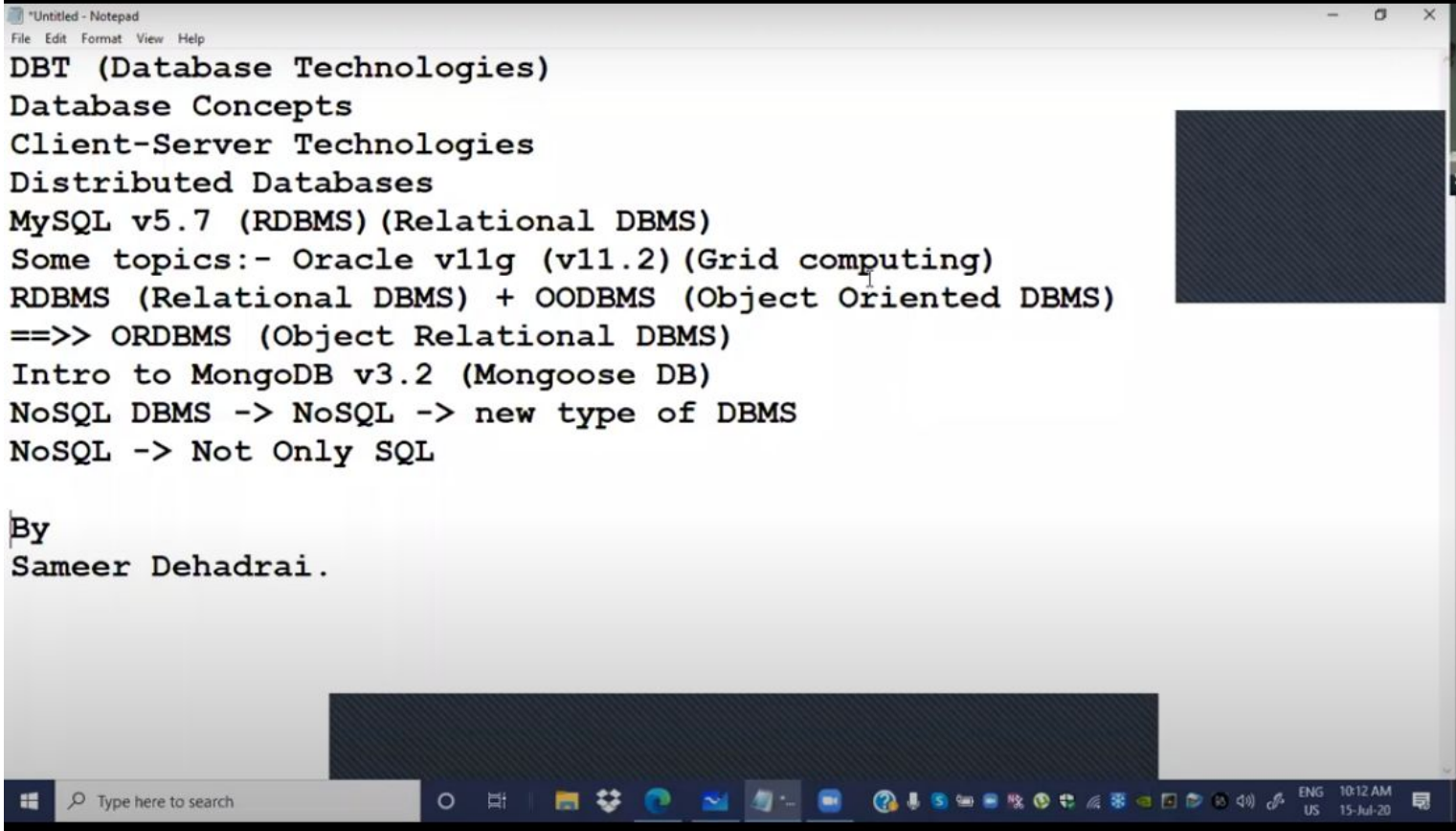
Database Lec - 1



11:00 / 3:05:45

Scroll for details

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File Edit Format View Help

MySQL

Computaire -> to compute/calculate

(input)				(output)
Data	-->>	Computer	-->	Information
(raw facts)				(meaningful data)
e.g.				(processed data)
22021984				

DATABASE -> collection of LARGE amounts of data

Type here to search

ENG US 10:54 AM 15-Jul-20

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File Edit Format View Help

DBMS -> Database Management System
-> readymade s/w that helps you to manage your data
ANSI definition -> collection of programs (readymade s/w) that allows you to insert, update, delete, and process
Processing -> convert Data into Information

Various DBMS:-
e.g. MS Excel, dBASE, Foxbase, Foxpro, Dataease, Dataflex, DB Vista, Advanced Revelation, Quattro Pro, etc.

MySQL (RDBMS)(Relaitonal DBMS)

DBMS vs RDBMS

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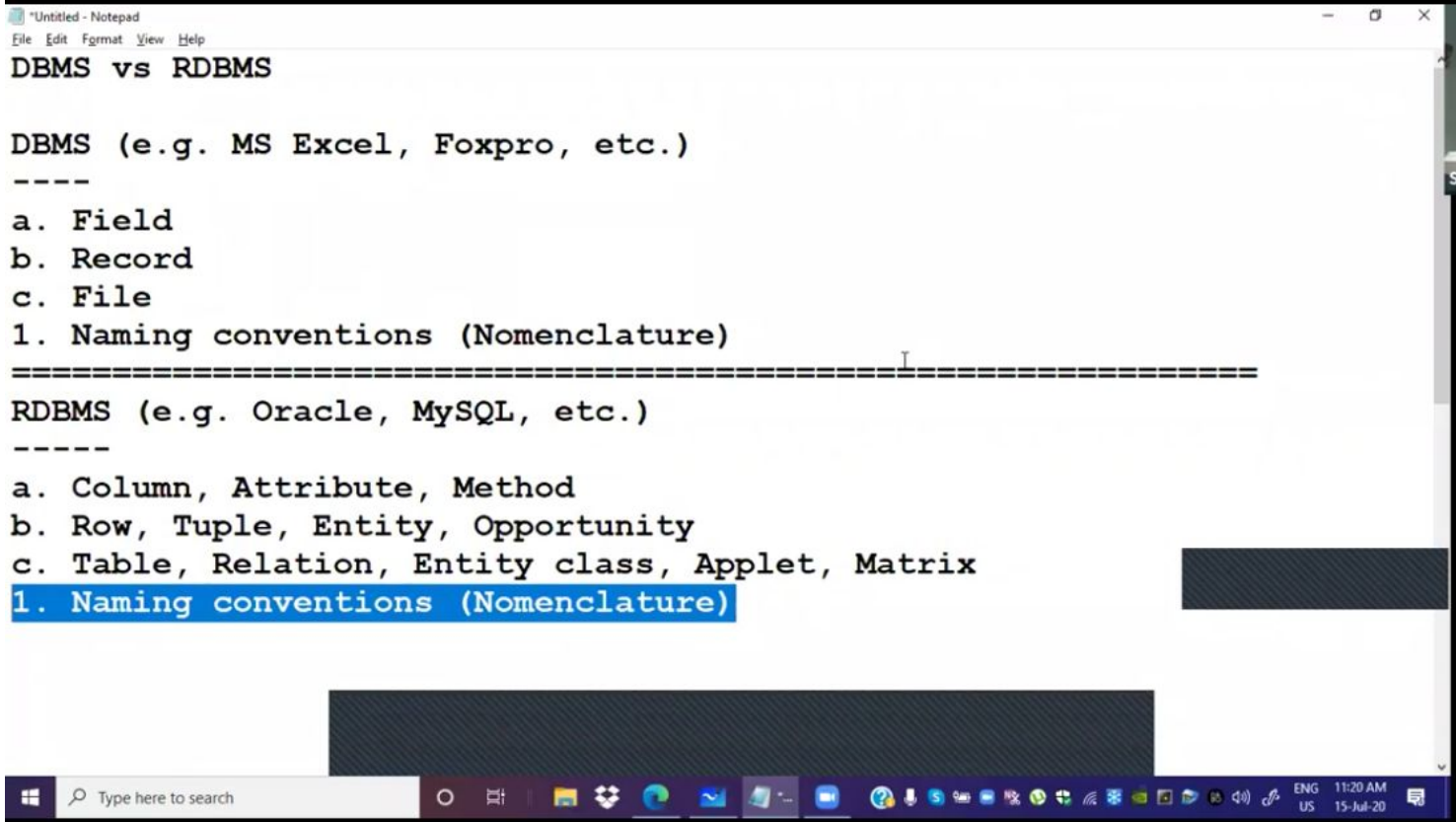
*Untitled - Notepad
File Edit Format View Help
DBMS vs RDBMS
DBMS (e.g. MS Excel, Foxpro, etc.)
----
a. Field
b. Record
c. File
1. Naming conventions (Nomenclature)
==========
RDBMS (e.g. Oracle, MySQL, etc.)
-----
a. Column, Attribute, Method
b. Row, Tuple, Entity, Opportunity
c. Table, Relation, Entity class, Applet, Matrix
1. Naming conventions (Nomenclature)
Type here to search
ENG US
11:20 AM 15-Jul-20


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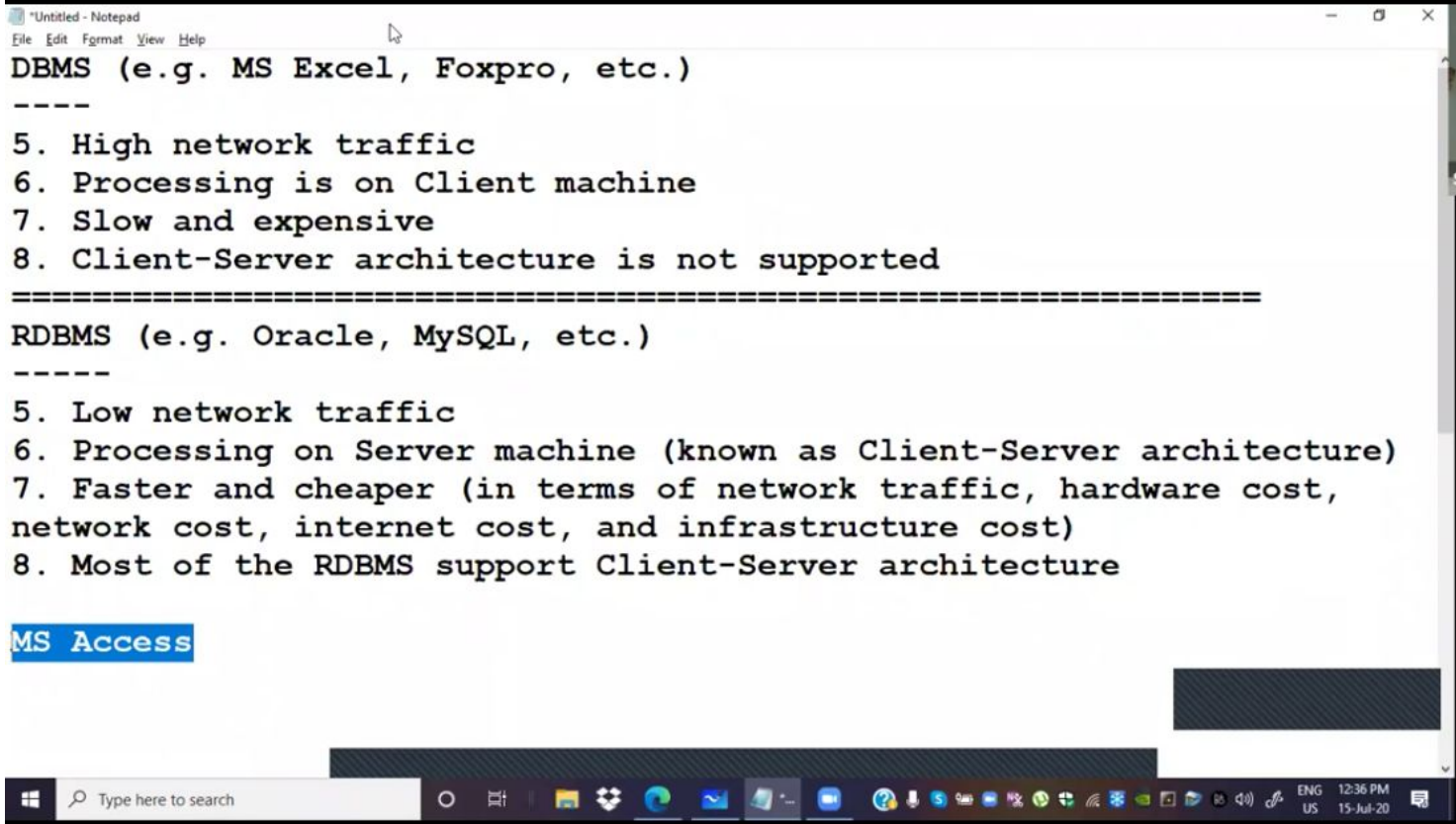
*Untitled - Notepad
File Edit Format View Help
DBMS (e.g. MS Excel, Foxpro, etc.)
---
5. High network traffic
6. Processing is on Client machine
7. Slow and expensive
8. Client-Server architecture is not supported
==========
RDBMS (e.g. Oracle, MySQL, etc.)
-----
5. Low network traffic
6. Processing on Server machine (known as Client-Server architecture)
7. Faster and cheaper (in terms of network traffic, hardware cost, network cost, internet cost, and infrastructure cost)
8. Most of the RDBMS support Client-Server architecture
MS Access
Type here to search
ENG US
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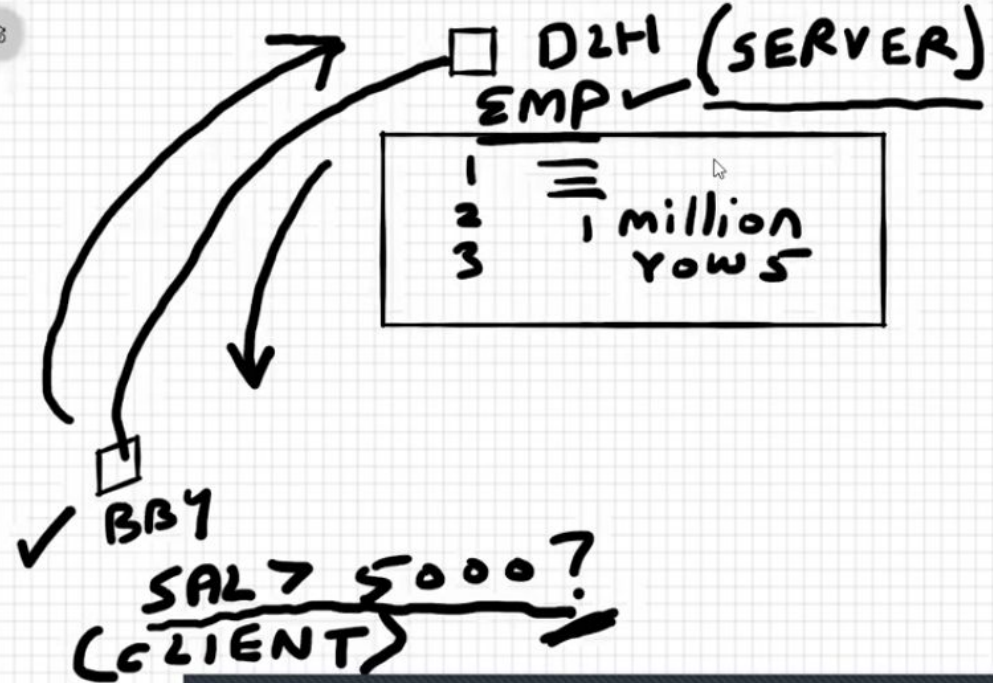
Microsoft Whiteboard



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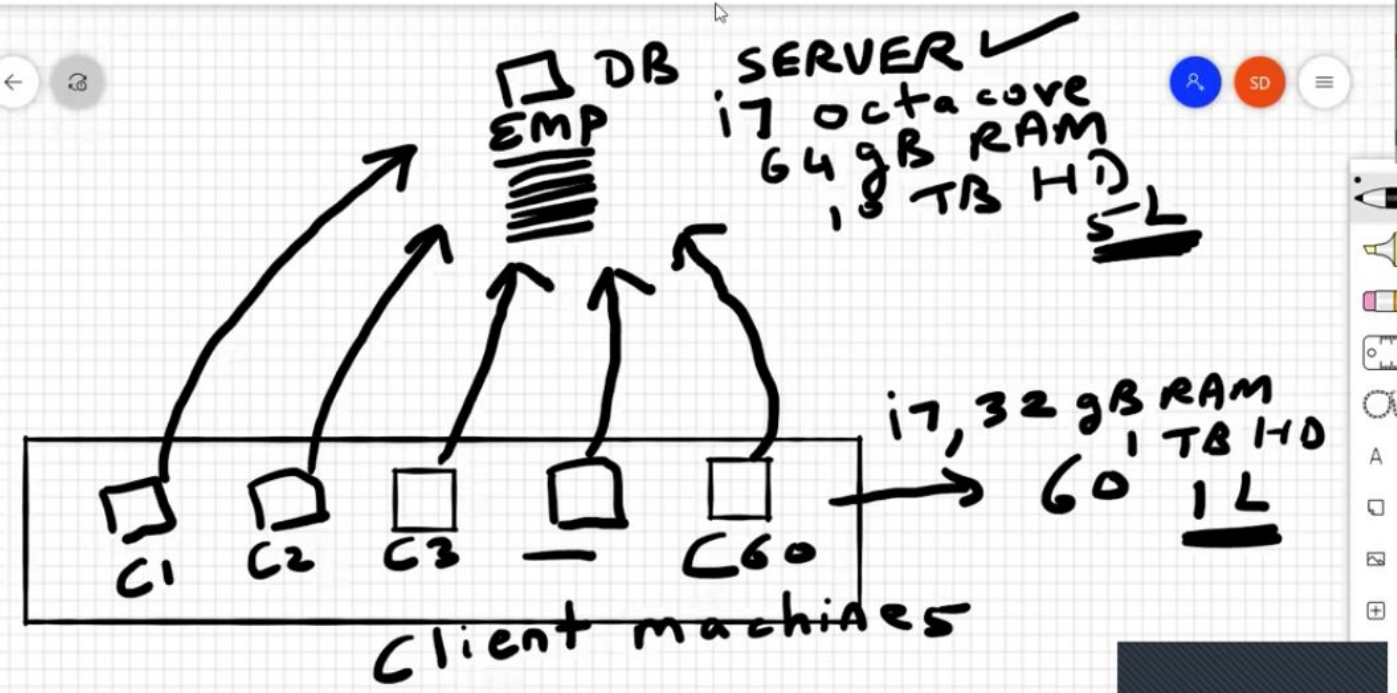
Microsoft Whiteboard



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DBMS (e.g. MS Excel, Foxpro, etc.)

---

9. File level locking

10. Not suitable for multi-user

==========

RDBMS (e.g. Oracle, MySQL, etc.)

-----

9. Row level locking (table is not a file; internally every row is a file)

10. Suitable for multi-user

Type here to search

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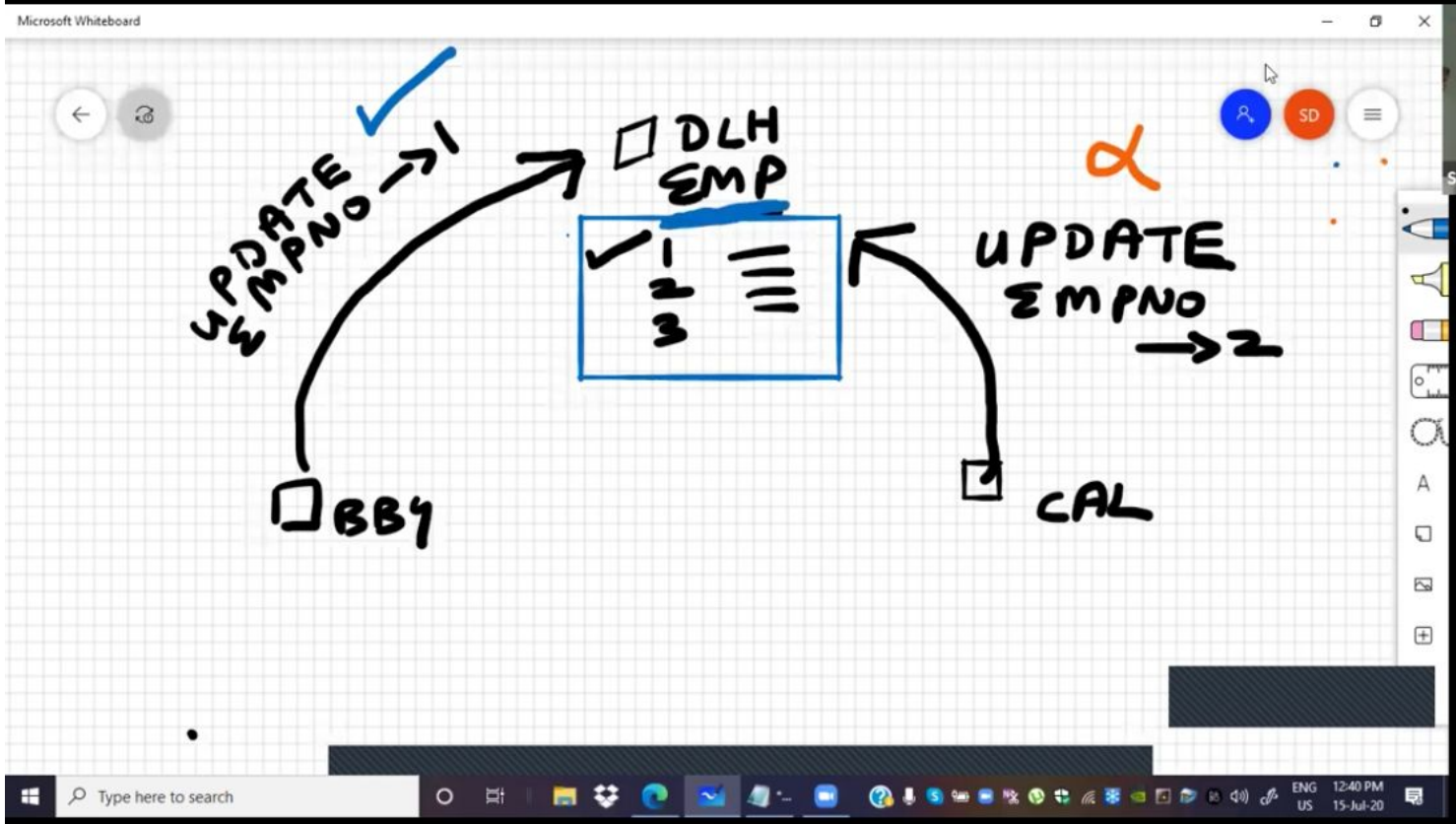
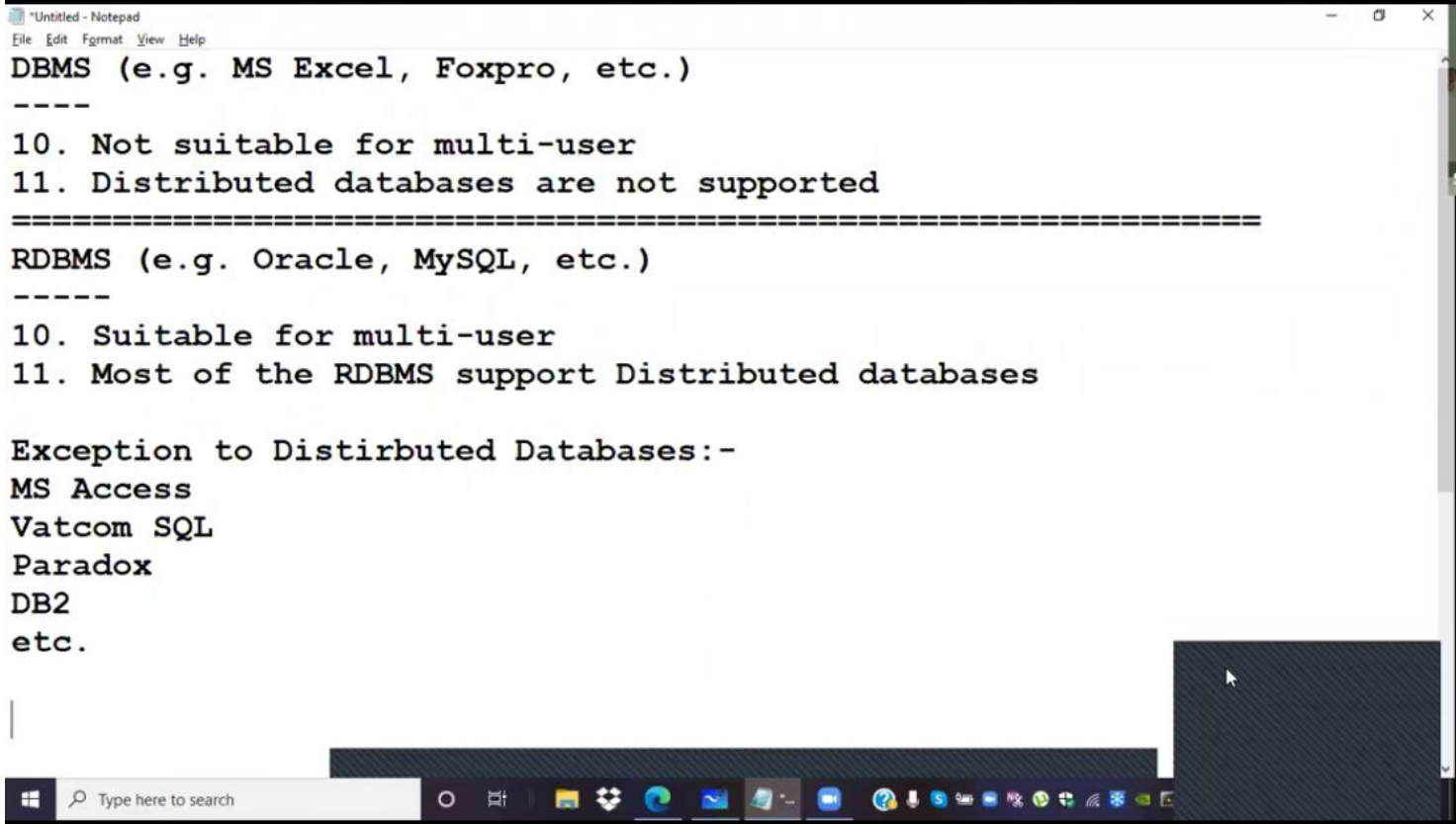

Microsoft Whiteboard
UPDATE EMPNO → 1
DLH EMP
1
2
3
UPDATE EMPNO → 2
BBY
CAL
SD
Sameer Dehadrai
Type here to search
ENG US
12:40 PM 15-Jul-20


*Untitled - Notepad
File Edit Format View Help
DBMS (e.g. MS Excel, Foxpro, etc.)
----
10. Not suitable for multi-user
11. Distributed databases are not supported
==========
RDBMS (e.g. Oracle, MySQL, etc.)
-----
10. Suitable for multi-user
11. Most of the RDBMS support Distributed databases
Exception to Distirbuted Databases:-
MS Access
Vatcom SQL
Paradox
DB2
etc.
Type here to search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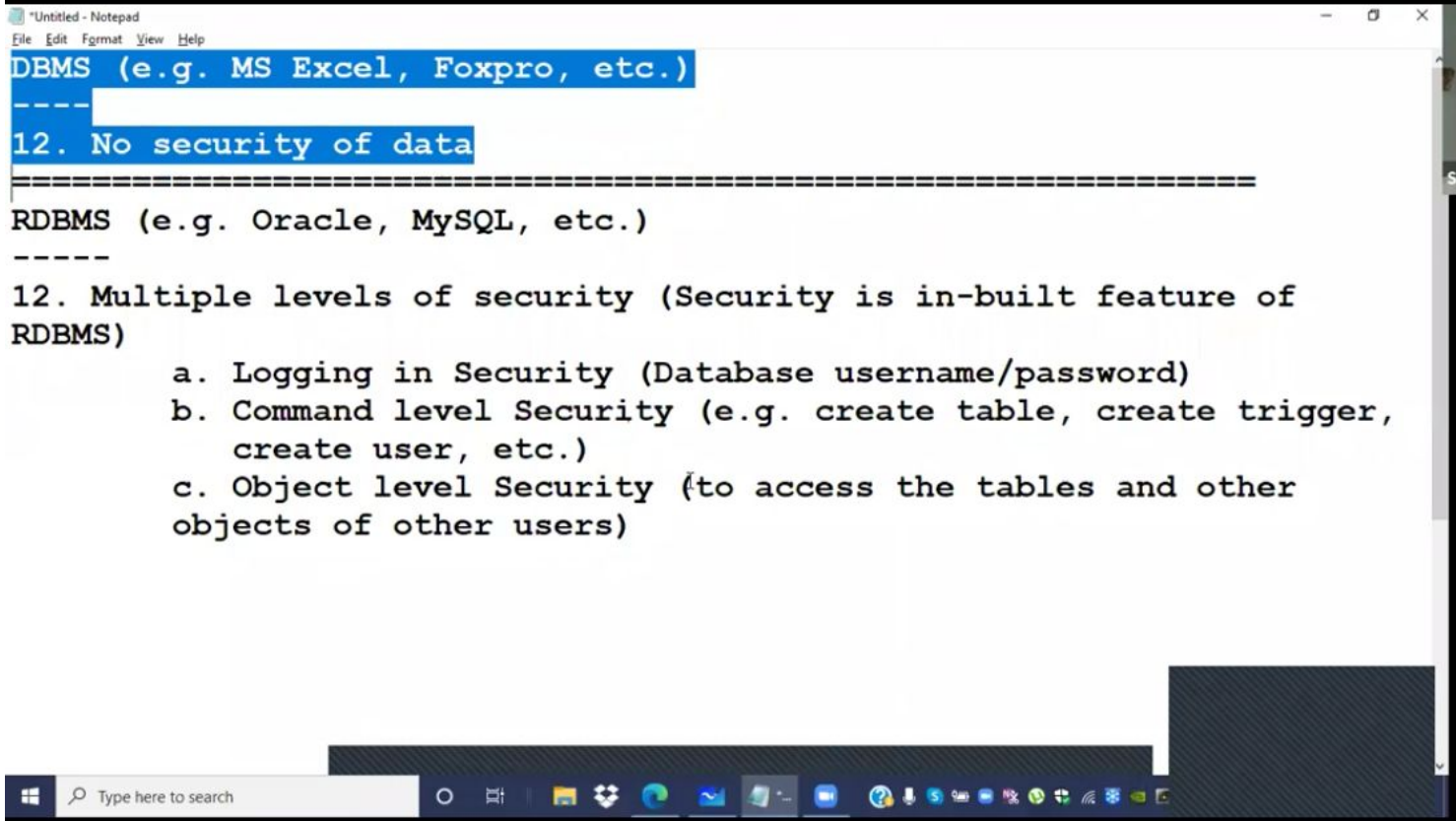
*Untitled - Notepad
File Edit Format View Help
DBMS (e.g. MS Excel, Foxpro, etc.)
---
12. No security of data
==========
RDBMS (e.g. Oracle, MySQL, etc.)
-----
12. Multiple levels of security (Security is in-built feature of RDBMS)
a. Logging in Security (Database username/password)
b. Command level Security (e.g. create table, create trigger, create user, etc.)
c. Object level Security (to access the tables and other objects of other users)
Type here to search


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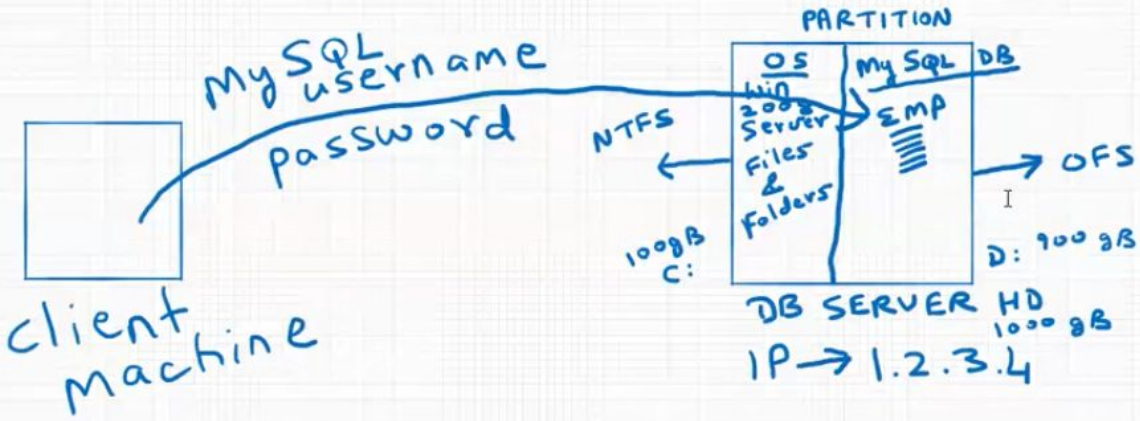
Microsoft Whiteboard



