RECORD BASED DATA MODEL – RELATIONAL DATA MODEL

Attributes / Columns / Fields

Rows / Records / Tuples

Customer_Loan records from Customer_Loan table

Cust_ID	Loan_No	Amount_in_Dollars
101	1011	8755.00
103	2010	2555.00
104	2056	3050.00
103	2015	2000.00

No. of Records / Rows / Tuples: Cardinality of the Relation

No. of Attributes / Columns / Fields : Degree of the Relation
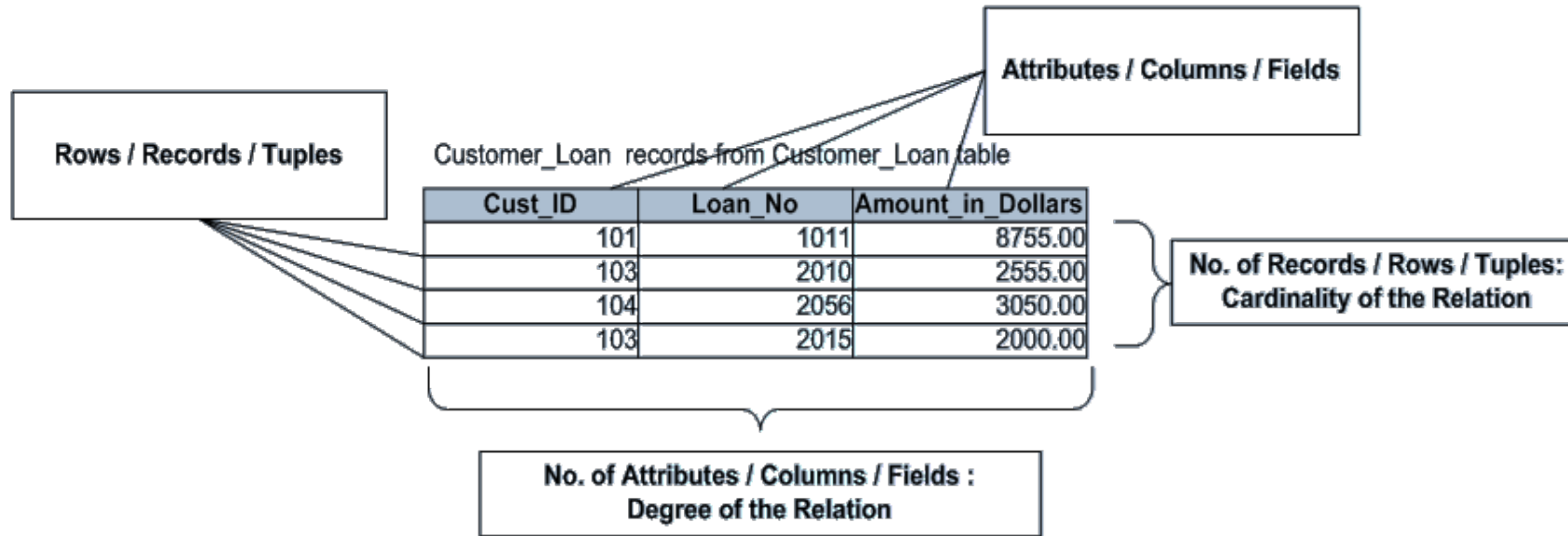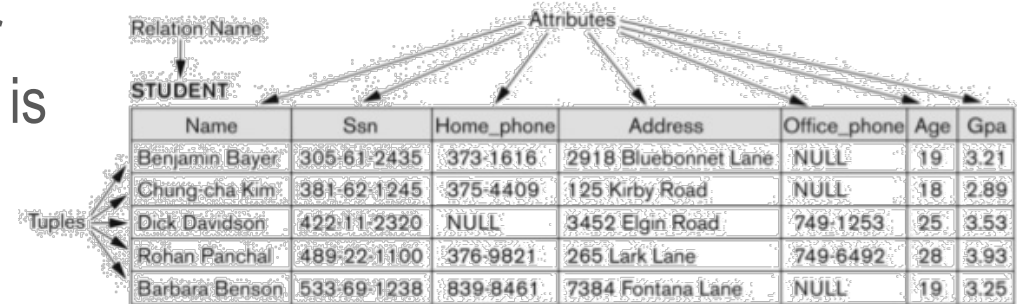
Cust_ID	Cust_Last_Name	Cust_Mid_Name	Cust_First_Name	Account_No	Account_Type	Bank_Branch	Cust_Email
101	Smith	A.	Mike	1020	Savings	Downtown	Smith_Mike@yahoo.com
102	Smith	S.	Graham	2348	Checking	Bridgewater	Smith_Graham@rediffmail.com
103	Langer	G.	Justin	3421	Savings	Plainsboro	Langer_Justin@yahoo.com
104	Quails	D.	Jack	2367	Checking	Downtown	Quails_Jack@yahoo.com
105	Jones	E.	Simon	2389	Checking	Brighton	Jones_Simon@rediffmail.com

