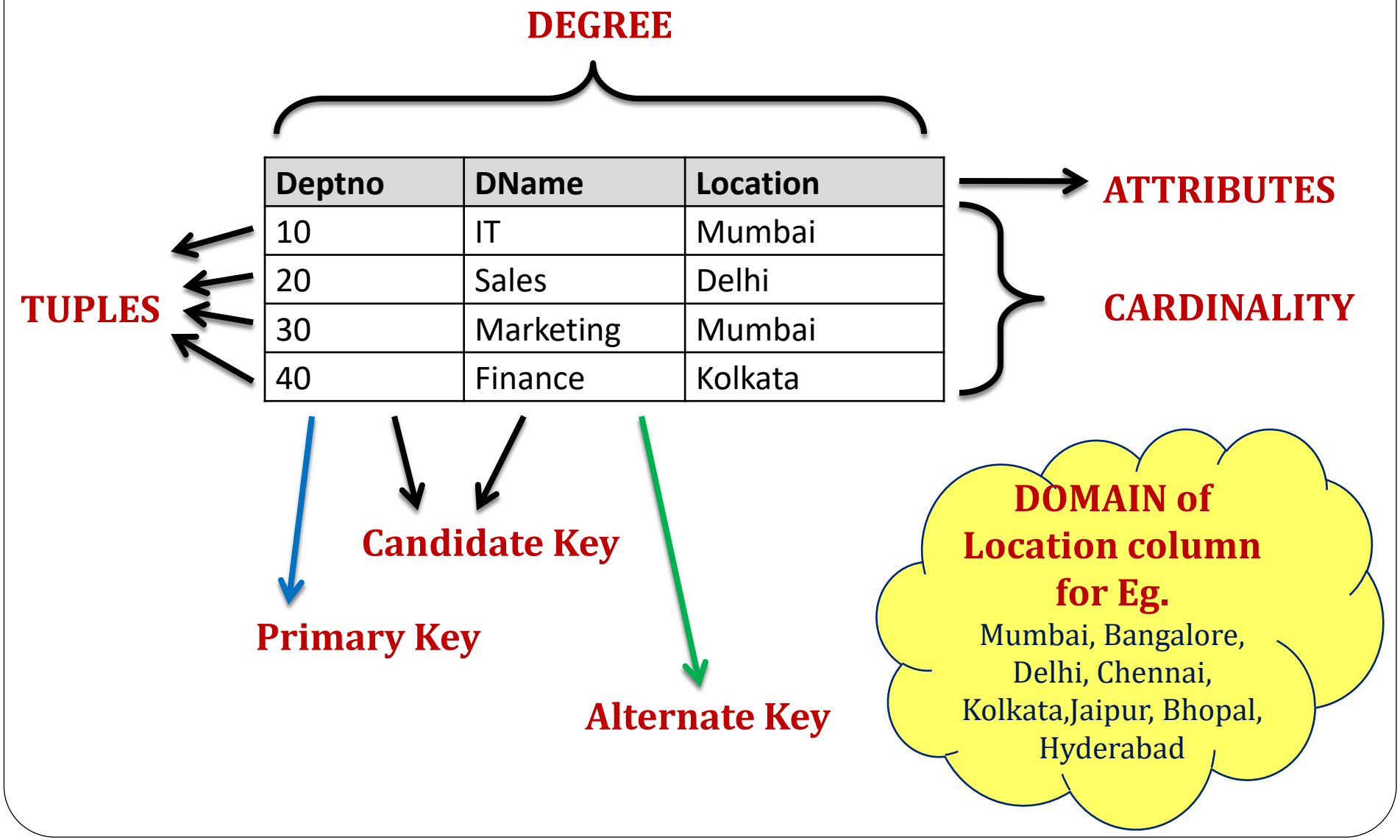
RELATIONAL DATA MODEL

- The relational data model is organized into tables.These tables are called relations.
- A row in a table represents a relationship among a set of values.
- Since a table is a collection of such relationships, it is generally referred to using the mathematical term relation, from which the relational data model derives its name.

RELATIONAL MODEL TERMINOLOGY

TERMINOLOGY	Definition
RELATION	A **relation is a table** storing logically related data; ✓A data must be atomic in a cell; ✓All rows of this table are distinct; ✓Ordering of rows and columns is immaterial.
DOMAIN	This is **a pool of a values** from which the actual values appearing in a given column are drawn
TUPLE / RECORD/ ROW	A **row of a relation** is generally referred to a tuple.
ATTRIBUTE/ FIELD/ COLUMN	A **column of a relation** is generally referred to as an attribute.
DEGREE	This refers to the **no. of attributes in a relation.**
CARDINALITY	This refers to **no. of tuples in a relation.**

RELATION:- Dept



RELATIONAL MODEL TERMINOLOGY CONTD.

TERMINOLOGY	Definition
PRIMARY KEY	This refers to a set of one or more attributes that can uniquely identify tuples within the relation.
CANDIDATE KEY	All attribute combinations inside a relation that can serve as primary key are candidate keys as they are candidate for primary key positions.
ALTERNATE KEY	A candidate key that is not primary key, is called an alternate key.
FOREIGN KEY	A non key attribute, whose values are derived from the primary key of some other table , is known as foreign key in its current table.