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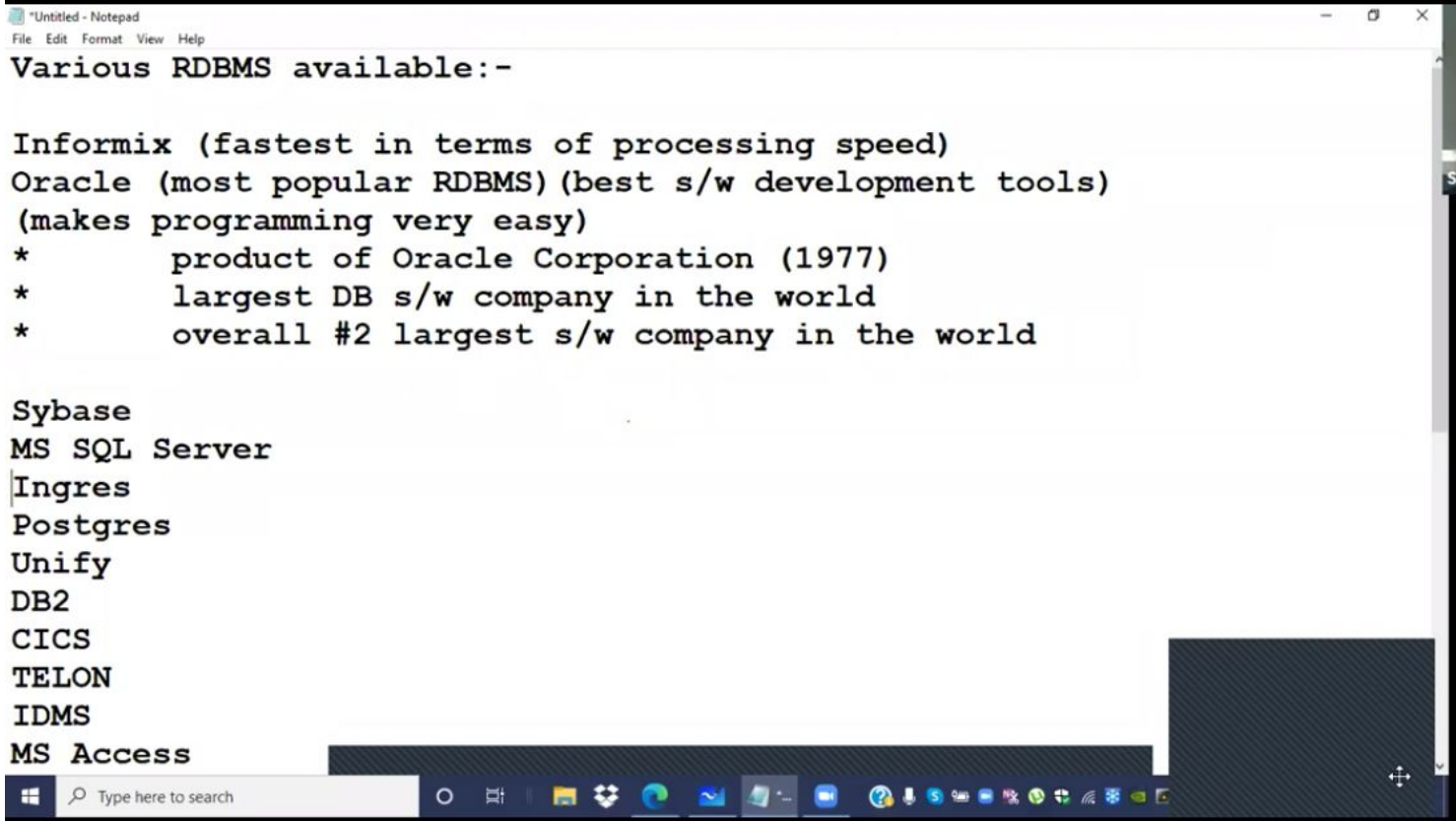
Type here to search


*Untitled - Notepad
File Edit Format View Help
Various RDBMS available:-
Informix (fastest in terms of processing speed)
Oracle (most popular RDBMS)(best s/w development tools)
(makes programming very easy)
* product of Oracle Corporation (1977)
* largest DB s/w company in the world
* overall #2 largest s/w company in the world
Sybase
MS SQL Server
Ingres
Postgres
Unify
DB2
CICS
TELON
IDMS
MS Access
Type here to search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Day 2

*DBT - Notepad

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```
Oracle (most popular RDBMS)(best s/w development tools)
(makes programming very easy)
*       product of Oracle Corporation (1977)
*       largest DB s/w company in the world
*       overall #2 largest s/w company in the world
*       63% of world commercial database market
        (in Client-Server environment)
*       86% of world commercial database market
        (in the Internet environment)
*       works with 113 OS

Sybase (going down)(SAP acquired Sybase)

MS SQL Server (good RDBMS)(competition for Oracle)
(very popular with .Net programmers)
(works only with Windows OS)(16% of world DB market)

Ingres
Postgres
```

Type here to search

ENG US 16-Jul-20

*DBT - Notepad
File Edit Format View Help

(in the Internet environment)

* works with 113 OS

Character based (only work with Unix/Linux, DOS OS):-
Ingres
Postgres
Unify (used by Dena Bank)

DB2
CICS
TELON
IDMS
MS Access
Paradox
Vatcom SQL
MySQL
etc.

Type here to search

086 San

*DBT - Notepad
File Edit Format View Help

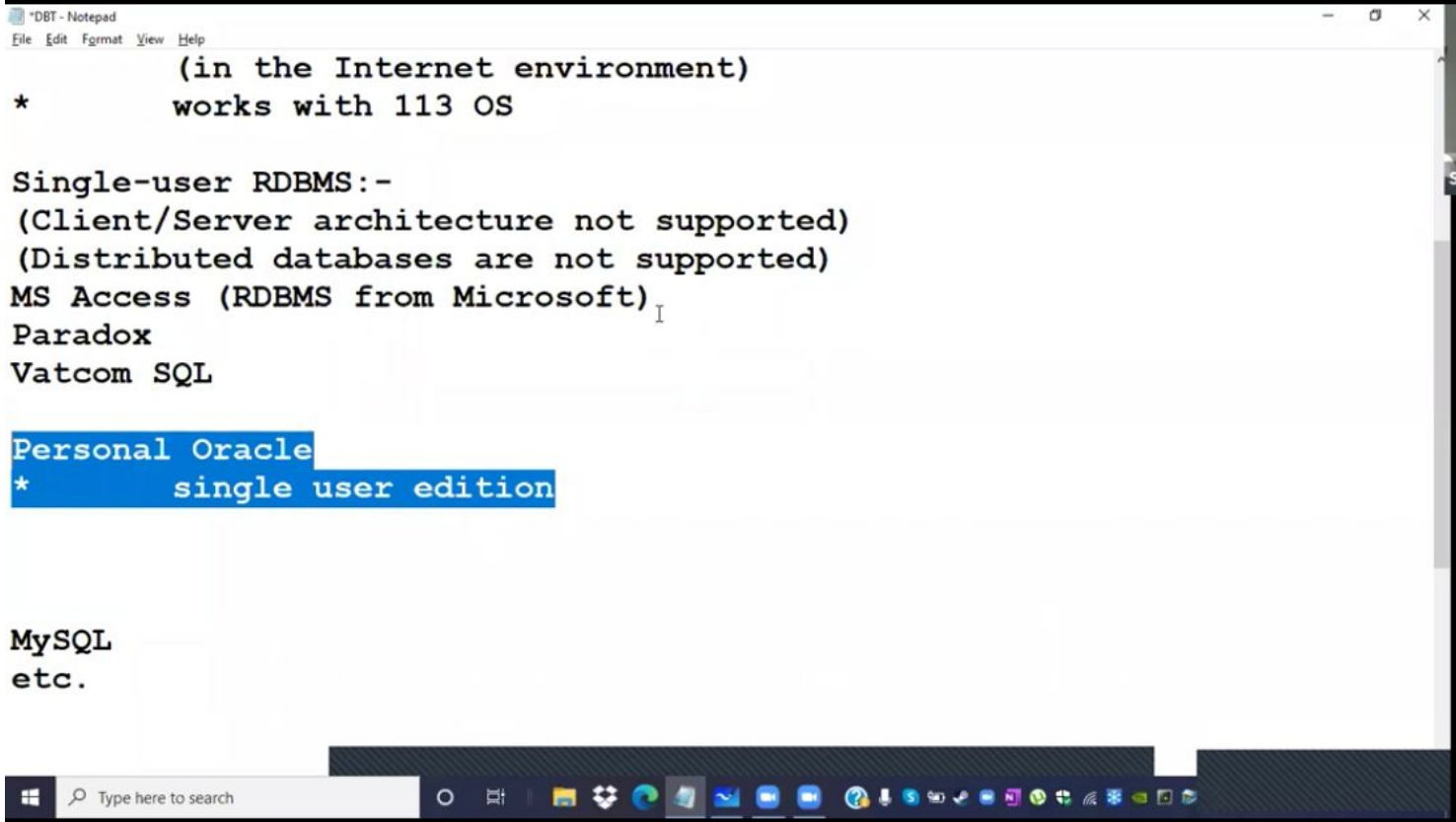
(in the Internet environment)
* works with 113 OS

DB Server has to be a mainframe (super computer):-
(Pune Univ)
DB2 (good RDBMS from IBM)
CICS
TELON
IDMS

MS Access
Paradox
Vatcom SQL
MySQL
etc.

Type here to search

086 San


*DBT - Notepad
File Edit Format View Help
(in the Internet environment)
* works with 113 OS
Single-user RDBMS:-
(Client/Server architecture not supported)
(Distributed databases are not supported)
MS Access (RDBMS from Microsoft)
Paradox
Vatcom SQL
Personal Oracle
* single user edition
MySQL
etc.
Type here to search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086 San

*DBT - Notepad

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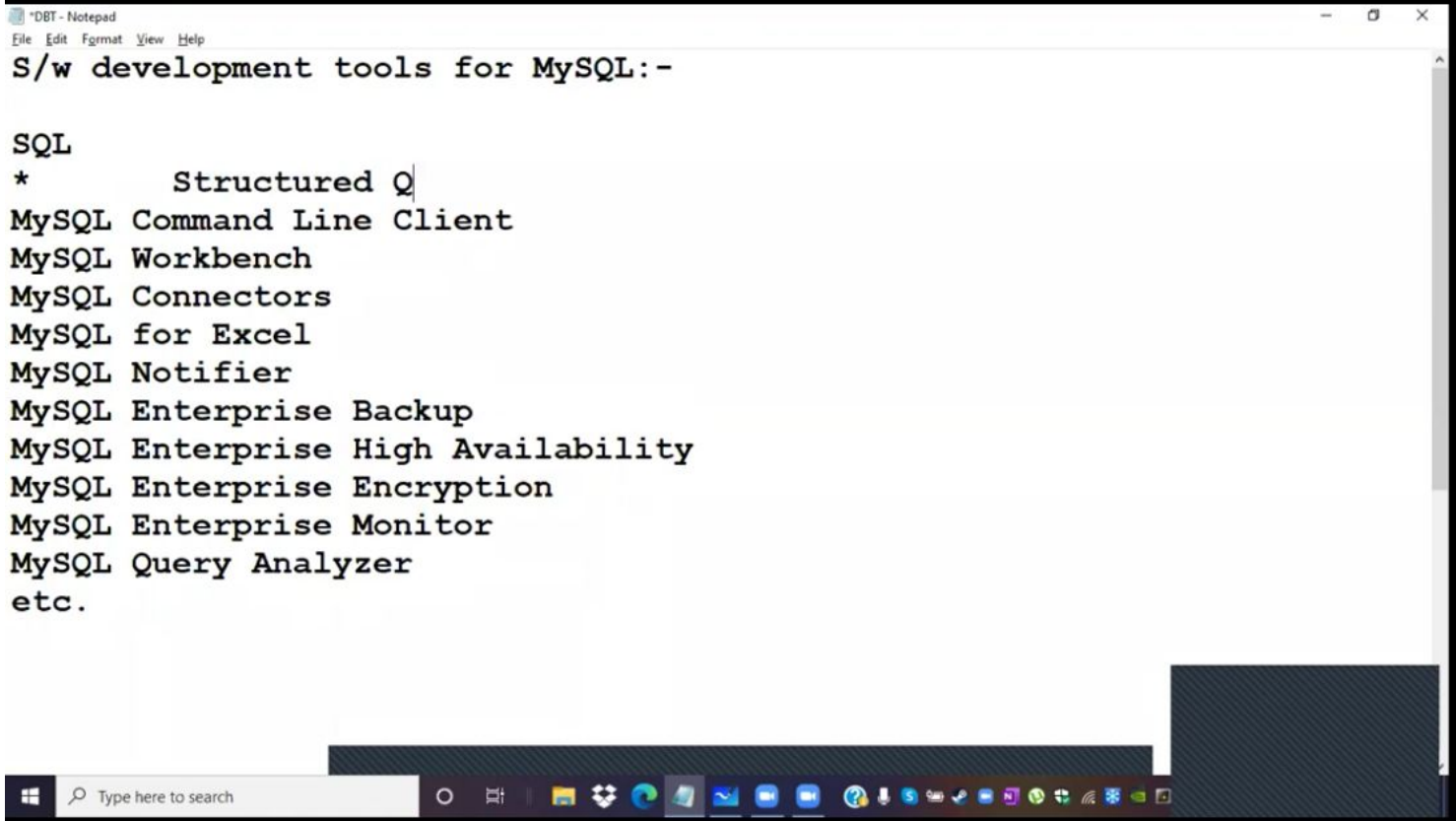
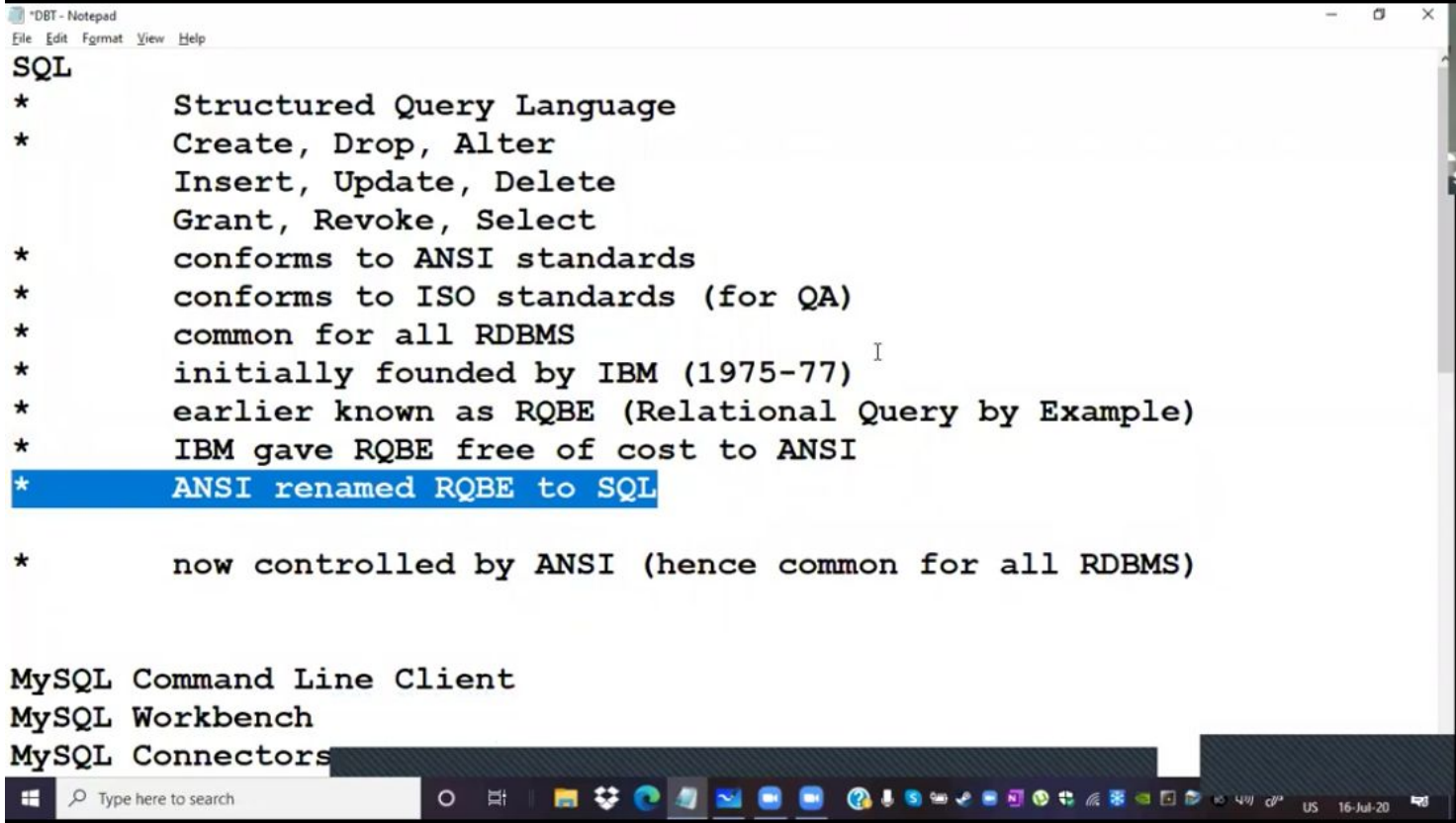
MySQL

* MySQL was launched by a Swedish company in 1995 (C and C++ source code)
* it's name is a combination of "My", the name of co-founder Michael Widenius' daughter, and "SQL"
* MySQL is an open-source RDBMS
* most widely used open-source RDBMS
* free RDBMS (42% of world free database market)
* part of the widely used LAMP open-source web application software stack (and other "AMP" stacks)
  e.g. LAMP, WAMP, MAMP, etc.
* e.g. Facebook, WhatsApp, Twitter, Flickr, YouTube, WordPress, Google (though for not searches), etc.
* Sun Microsystems acquired MySQL in 2008
* Oracle acquired Sun Microsystems in 2010

Type here to search

035_Dipe...


*DBT - Notepad
File Edit Format View Help
S/w development tools for MySQL:-
SQL
* Structured Q
MySQL Command Line Client
MySQL Workbench
MySQL Connectors
MySQL for Excel
MySQL Notifier
MySQL Enterprise Backup
MySQL Enterprise High Availability
MySQL Enterprise Encryption
MySQL Enterprise Monitor
MySQL Query Analyzer
etc.
Type here to search


*DBT - Notepad
File Edit Format View Help
SQL
* Structured Query Language
* Create, Drop, Alter
Insert, Update, Delete
Grant, Revoke, Select
* conforms to ANSI standards
* conforms to ISO standards (for QA)
* common for all RDBMS
* initially founded by IBM (1975-77)
* earlier known as RQBE (Relational Query by Example)
* IBM gave RQBE free of cost to ANSI
* ANSI renamed RQBE to SQL
* now controlled by ANSI (hence common for all RDBMS)
MySQL Command Line Client
MySQL Workbench
MySQL Connectors
Type here to search
US
16-Jul-20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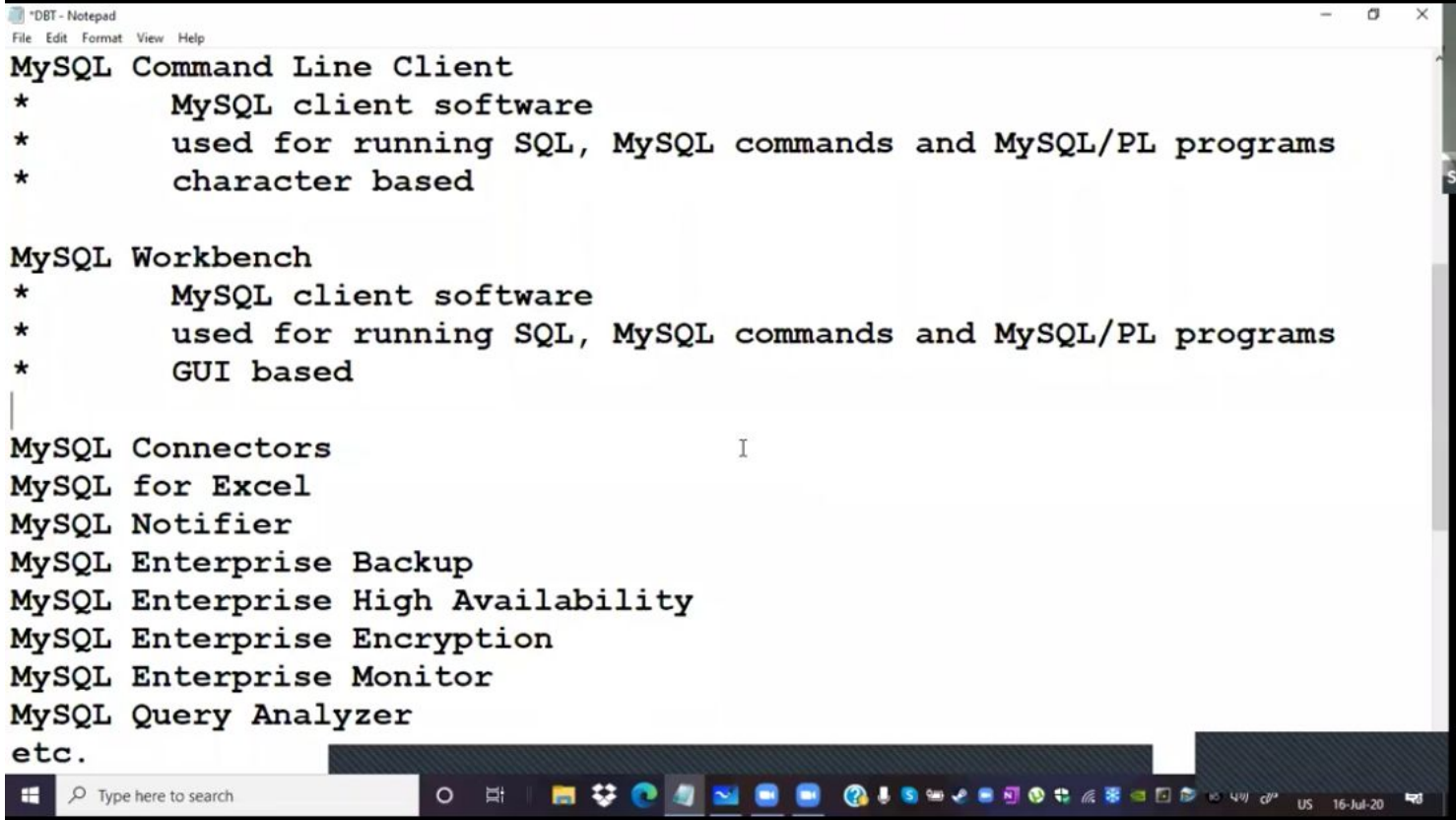
*DBT - Notepad
File Edit Format View Help
MySQL Command Line Client
* MySQL client software
* used for running SQL, MySQL commands and MySQL/PL programs
* character based
MySQL Workbench
* MySQL client software
* used for running SQL, MySQL commands and MySQL/PL programs
* GUI based
MySQL Connectors
MySQL for Excel
MySQL Notifier
MySQL Enterprise Backup
MySQL Enterprise High Availability
MySQL Enterprise Encryption
MySQL Enterprise Monitor
MySQL Query Analyzer
etc.
Type here to search
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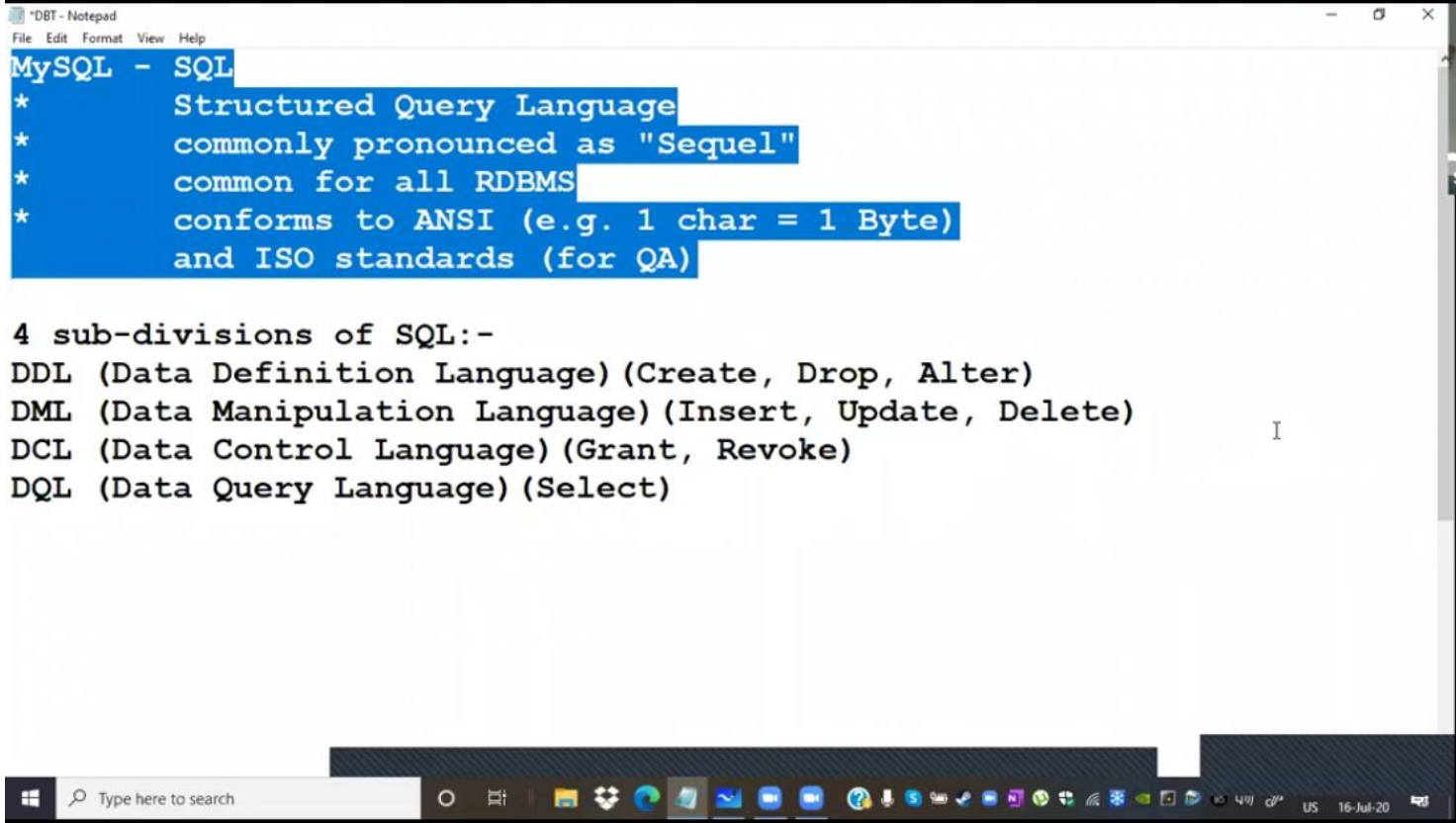
*DBT - Notepad
File Edit Format View Help
MySQL - SQL
* Structured Query Language
* commonly pronounced as "Sequel"
* common for all RDBMS
* conforms to ANSI (e.g. 1 char = 1 Byte)
and ISO standards (for QA)
4 sub-divisions of SQL:-
DDL (Data Definition Language)(Create, Drop, Alter)
DML (Data Manipulation Language)(Insert, Update, Delete)
DCL (Data Control Language)(Grant, Revoke)
DQL (Data Query Language)(Select)
Type here to search
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*DBT - Notepad

File Edit Format View Help