records from Customer_Details table

RELATIONAL DATA MODELS BASICS

➤ Data is viewed as existing in two dimensional tables known as relations

➤ A relation (table) consists of unique attributes (columns) and tuples (rows)

➤ Sometimes the value to be inserted into a particular cell may be unknown, or it may have no value. This is represented by a NULL.

➤ Relational Database: Any database whose logical organization is based on relational data model

➤ RDBMS: A DBMS that manages the relational database

Relation Name						
STUDENT			Attributes			
Name	Ssn	Home_phone	Address	Office_phone	Age	Gpa
Benjamin Bayer	305-61-2435	373-1616	2918 Bluebonnet Lane	NULL	19	3.21
Chung-cha Kim	381-62-1245	375-4409	125 Kirby Road	NULL	18	2.89
Dick Davidson	422-11-2320	NULL	3452 Elgin Road	749-1253	25	3.53
Rohan Panchal	489-22-1100	376-9821	265 Lark Lane	749-6492	28	3.93
Barbara Benson	533-69-1238	839-8461	7384 Fontana Lane	NULL	19	3.25

The attributes and tuples of a relation STUDENT

RELATIONAL MODELS BASICS

Relation or Relation Table: Set of tuples and unique attributes

**Attribute:** Header of a column in a relation

STUDENT

ID	Name	Email	DOB	Address	GPA
5001	Suman Shah	sumans@aol.com	12/01/1994	#24, 2nd floor, Trupti Bldg, DVG Road, Bengaluru	3.8
5002	Arun Kumar	akumar@ge.com	23/11/1993	#34, Near Bus Stand, Shan Plaza, Mangalore	4.1
5003	Mary Francis	maryfran@ms.com	12/05/1993	#44, Meeta Towers, D. U. Road, Mysore	4.2

Tuple: A row in a relation

**Domain:** A set of atomic values of an attribute

KEY AND NON-KEY ATTRIBUTES

➢ Key Attributes
- • The attributes that participate in the selection of candidate key are Key attributes

