

## **Practical 5**

**Name: Shivam Tawari**

**Roll no: A-58**

**Aim:** Exercise 1.Data retrieval from the designed database. e.g. SELECT

### **Theory:**

1. The MIN() function returns the smallest value of the selected column.

```
SELECT MIN(column_name)
```

```
FROM table_name
```

```
WHERE condition;
```

2. The MAX() function returns the largest value of the selected column.

```
SELECT MAX(column_name)
```

```
FROM table_name
```

```
WHERE condition;
```

3. The COUNT() function returns the number of rows that matches a specified criterion.

```
SELECT COUNT(column_name)
```

```
FROM table_name
```

```
WHERE condition;
```

4. The AVG() function returns the average value of a numeric column.

```
SELECT AVG(column_name)
```

```
FROM table_name
```

```
WHERE condition;
```

5. The SUM() function returns the total sum of a numeric column.

```
SELECT SUM(column_name)
```

```
FROM table_name
```

```
WHERE condition;
```

## Program/Queries:

SQL Code followed by Output Screenshot for each table

Task1: retrieve the data using SELECT Statement (on all tables present in your project)

### SQL Query:

SELECT \* FROM Students;

### Output :-

The screenshot shows a PostgreSQL query editor window titled "Query - temp on postgres@localhost:5432". The SQL Editor contains the following code:

```
ALTER TABLE Students RENAME COLUMN ContactDetails TO ContactNumber;
ALTER TABLE Students ADD Age INT;
ALTER TABLE Students ADD CHECK (Age > 10);

INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE1111123', '2019AAIE1111234');

SELECT * FROM Students;
```

The Output pane displays the results of the query in a table with 7 rows and 10 columns:

	regid character varying(20)	firstname character varying(100)	lastname character varying(100)	dateofbirth date	semester integer	departmentid integer	contactnumber bigint	age integer	
1	2019AAIE1111010	Ajay	Sandhu	2000-05-15	4	2	9452195859	21	
2	2020AAIE1111117	Abhishek	Ingle	2001-04-12	2	1	8683738291	20	
3	2019AAIE1111445	Elon	Morgan	2001-11-09	4	1	7685949322	19	
4	2019AAIE1111007	Shivam	Tawari	2001-10-07	5	1	7020282332	19	
5	2019AAIE1111234	Rajat	Sharma	2001-09-18	5	1	9523654715	19	
6	2018AAIE1111123	Rohit	Kumar	2001-01-05	7	3	9686940294	20	
7	2020AAIE1111001	Kumar	Sangameshwar	2001-10-21	3	2	6909029310	19	

### SQL Query:

SELECT \* FROM Departments;

### Output :-

The screenshot shows a PostgreSQL SQL Editor window titled "Query - temp on postgres@localhost:5432". The query editor contains the following SQL code:

```

ALTER TABLE Students ADD Age INT;
ALTER TABLE Students ADD CHECK (Age > 10);

INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivan', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9696940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE111123', '2019AAIE1111234');

SELECT * FROM Students;
SELECT * FROM Departments;

```

The output pane shows the result of the query, displaying a table with 5 rows and 4 columns:

deptid	deptname	deptest	headofdept
integer	character varying(30)	date	character varying(30)
1	1 Artificial Intelligence	2019-01-01	A. Thomas
2	2 Computer Science	2010-01-01	Snehlata Dongre
3	3 Information Technology	2009-01-01	Mahendra Gaikwad
4	4 Data Science	2021-01-01	A. Thomas
5	5 Electrical Engineering	2005-01-01	Prema Daigavane

The status bar at the bottom indicates "OK", "Ln 47, Col 27, Ch 1757", "5 rows", and "20 ms".