```
Rules for tablenames, columnnames, variablenames:-
*       max 30 characters
*       A - Z, a - z, 0 - 9 allowed
*       has to begin with an alphabet
*       Special characters $, _ allowed
*       In Oracle, you can also # in tablename
*       in MySQL, if you want to special character # in tablename,
        enclose it in back-quotes
*       ` `
*       e.g.
        `EMP#`
*       134 Reserved words not allowed in tablename
```

Type here to search

US 16-Jul-20

Datatypes

*DBT - Notepad

File Edit Format View Help

Datatypes:-

Char (allows any character)(could be alpha-numeric also)
(max upto 255 characters)(fixed length character data)
(wastage of HD space)
e.g. ROLL_NO, PAN_NO, etc.

Varchar (variable length character)(allows any character)
(could be alpha-numeric also)(max upto 65,535 characters)
(conserve on HD space) e.g. ADDRESS, CITY, etc.

* Benefit of CHAR, the searching and retrieval will be very fast

Longtext (allows any character)(max 4,294,967,295 characters)
(4 Gb - 1)

Longblob
Int

Type here to search

ENG US 12:32 PM 16-Jul-20

Database lec-2.mp4 - VLC media player

Media Playback Audio Video Subtitle Tools View Help

*DBT - Notepad

File Edit Format View Help

Datatypes:-

Longtext (allows any character)(max 4,294,967,295 characters)
(4 Gb - 1) e.g. RESUME, EXPERIENCE, REMARKS, COMMENTS, etc.
(variable length)

Longblob (Long Binary Large Object)(allows binary data)
(max 4,294,967,295 Bytes of binary data)
e.g. PHOTOS, CHARTS, GRAPHS, MAPS, SOUND, MUSIC, VIDEOS, etc.

Int
Float
Date
Time
Datetime
Year
etc.

Type here to search

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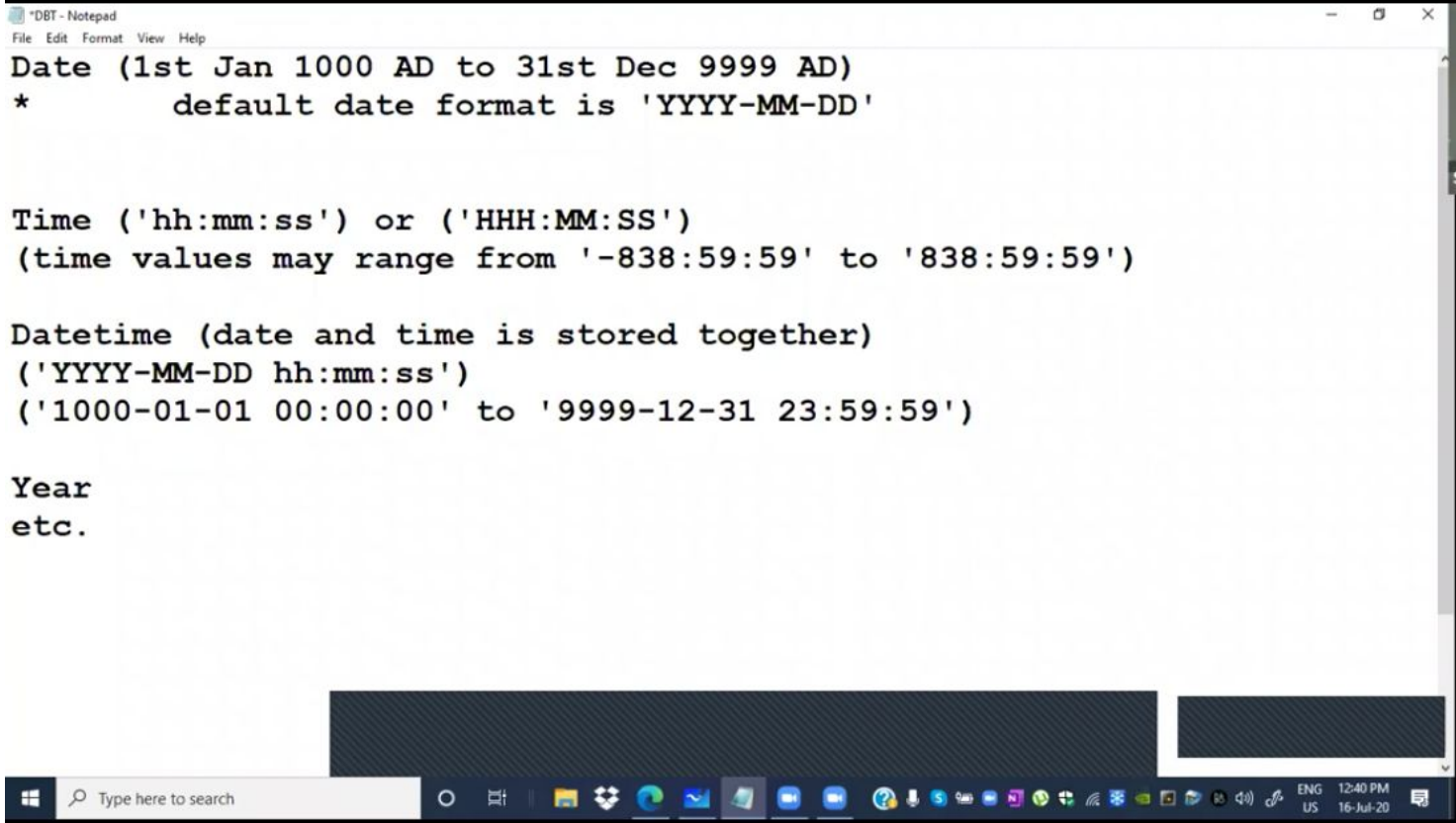
1:55:47 3:09:40

125%


*DBT - Notepad
File Edit Format View Help
Date (1st Jan 1000 AD to 31st Dec 9999 AD)
* default date format is 'YYYY-MM-DD'
Time ('hh:mm:ss') or ('HHH:MM:SS')
(time values may range from '-838:59:59' to '838:59:59')
Datetime (date and time is stored together)
('YYYY-MM-DD hh:mm:ss')
('1000-01-01 00:00:00' to '9999-12-31 23:59:59')
Year
etc.
Type here to search
ENG US
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*DBT - Notepad

File Edit Format View Help

Time ('hh:mm:ss') or ('HHH:MM:SS')
(time values may range from '-838:59:59' to '838:59:59')

Datetime (date and time is stored together)
('YYYY-MM-DD hh:mm:ss')
('1000-01-01 00:00:00' to '9999-12-31 23:59:59')

Year (YYYY)(1901 to 2155)

* max 4096 columns per table provided the row size
<= 65,535 Bytes
* no limit on number of rows per table provided
table size <= 64 Terabytes

Type here to search

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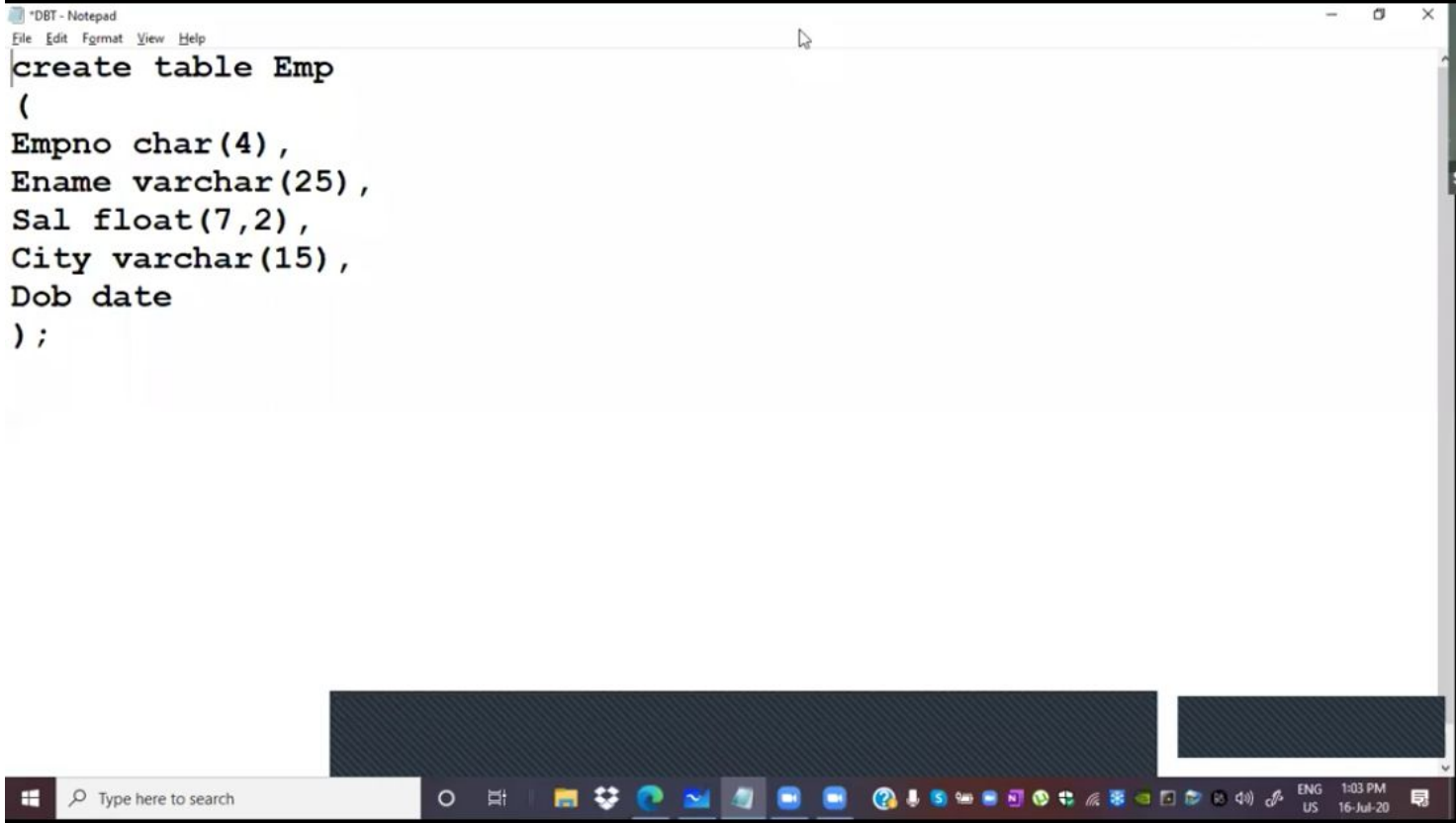
*******IMP**********
--max 4096 columns in a table provided (total row size) is less than 64kb (i.e summation of sizes of datatypes of all columns should be less that 64kb)

--no limit on number of rows provided table size is less than 64tb


*DBT - Notepad
File Edit Format View Help
create table Emp
(
Empno char(4),
Ename varchar(25),
Sal float(7,2),
City varchar(15),
Dob date
);
Type here to search
ENG
US
1:03 PM
16-Jul-20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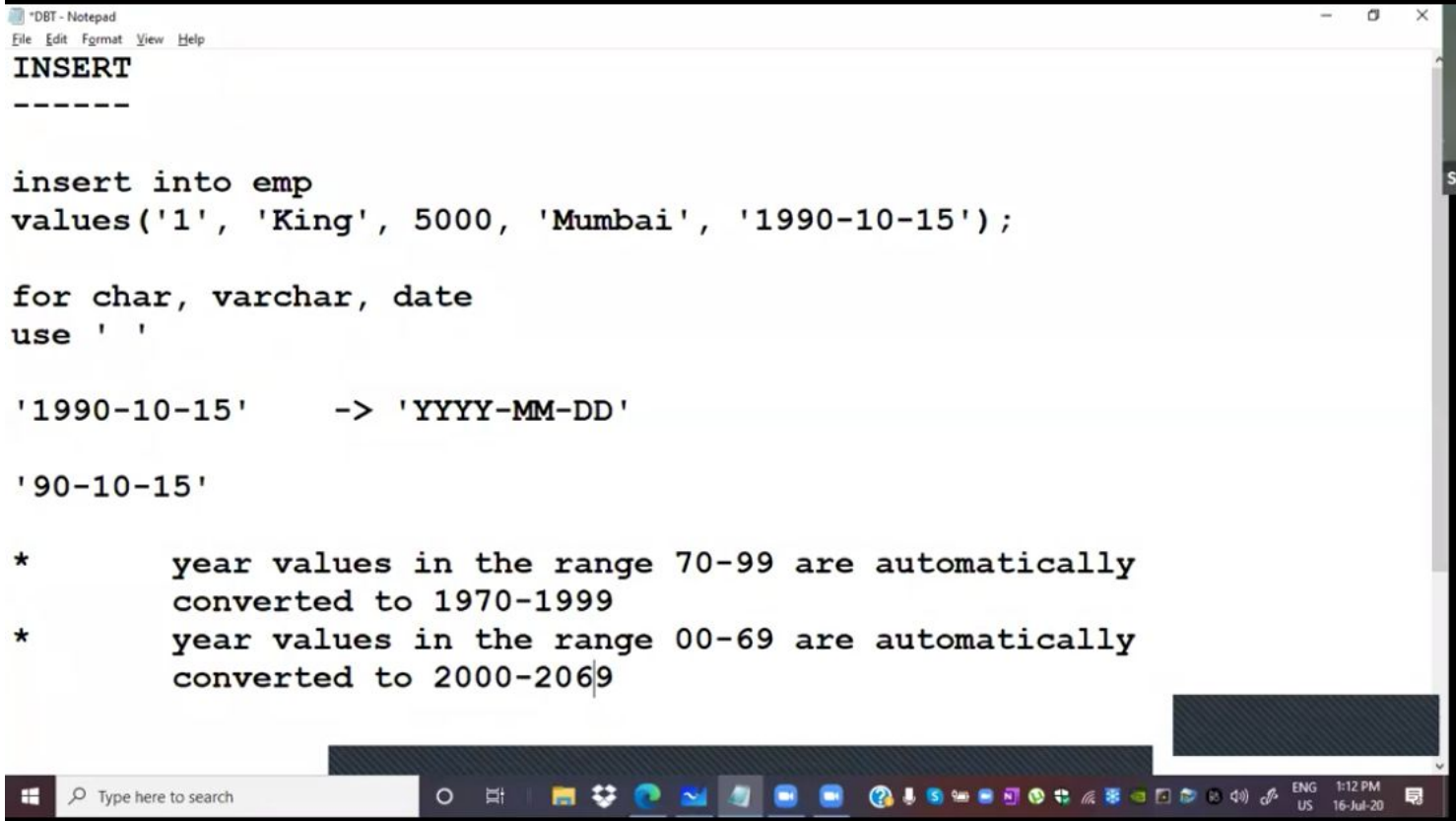
*DBT - Notepad
File Edit Format View Help
INSERT
------
insert into emp
values('1', 'King', 5000, 'Mumbai', '1990-10-15');
for char, varchar, date
use ' '
'1990-10-15' -> 'YYYY-MM-DD'
'90-10-15'
* year values in the range 70-99 are automatically converted to 1970-1999
* year values in the range 00-69 are automatically converted to 2000-2069
Type here to search
ENG US
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16-Jul-20


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*DBT - Notepad

File Edit Format View Help

```
insert into emp(empno, sal)
values('3', 7000);

*       NULL means nothing
*       NULL value is having ASCII value 0
*       Special treatment given to NULL value in all RDBMS
*       NULL value is independent of datatype
*       NULL value occupies only 1 Byte
*       if row is ending with NULLs, those columns will not occupy any
        space
*       those columns that are likely to have large number of Nulls,
        they should preferably be specified at the end of the table
        structure, to conserve on HD space
```

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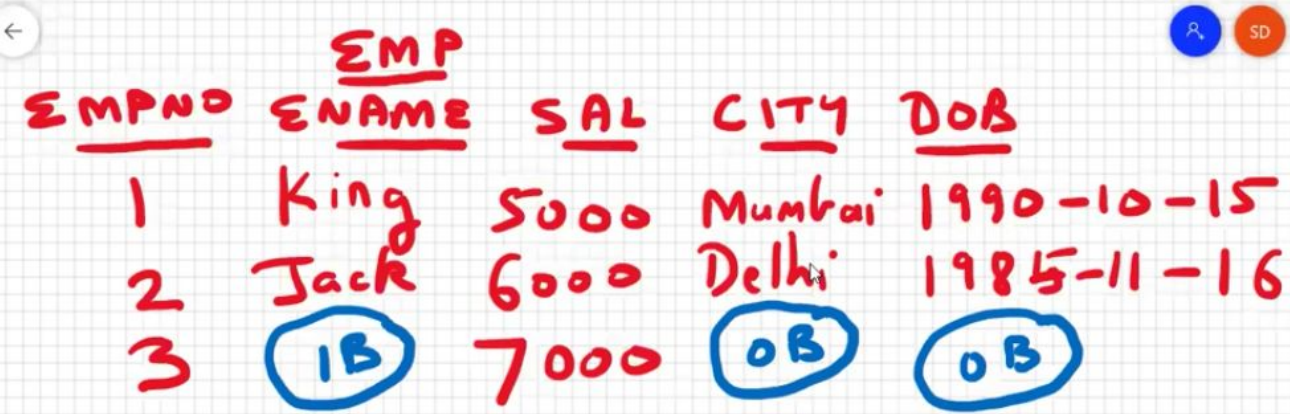
ENG US 1:28 PM 16-Jul-20

Microsoft Whiteboard



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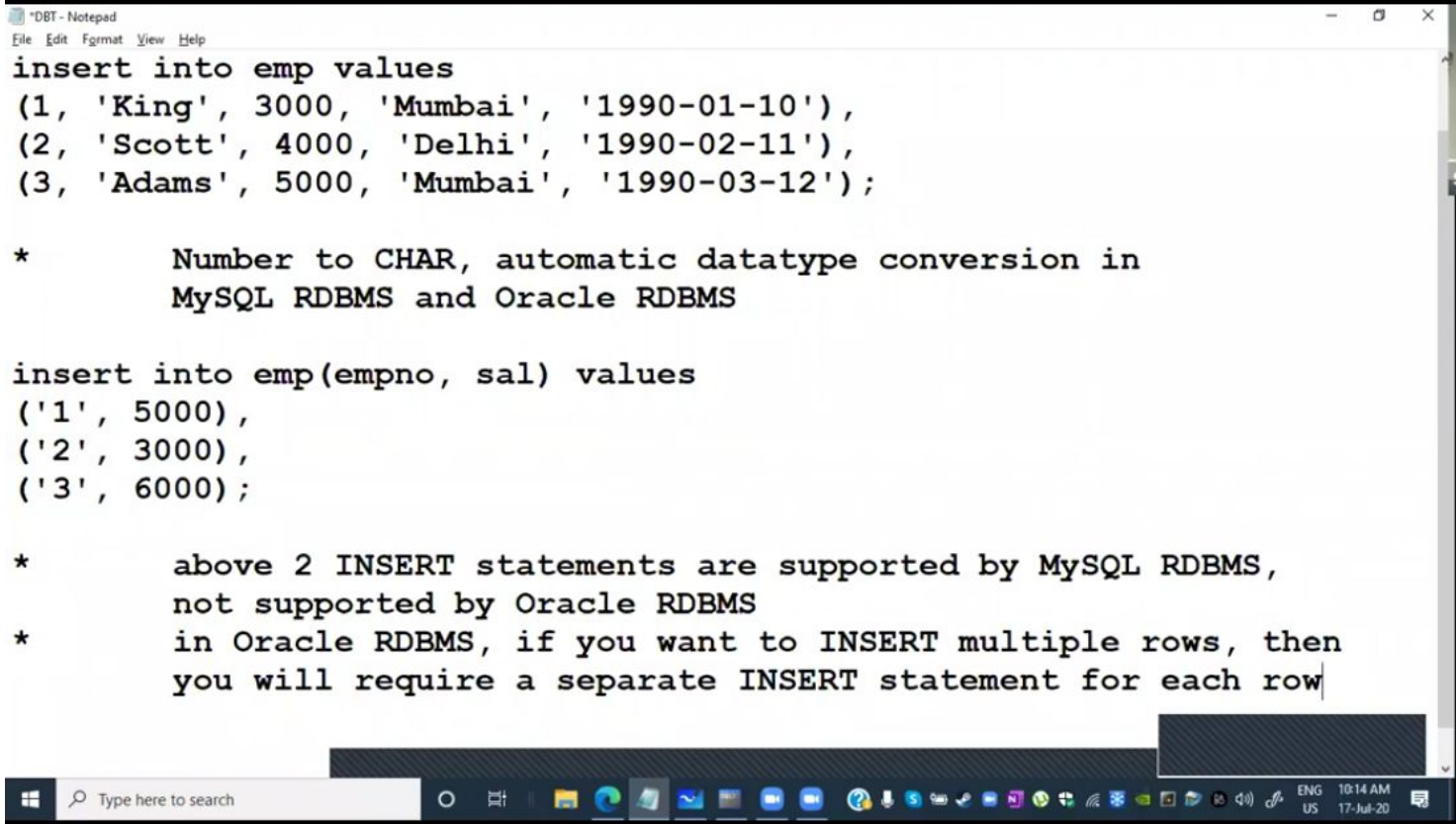
*DBT - Notepad
File Edit Format View Help
insert into emp values
(1, 'King', 3000, 'Mumbai', '1990-01-10'),
(2, 'Scott', 4000, 'Delhi', '1990-02-11'),
(3, 'Adams', 5000, 'Mumbai', '1990-03-12');
* Number to CHAR, automatic datatype conversion in
MySQL RDBMS and Oracle RDBMS
insert into emp(empno, sal) values
('1', 5000),
('2', 3000),
('3', 6000);
* above 2 INSERT statements are supported by MySQL RDBMS,
not supported by Oracle RDBMS
* in Oracle RDBMS, if you want to INSERT multiple rows, then
you will require a separate INSERT statement for each row
Type here to search
ENG US
10:14 AM
17-Jul-20

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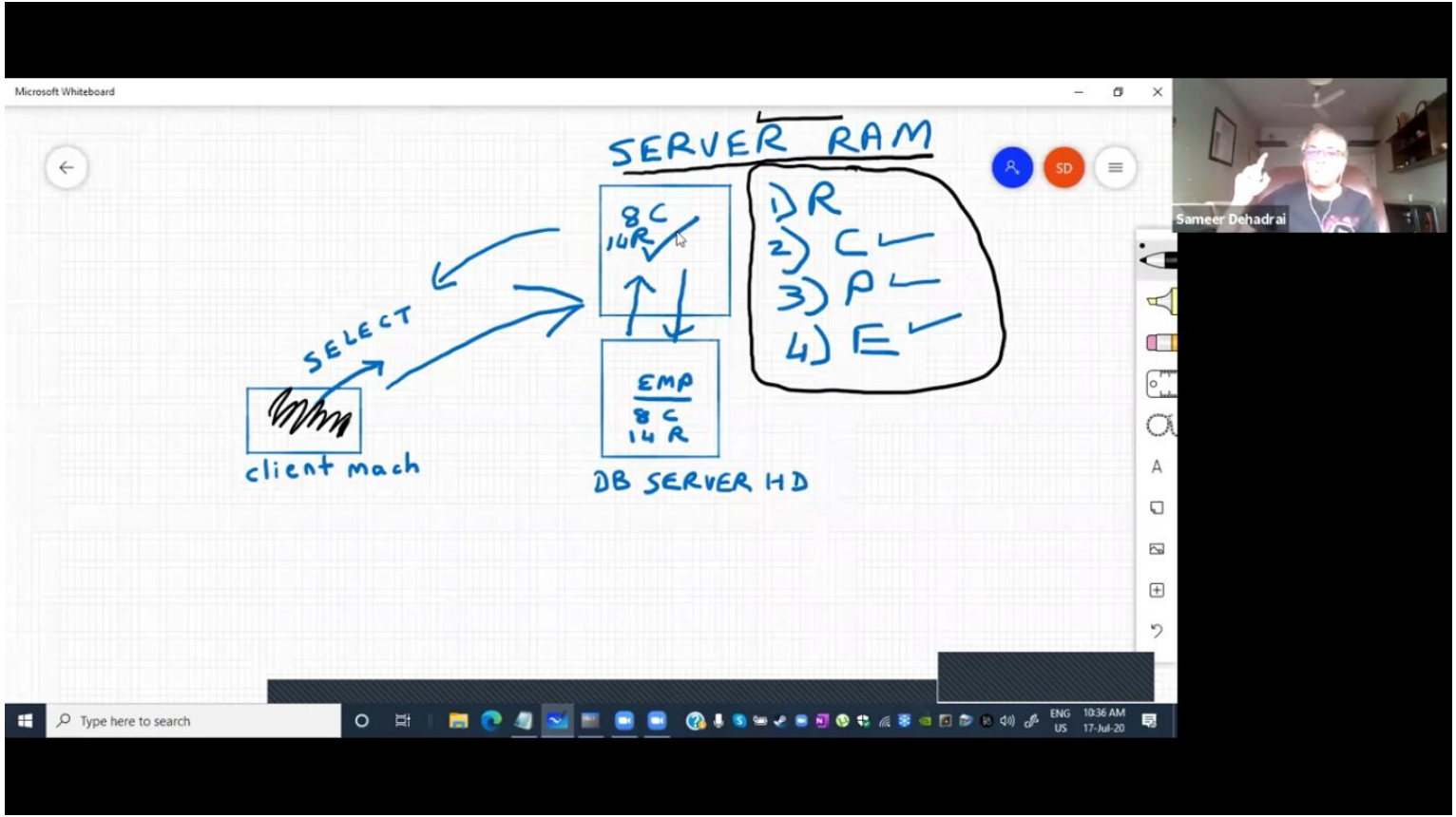
Working of Select statement

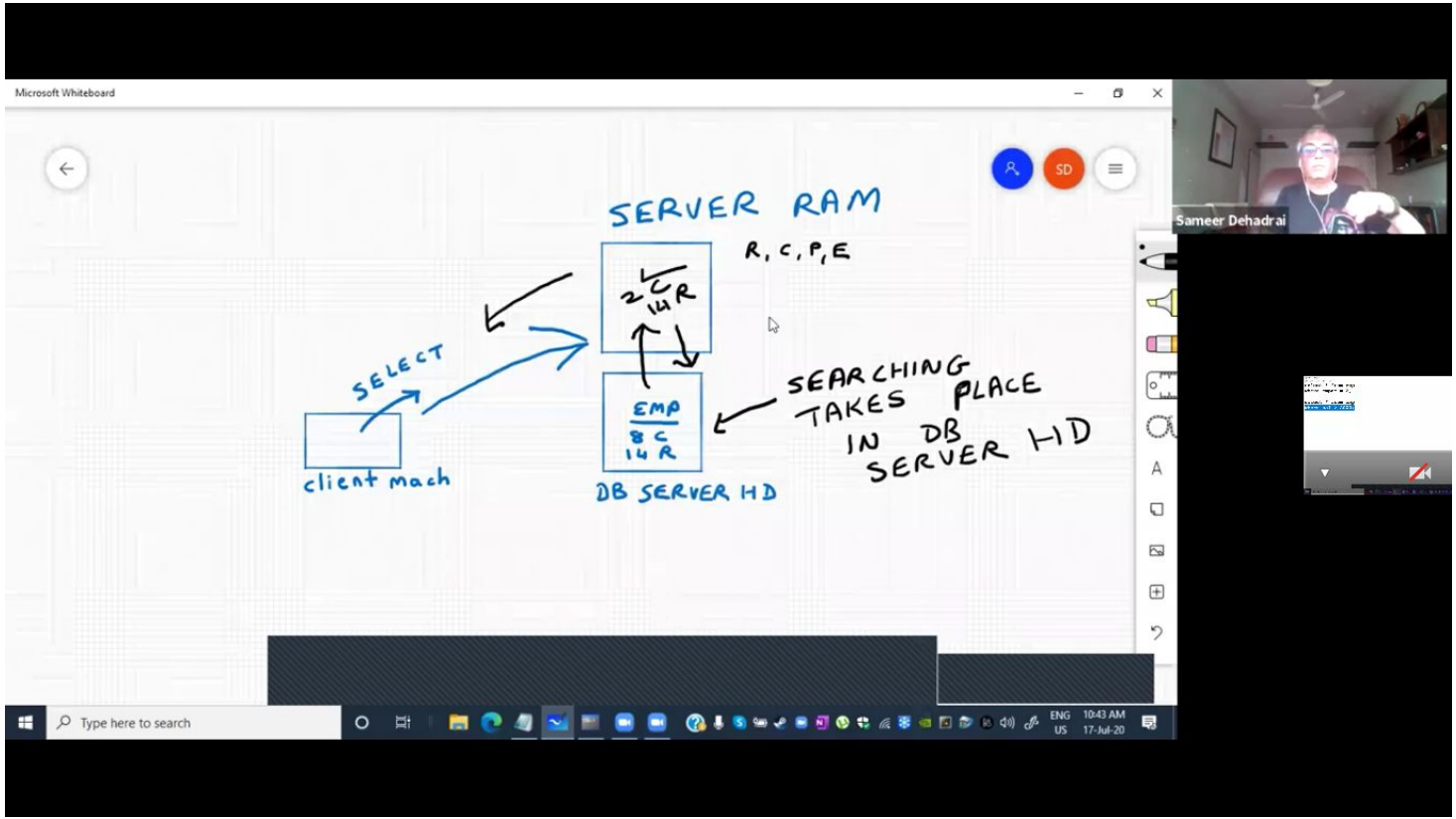
RCPE read compile plan execute

It does not create an exe file like c++. Every time RCPE is done on server

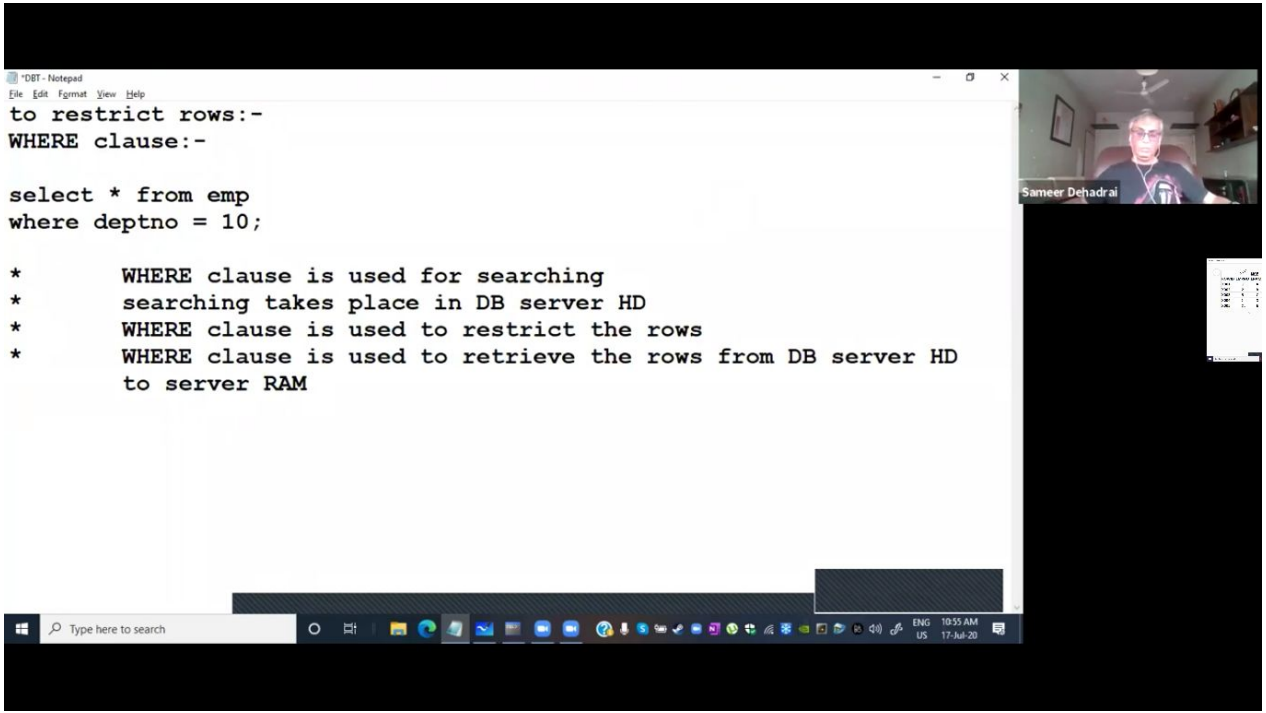
All columns


Microsoft Whiteboard
SERVER RAM
8C
14R
1) R
2) C
3) P
4) E
EMP
8C
14R
SELECT
client mach
DB SERVER HD
Sameer Dehadrai
Type here to search
ENG
US
10:36 AM
17-Jul-20

Restricting columns



Restricting rows



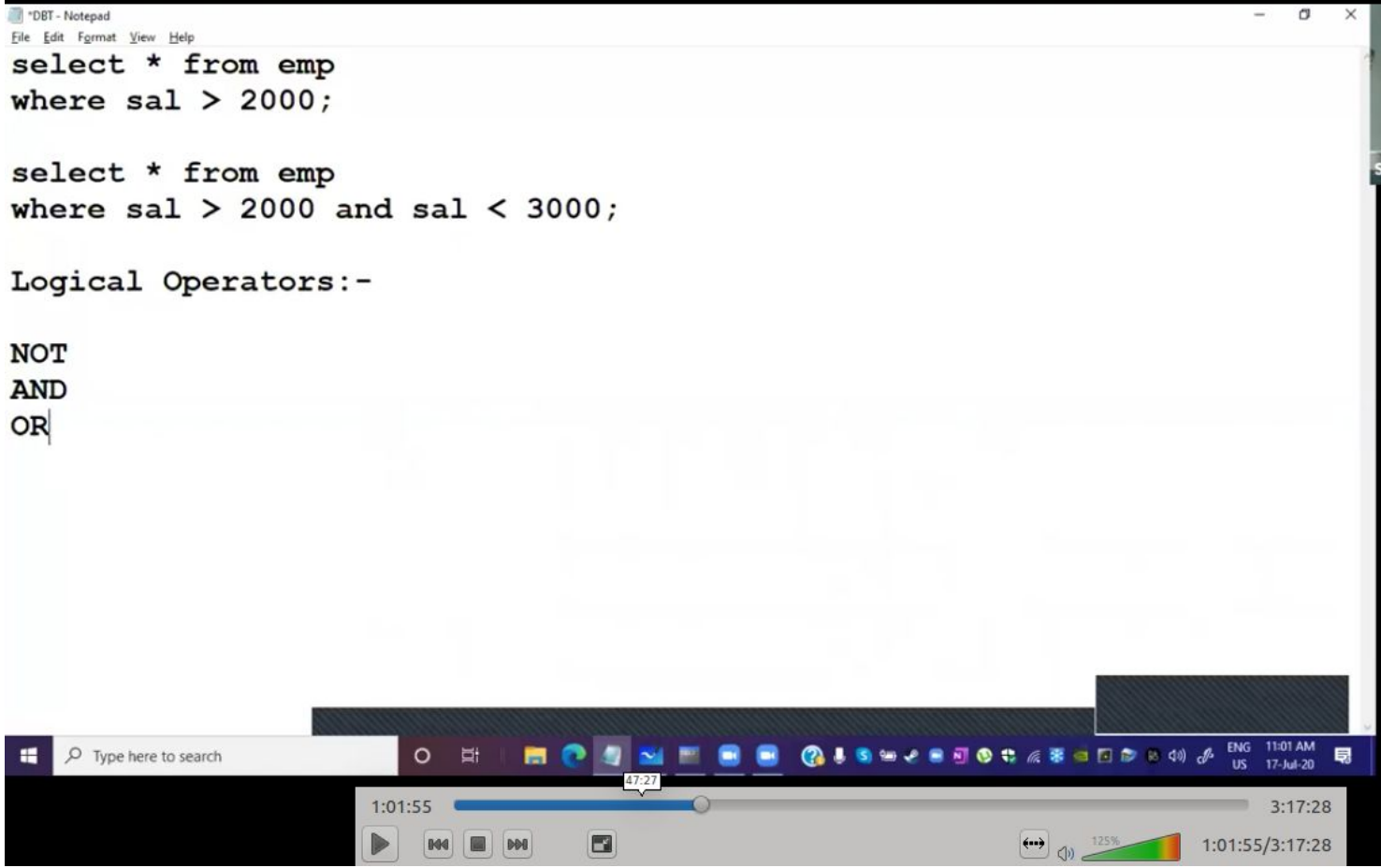
*DBT - Notepad

File Edit Format View Help

```
select * from emp
where deptno = 10;

select * from emp
where sal > 2000;

