

# Lecture 6



## Introduction to Relational Algebra - 3



## Some more about Relational Operators

- Primitive Operators
  - **Union, Difference, Product, Restriction and Projection**
- Type Compatible Relations / UNION Compatible
- Three more operators
  - **RENAME**
  - **SUMMARIZE**
  - **EXTEND**

# Special Operators

## ■ RENAME

- it takes a relation **A** and conceptually, atleast returns a new copy of that relation in which some attributes has been given a new name.
- Written as

**A RENAME X AS Y**

where **X** is an attribute name in **A**

- its purpose is basically to rename attributes within a specified relation

**A**

ID	Name	Age	Department	NIC
S1	Ahmad	23	Sales	245-77-245367
S2	Salman	34	Marketing	234-66-245368
S3	Karim	21	Sales	255-79-256369
S4	Tariq	29	Admin	245-71-325370

**A RENAME NIC AS IDCARD#**

ID	Name	Age	Department	IDCARD#
S1	Ahmad	23	Sales	245-77-245367
S2	Salman	34	Marketing	234-66-245368
S3	Karim	21	Sales	255-79-256369
S4	Tariq	29	Admin	245-71-325370

# Special Relational Operators

## ■ EXTEND

- takes a specified relation **A** and conceptually, at least makes a new relation that is similar to the original relation but includes some additional attributes, values of which are obtained by evaluating some scalar computational expression.
- Written as  
**EXTEND A ADD *exp* AS Y**
- the attributes added in this way can be used for any  $\theta$  operation.
- It provides a way of incorporating horizontal or row-wise computations.

# Special Relational Operators

## ■ EXTEND

- Returns a relation same as some specified relation but having some extra attributes generated on the basis of some computation.

A

ID	Name	Department	Date_of_Birth
S1	Ahmad	Sales	24-5-1977
S2	Salman	Marketing	23-4-1966
S3	Karim	Sales	25-5-1979
S4	Tariq	Admin	24-5-1971

**EXTEND A ADD (CURRENTDATE-Date \_of\_Birth) AS Age**

ID	Name	Department	Date of Birth	Age
S1	Ahmad	Sales	24-5-1977	24
S2	Salman	Marketing	23-4-1966	35
S3	Karim	Sales	25-5-1979	22
S4	Tariq	Admin	24-5-1971	30

# Special Relational Operators

## ■ SUMMARIZE

- Let relation **A** with heading  $[X, \dots, Z]$ , then  
**SUMMARIZE A BY (X,..,Y) ADD exp AS M**  
is a relation with heading  $[X, \dots, Y, M]$  and with a body consisting of the set of all tuples that are a projection of **A** over  $[X, \dots, Y]$ , extended with a value for the new attribute M; that new M-value is computed by evaluating the aggregate expression exp on all tuples of **A** that have the same values for  $X, \dots, Y$
- It provides a way of incorporating vertical or column-wise computations.

# Special Relational Operators

## ■ SUMMARIZE

**A**

ID	Name	Age	Department	NIC
S1	Ahmad	23	Sales	245-77-245367
S2	Salman	34	Marketing	234-66-245368
S3	Karim	21	Sales	255-79-256369
S4	Tariq	29	Admin	245-71-325370

**SUMMARIZE A BY Department ADD Count AS Employees**

Department	Employees
Sales	2
Marketing	1
Admin	1

## Quiz # 3

- Consider relations A and B such that

Empno	Ename	Job	Mgr	Sal	Deptno
7839	king	president		5000	10
7698	blake	manager	7839	2850	30
7782	clark	manager	7839	2450	10
7566	jones	manager	7839	2975	20
7654	martin	salesman	7698	1250	30
7934	milller	clerk	7782	1300	10

Deptno	Dname	Loc
10	Accounting	NY
20	Research	DA
30	Sales	CH

**Find the following:**

- **JOIN A and B over Deptno**
- **$\theta$ -JOIN A and B over Deptno where  $A.Deptno = B.Deptno$**
- **Write a statement which results only those tuples from A whose Job is manager and also tell the B.Dname and B.Loc for these tuples.**
- **Write a statement which results A.Ename, B.Dname and B.Loc for those tuples where  $A.Sal > 2500$**