

Database Management

Introduction to DBMS

Indranil Saha

Department of Computer Science and Engineering
Indian Institute of Technology Kanpur



What is a Database?

- Logically modeled clusters of information or data stored electronically in a computer system
- Set up for easy access, management, and modification

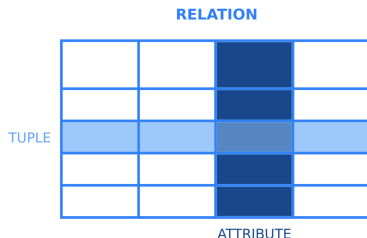
Student Database					
Std ID ▾	Std Name ▾	Marks ▾	Percentage ▾	Grade ▾	Remark ▾
GA-001	Jhon	285	71.25	A	Pass
GA-002	Smith	248	62	B	Pass
GA-003	Emma	329	82.25	A+	Pass
GA-004	Sandy	249	62.25	B	Pass
GA-005	Olivea	150	37.5	F	Fail
GA-006	James	187	46.75	D	Pass
GA-007	Eva	352	88	A+	Pass
GA-008	Noah	279	69.75	B	Pass
GA-009	Charlotte	282	70.5	A	Pass
GA-010	Elijah	301	75.25	A	Pass

Database Management System

- A computer program that allows users to interact with a database
- Has an underlying model that structures how data is stored and accessed
- Allows to the following operations
 - **Update:** insertion, deletion, and modification of data
 - **Retrieval:** providing information in a form directly usable for other applications
 - **Management:** Enforcing data security, maintaining data integrity, dealing with concurrency control, and so on

Relational Data Model

- In this relational model, data is organized into tables of rows and columns
- Tables are more formally referred to as **relations**
- A relation is a set of tuples, which are the rows in a table
- Each tuple shares a set of **attributes**, which are the columns in a table



- A relational database management system (RDBMS) is a DBMS that employs the relational data model
- Employ **Structured Query Language (SQL)** for managing and accessing data held within the database

Transaction

- A single logical unit of work that accesses (reads) and possibly modifies (writes) the contents of a database
- In order to maintain consistency in a database before and after the transaction, certain properties are followed
 - ACID properties

ACID Properties

- Atomicity
- Consistency
- Isolation
- Durability

Database Management

Introduction to DBMS

Indranil Saha

Department of Computer Science and Engineering
Indian Institute of Technology Kanpur