Relatioal Operators:-

>
>=
<
<=
!=      or      <>
=
```

Type here to search

ENG US 10:57 AM 17-Jul-20


*DBT - Notepad
File Edit Format View Help
select * from emp
where sal > 2000;
select * from emp
where sal > 2000 and sal < 3000;
Logical Operators:-
NOT
AND
OR
Type here to search
ENG US
11:01 AM
17-Jul-20
47:27
1:01:55
3:17:28
125%
1:01:55/3:17:28

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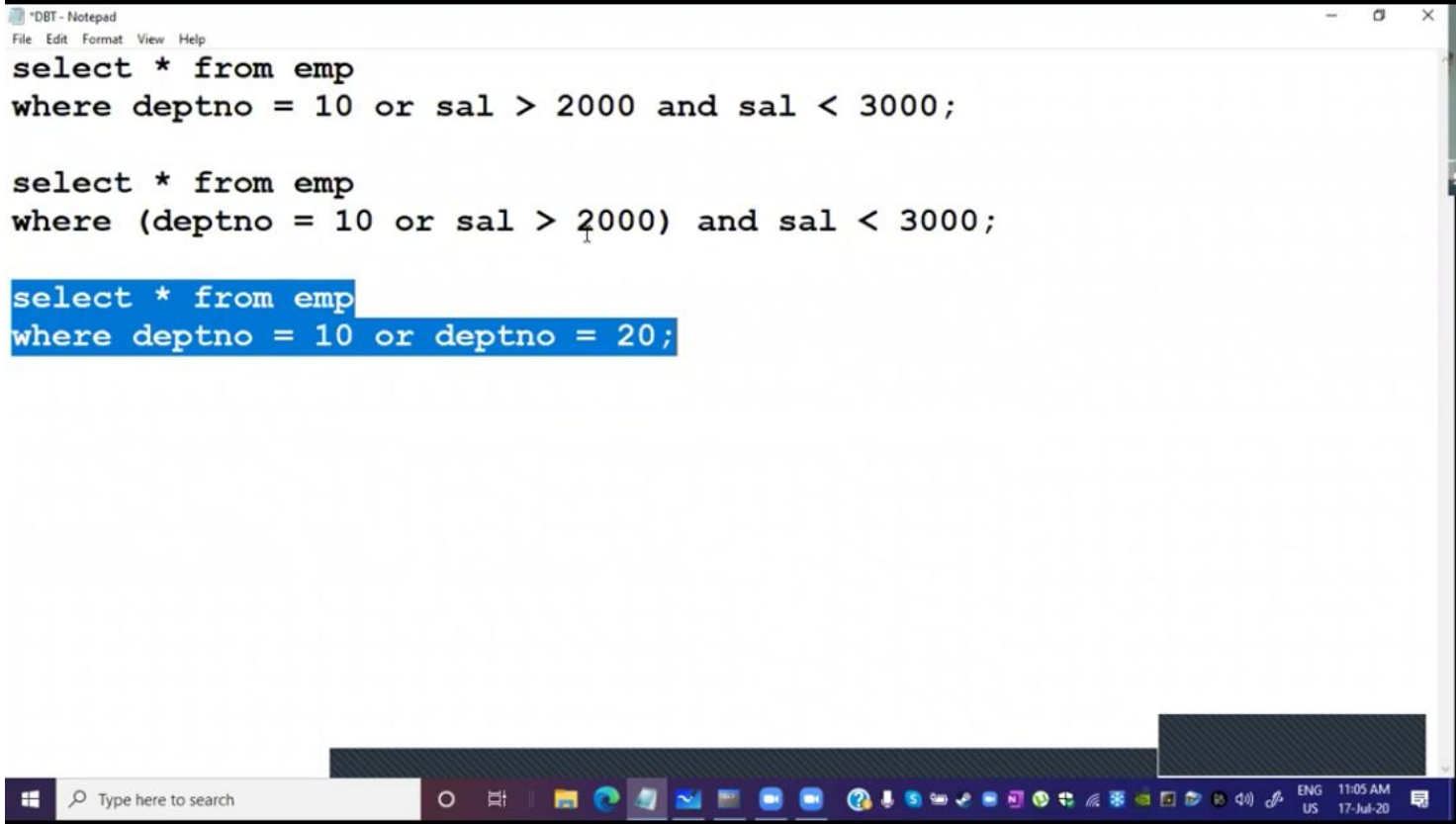

*DBT - Notepad
File Edit Format View Help
select * from emp
where deptno = 10 or sal > 2000 and sal < 3000;
select * from emp
where (deptno = 10 or sal > 2000) and sal < 3000;
select * from emp
where deptno = 10 or deptno = 20;
Type here to search
ENG
US
11:05 AM
17-Jul-20


Sameer Dehadrai

*DBT - Notepad

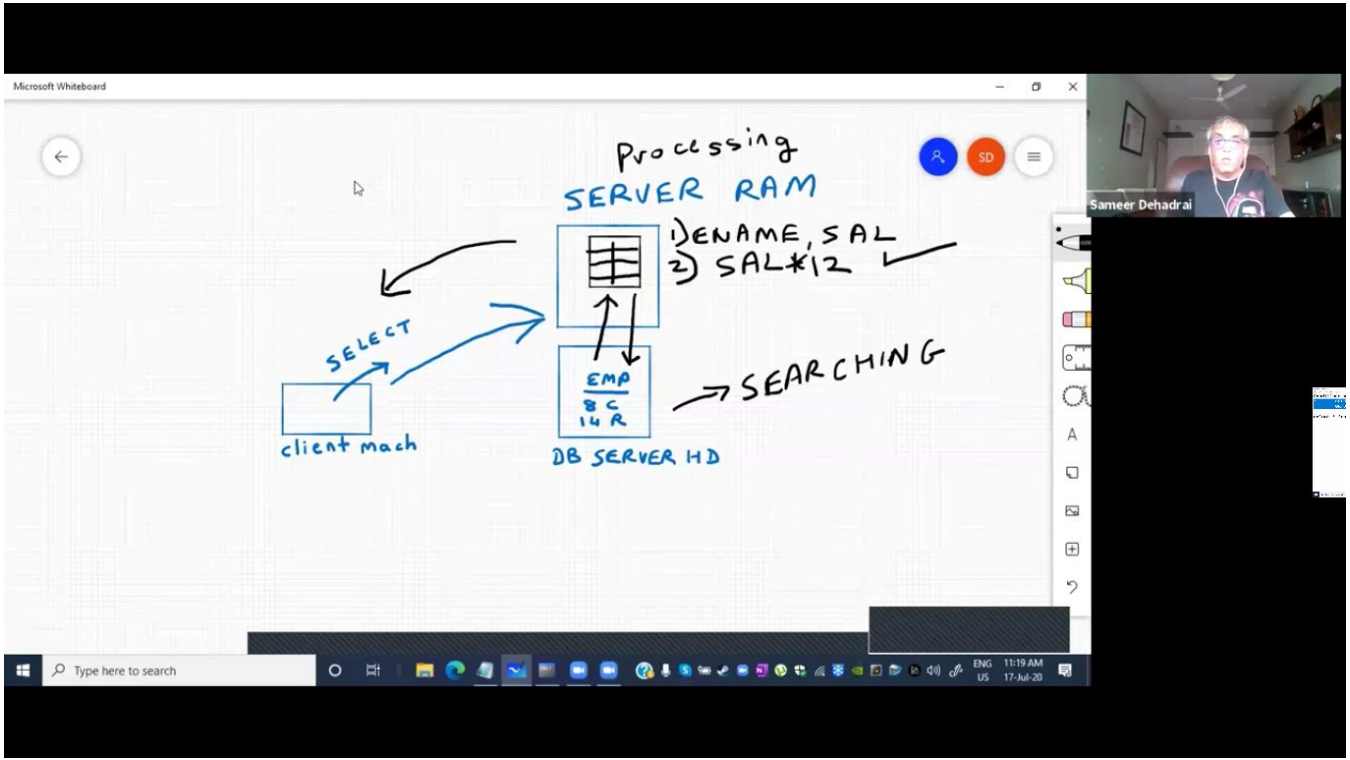
File Edit Format View Help

```
select * from emp
where job = 'MANAGER';

select * from emp
where job = 'manager';

*       data is case-sensitive in MySQL RDBMS and Oracle RDBMS
*       queries are case-insensitive in MySQL RDBMS
*       queries are case-sensitive in Oracle RDBMS
```

Type here to search

ENG US 11:10 AM 17-Jul-20

computed column aka derived column aka fake column or pseudo column
Working it gets calculated in the ram of server. Searching takes place in hard disk and 2 original columns are retrieved then the derived column is formed



*DBT - Notepad

File Edit Format View Help

Arithmetic Operators:-

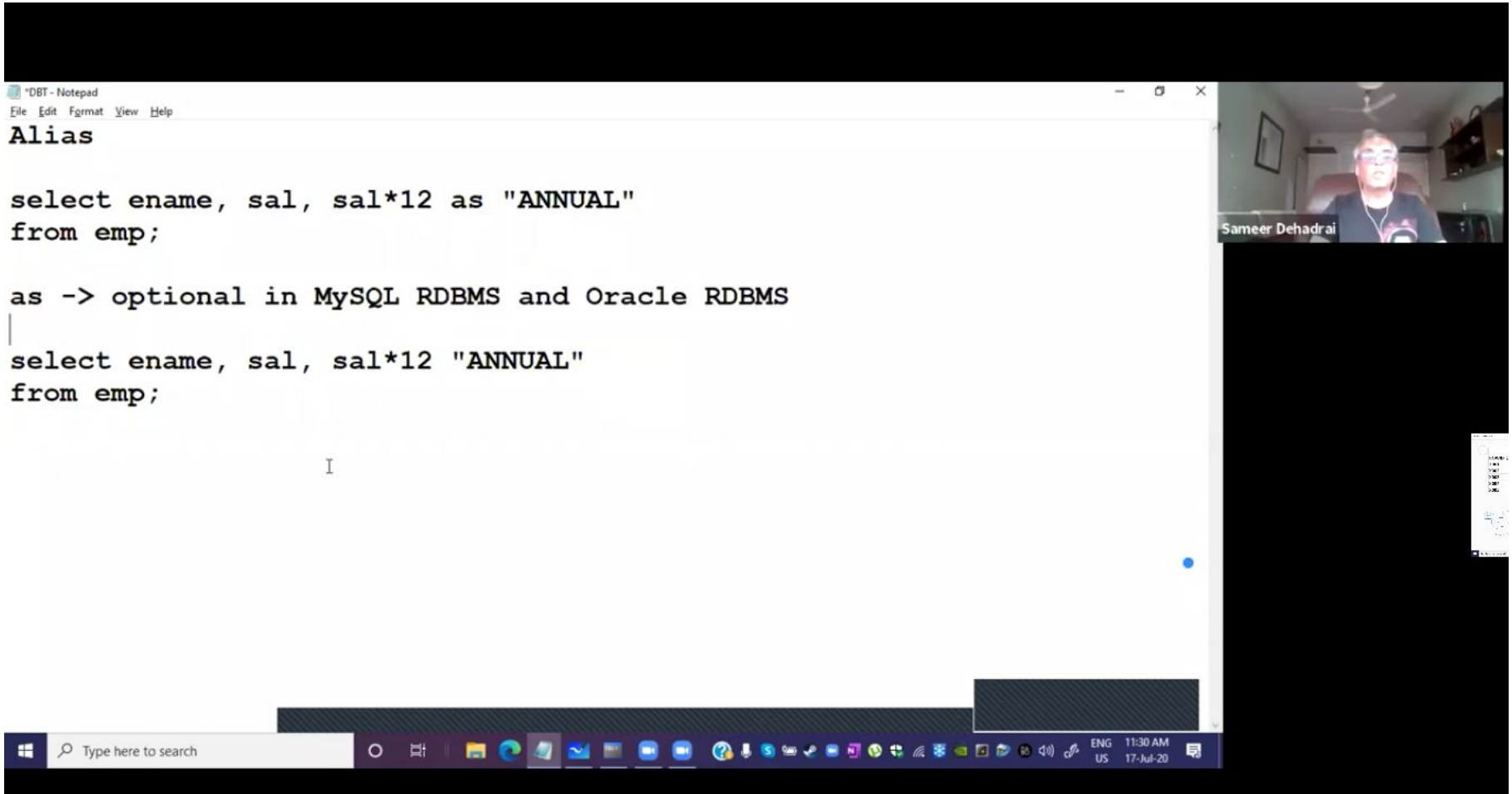
1. ( )
2. ** used for exponentiation
3. / sal**3
4. * sal**1/3
5. + sal**(1/3)
6. -

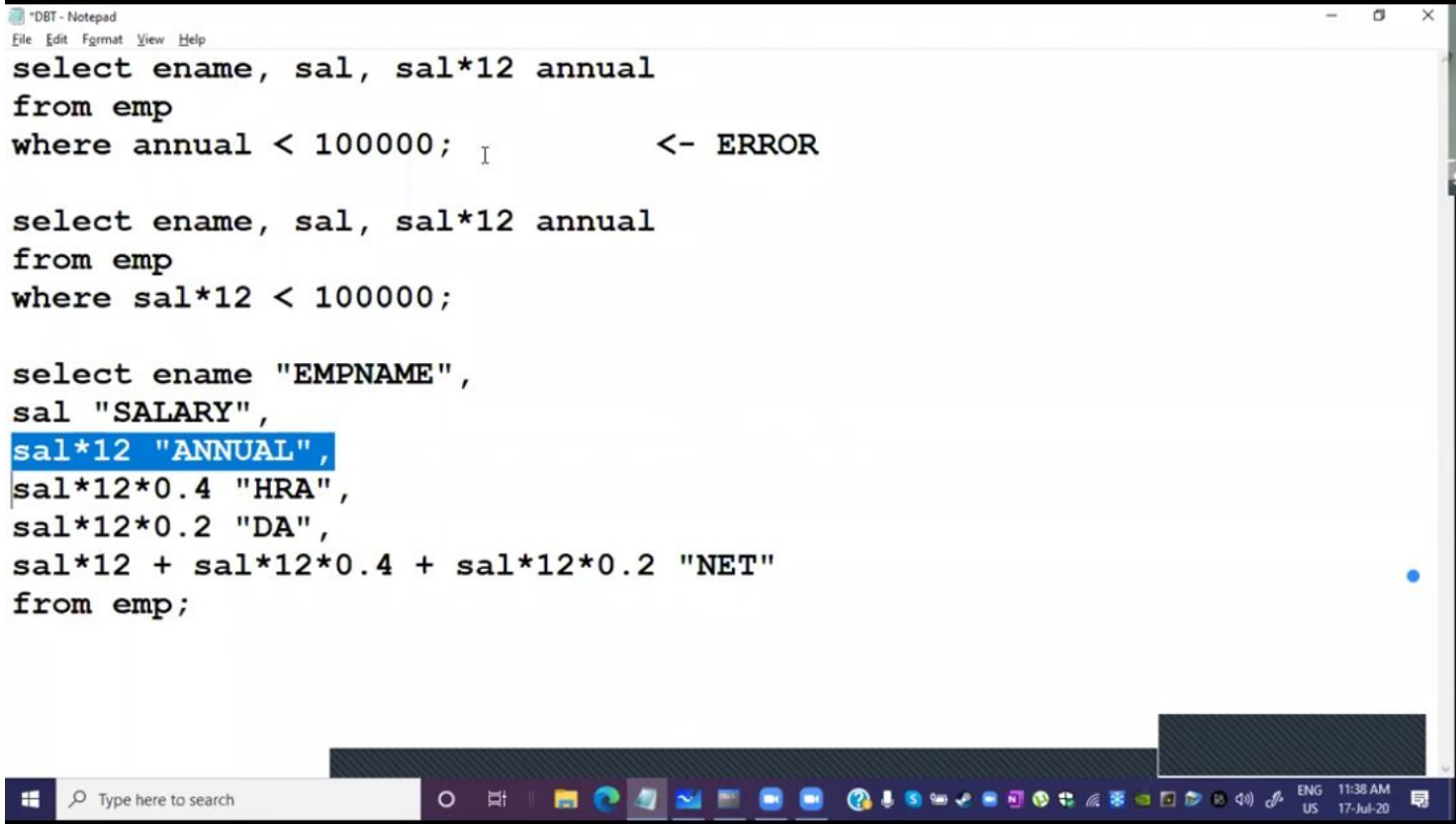
** operator is supported by Oracle RDBMS
** operator is not supported by MySQL RDBMS
in MySQL, if you want to perform exponentiation, you will have to use the POWER function

Type here to search

ENG US 11:25 AM 17-Jul-20

Alias


*DBT - Notepad
File Edit Format View Help
Alias
select ename, sal, sal*12 as "ANNUAL"
from emp;
as -> optional in MySQL RDBMS and Oracle RDBMS
select ename, sal, sal*12 "ANNUAL"
from emp;
Sameer Dehadrai
Type here to search
ENG
US
11:30 AM
17-Jul-20


*DBT - Notepad
File Edit Format View Help
select ename, sal, sal*12 annual
from emp
where annual < 100000; <- ERROR
select ename, sal, sal*12 annual
from emp
where sal*12 < 100000;
select ename "EMPNAME",
sal "SALARY",
sal*12 "ANNUAL",
sal*12*0.4 "HRA",
sal*12*0.2 "DA",
sal*12 + sal*12*0.4 + sal*12*0.2 "NET"
from emp;
Type here to search
ENG US
11:38 AM 17-Jul-20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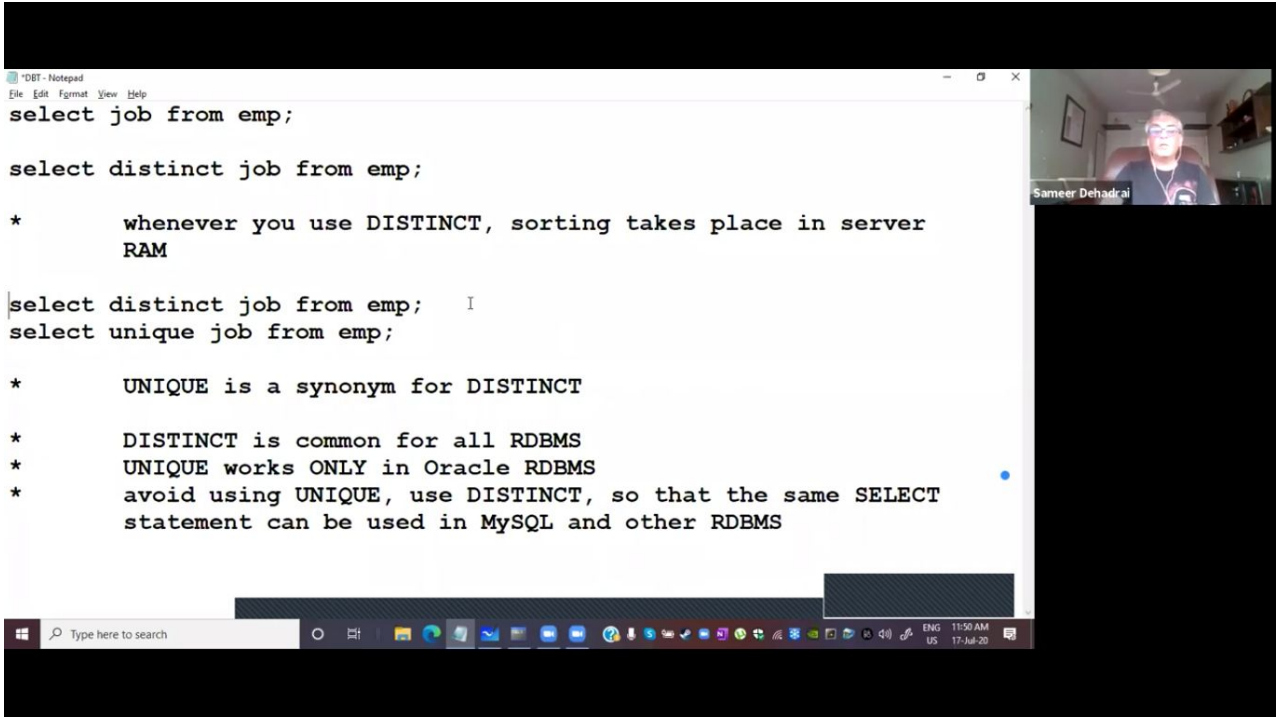
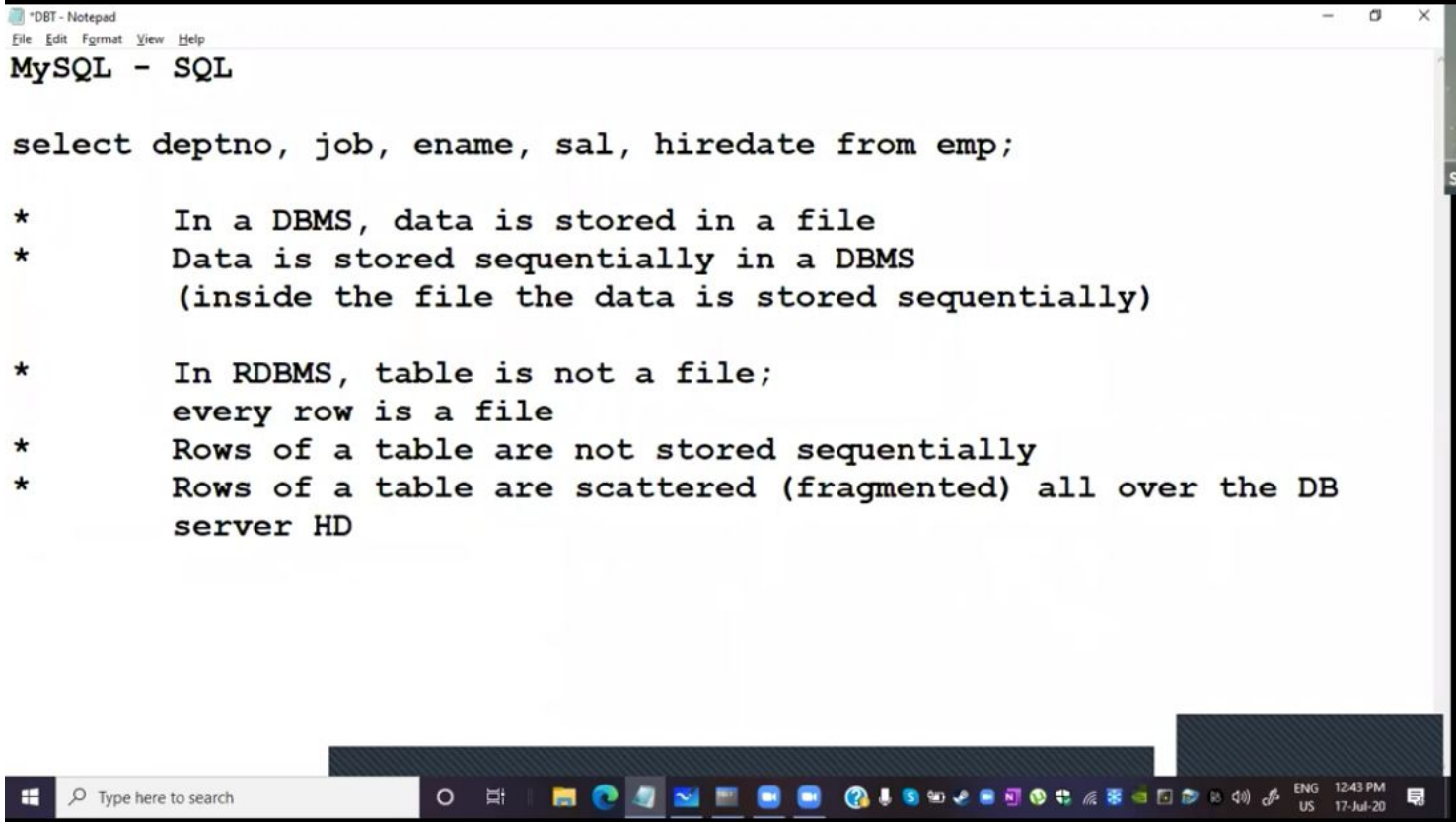
Distinct

sorting will take place internally!!!!!!! Distinct entire row entry will be taken, you can only write distinct once. Distinct has to be the first keyword.




*DBT - Notepad
File Edit Format View Help
MySQL - SQL
select deptno, job, ename, sal, hiredate from emp;
* In a DBMS, data is stored in a file
* Data is stored sequentially in a DBMS
(inside the file the data is stored sequentially)
* In RDBMS, table is not a file;
every row is a file
* Rows of a table are not stored sequentially
* Rows of a table are scattered (fragmented) all over the DB
server HD
Type here to search
ENG
US
12:43 PM
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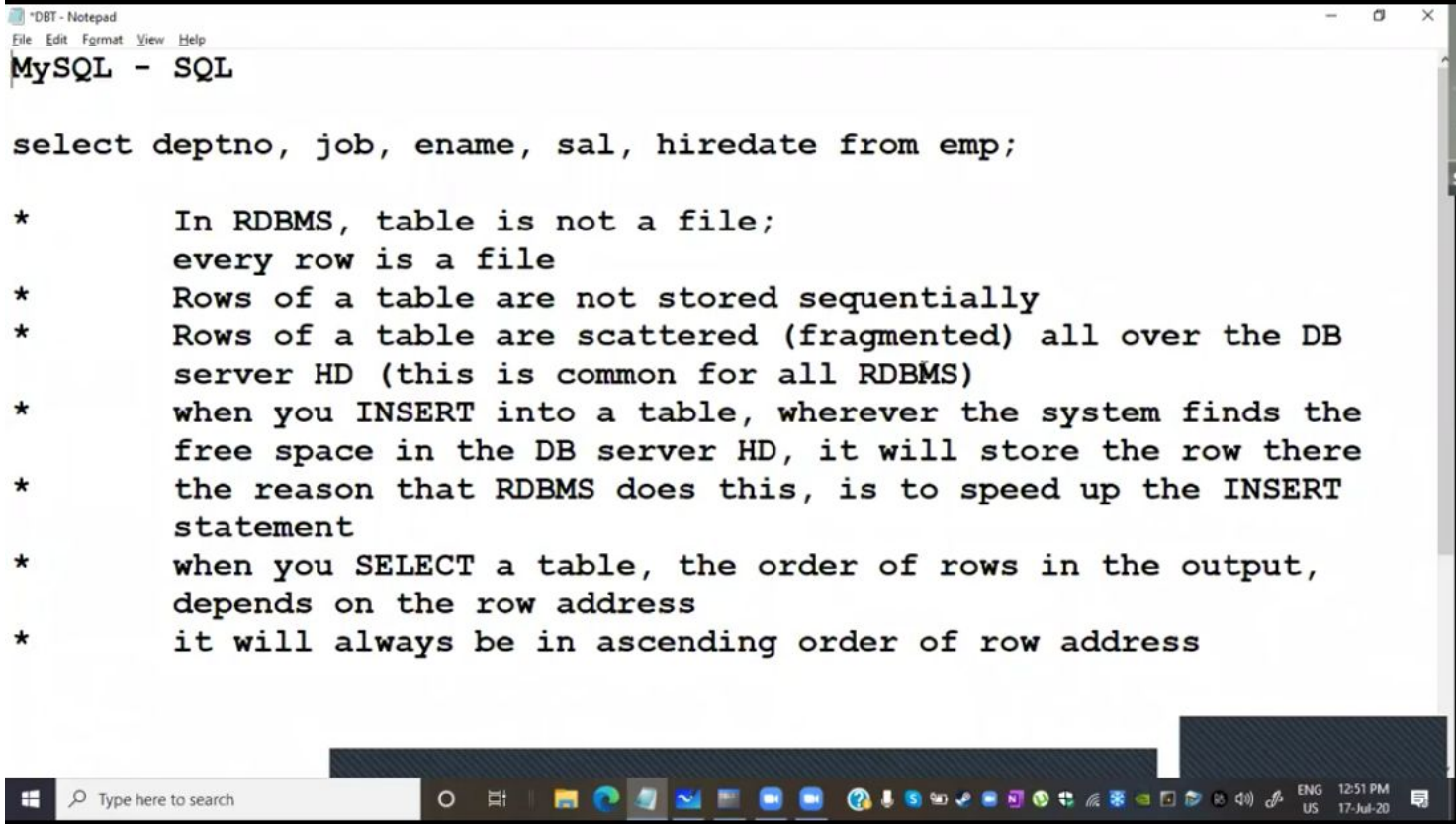
*DBT - Notepad
File Edit Format View Help
MySQL - SQL
select deptno, job, ename, sal, hiredate from emp;
* In RDBMS, table is not a file;
every row is a file
* Rows of a table are not stored sequentially
* Rows of a table are scattered (fragmented) all over the DB
server HD (this is common for all RDBMS)
* when you INSERT into a table, wherever the system finds the
free space in the DB server HD, it will store the row there
* the reason that RDBMS does this, is to speed up the INSERT
statement
* when you SELECT a table, the order of rows in the output,
depends on the row address
* it will always be in ascending order of row address
Type here to search
ENG
US
12:51 PM
17-Jul-20

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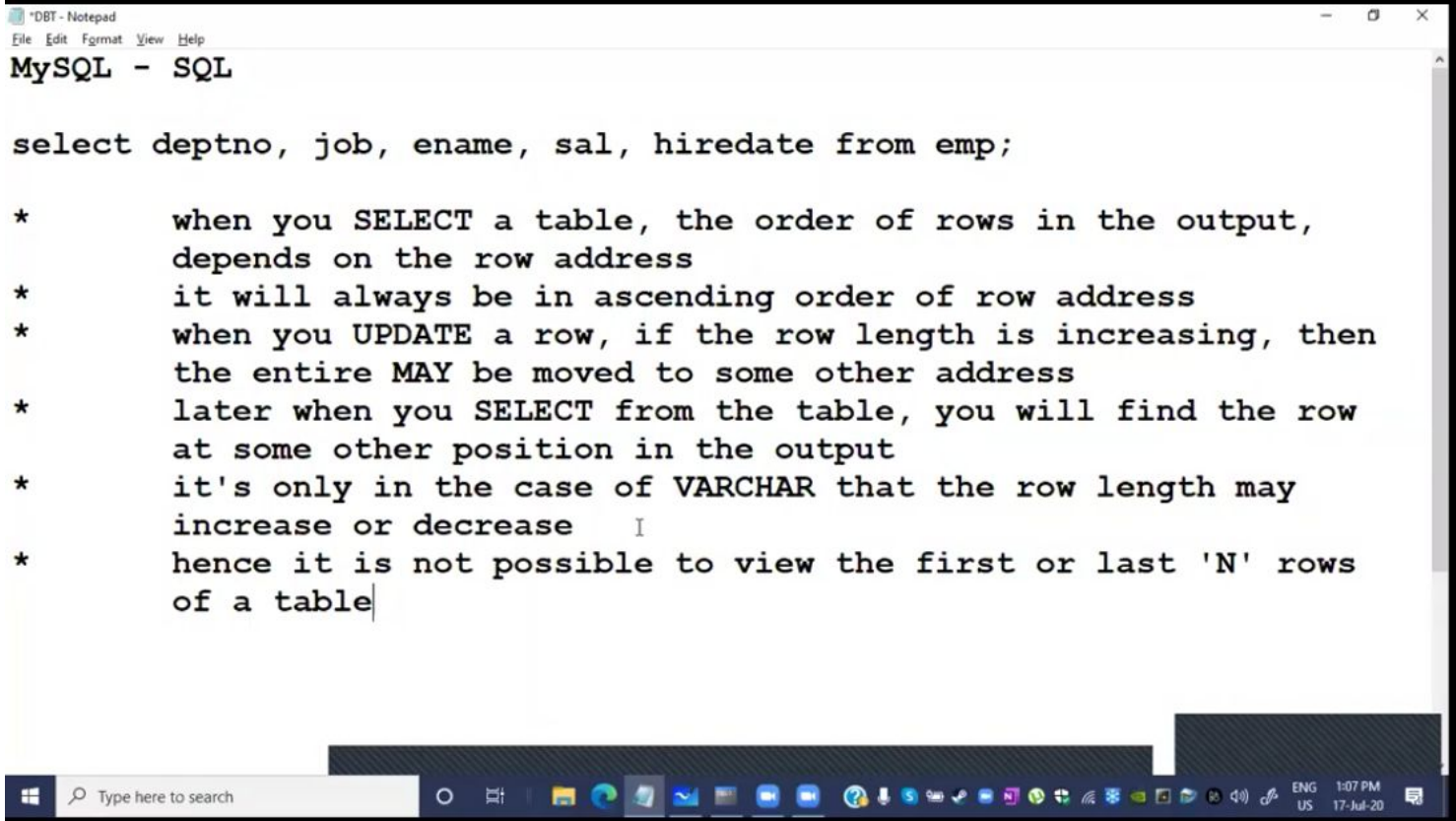
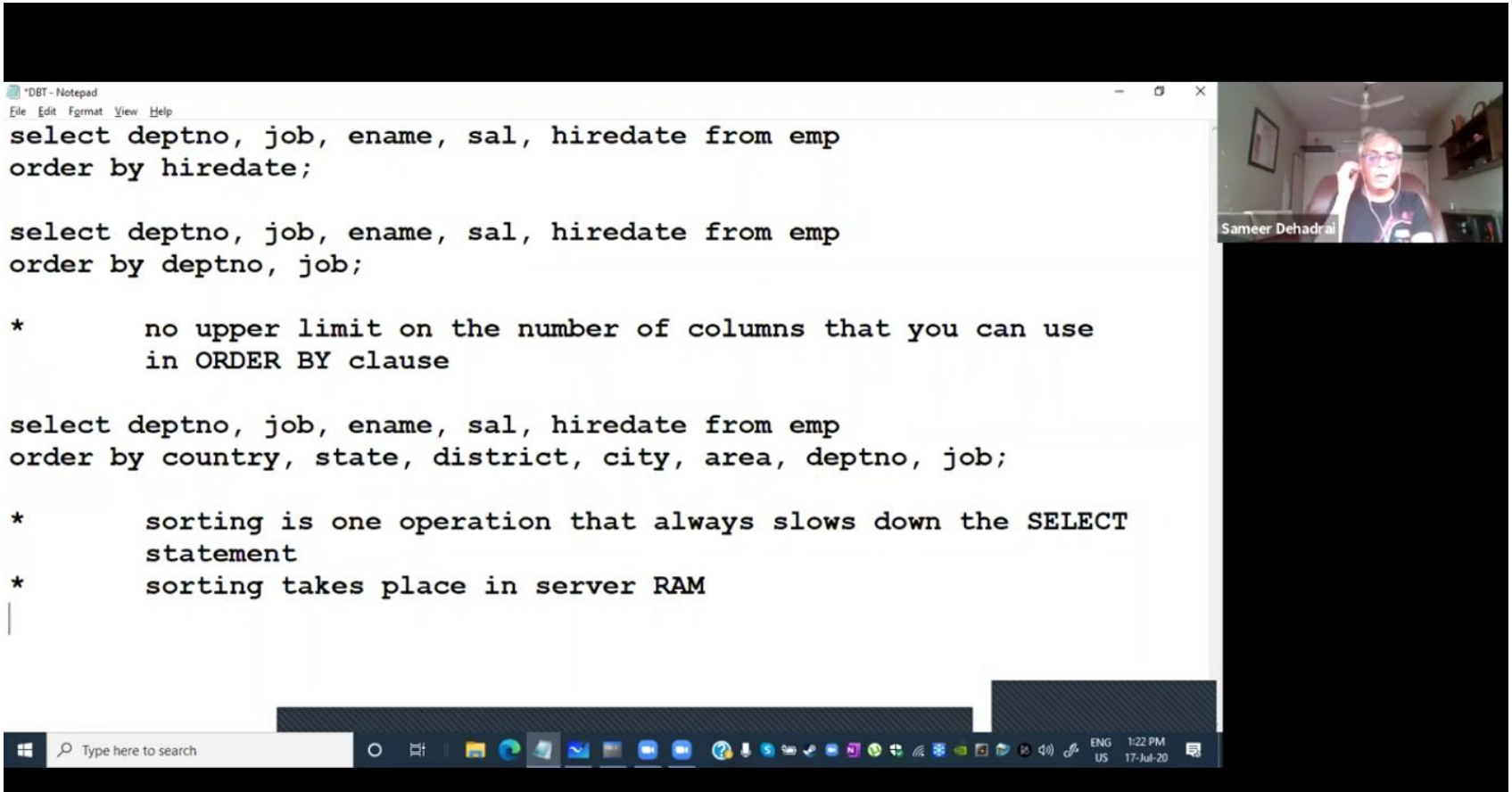

*DBT - Notepad
File Edit Format View Help
MySQL - SQL
select deptno, job, ename, sal, hiredate from emp;
* when you SELECT a table, the order of rows in the output, depends on the row address
* it will always be in ascending order of row address
* when you UPDATE a row, if the row length is increasing, then the entire MAY be moved to some other address
* later when you SELECT from the table, you will find the row at some other position in the output
* it's only in the case of VARCHAR that the row length may increase or decrease
* hence it is not possible to view the first or last 'N' rows of a table
Type here to search
ENG US
1:07 PM 17-Jul-20

ORDER BY for sorting



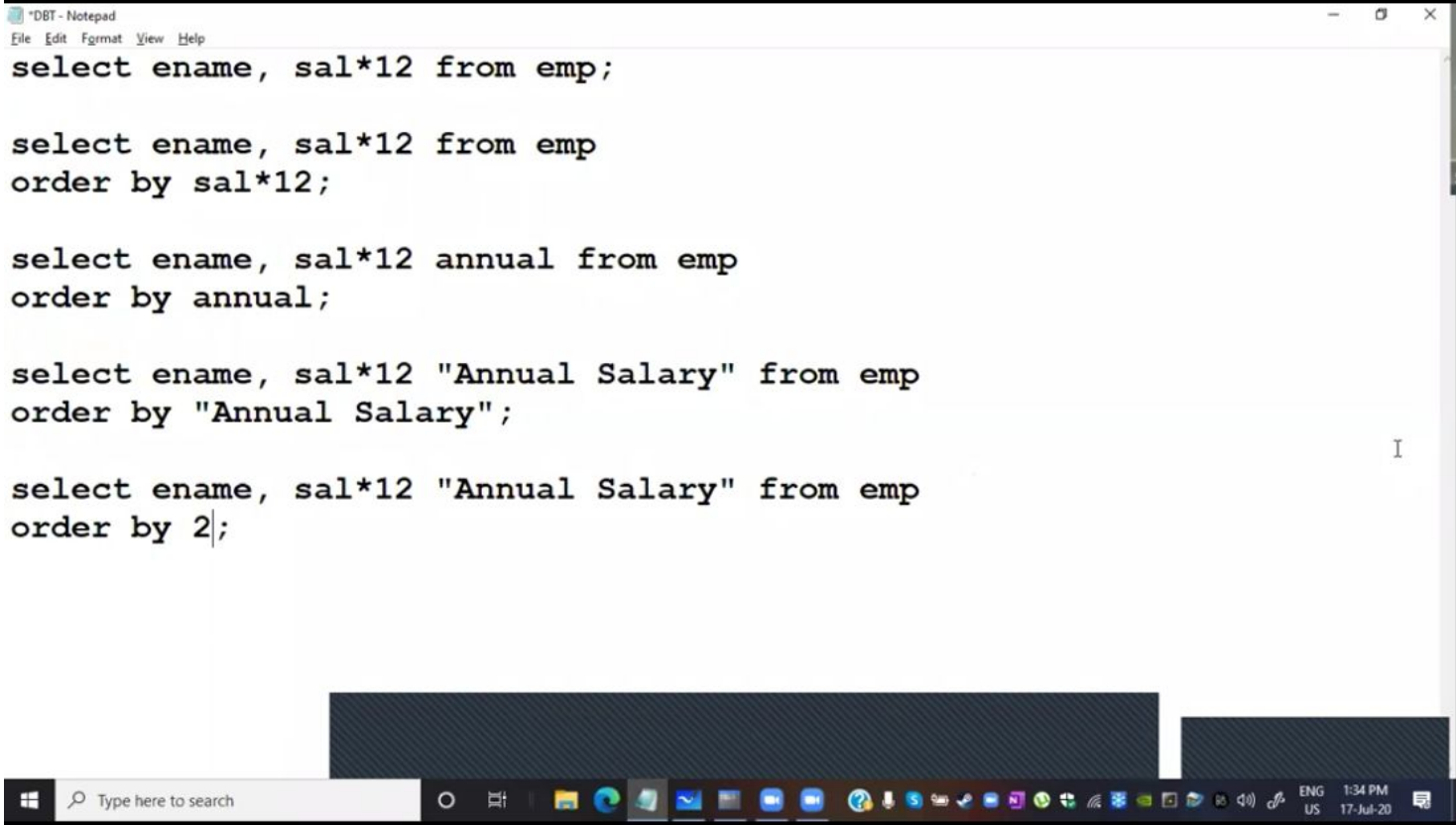
*DBT - Notepad

File Edit Format View Help

