



Basic Data Concepts:

Relational Data Models

Objectives

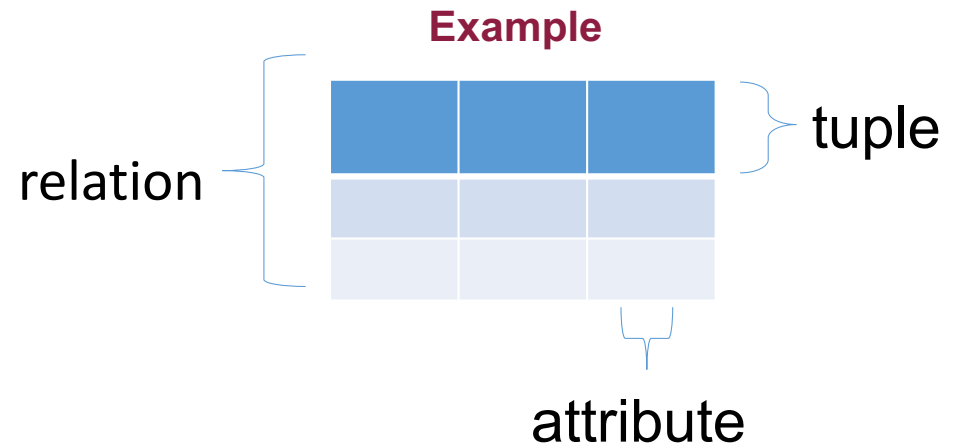


Objective

Utilize relational
model and relational
algebra

Relational Data Model

| A relational database consists of a collection of tables, each of which is assigned a unique name



Relational Data Model

| Domains

- Let D_1, D_2, \dots, D_n be sets of atomic values

| N-Tuple

- ordered sequence (d_1, d_2, \dots, d_n) s.t. $d_i \in D_i$

| Relation

- n attributes is a set of n -tuples, which is a subset of the Cartesian product of the domains of the attributes
- $D_1 \times \dots \times D_n$ where D_i is the domain of the i^{th} attribute

Relational Database



| A **relational database** is a **set** of relations.

- The tuples in a relation are unordered.
- There are no duplicate elements in a set

| Algorithm

- $|D_i|$ denote the cardinality (number of values) of domain D_i
- Cartesian product:
 $|D_1| * |D_2| * \dots * |D_n|$

Example Relation



ID	Name	Major
1111	Student1	CSE
2222	Student2	EEE
3333	Student3	CSE
4444	Student4	EEE
5555	Student5	CSE

Query Language



Procedural/Imperative Language

Instructs the system to perform a sequence of operators to compute a result

Relational Algebra

Non-Procedural/Declarative Language

Tells what data is to be retrieved but does not tell the system how to retrieve the data

Relational Calculus

SQL