



# Database and its Applications

## Data Models and Mathematical Foundations

---

Pooja T S  
Computer Applications

# Database and its Applications

---

**Data Models and Mathematical Foundations**

**Experiential Learning II: Basic Questions**

**Pooja T S**

Computer Applications



# Database and its Applications

## Base Tables for Relational Algebra

### ► Students Table:

| RollNo | Name  | Age | Dept |
|--------|-------|-----|------|
| 101    | Alice | 20  | CS   |
| 102    | Bob   | 22  | IT   |
| 103    | Carol | 19  | CS   |
| 104    | David | 23  | ECE  |
| 105    | Emma  | 21  | CS   |



# Database and its Applications

## Base Tables for Relational Algebra

### ► Courses Table:

| CourseID | Title       | Dept | Year |
|----------|-------------|------|------|
| C1       | DBMS        | CS   | 2024 |
| C2       | Networks    | CS   | 2023 |
| C3       | AI          | IT   | 2024 |
| C4       | Mathematics | ECE  | 2023 |
| C5       | OS          | CS   | 2024 |



# Database and its Applications

## Base Tables for Relational Algebra

### ► Enrollments Table:

| RollNo | CourseID |
|--------|----------|
| 101    | C1       |
| 101    | C3       |
| 102    | C1       |
| 102    | C5       |
| 103    | C2       |
| 103    | C4       |
| 104    | C1       |
| 105    | C5       |



# Database and its Applications

## Experiential Learning II: Basic Problems



- ▶ Q1: Select all students in the **CS** department.
- ▶ Q2: Project only the **Name** and **Dept** of students.
- ▶ Q3: Select courses offered in **2024**.
- ▶ Q4: Project only the **Title** of courses (no duplicates).
- ▶ Q5: Find the **union** of students enrolled in DBMS (C1) and OS (C5).
- ▶ Q6: Find the **intersection** of students enrolled in DBMS (C1) and AI (C3).
- ▶ Q7: Find students enrolled in DBMS (C1) but not in OS (C5).
- ▶ Q8: Compute the Cartesian Product: **Students**  $\times$  **Courses**.
- ▶ Q9: Select all enrollments where course is DBMS (C1).
- ▶ Q10: Project all distinct **Dept** values from Students.



**PES**  
UNIVERSITY

CELEBRATING 50 YEARS

**Pooja T S**  
**Assistant Professor**  
**Department of Computer Applications**  
**poojats@pes.edu**  
**080-26721983 Extn: 233**