```
select ename, sal*12 from emp;

select ename, sal*12 from emp
order by sal*12;

select ename, sal*12 annual from emp
order by annual;

select ename, sal*12 "Annual Salary" from emp
order by "Annual Salary";

select ename, sal*12 "Annual Salary" from emp
order by "Annual Salary";
```

Type here to search

ENG US 1:33 PM 17-Jul-20


*DBT - Notepad
File Edit Format View Help
select ename, sal*12 from emp;
select ename, sal*12 from emp
order by sal*12;
select ename, sal*12 annual from emp
order by annual;
select ename, sal*12 "Annual Salary" from emp
order by "Annual Salary";
select ename, sal*12 "Annual Salary" from emp
order by 2;
Type here to search
ENG
US
1:34 PM
17-Jul-20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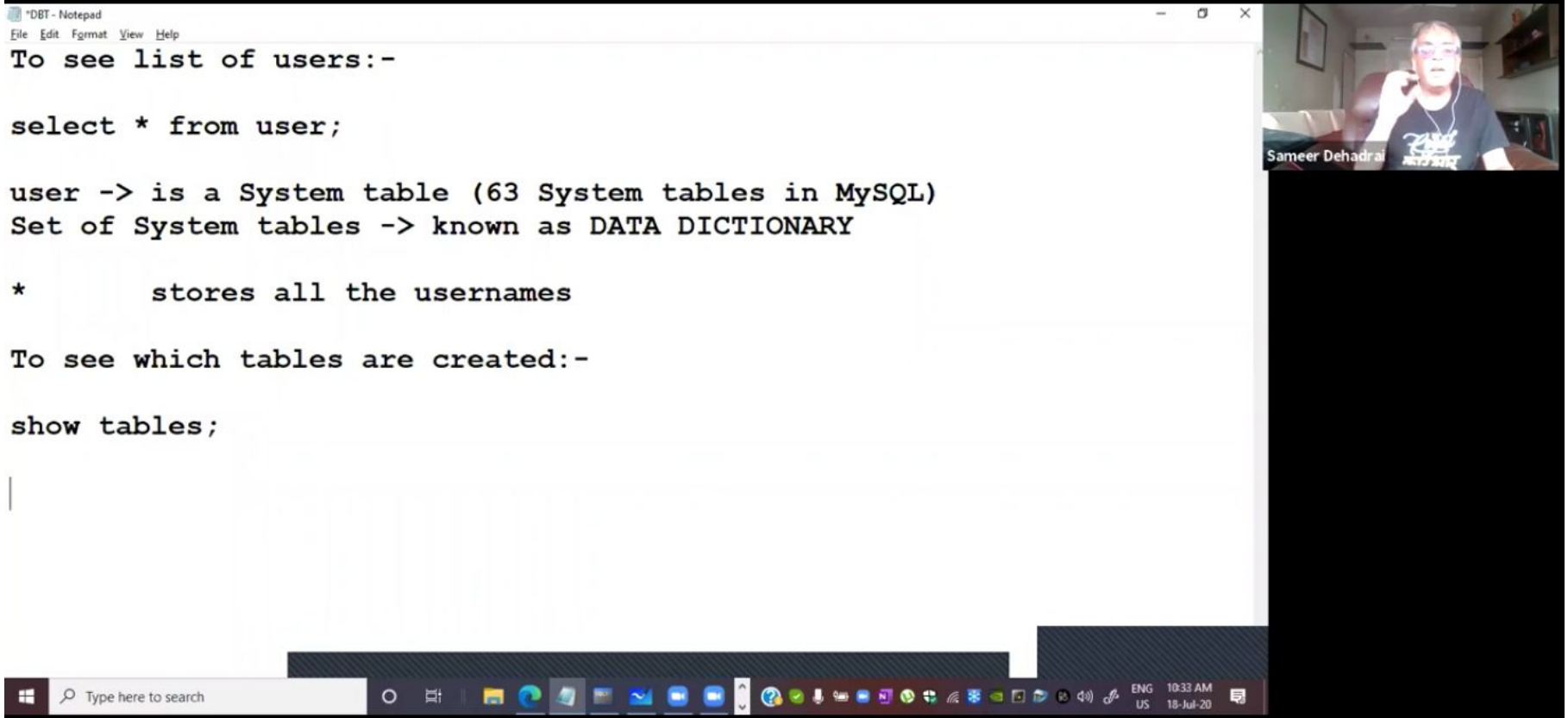
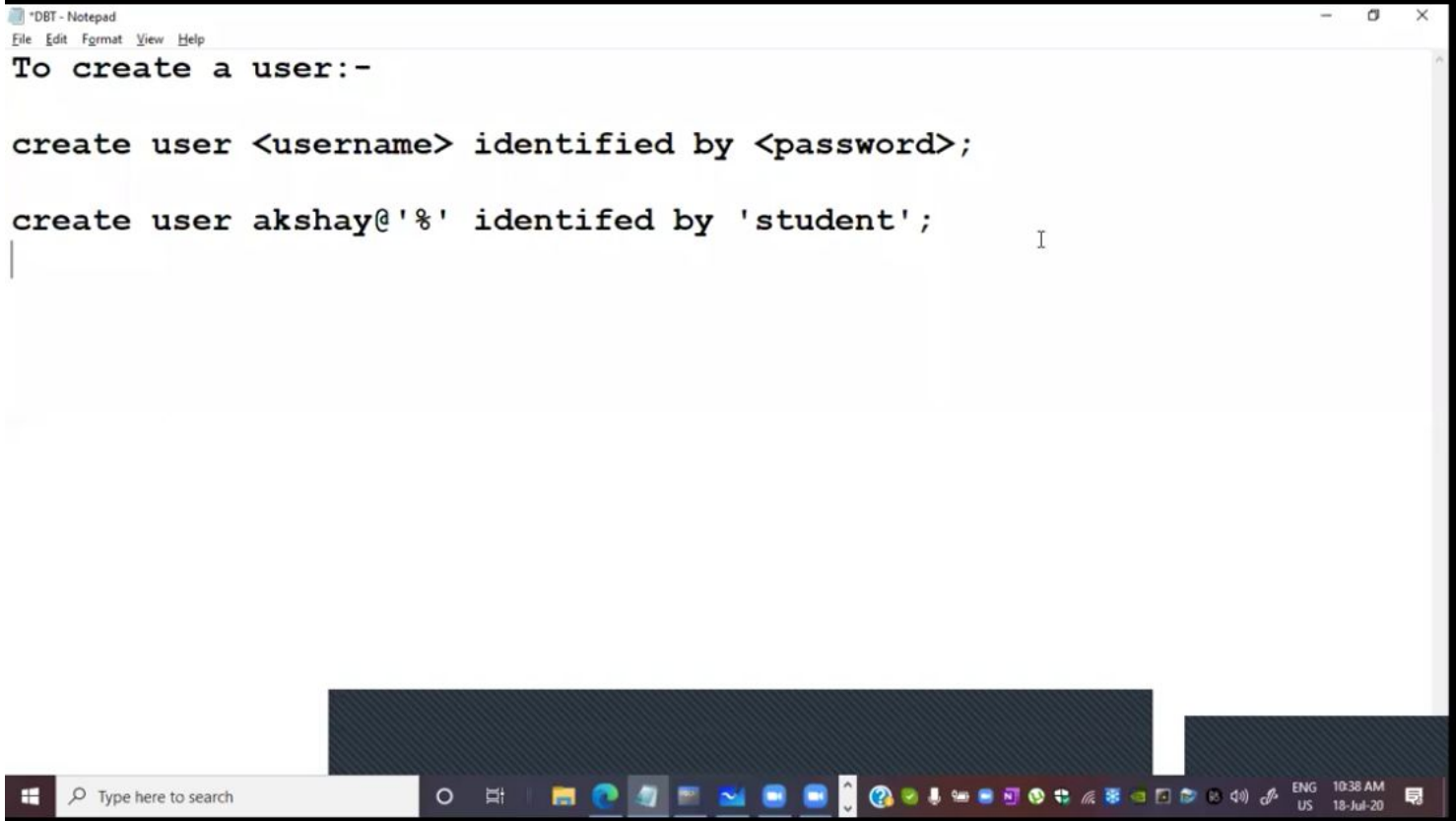
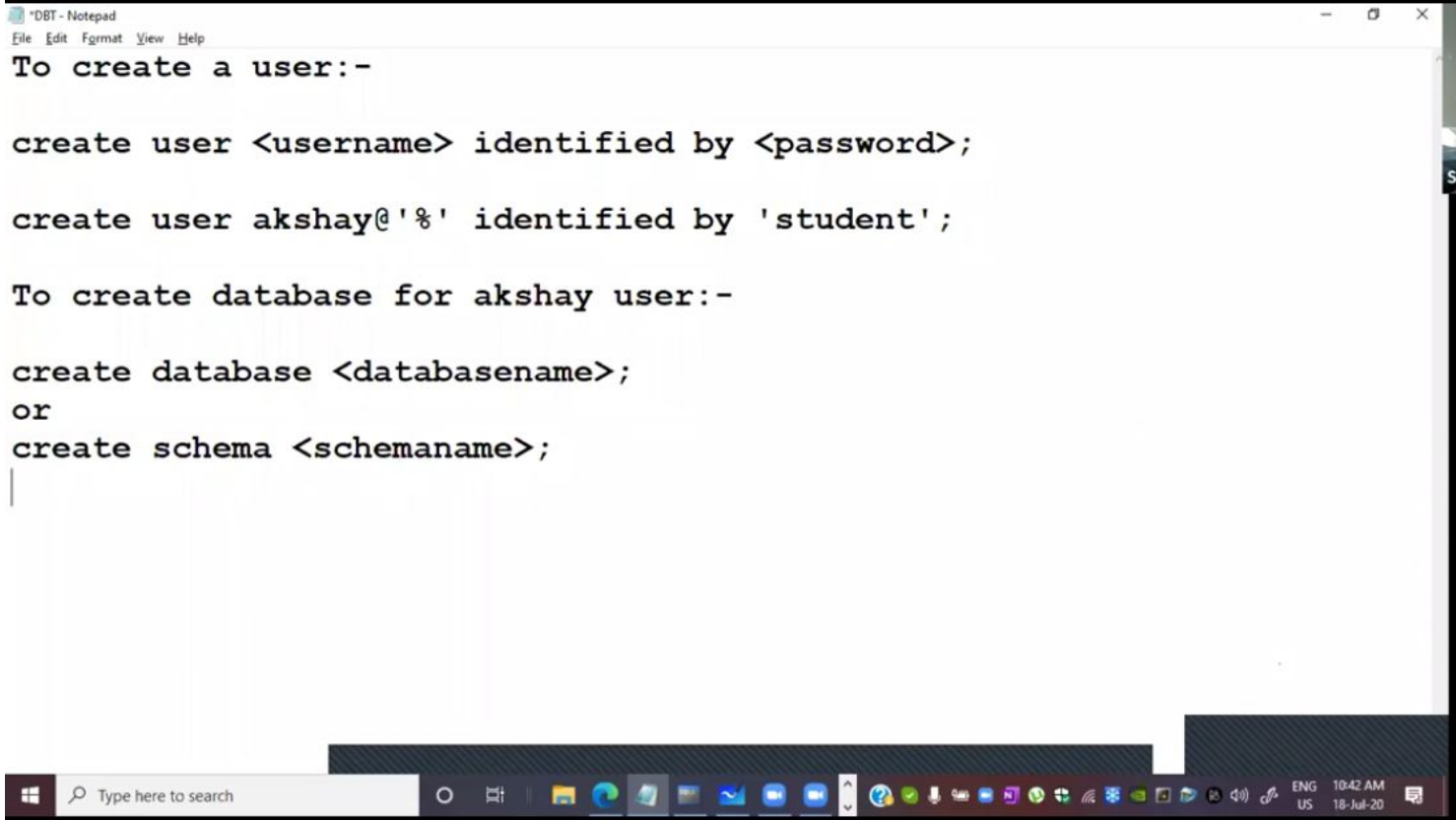

*DBT - Notepad
File Edit Format View Help
To see list of users:-
select * from user;
user -> is a System table (63 System tables in MySQL)
Set of System tables -> known as DATA DICTIONARY
* stores all the usernames
To see which tables are created:-
show tables;
Sameer Dehadrai
Type here to search
ENG
US
10:33 AM
18-Jul-20


*DBT - Notepad
File Edit Format View Help
To create a user:-
create user <username> identified by <password>;
create user akshay@'%' identifed by 'student';
Type here to search
ENG
US
10:38 AM
18-Jul-20


*DBT - Notepad
File Edit Format View Help
To create a user:-
create user <username> identified by <password>;
create user akshay@'%' identified by 'student';
To create database for akshay user:-
create database <databasename>;
or
create schema <schemaname>;
Type here to search
ENG
US
10:42 AM
18-Jul-20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*DBT - Notepad

File Edit Format View Help

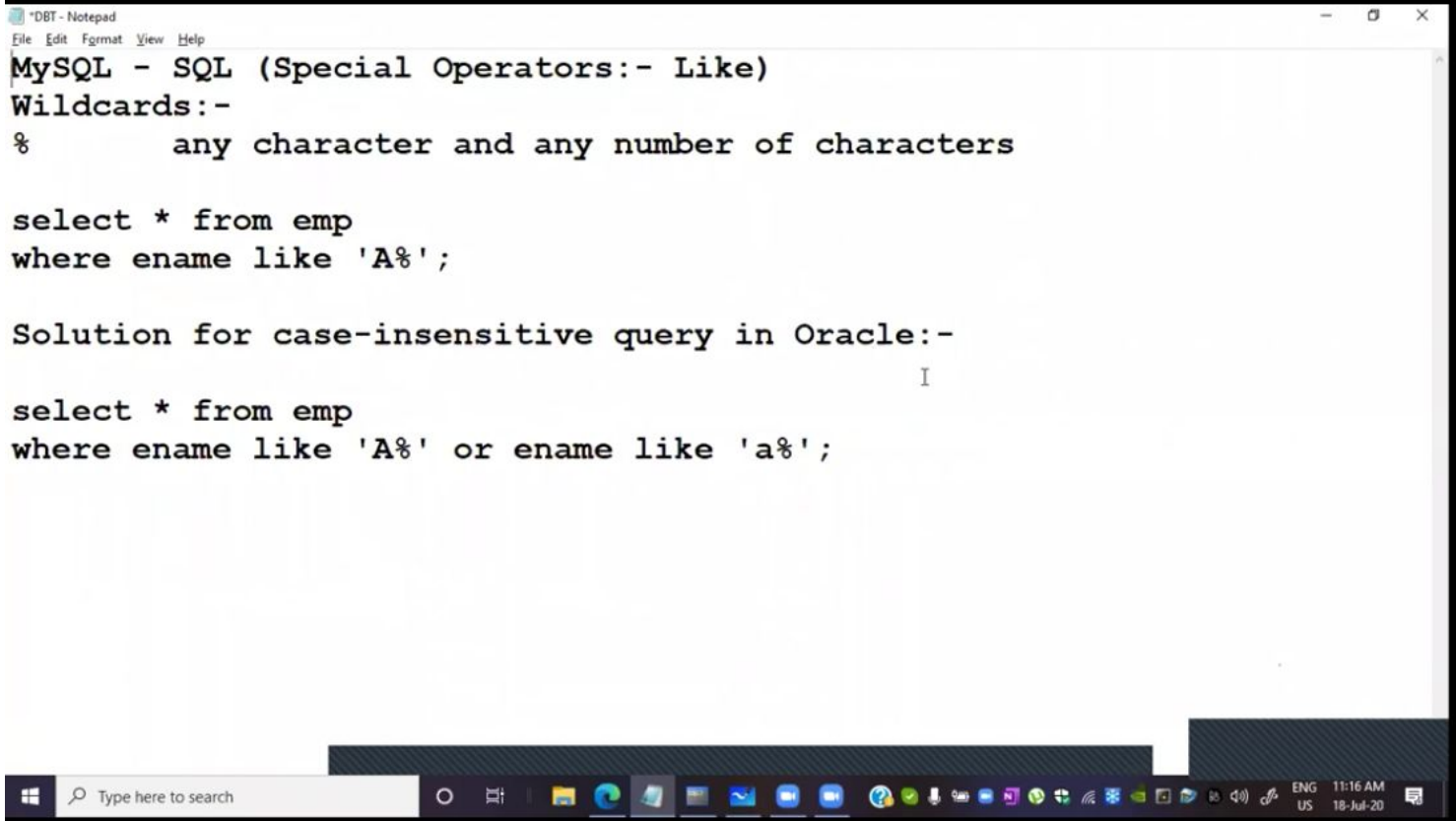
```
select * from emp
where ename > 'A' and ename < 'B';
```

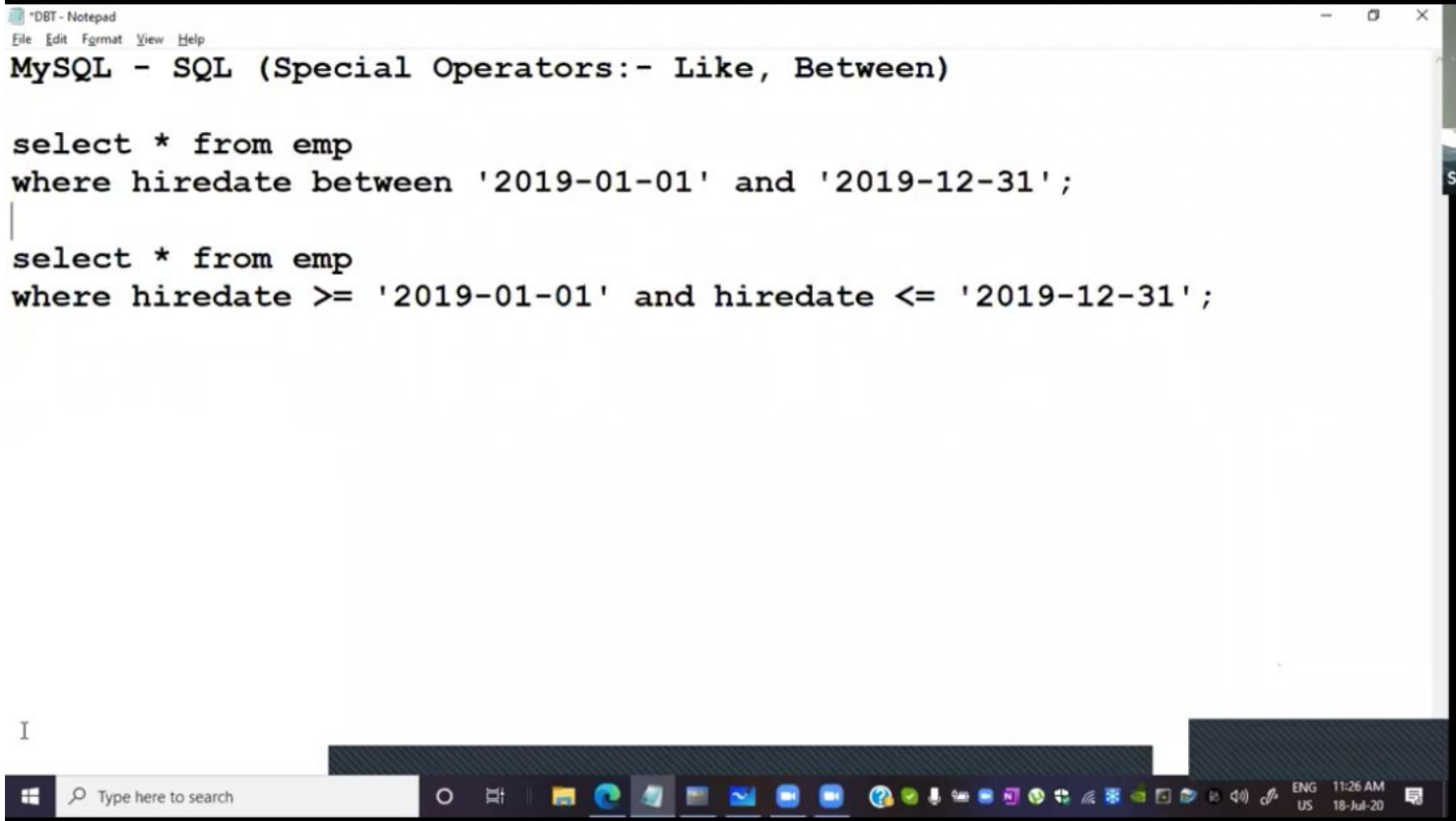
Blank-padded comparision semantics:-

* when you compare 2 strings of different length, the shorter of the 2 strings is temporarily padded with blank spaces on RHS such that their lengths become equal
* then MySQL will do the comparision, character by character, based on ASCII value

Type here to search

ENG US 11:11 AM 18-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL (Special Operators:- Like)
Wildcards:-
% any character and any number of characters
select * from emp
where ename like 'A%';
Solution for case-insensitive query in Oracle:-
select * from emp
where ename like 'A%' or ename like 'a%';
Type here to search
ENG
US
11:16 AM
18-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL (Special Operators:- Like, Between)
select * from emp
where hiredate between '2019-01-01' and '2019-12-31';
select * from emp
where hiredate >= '2019-01-01' and hiredate <= '2019-12-31';
Type here to search
ENG
US
11:26 AM
18-Jul-20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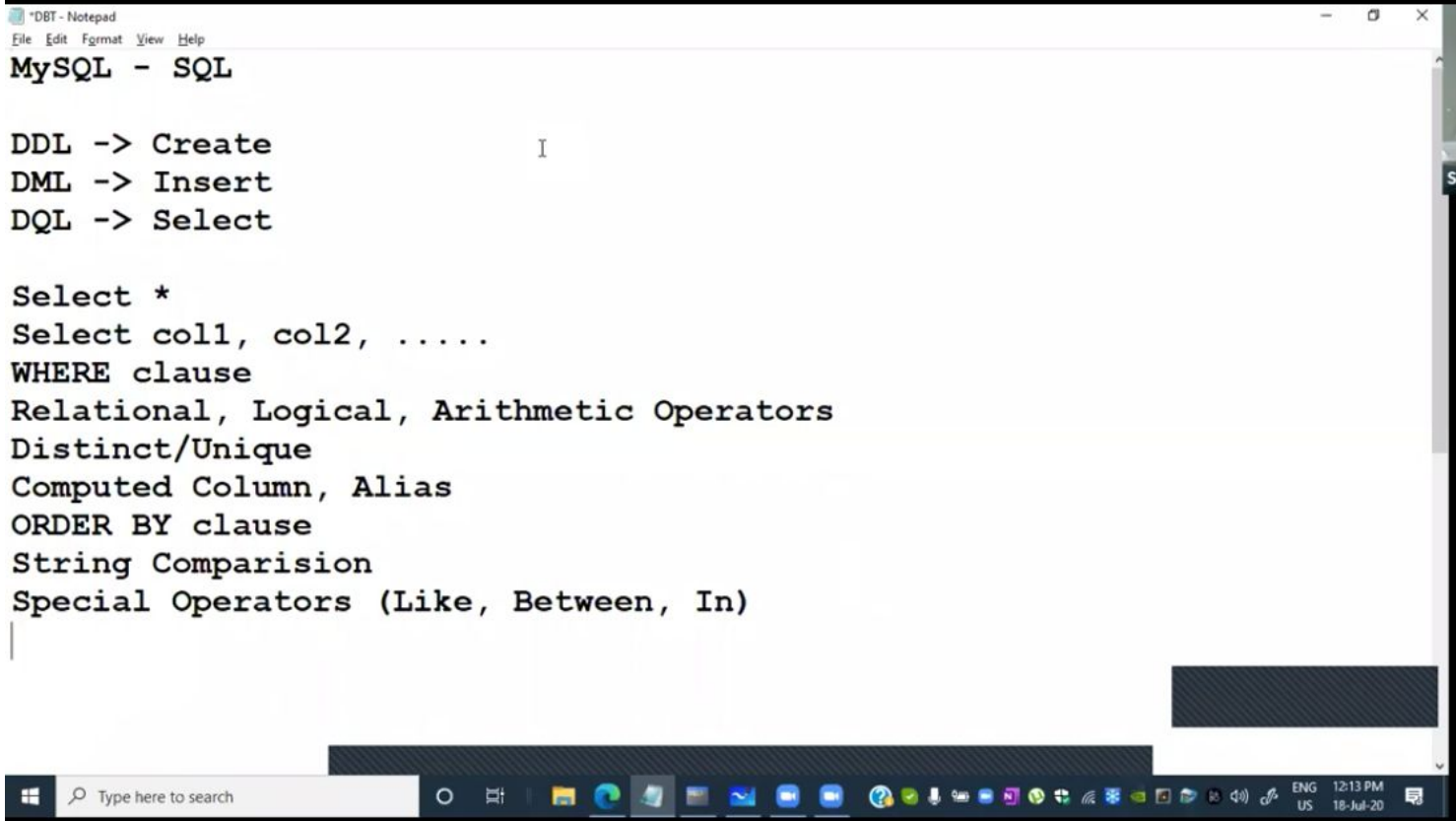
*DBT - Notepad

File Edit Format View Help

```
MySQL - SQL (Special Operators:- Like, Between, In)

select * from emp
where deptno = 10 or deptno = 20 or deptno = 30;

select * from emp
where deptno in(10,20,30,....,....);