DEPT (Primary table / Master table)

Deptno	DName	Location
10	IT	Mumbai
20	Sales	Delhi
30	Marketing	Mumbai
40	Finance	Kolkata

Primary Key of DEPT table

EMP (Foreign table / Detail table)

Primary Key of EMP table

Foreign Key

Empno	Ename	Job	Sal	Hiredate	Deptno
1001	ABC	Clerk	20000	25-10-2006	20
1002	EFG	Salesman	25000	12-08-2008	10
1006	XYZ	Manager	30000	19-05-2008	30
1003	PQR	Analyst	30000	10-07-2007	20

REFERENTIAL INTEGRITY

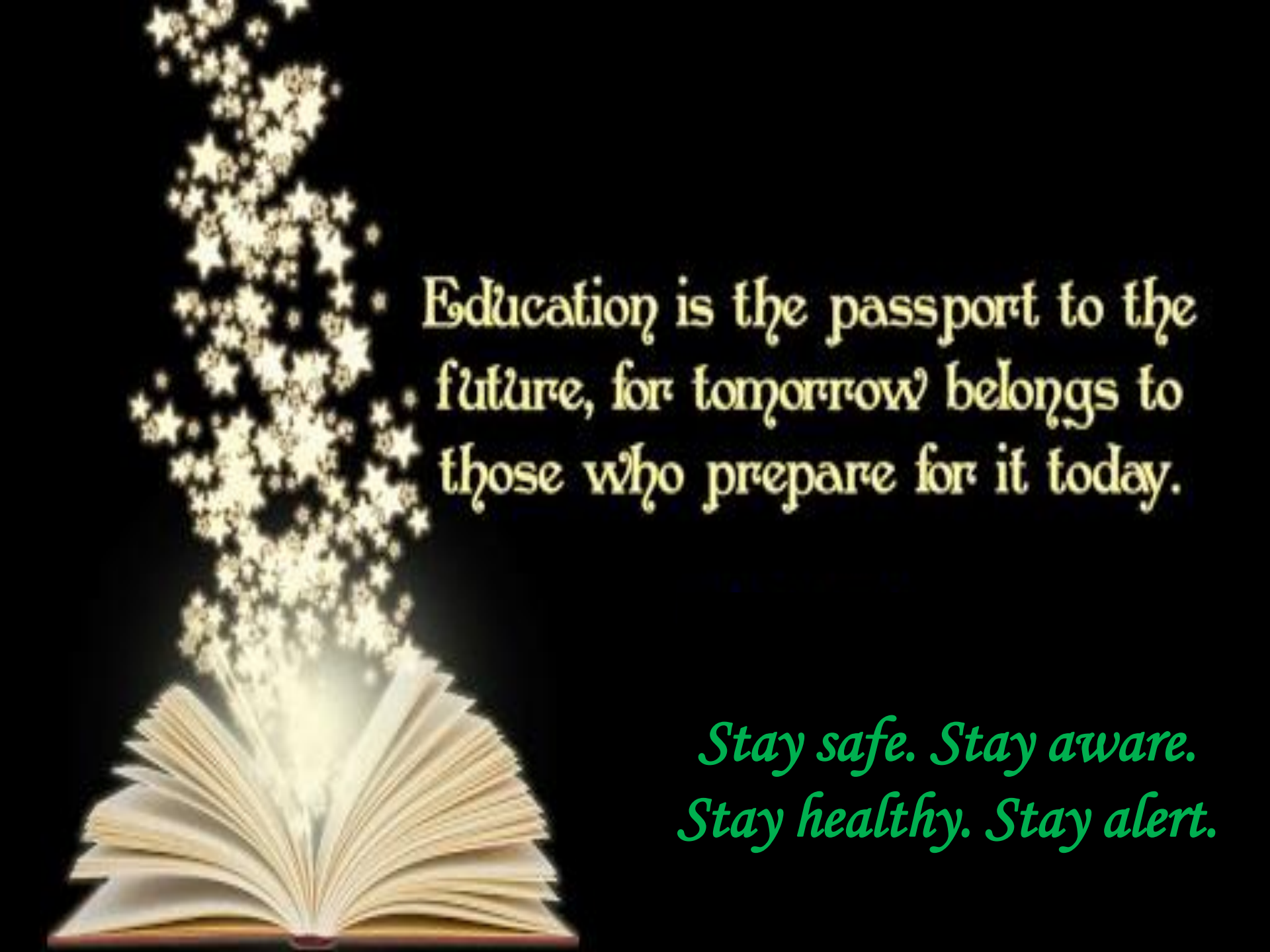
A referential integrity is a system of rules that DBMS uses to ensure that relationships between records in related tables are valid and that users don't accidentally delete or change related data.

CONDITIONS SET FOR **REFERENTIAL INTEGRITY CONSTRAINTS**

- ✓ The matching field from the primary table is a primary key or has unique index.
- ✓ The related field have same data type.
- ✓ Both table belong to the same database. Referential integrity cannot be enforced for linked table from database in other format.

RULES FOR **REFERENTIAL INTEGRITY CONSTRAINTS**

- ➢ You can't enter a value in the foreign key field of the related table that doesn't exist in the primary key of the primary table.
- ➢ You can't delete a record from a primary table if matching records exist in a related table.
- ➢ You can't change a primary key value in the primary table, if that record has relatedrecords in the foreign key field.


Education is the passport to the future, for tomorrow belongs to those who prepare for it today.
Stay safe. Stay aware.
Stay healthy. Stay alert.

THANK YOU
FOR YOUR
PATIENT HEARING ☺