

Practical 8

Name: Shivam Tawari

Roll Number: A-58

Aim: Exercise 4: Database updates and data integrity.

Theory:

TCL (Transaction Control Language): TCL commands deal with the transaction within the database.

Examples of TCL commands:

COMMIT– commits a Transaction.

ROLLBACK– rolls back a transaction in case of any error occurs.

SAVEPOINT–sets a savepoint within a transaction.

SET TRANSACTION–specify characteristics for the transaction.

1. COMMIT command is used to permanently save any transaction into the database.

When we use any DML command like INSERT, UPDATE or DELETE, the changes made by these commands are not permanent, until the current session is closed, the changes made by these commands can be rolled back.

To avoid that, we use the COMMIT command to mark the changes as permanent.

2. SAVEPOINT command is used to temporarily save a transaction so that you can rollback to that point whenever required.

Following is savepoint command's syntax,

SAVEPOINT savepoint_name;

3. ROLLBACK command restores the database to last committed state. It is also used with SAVEPOINT command to jump to a savepoint in an ongoing transaction.

If we have used the UPDATE command to make some changes into the database, and realise that those changes were not required, then we can use the ROLLBACK command to rollback those changes, if they were not committed using the COMMIT command.

Following is rollback command's syntax,

ROLLBACK TO savepoint_name;

Program/Queries:

SQL Scripts:

1) BEGIN;
INSERT INTO Students VALUES

```
('2019AAIE1111058', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19);  
COMMIT;
```

```
INSERT INTO Students VALUES
```

```
('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);  
ROLLBACK;
```

```
INSERT INTO Students VALUES
```

```
('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) ;
```

```
SELECT * FROM Students;
```

The screenshot shows a PostgreSQL SQL Editor window with a script containing the following SQL statements:

```
ALTER TABLE Students ADD CHECK (Age > 10);  
ALTER TABLE Students ADD TGID INT;  
  
BEGIN;  
INSERT INTO Students VALUES  
( '2019AAIE1111058', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19);  
COMMIT;  
  
INSERT INTO Students VALUES  
( '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);  
ROLLBACK;  
  
INSERT INTO Students VALUES  
( '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) ;  
  
SELECT * FROM Students;
```

The Output pane at the bottom shows the result of the SELECT statement, displaying a table with 4 rows of student data:

	regid character varying(20)	firstname character varying(100)	lastname character varying(100)	dateofbirth date	semester integer	departmentid integer	contactnumber bigint	age integer	tgid integer
1	2019AAIE1111058	Shivam	Tawari	2001-10-07	4	1	7020282332	19	
2	2018AAIE1111123	Rohit	Kumar	2001-01-05	6	3	9686940294	20	
3	2019AAIE1111445	Elon	Morgan	2001-11-09	4	1	7685949322	19	
4	2020AAIE1111001	Kumar	Sangameshwar	2001-10-21	2	2	6909029310	19	

```
2) BEGIN;
```

```
INSERT INTO Students VALUES
```

```
('2019AAIE1111058', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19);  
SAVEPOINT save_1;
```

```
INSERT INTO Students VALUES
```

```
('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);
SAVEPOINT save_2;
```

INSERT INTO Students VALUES

```
( '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) ;
ROLLBACK to SAVEPOINT save_2;
```

The screenshot shows a PostgreSQL SQL Editor window with the following SQL query:

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

BEGIN;
INSERT INTO Students VALUES
('2019AAIE1111007', 'Shivam', 'Tawari', '2001-10-07', 4, 1, 7020282332, 19);
SAVEPOINT save_1;

INSERT INTO Students VALUES
('2019AAIE1111010', 'Ajay', 'Sandhu', '2000-05-15', 4, 2, 9452195859, 21),
('2020AAIE111117', 'Abhishek', 'Ingle', '2001-04-12', 2, 1, 8683738291, 20),
('2019AAIE1111234', 'Rajat', 'Sharma', '2001-09-18', 4, 1, 9523654715, 19);
SAVEPOINT save_2;

INSERT INTO Students VALUES
('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) ;
ROLLBACK to SAVEPOINT save_2;

SELECT * FROM Students;
```

The output pane shows the following data:

regid	character varying(20)	firstname	character varying(100)	lastname	character varying(100)	dateofbirth	date	semester	integer	departmentid	integer	contactnumber	bigint	age	integer	tgid	integer
1	2019AAIE1111007	Shivam	Tawari			2001-10-07		4		1		7020282332		19			
2	2019AAIE1111010	Ajay	Sandhu			2000-05-15		4		2		9452195859		21			
3	2020AAIE111117	Abhishek	Ingle			2001-04-12		2		1		8683738291		20			
4	2019AAIE1111234	Rajat	Sharma			2001-09-18		4		1		9523654715		19			

3) CREATE VIEW STUDENT_058 AS

```
SELECT REGID, FIRSTNAME, LASTNAME, SEMESTER
FROM Students
WHERE REGID='2019AAIE1111058';
```

```
SELECT * FROM STUDENT_058;
```

Query - P8 on postgres@localhost:5433 *

File Edit Query Favorites Macros View Help

SQL Editor Graphical Query Builder

Previous queries Delete Delete All

```
SAVEPOINT save_1;

INSERT INTO Students VALUES
('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);
SAVEPOINT save_2;

INSERT INTO Students VALUES
('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) ;
ROLLBACK to SAVEPOINT save_2;

CREATE VIEW STUDENT_058 AS
SELECT REGID, FIRSTNAME, LASTNAME, SEMESTER
FROM Students
WHERE REGID='2019AAIE1111058';

SELECT * FROM STUDENT_058;
```

Scratch pad

Output pane

Data Output Explain Messages History

	regid character varying(20)	firstname character varying(100)	lastname character varying(100)	semester integer
1	2019AAIE1111058	Shivam	Tavari	4

OK. Unix Ln 78, Col 26, Ch 2527 1 row. 109 ms

Conclusion: Hence, we have learnt and performed up-dation in database and data integrity, Transaction processing and control statement use in transaction.