IN -> logical OR

select *
```

Type here to search

ENG US 11:34 AM 18-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL
DDL -> Create
DML -> Insert
DQL -> Select
Select *
Select col1, col2, ...
WHERE clause
Relational, Logical, Arithmetic Operators
Distinct/Unique
Computed Column, Alias
ORDER BY clause
String Comparision
Special Operators (Like, Between, In)
Type here to search
ENG US
12:13 PM 18-Jul-20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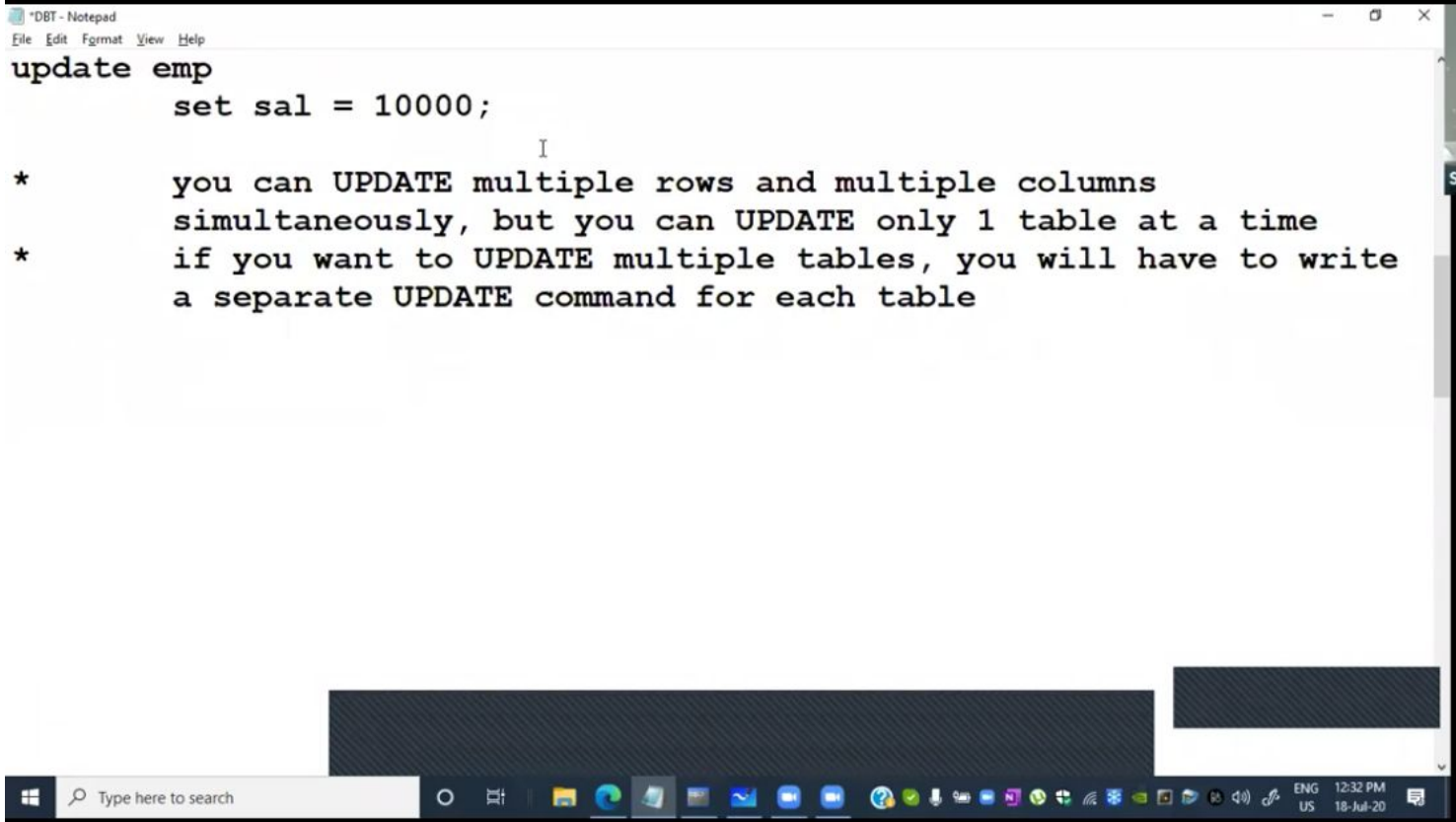
*DBT - Notepad

File Edit Format View Help

```
update emp
        set sal = 10000, city = 'P'
                where empno = 1;

update emp
        set sal = 10000
                where empno = 1;

update emp
        set sal = 10000
                where city = 'B';

