CSE3103 : Database

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Aggregate Function

- Aggregate function take a collection of values and return a single value as a result.

- Value comes from the same attribute(same domain).

  Notation:

  $$_G\mathcal{G}_{F(A)}(R)$$

Symbols	Meaning
G	Group By
F	Function
A	Attributes
R	Relation
$\mathcal{G}$	Aggregation Symbol

Aggregate Function

Aggregate function that are regularly used is given below:

- Max
- Min
- Sum
- Count
- Count-distinct
- Average
- Etc.

Aggregate Function : Example

Instructor

ID	Name	Department	Salary
11	Alen	CSE	25000
23	Brown	EEE	25000
54	Cook	EEE	35000
29	Dawson	MCE	10000
45	Emly	CEE	15000
56	Frank	CSE	40000
67	Givson	MCE	30000

Questions:

1. Find the total salary of the instructors?

$$G_{SUM(Salary)}(Instructor)$$

2. How many instructor are there in the instructor relation?

$$G_{COUNT(ID)}(Instructor)$$

3. How many departments are there in the instructor relation?

$$G_{COUNT-DISTINCT(department)}(Instructor)$$

4. Find the average salary of the instructors according to the department?

$$Department\,G_{AVERAGE(sALARY)}(Instructor)$$

Assignment Operation

- The assignment operation provides a convenient way to express complex queries.
- Write query as a sequential program consisting of series of assignments.
- Followed by an expression whose value is displayed as a result of the query.
- Assignment must always be made to a temporary relation variable.

Notation: ←

Example: Assignment operation

Borrower	
Name	Loan_no
Mr. Kamal	L-17
Mr. Jamal	L-23

Loan		
Loan_No	Branch	Amount
L-14	Banani	75,000
L-23	Gulshan	50,000

Question:
Find the names of the customers of a Bank who have a Loan at Gulshan Branch?

Answer:

$\rho_{\text{Loan\_No} \rightarrow \text{Borrow. Loan\_No}}$ (Borrower)

$\rho_{\text{Loan\_No} \rightarrow \text{Loan. Loan\_No}}$ (Loan)

Temp1 ⟵ Borrower X Loan
Temp2 ⟵ Borrow. Loan_No = Loan. Loan_No
Temp3 ⟵ Branch = "Gulshan"

$\Pi_{\text{name}} (\sigma_{\text{Temp2} \land \text{Temp3}} (\text{Temp1}))$

Practice: Relational Algebra

Table01 :Doctor

DoctorId	FirstName	LastName	Speciality	ServiceYear	Salary
5001	Amit	Chowdhury	Neurology	5	45000
5002	Taslima	Khatun	Surgery	9	80000
5003	Marina	Tabassum	Medicine	8	75000
5004	Ahmed	Syed	Orthopedics	11	10000
5005	Fatima	Rahman	Pediatrics	3	30000

Table02 :Patient

PatientId	PatientName	Category	WardCode	Severity
6001	Rahim Ahmed	Medicine	45671234	N
6002	Sabbir Hassan	Orthopedics	65381267	M
6003	Asif Chowdhury	Pediatrics	98745600	S
6004	Syeeda Sultana	Surgery	12765890	N
6005	Marzok Rahman	Medicine	63829014	S

Table03 :Admission

AdmissionId	DoctorId	PatientId	DaysStay	AdmissionDate	Bill
7001	5003	6003	2	2018-11-21	16000.50
7002	5001	6002	1	2018-12-14	2000.00
7003	5002	6005	3	2019-01-02	22000.00
7004	5005	6004	4	2019-01-11	5000.60
7005	5004	6001	6	2019-01-09	70000

QUESTIONS:

1. List all the doctors that who do not practice in "Surgery" specialty.
2. Display Severity 'S' patients with their id and ward code.
3. List the information of all the patients who got admitted in "Medicine" category.
4. List the name of all the doctors whose salary is greater than 45000.
5. Find the average Bill for the patient.
6. Show the doctor name of the patient whose Patient Id 6002.
7. Find the name of the patient and doctor whose bill is not more than 10000.