➢ Non-Key Attributes
- • The attributes other than the Candidate Key attributes in a table/relation are called Non-Key attributes
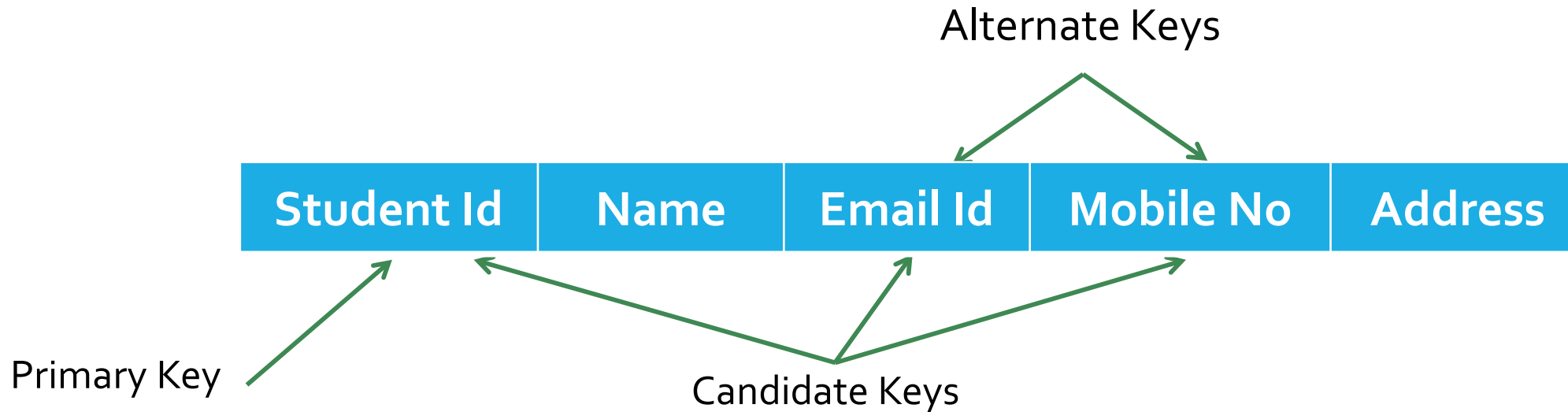
Student Table

Student Id	Name	Email Id	Mobile No	Address

Key attribute   Non- Key attribute
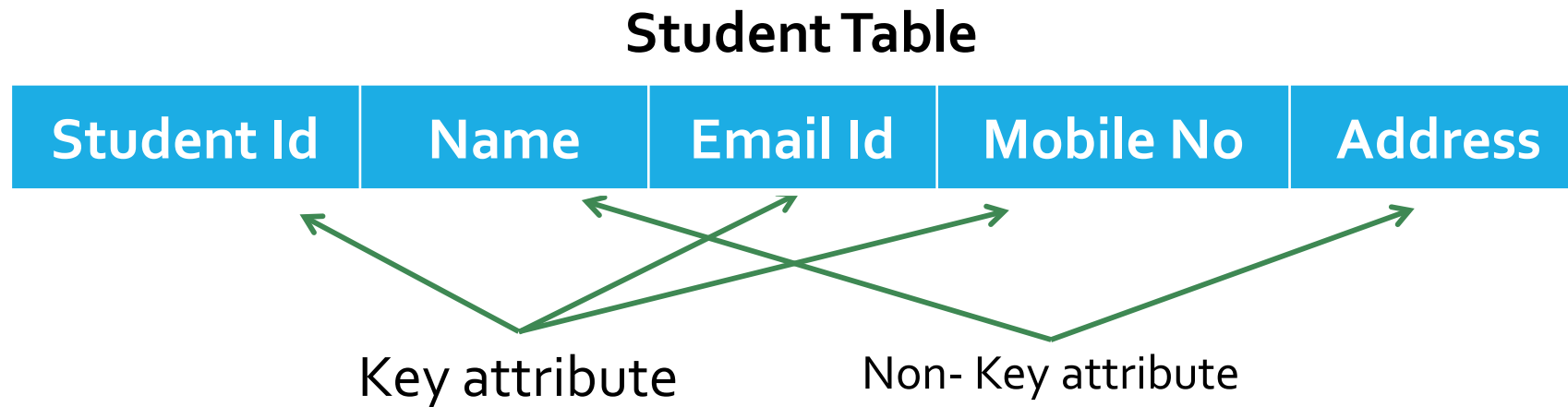
CANDIDATE KEY

- ➤ Candidate keys are identified during the design of the data base
- ➤ Candidate key is an attribute, that is sufficient to distinguish every tuple in the relation from each one
- ➤ Composite Candidate key is a Candidate key comprising of two or more attributes