update emp
        set sal = sal + sal*0.4
                where city = 'B';
```

Type here to search

ENG US 12:21 PM 18-Jul-20


*DBT - Notepad
File Edit Format View Help
update emp
set sal = 10000;
* you can UPDATE multiple rows and multiple columns
simultaneously, but you can UPDATE only 1 table at a time
* if you want to UPDATE multiple tables, you will have to write
a separate UPDATE command for each table
Type here to search
ENG
US
12:32 PM
18-Jul-20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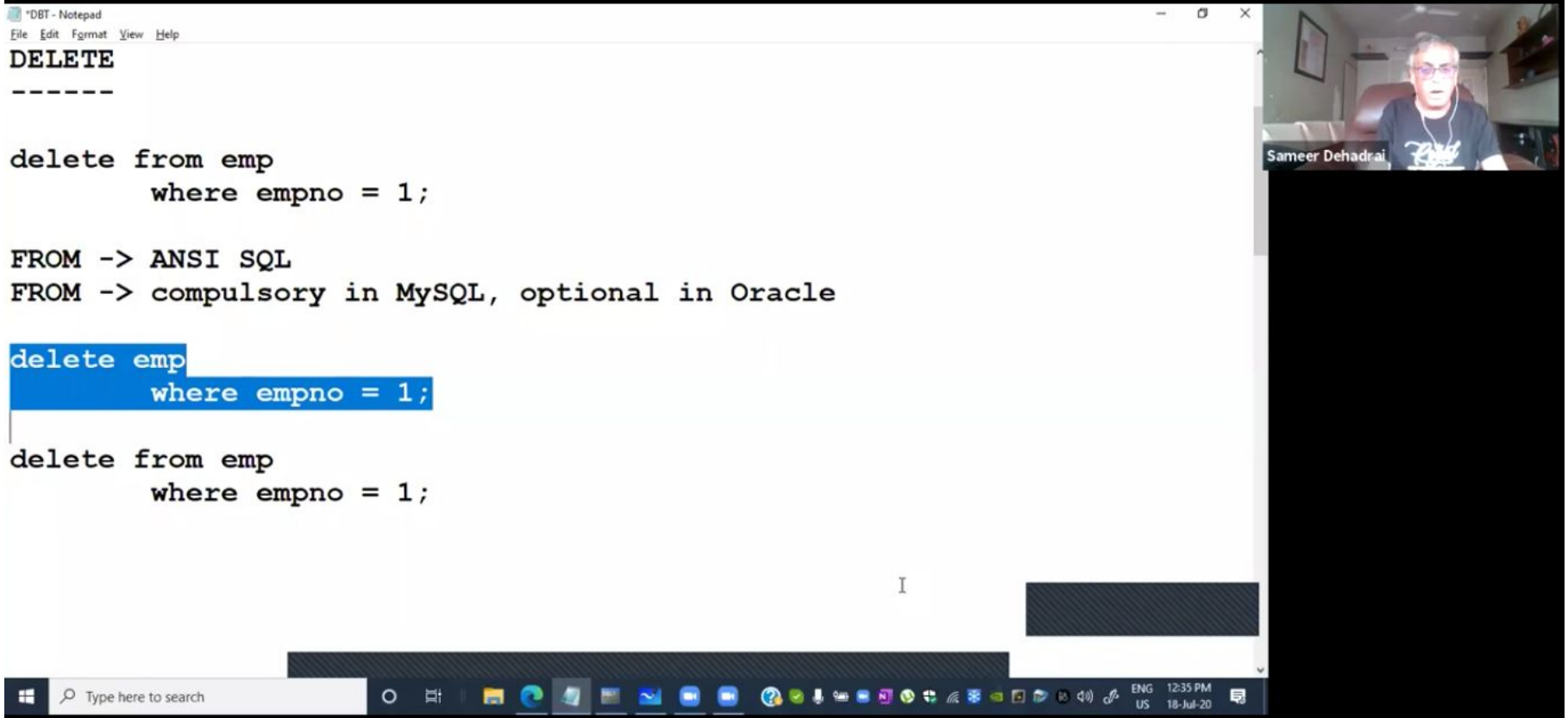
*DBT - Notepad
File Edit Format View Help
DELETE
------
delete from emp
where empno = 1;
FROM -> ANSI SQL
FROM -> compulsory in MySQL, optional in Oracle
delete emp
where empno = 1;
delete from emp
where empno = 1;
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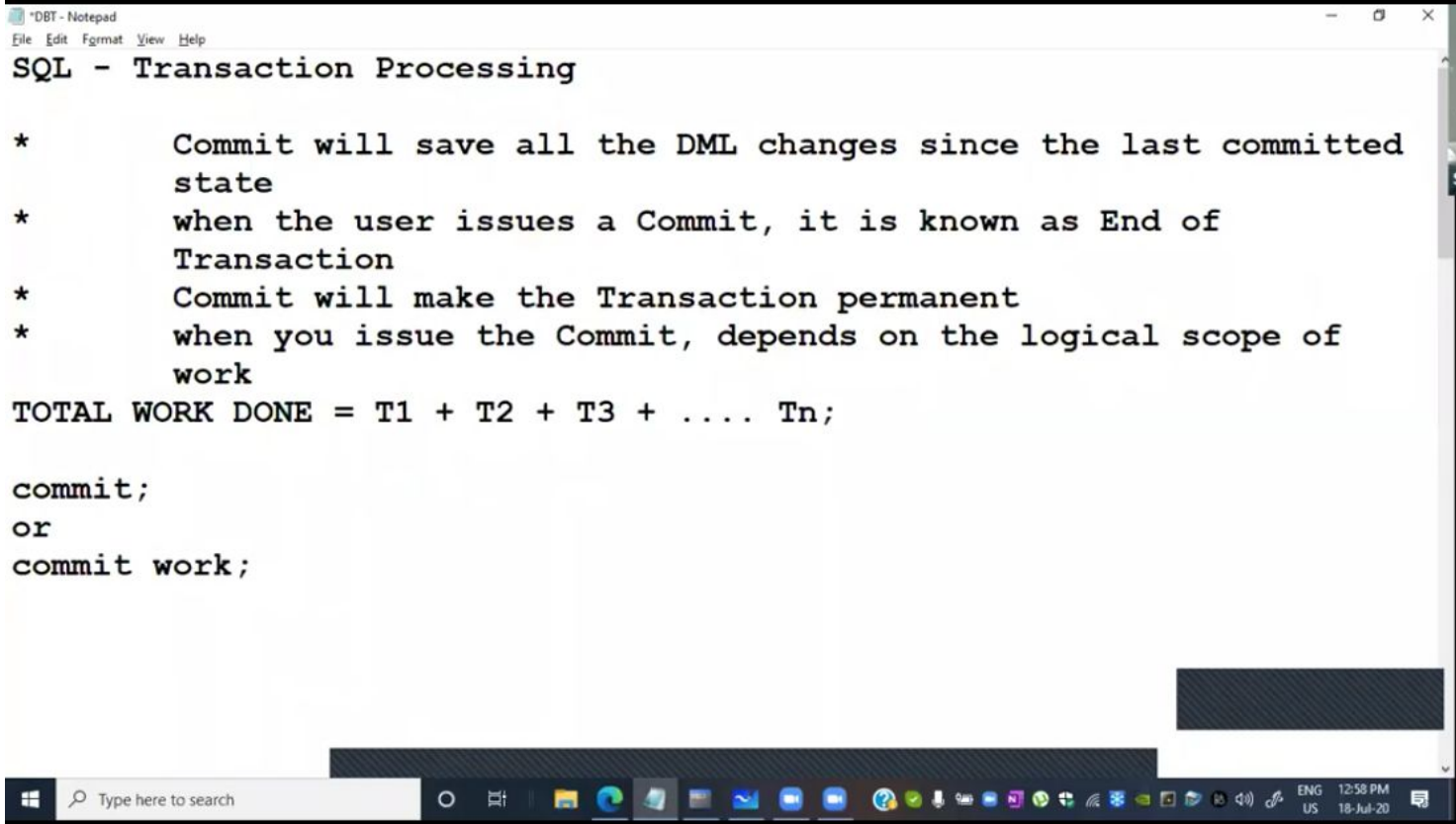
Type here to search
ENG
US
12:35 PM
18-Jul-20

Transaction processing


*DBT - Notepad
File Edit Format View Help
SQL - Transaction Processing
* Commit will save all the DML changes since the last committed state
* when the user issues a Commit, it is known as End of Transaction
* Commit will make the Transaction permanent
* when you issue the Commit, depends on the logical scope of work
TOTAL WORK DONE = T1 + T2 + T3 + ... Tn;
commit;
or
commit work;
Type here to search
ENG US
12:58 PM 18-Jul-20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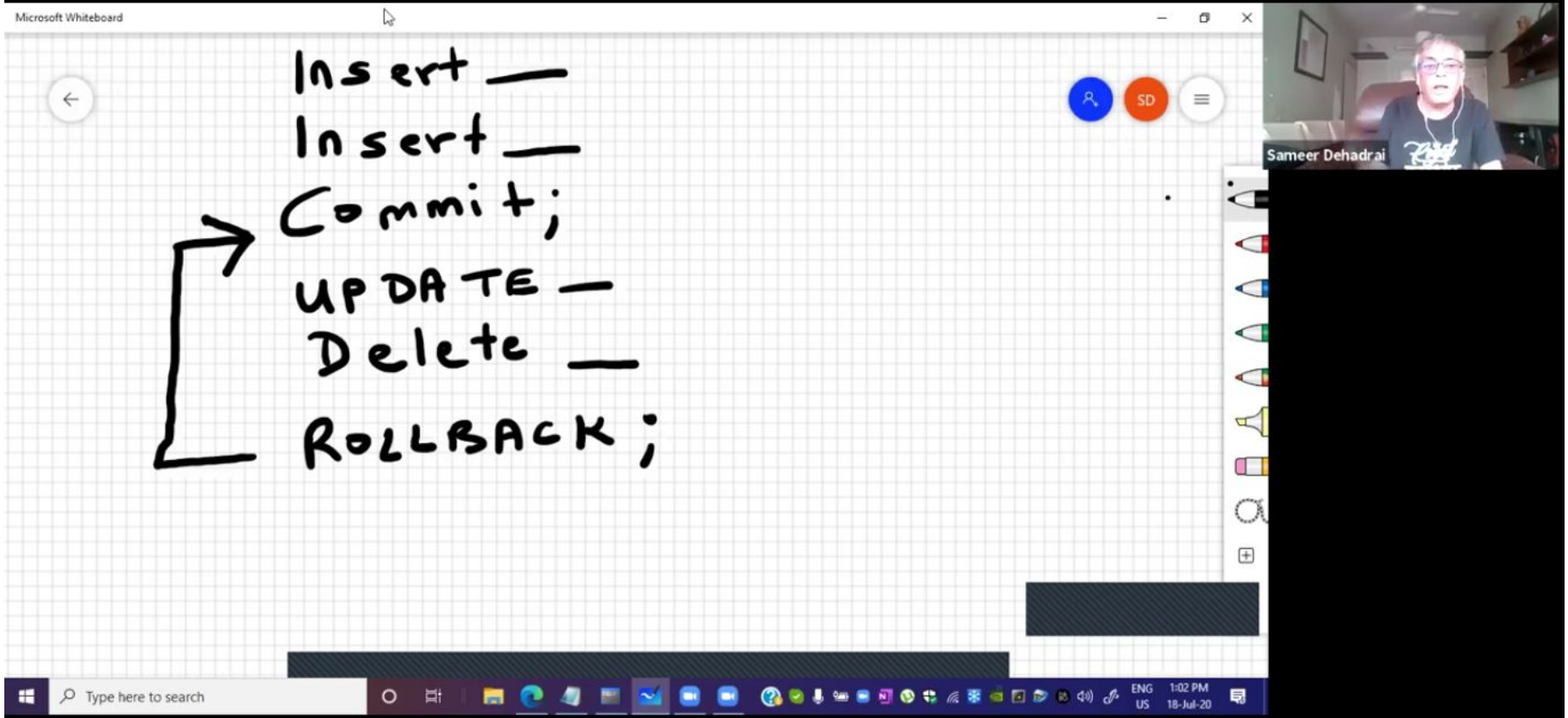
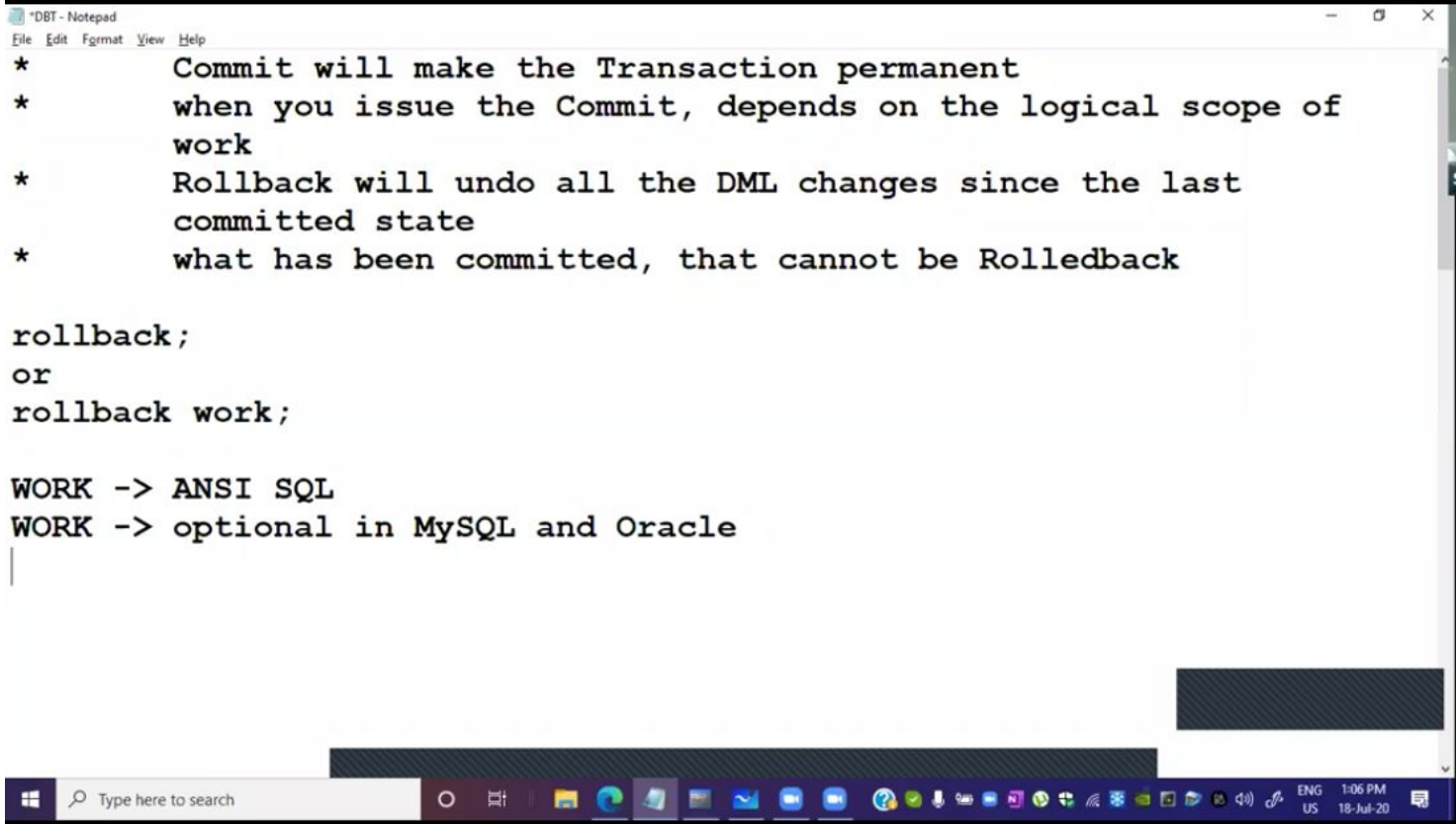

Microsoft Whiteboard
Insert —
Insert —
Commit;
UPDATE —
Delete —
ROLLBACK;
SD
Sameer Dehadrai
Type here to search
ENG
US
1:02 PM
18-Jul-20


*DBT - Notepad
File Edit Format View Help
* Commit will make the Transaction permanent
* when you issue the Commit, depends on the logical scope of work
* Rollback will undo all the DML changes since the last committed state
* what has been committed, that cannot be Rolledback
rollback;
or
rollback work;
WORK -> ANSI SQL
WORK -> optional in MySQL and Oracle
Type here to search
ENG US
1:06 PM 18-Jul-20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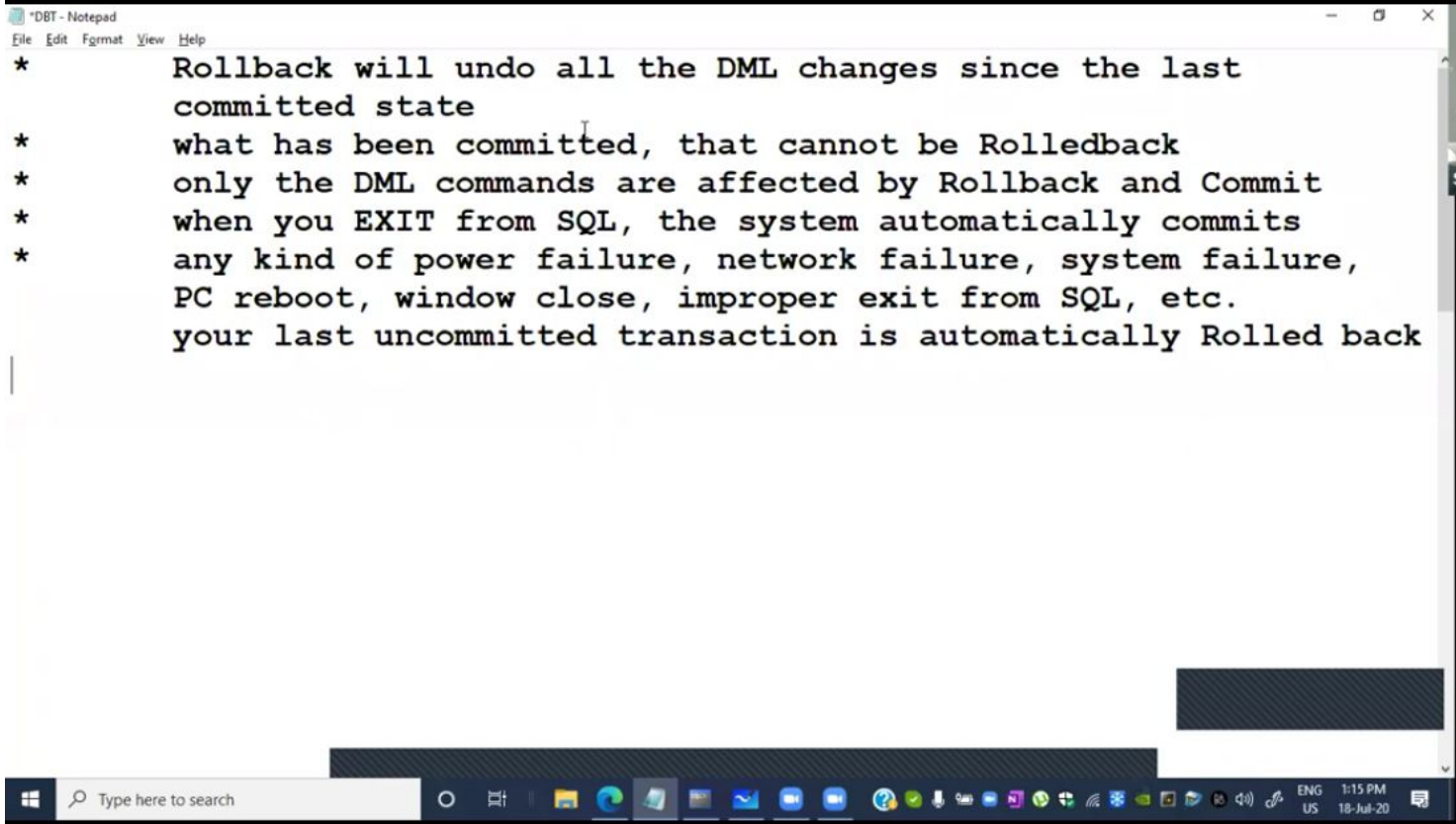
*DBT - Notepad
File Edit Format View Help
* Rollback will undo all the DML changes since the last committed state
* what has been committed, that cannot be Rolledback
* only the DML commands are affected by Rollback and Commit
* when you EXIT from SQL, the system automatically commits
* any kind of power failure, network failure, system failure, PC reboot, window close, improper exit from SQL, etc.
your last uncommitted transaction is automatically Rolled back
Type here to search
ENG US
1:15 PM 18-Jul-20


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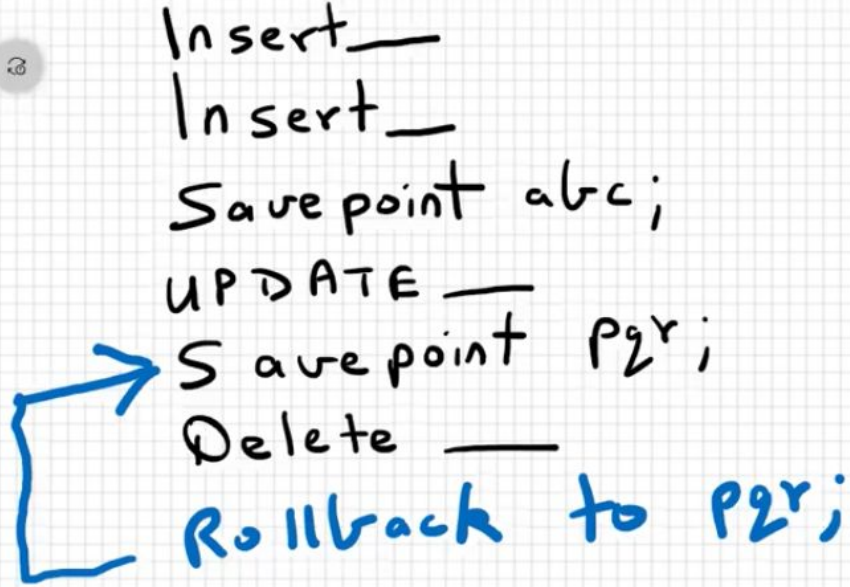
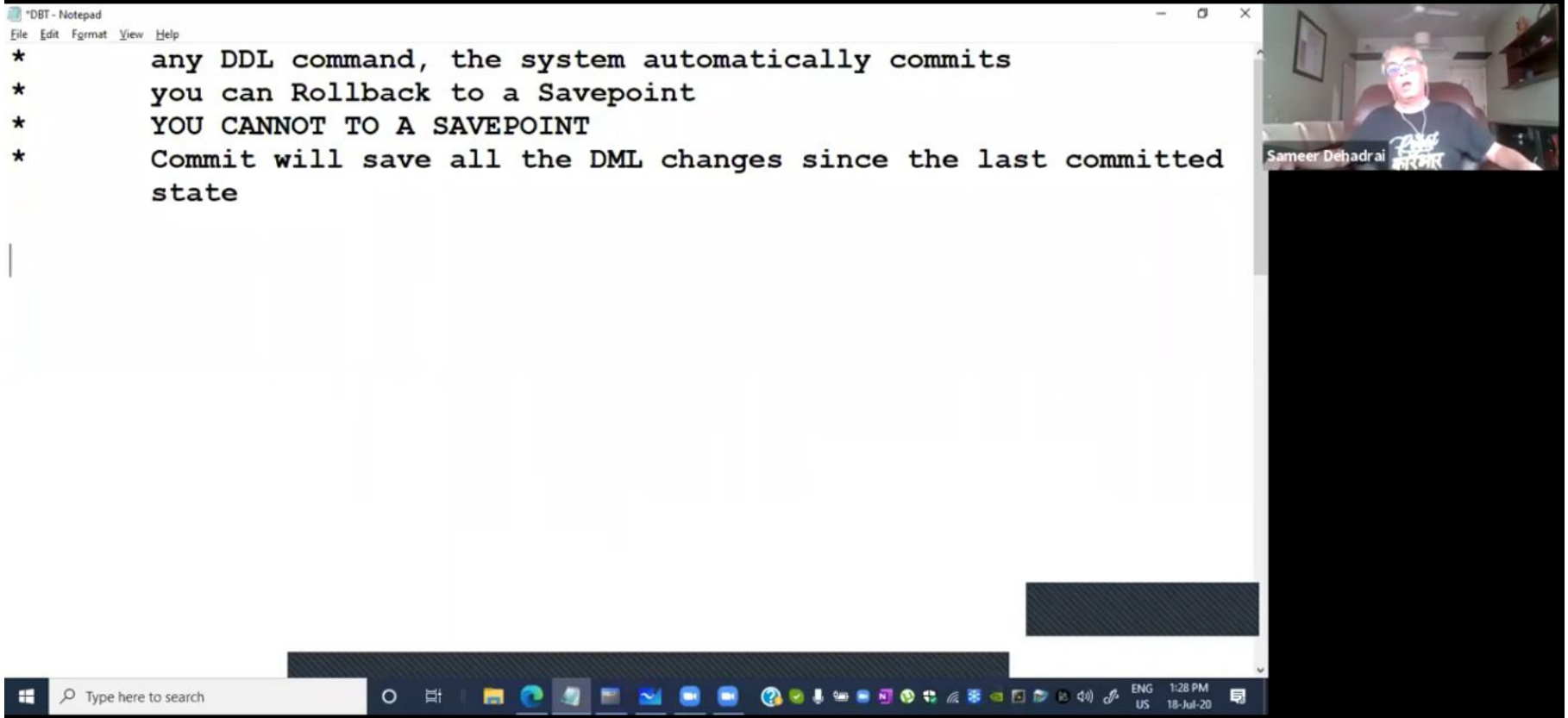
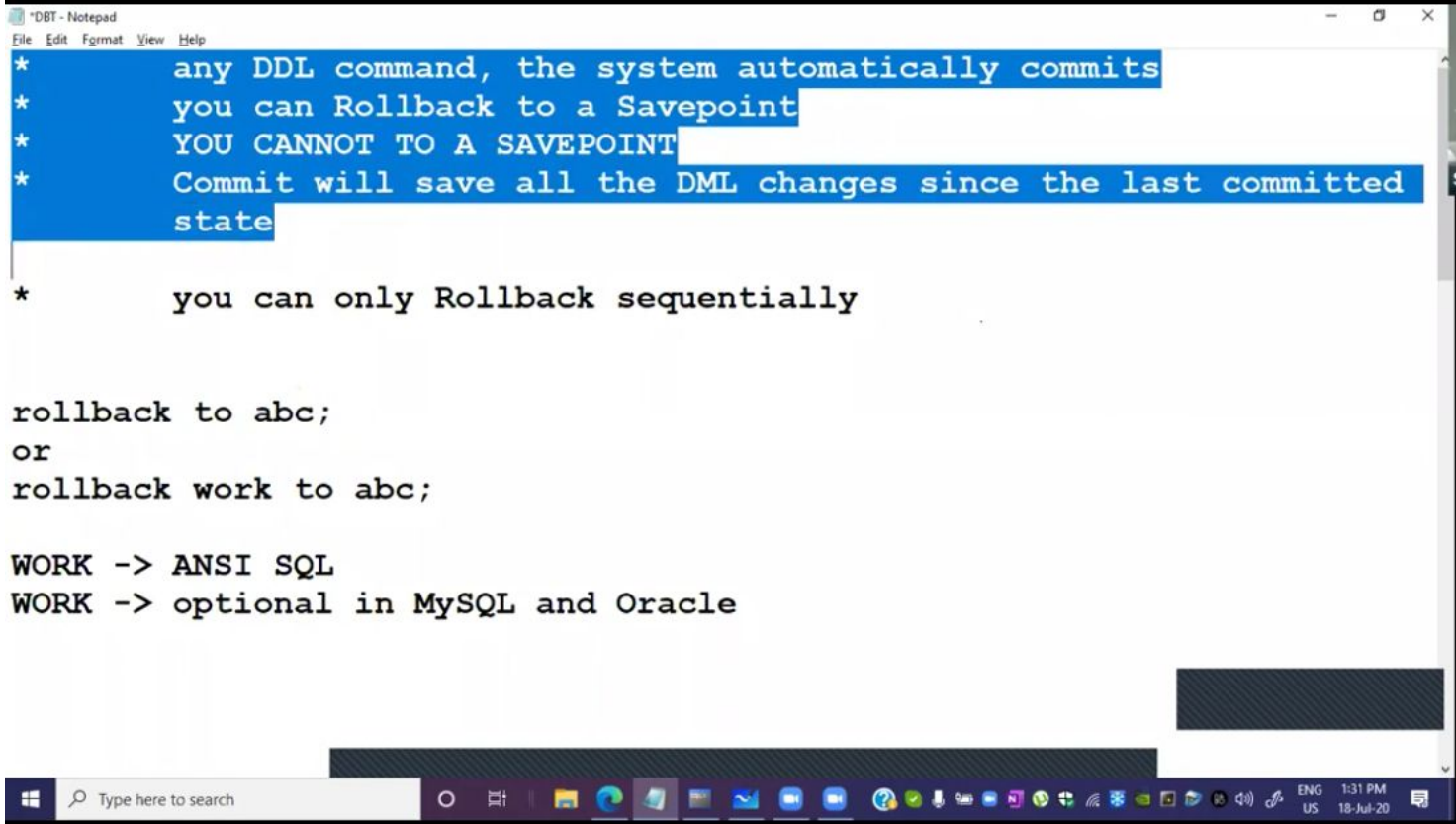
Microsoft Whiteboard



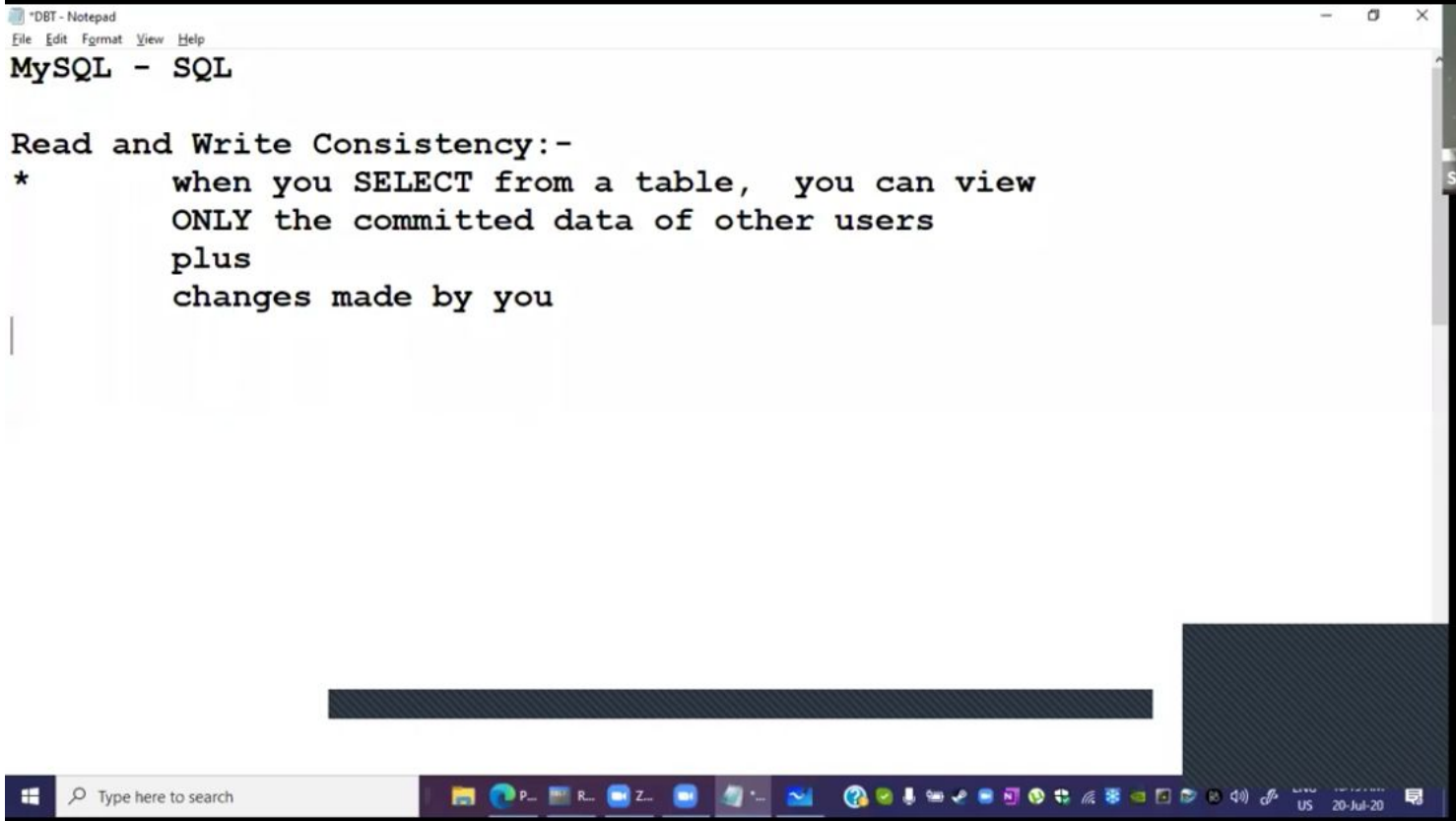
Type here to search

ENG US 1:26 PM 18-Jul-20


*DBT - Notepad
File Edit Format View Help
* any DDL command, the system automatically commits
* you can Rollback to a Savepoint
* YOU CANNOT TO A SAVEPOINT
* Commit will save all the DML changes since the last committed state
Sameer Dehadrai
Type here to search
ENG US
1:28 PM 18-Jul-20


*DBT - Notepad
File Edit Format View Help
* any DDL command, the system automatically commits
* you can Rollback to a Savepoint
* YOU CANNOT TO A SAVEPOINT
* Commit will save all the DML changes since the last committed state
* you can only Rollback sequentially
rollback to abc;
or
rollback work to abc;
WORK -> ANSI SQL
WORK -> optional in MySQL and Oracle
Type here to search
ENG US
1:31 PM 18-Jul-20


Sameer Dehadrai


*DBT - Notepad
File Edit Format View Help
MySQL - SQL
Read and Write Consistency:-
* when you SELECT from a table, you can view
ONLY the committed data of other users
plus
changes made by you
Type here to search
US
20-Jul-20


Sameer Dehadrai

*DBT - Notepad

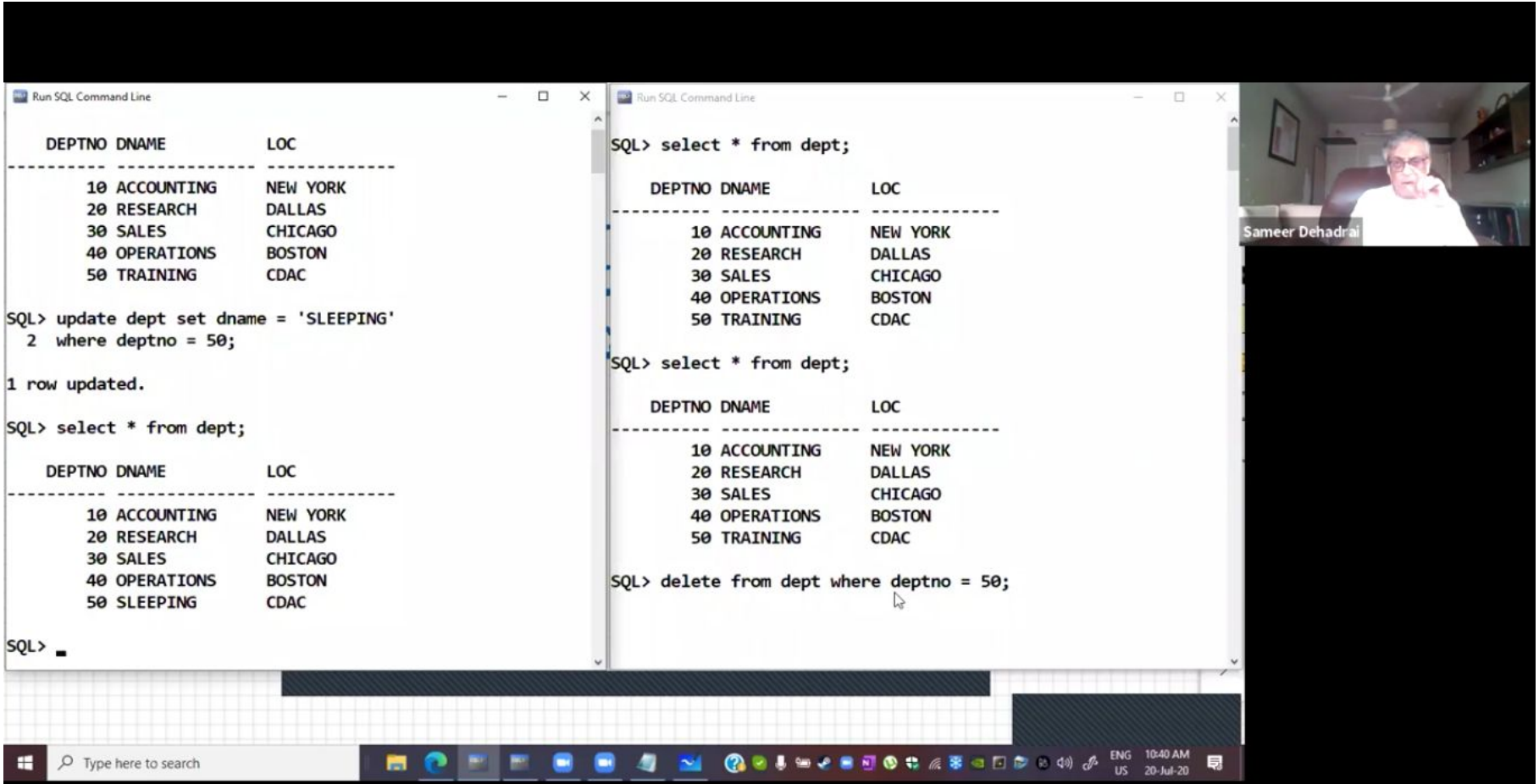
File Edit Format View Help

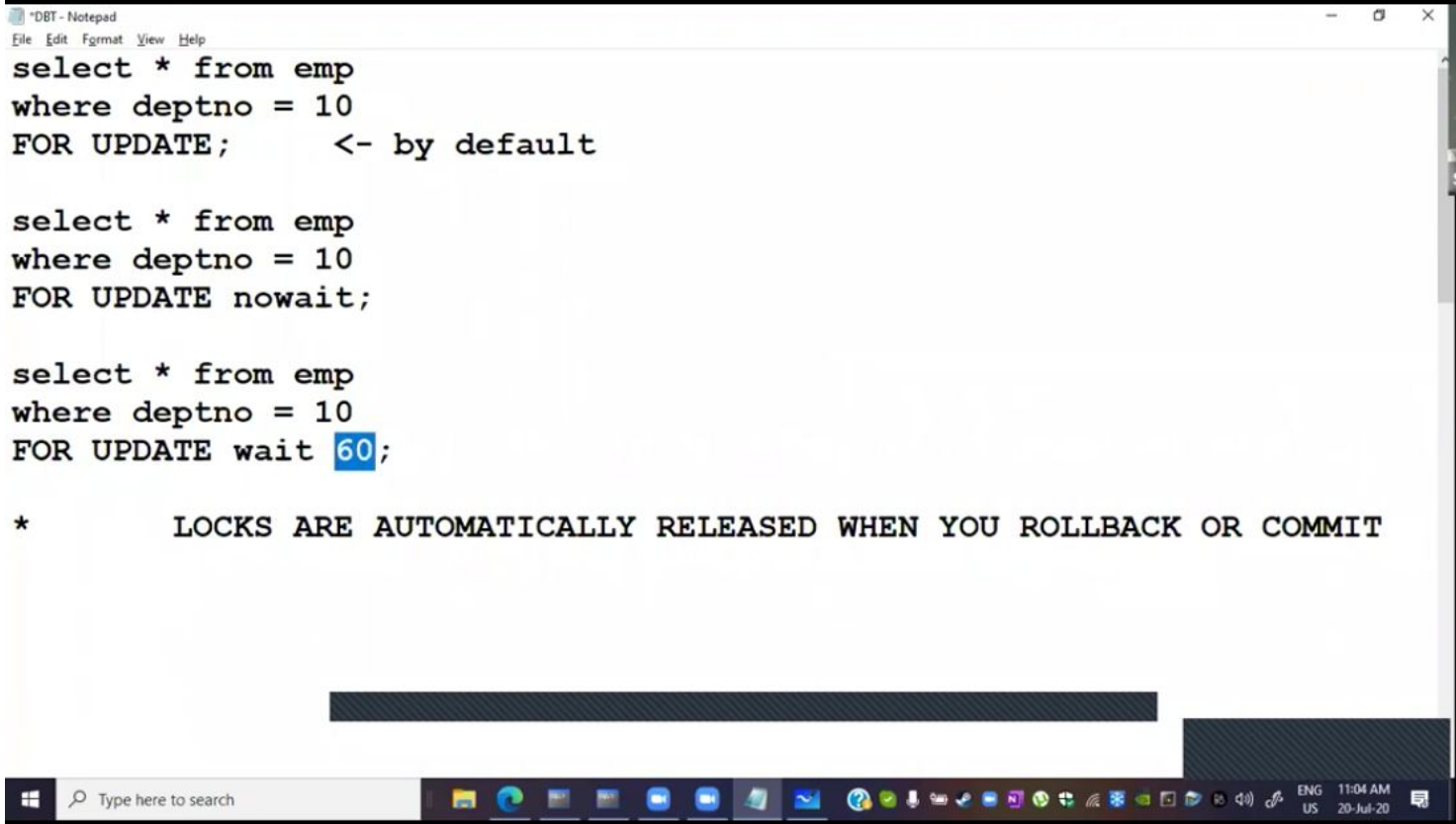
MySQL - SQL - Row Locking

* when you UPDATE or DELETE a row, that row is automatically locked for other users
* when you UPDATE or DLETE a row, that row becomes READ_ONLY for other users
* ROW LOCKING IN MySQL and ORACLE IS AUTOMATIC
* other users can SELECT from that table (they will view the old data before your changes)
* other users can INSERT into that table
* other users can UPDATE or DLETE "other" rows
* no other user can UPDATE or DELETE your locked row, till you have issued a Rollback or Commit
* LOCKS AUTOMATICALLY RELEASED WHEN YOU ROLLBACK OR COMMIT

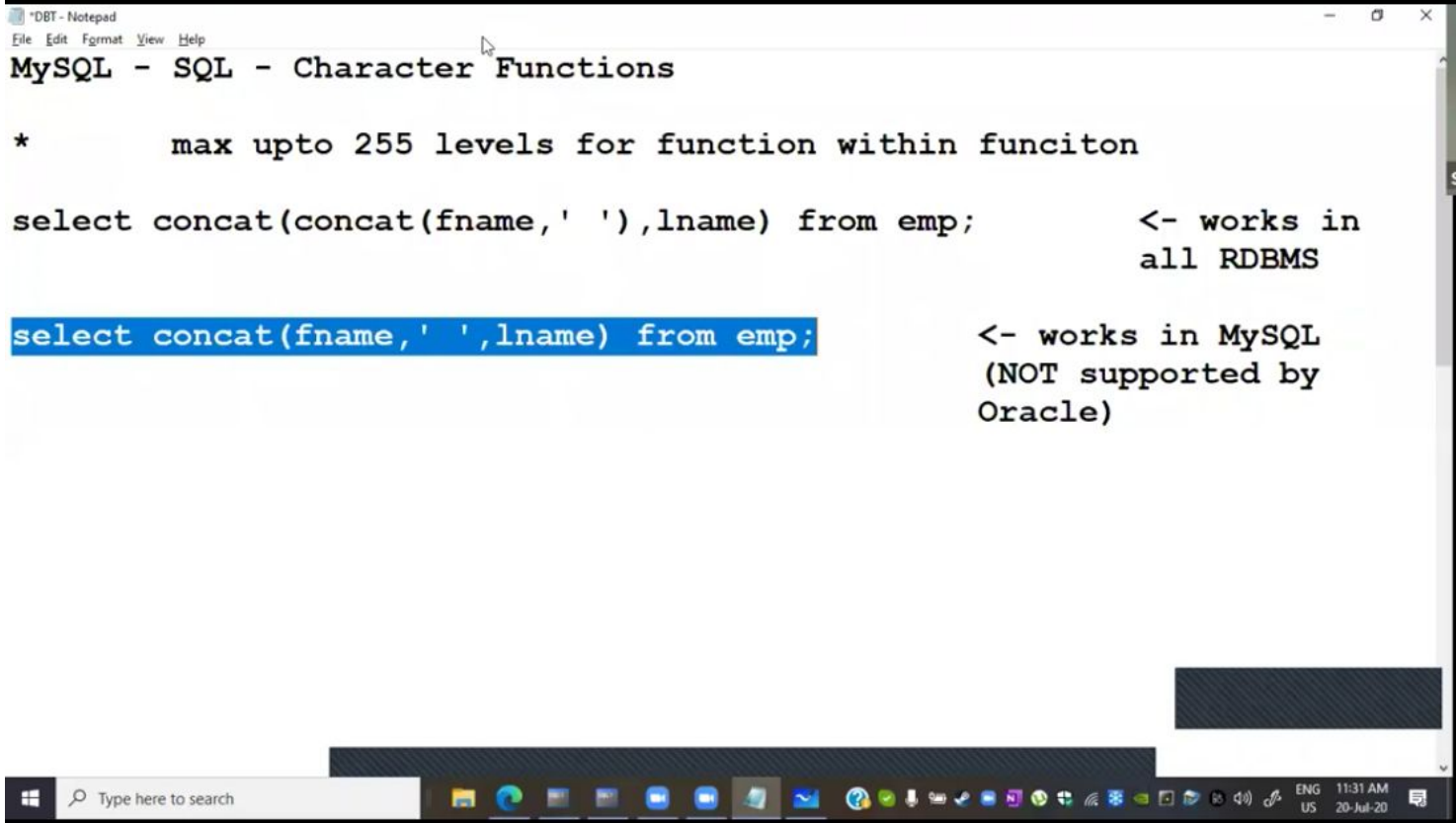
Type here to search

ENG US 10:33 AM 20-Jul-20

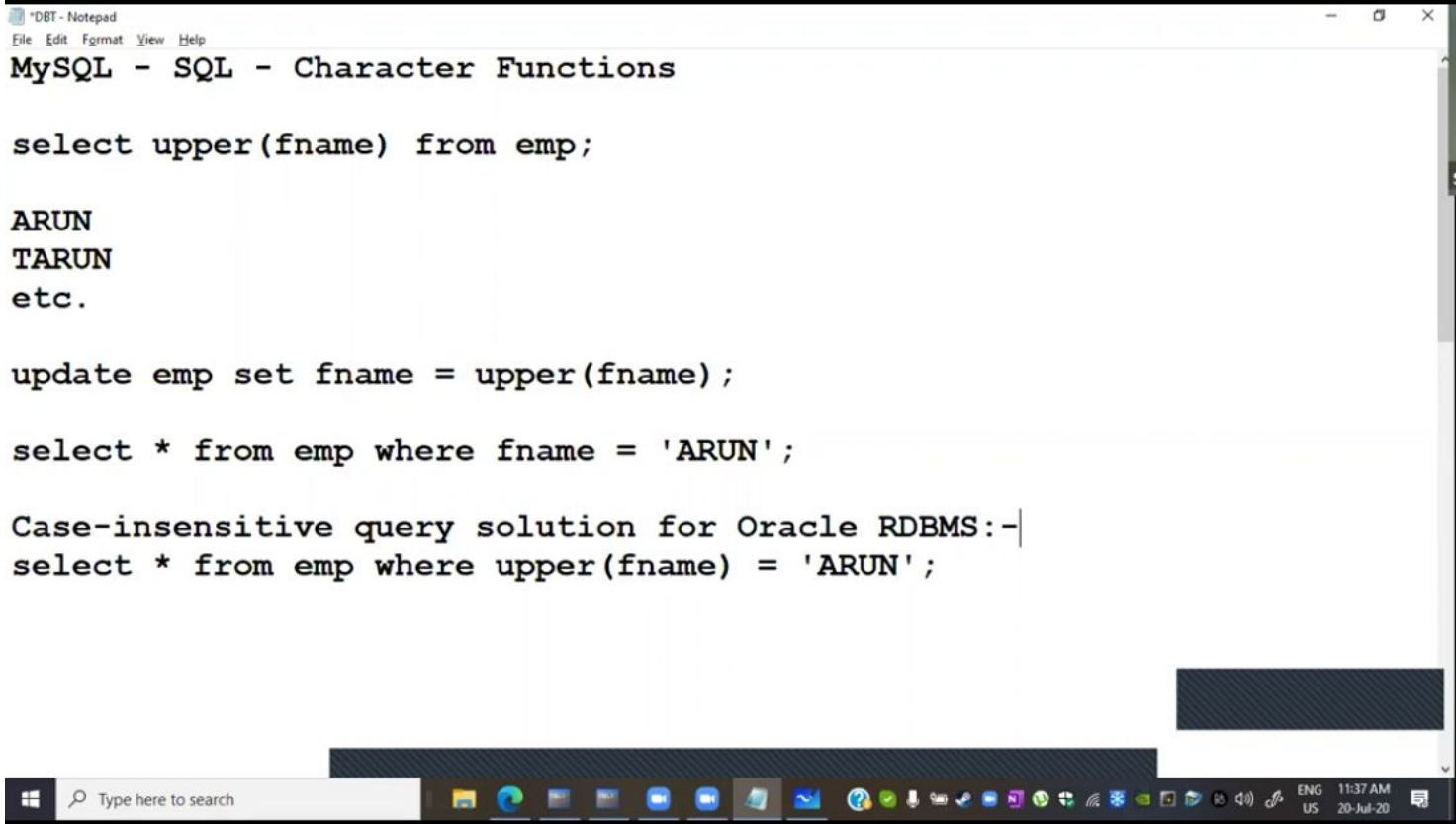

Run SQL Command Line
DEPTNO DNAME LOC
10 ACCOUNTING NEW YORK
20 RESEARCH DALLAS
30 SALES CHICAGO
40 OPERATIONS BOSTON
50 TRAINING CDAC
SQL> update dept set dname = 'SLEEPING'
2 where deptno = 50;
1 row updated.
SQL> select * from dept;
DEPTNO DNAME LOC
10 ACCOUNTING NEW YORK
20 RESEARCH DALLAS
30 SALES CHICAGO
40 OPERATIONS BOSTON
50 SLEEPING CDAC
SQL>
Run SQL Command Line
SQL> select * from dept;
DEPTNO DNAME LOC
10 ACCOUNTING NEW YORK
20 RESEARCH DALLAS
30 SALES CHICAGO
40 OPERATIONS BOSTON
50 TRAINING CDAC
SQL> select * from dept;
DEPTNO DNAME LOC
10 ACCOUNTING NEW YORK
20 RESEARCH DALLAS
30 SALES CHICAGO
40 OPERATIONS BOSTON
50 TRAINING CDAC
SQL> delete from dept where deptno = 50;
Sameer Dehadrai
Type here to search
ENG US
10:40 AM 20-Jul-20


*DBT - Notepad
File Edit Format View Help
select * from emp
where deptno = 10
FOR UPDATE; <- by default
select * from emp
where deptno = 10
FOR UPDATE nowait;
select * from emp
where deptno = 10
FOR UPDATE wait 60;
* LOCKS ARE AUTOMATICALLY RELEASED WHEN YOU ROLLBACK OR COMMIT
Type here to search
ENG US
11:04 AM 20-Jul-20


Sameer Dehadrai


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - Character Functions
* max upto 255 levels for function within funciton
select concat(concat(fname,' '),lname) from emp;
<- works in all RDBMS
select concat(fname,' ',lname) from emp;
<- works in MySQL (NOT supported by Oracle)
Type here to search
ENG US
11:31 AM 20-Jul-20


Sameer Dehadrai


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - Character Functions
select upper(fname) from emp;
ARUN
TARUN
etc.
update emp set fname = upper(fname);
select * from emp where fname = 'ARUN';
Case-insensitive query solution for Oracle RDBMS:-
select * from emp where upper(fname) = 'ARUN';
Type here to search
ENG US
11:37 AM
20-Jul-20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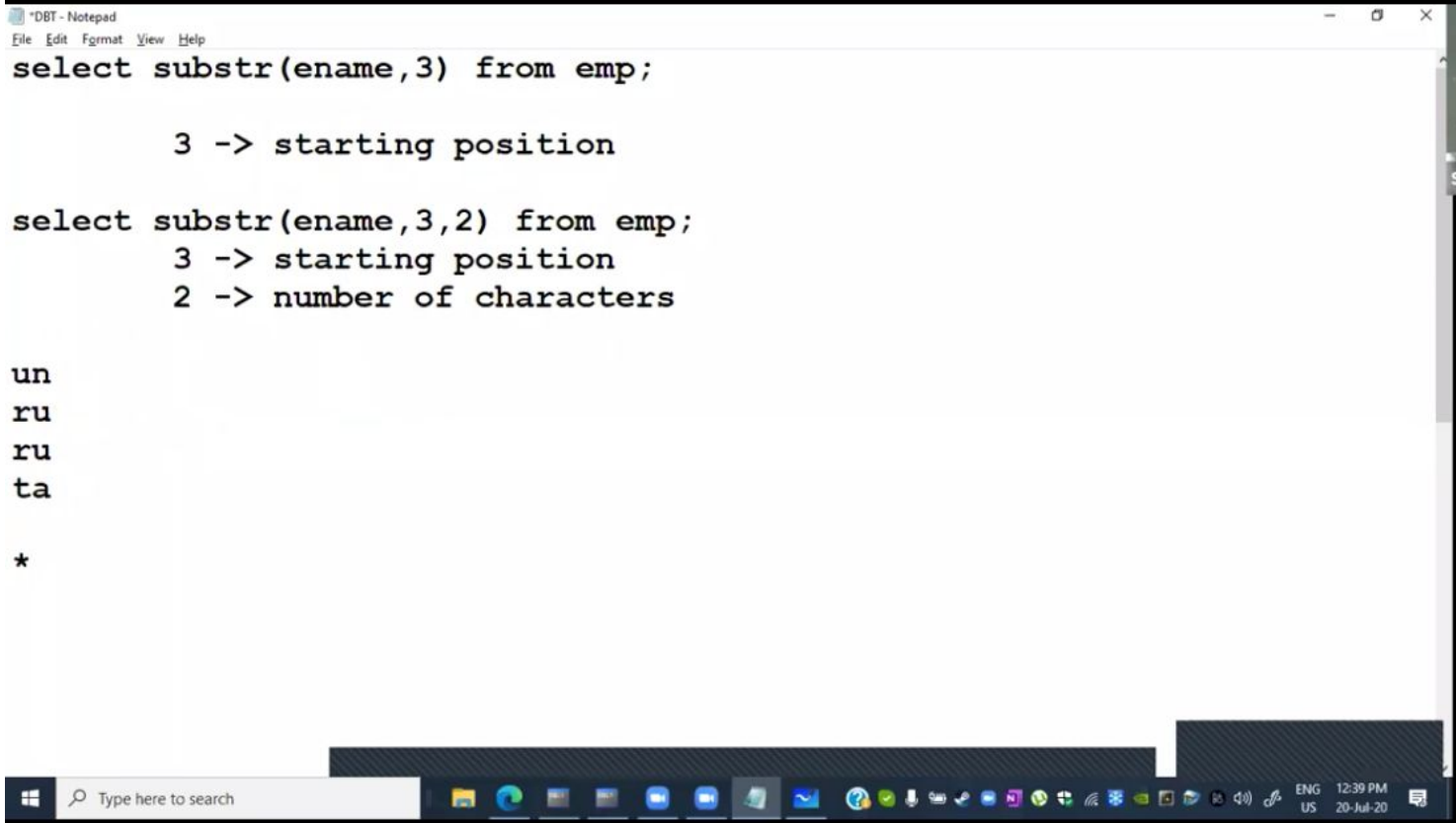
*DBT - Notepad
File Edit Format View Help
select substr(ename,3) from emp;
3 -> starting position
select substr(ename,3,2) from emp;
3 -> starting position
2 -> number of characters
un
ru
ru
ta
*
Type here to search
ENG
US
12:39 PM
20-Jul-20


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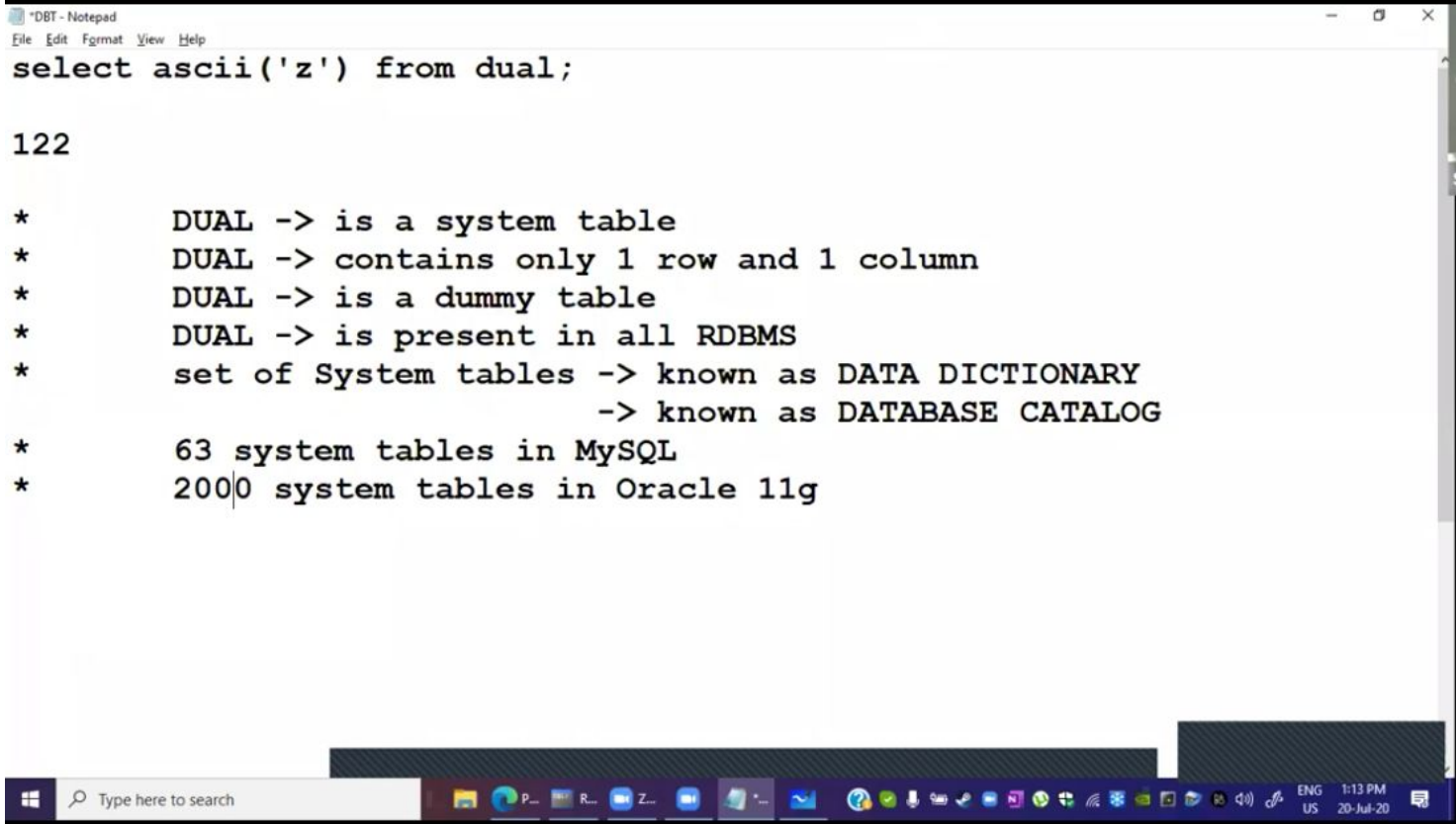
*DBT - Notepad
File Edit Format View Help
select ascii('z') from dual;
122
* DUAL -> is a system table
* DUAL -> contains only 1 row and 1 column
* DUAL -> is a dummy table
* DUAL -> is present in all RDBMS
* set of System tables -> known as DATA DICTIONARY
-> known as DATABASE CATALOG
* 63 system tables in MySQL
* 2000 system tables in Oracle 11g
Type here to search
ENG US
1:13 PM
20-Jul-20


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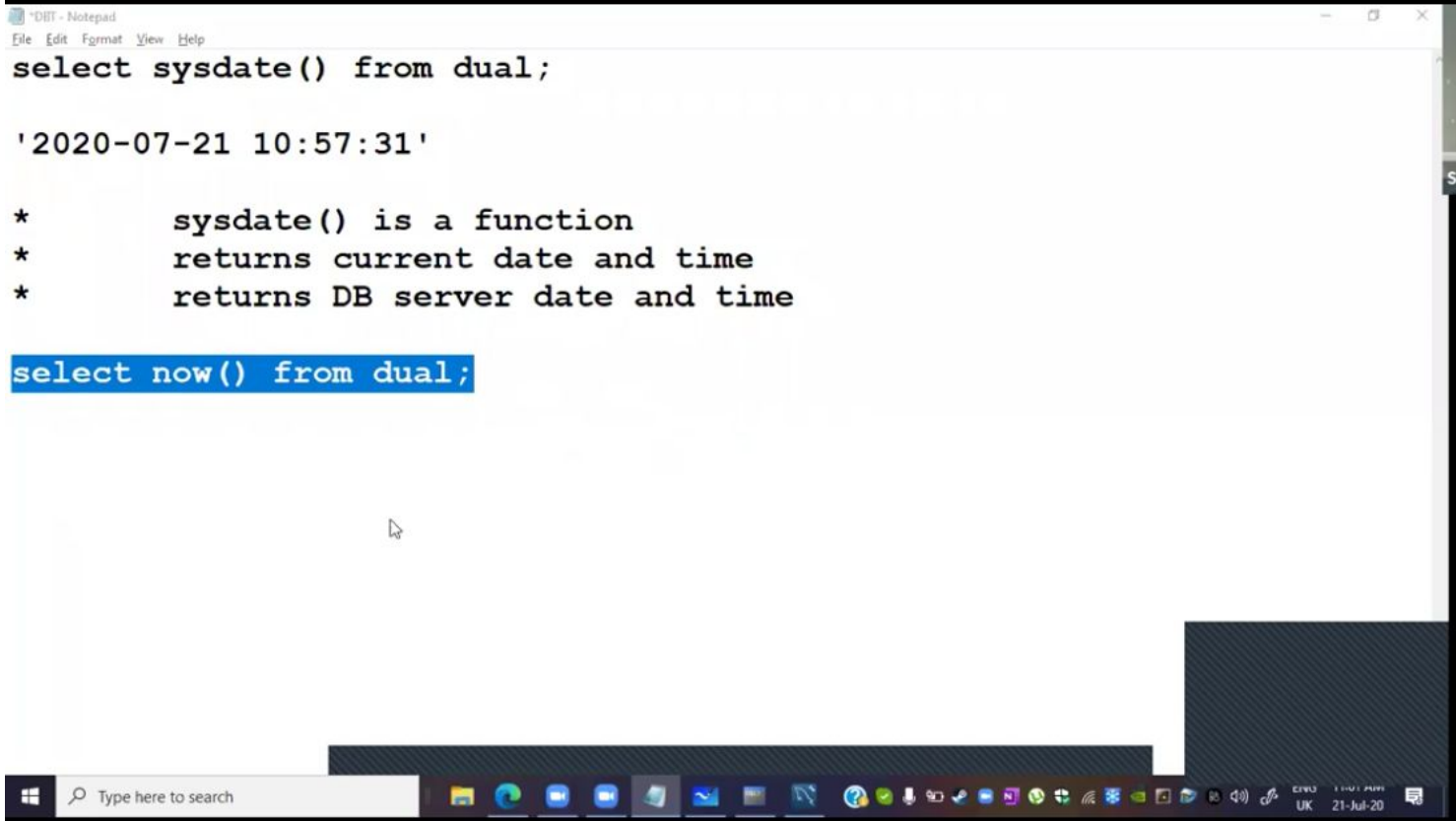
*DBT - Notepad
File Edit Format View Help
select sysdate() from dual;
'2020-07-21 10:57:31'
* sysdate() is a function
* returns current date and time
* returns DB server date and time
select now() from dual;
Type here to search
ENG
UK
21-Jul-20


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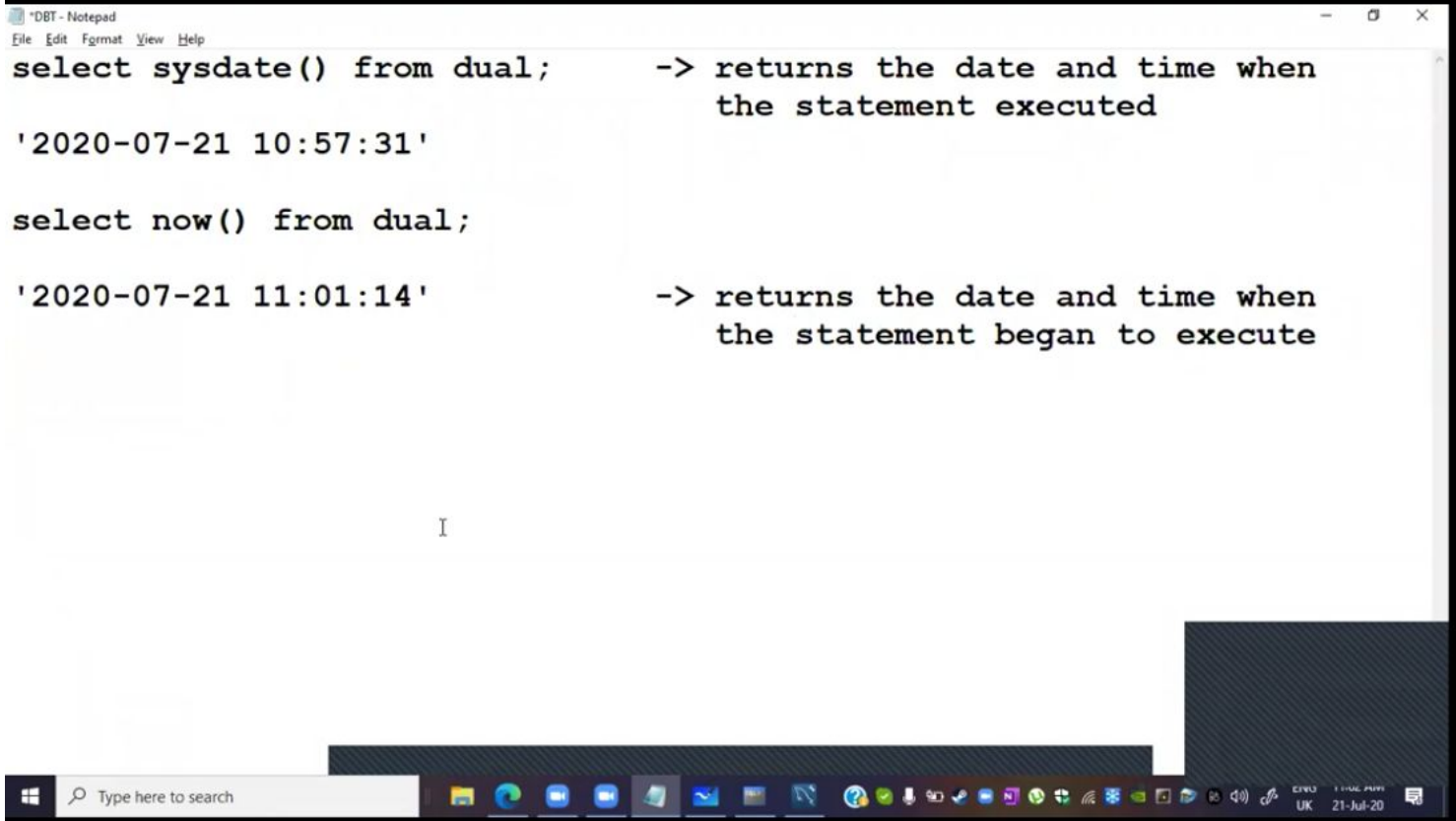

*DBT - Notepad
File Edit Format View Help
select sysdate() from dual; -> returns the date and time when
the statement executed
'2020-07-21 10:57:31'
select now() from dual;
'2020-07-21 11:01:14' -> returns the date and time when
the statement began to execute
Type here to search
21-Jul-20

*DBT - Notepad

File Edit Format View Help

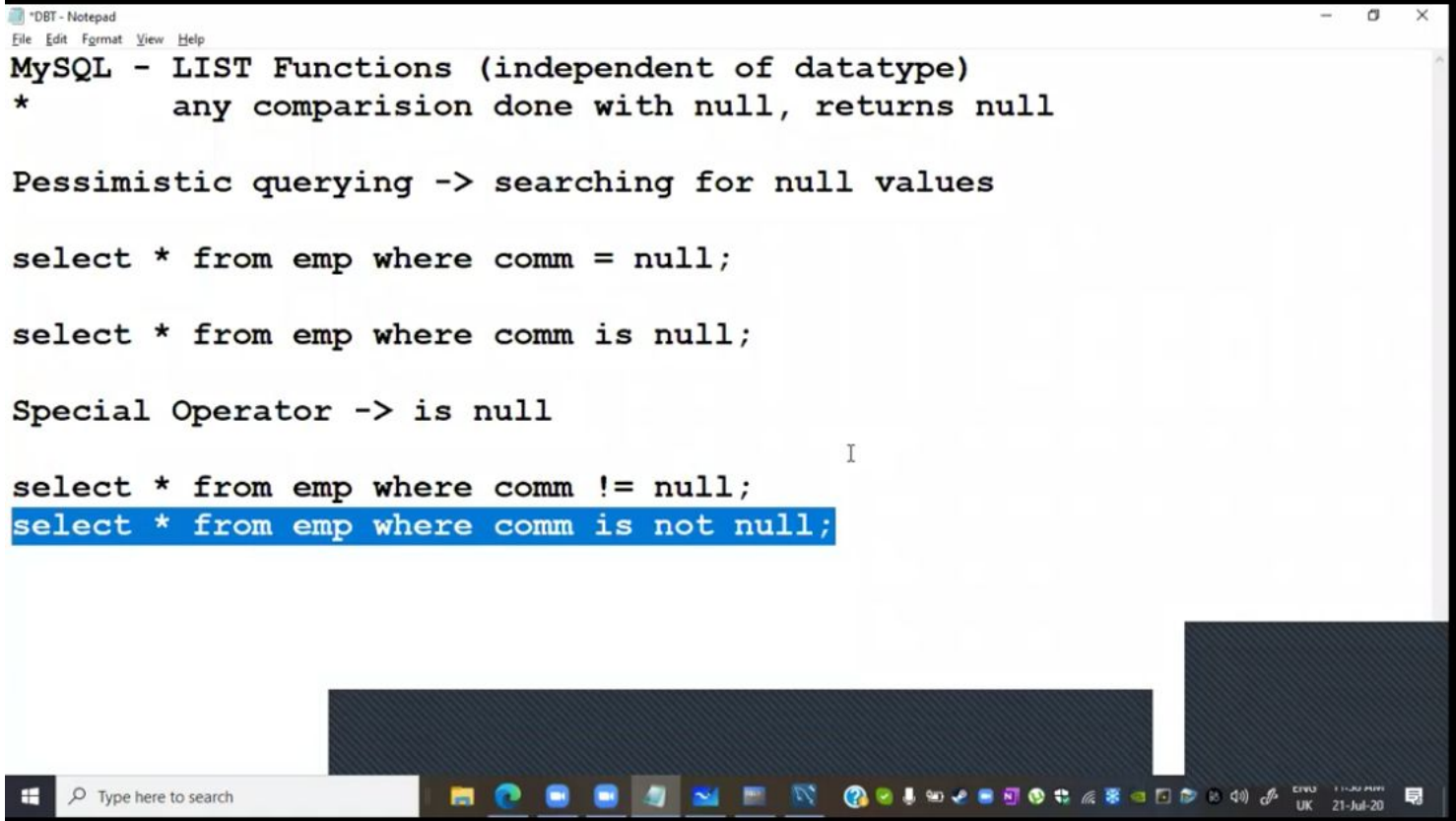
MySQL - LIST Functions (independent of datatype)

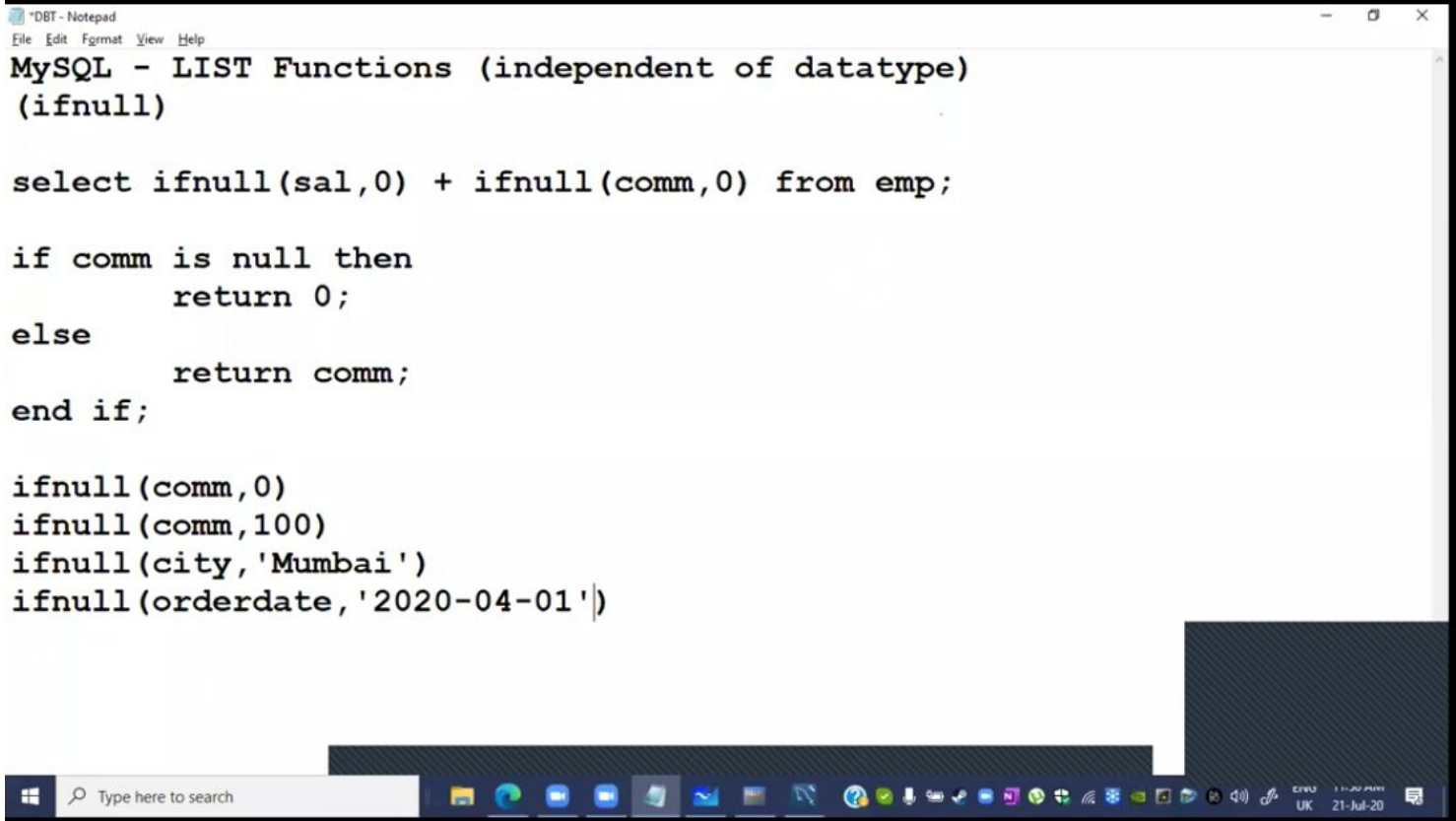
* any comparision done with null, returns null

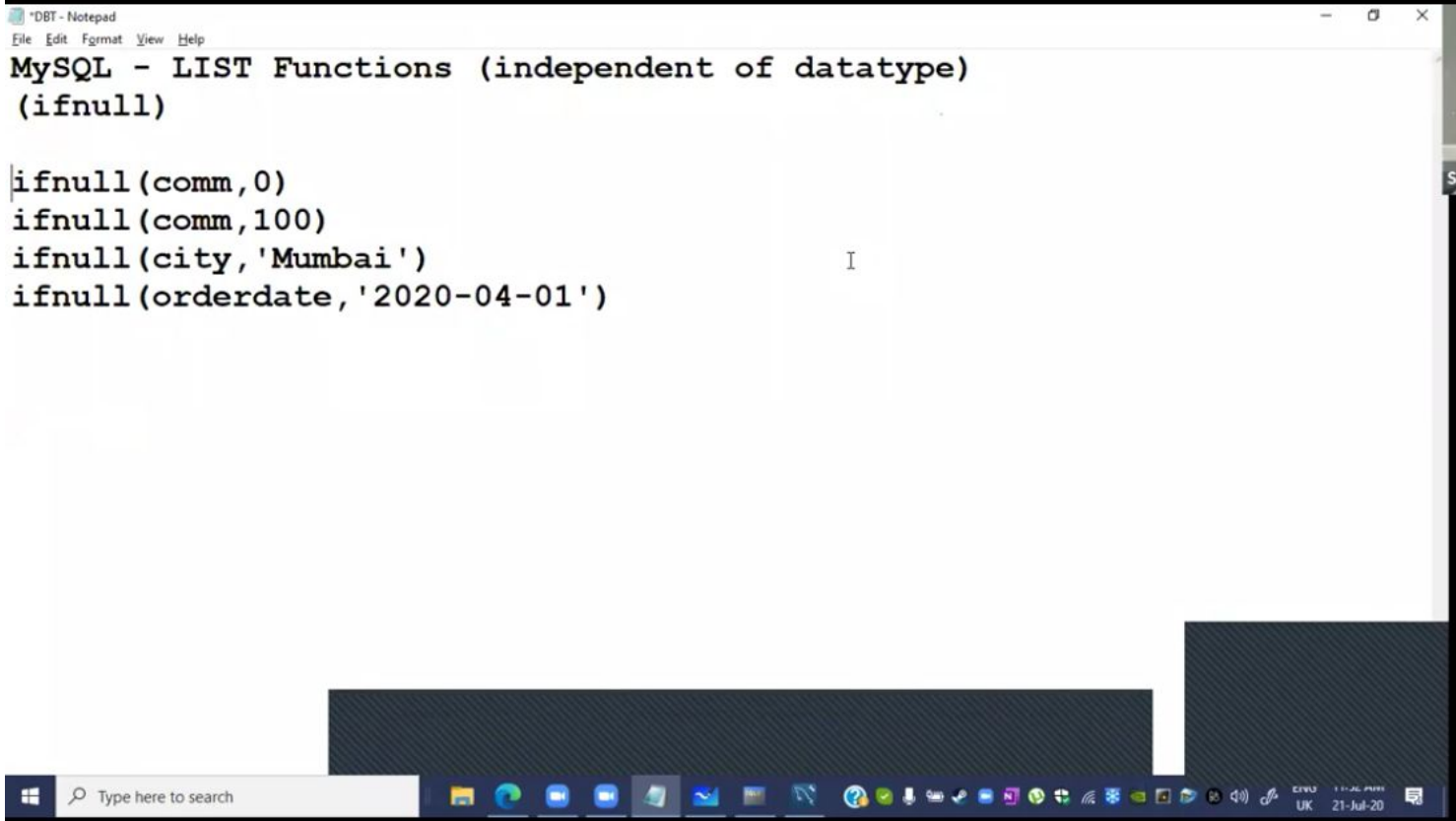
```
select * from emp where comm = null;
```

Type here to search

ENG UK 21-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - LIST Functions (independent of datatype)
* any comparision done with null, returns null
Pessimistic querying -> searching for null values
select * from emp where comm = null;
select * from emp where comm is null;
Special Operator -> is null
select * from emp where comm != null;
select * from emp where comm is not null;
Type here to search
ENG
UK
21-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - LIST Functions (independent of datatype)
(ifnull)
select ifnull(sal,0) + ifnull(comm,0) from emp;
if comm is null then
return 0;
else
return comm;
end if;
ifnull(comm,0)
ifnull(comm,100)
ifnull(city,'Mumbai')
ifnull(orderdate,'2020-04-01')
Type here to search
ENG
UK
21-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - LIST Functions (independent of datatype)
(ifnull)
ifnull(comm,0)
ifnull(comm,100)
ifnull(city,'Mumbai')
ifnull(orderdate,'2020-04-01')
Type here to search
ENG
UK
21-Jul-20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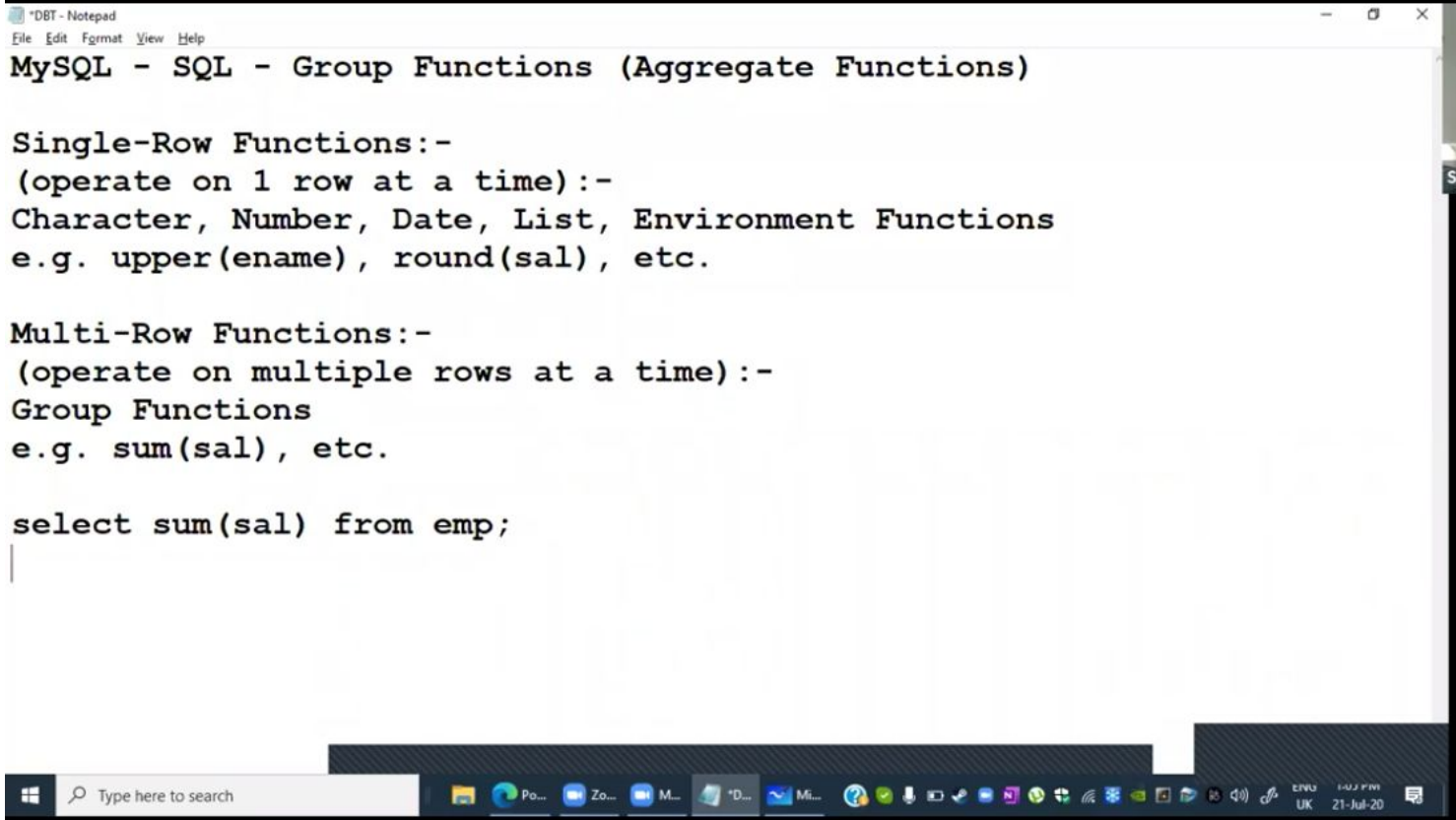
Group functions


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - Group Functions (Aggregate Functions)
Single-Row Functions:-
(operate on 1 row at a time):-
Character, Number, Date, List, Environment Functions
e.g. upper(ename), round(sal), etc.
Multi-Row Functions:-
(operate on multiple rows at a time):-
Group Functions
e.g. sum(sal), etc.
select sum(sal) from emp;
Type here to search
ENG
UK
21-Jul-20


Sameer Dehadrai

Microsoft Whiteboard

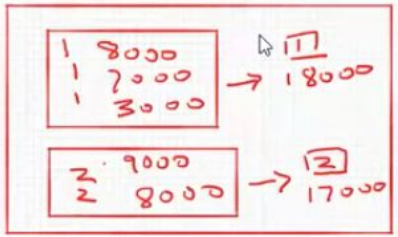
EMP

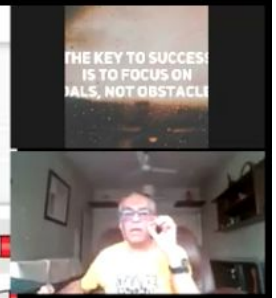
EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

DB Server HD

Server RAM

1) Rows retrieved from DB Server HD to server RAM
2) Sorting deptwise
3) Grouping deptwise
4) Summation / Calculation





Type here to search

22-Jul-20

Day-7.mp4 - VLC media player

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*DBT - Notepad

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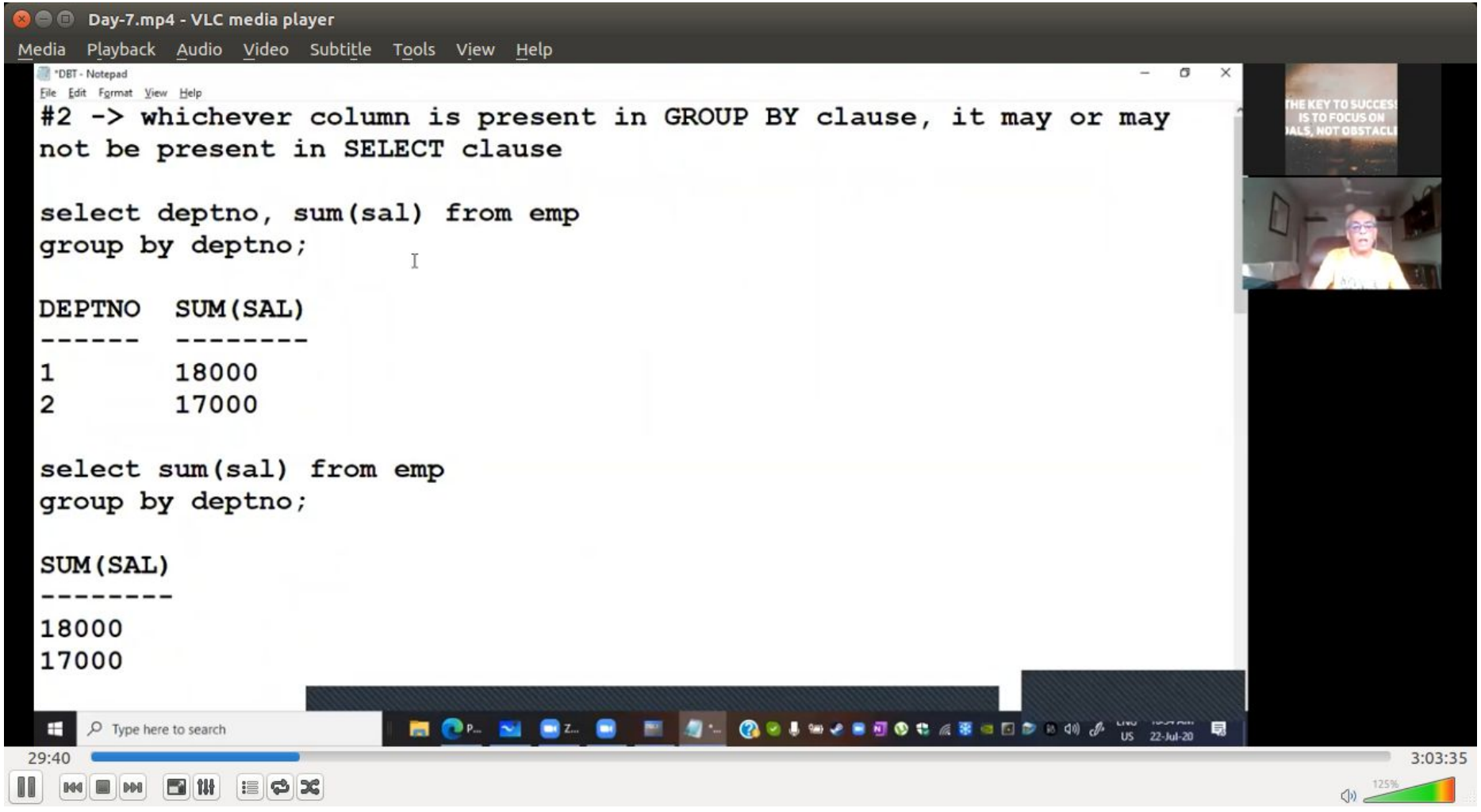
```
SELECT clause -> select deptno, sum(sal)
FROM clause -> from emp
GROUP BY clause -> group by deptno