Task2: Try to retrieve the data from table for selected attribute

SQL Query:

SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 4;

Output :-

Query - temp on postgres@localhost:5432 \*

```

ALTER TABLE Students ADD CHECK (Age > 10);

INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE1111123', '2019AAIE1111234');

SELECT * FROM Students;
SELECT * FROM Departments;
SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5;

```

	regid character varying(20)	firstname character varying(100)	lastname character varying(100)	contactnumber bigint
1	2019AAIE1111007	Shivam	Tawari	7020282332
2	2019AAIE1111234	Rajat	Sharma	9523654715

Task3: Try to use aggregate functions on your database table

### SQL Query:

SELECT count(\*) FROM Students;

Output :-

Query - temp on postgres@localhost:5432 \*

```

ALTER TABLE Students ADD CHECK (Age > 10);

INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE1111123', '2019AAIE1111234');

SELECT * FROM Students;
SELECT * FROM Departments;
SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5;
SELECT count(*) FROM Students;

```

	count bigint
1	7

## SQL Query:

SELECT MIN(Semester) FROM Students;

## Output :-

The screenshot shows a PostgreSQL SQL Editor window titled "Query - temp on postgres@localhost:5432". The SQL Editor contains the following queries:

```
INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE111123', '2019AAIE1111234');

SELECT * FROM Students;
SELECT * FROM Departments;
SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5;
SELECT count(*) FROM Students;
SELECT MIN(Semester) FROM Students;
```

The Output pane shows the result of the last query:

min	integer
1	2

The status bar at the bottom indicates "1 row. 30 ms".

## SQL Query:

SELECT MAX(Semester) FROM Students;

## Output :-

The screenshot shows a PostgreSQL SQL Editor window titled "Query - temp on postgres@localhost:5432". The SQL Editor contains the following queries:

```
INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),
('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),
('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),
('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19);

UPDATE Students SET Semester = Semester + 1
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE111123', '2019AAIE1111234');

SELECT * FROM Students;
SELECT * FROM Departments;
SELECT count(*) FROM Students;
SELECT MIN(Semester) FROM Students;
SELECT MAX(Semester) FROM Students;
```

The Output pane shows the result of the last query:

max	integer
1	7

The status bar at the bottom indicates "1 row. 20 ms".

Task4: To use logical and Comparison operator to retrieve the data

### SQL Query:

SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5  
AND DepartmentID = 1;

### Output :-

The screenshot shows a PostgreSQL query editor window titled "Query - temp on postgres@localhost:5432". The SQL Editor contains the following queries:

```
(('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19),  
(('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),  
(('2020AAIE1111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),  
(('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19),  
(('2018AAIE1111123', 'Rohit', 'Kumar', '2001-01-05', 6, 3, 9686940294, 20),  
(('2019AAIE1111445', 'Elon', 'Morgan', '2001-11-09', 4, 1, 7685949322, 19),  
(('2020AAIE1111001', 'Kumar', 'Sangameshwar', '2001-10-21', 2, 2, 6909029310, 19) ;  
  
UPDATE Students SET Semester = Semester + 1  
where RegID in ('2019AAIE1111007', '2020AAIE1111001', '2018AAIE1111234', '2019AAIE1111234');  
  
SELECT * FROM Students;  
SELECT * FROM Departments;  
SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5;  
SELECT count(*) FROM Students;  
SELECT MIN(Semester) FROM Students;  
SELECT MAX(Semester) FROM Students;  
SELECT RegID, FirstName, LastName, ContactNumber FROM Students WHERE Semester = 5 AND DepartmentID
```

The Output pane shows the results of the queries:

	regid character varying(20)	firstname character varying(100)	lastname character varying(100)	contactnumber bigint
1	2019AAIE1111007	Shivam	Tawari	7020282332
2	2019AAIE1111234	Rajat	Sharma	9523654715

The status bar at the bottom indicates "OK", "Ln 52, Col 34, Ch 1977", "2 rows", and "29 ms". The system clock shows "10:28 PM 9/6/2021".

**Conclusion:** Hence we have learnt and performed SQL query that data retrieval SQL query on tables also learnt, use of Aggregate functions, group by, order by, WHERE clause, Logical Operator and Comparison operation