Student Table

Student Id	Name	Email Id	Mobile No	Address
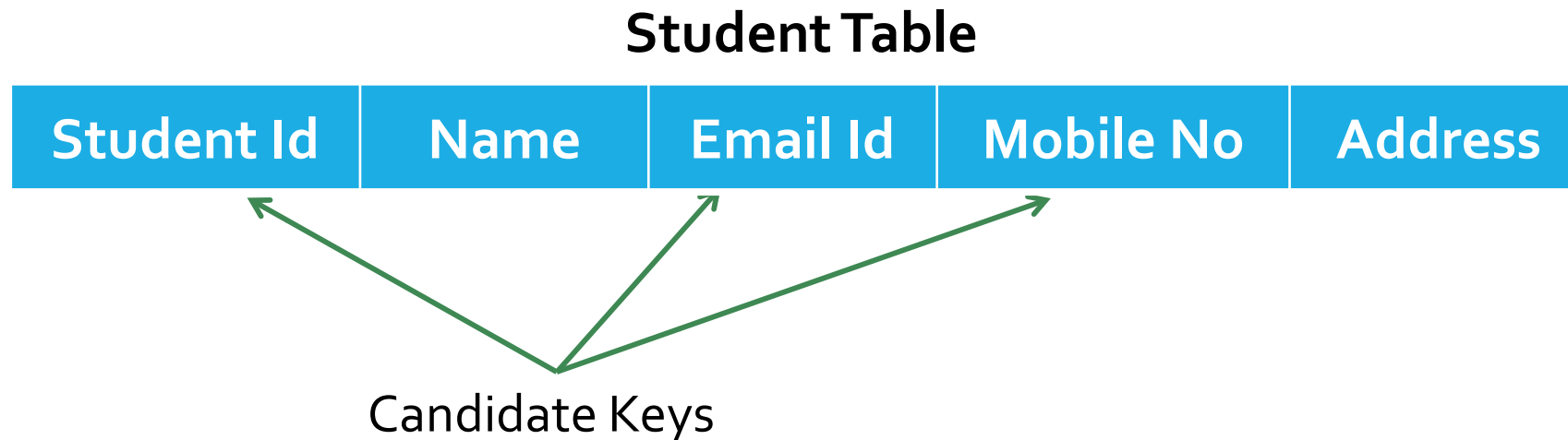
Candidate Keys

PRIMARY KEY

- ➢ One among the candidate keys is chosen by the database designer at the time of table creation. This key is called as PRIMARY KEY and is used to uniquely identify the tuples
- ➢ The remaining candidate keys (other than the primary key) are called as Alternate keys
- ➢ Cannot be NULL and have to be unique
- ➢ A relation (table) can have 0 or maximum ONE primary key

Alternate Keys

Student Id	Name	Email Id	Mobile No	Address

Primary Key

Candidate Keys

COMPOSITE PRIMARY KEY

➢ Composite Primary Key - combination of more than one attribute of the relation which uniquely identifies the tuple

Student Marks Table

Student Id	Subject ID	Marks

Composite primary key

Student Marks Table – Sample Data

Student Id	Subject ID	Marks
S1001	S100	87
S1001	S200	65
S1002	S100	45
S1002	S200	74
S1003	S200	64

FOREIGN KEY

➤ A set of attribute (s) whose values are required to match values of a column in the same or another table

➤ Foreign Key of a table (child table) should be the unique key in the parent table

➤ In the child table, FK need not have to be unique and they can also be null

➤ FK establishes relationships between the relational tables

Student Table(child Table)

Student Id	Name	Email Id	Mobile No	Branch Id

Branch Table(Parent Table)

Branch Id	Branch Name

Foreign Key

FEATURES OF RDBMS

Every piece of information is stored in the form of tables

Has primary keys for unique identification of rows

Has foreign keys to ensure data integrity

Provides SQL for data access

Uses indexes for faster data retrieval

Gives access privileges to ensure data security

THANK YOU