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MATHEMATICS FOR COMPUTER SCIENCE WEEK 2

1.SCENARIO ANALYSIS

The expression ∃x Students(x)^ Enrolled (x)) states that there exists at least one x such that x is a student and is enrolled. In a database, this for at least one enrolled student.

SQL Equivalent:

SQL

SELECT* FROM Students Where

Enrolled=TRUE LIMIT 1;

This SQL query returns any one student who is enrolled, satisfying the existential condition.

2.Set Theory Practice:

- A= {1,3}, B={2,3} ,U={1,2,3,4}
- A U B (Union)= {1,2,3} (all elements from A or B)
- A U B (Intersection)= {3} (common to both A and B)

Ȧ (Complement of A in U) = {2,4}

(elements in U but not in A)

These operations show basic set relationship relevant in data filtering and grouping.

3.Predicate Logic Research:

Quantifiers are essential in Logic and programming. ∀ (For all) is used in algorithms that apply a rule to all elements (e.g., loops), while ∃ (there exists) checks if a condition holds for at least one element. They help express conditions, validations, and database queries logically and precisely.

4.Venn Diagram Design:

Let A = {1,2} and B = {2,3}

- A U B = {1,2,3}
- A ∩ B = {2}
- A − B = {1}
- B − A = {3}