#1 -> Besides the group function, whichever column is present in
SELECT clause, it HAS to be present in GROUP BY clause

select deptno, sum(sal) from emp;
```

Type here to search

US 22-Jul-20

25:44 3:03:35

125%


Day-7.mp4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
*DBT - Notepad
File Edit Format View Help
#2 -> whichever column is present in GROUP BY clause, it may or may not be present in SELECT clause
select deptno, sum(sal) from emp
group by deptno;
DEPTNO SUM(SAL)
1 18000
2 17000
select sum(sal) from emp
group by deptno;
SUM(SAL)
18000
17000
Type here to search
29:40
3:03:35

Day-7.mp4 - VLC media player

Media Playback Audio Video Subtitle Tools View Help

*DBT - Notepad

File Edit Format View Help

```
select deptno, job, sum(sal) from emp
group by deptno, job;

*       no upper limit on the number of columns in GROUP BY clause

select ..............................
group by country, state, district, city;

*       if you large number of rows in the table and if you have
        large number of columns in GROUP BY clause, then the
        execution will be very slow
```

Type here to search

ENG US 22-Jul-20

48:58 3:03:35

125%

*DBT - Notepad

File Edit Format View Help

```
select deptno, job, sum(sal) from emp          <- FASTER
group by deptno, job;

select job, deptno, sum(sal) from emp          <- SLOWER
group by job, deptno;

select deptno, job, sum(sal) from emp
group by deptno, job;

select job, deptno, sum(sal) from emp
group by deptno, job;

select sum(sal), deptno, job, sum(sal) from emp
group by deptno, job;
```

Type here to search

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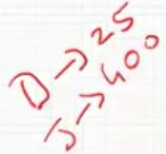
Microsoft Whiteboard



DEPTNO	JOB	SUM(SAL)
1	C	10000
1	M	8000
2	C	8000
2	M	9000

FAST

D(25)

[J(400)

[

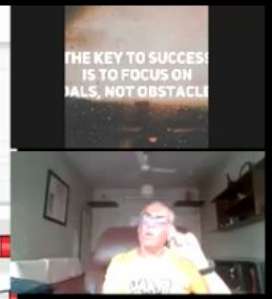
SLOW

J (400)

[D (25)

[

JOB	DEPTNO	SUM(SAL)
C	1	10000
C	2	8000
M	1	8000
M	2	9000



Type here to search

22-Jul-20

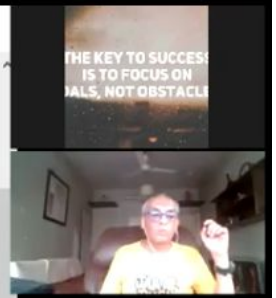
*DBT - Notepad

File Edit Format View Help

```
select job, deptno, sum(sal) from emp
group by deptno, job;

select sum(sal), job, deptno from emp
group by deptno, job;

*       position of columns in SELECT clause and the position of
        columns in GROUP BY clause, need not be the same
*       position of columns in SELECT clause will determine the
        position of columns in the output (you shall determine the
        position of columns in SELECT clause as per User requirements
*       the position of columns in GROUP BY clause will determine the
        sorting order, grouping order, summation order, and hence the
        speed of processing
```



Type here to search

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*DBT - Notepad

File Edit Format View Help

```
select deptno, sum(sal) from emp
group by deptno
having sum(sal) > 17000;

DEPTNO   SUM(SAL)
------   --------
1        18000

*        HAVING clause works AFTER the summation is done
*        it's recommended that only group functions should be used in
```

Type here to search

ENG US 22-Jul-20

Day-7.mp4 - VLC media player

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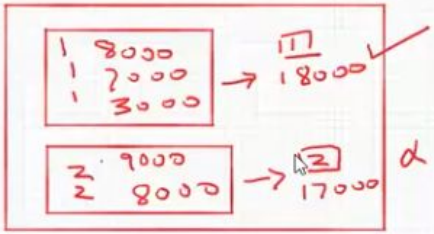
Microsoft Whiteboard

EMPNO	ENAME	EMP SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

DB Server HD

1) Rows retrieved from DB Server HD to Server RAM
2) Sorting deptwise
3) Grouping deptwise
4) Summation / Calculation
5) HAVING
6) ORDER BY

Server RAM



Type here to search

1:18:07 3:03:35

*DBT - Notepad

File Edit Format View Help

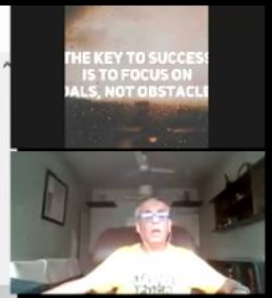
```
select sum(sal) from emp
group by deptno;

SUM(SAL)
--------
18000
17000

select max(sum(sal)) from emp
group by deptno;

MAX(SUM(SAL))
-------------
18000
```

<- NESTING OF GROUP FUNCTIONS IS SUPPORTED IN ORACLE (NOT SUPPORTED IN ANY OTHER RDBMS)



Type here to search

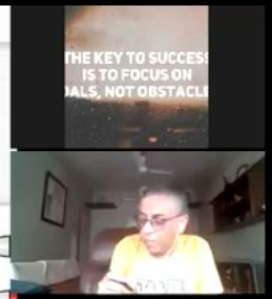
US 22-Jul-20

JOINS

Microsoft Whiteboard

		EMP			
EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

	DEPT	
DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal



Type here to search

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Microsoft Whiteboard

		EMP			
EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

	DEPT	
DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal

DNAME LOC

TRN Bby

TRN Bby

TRN Bby

EXP Dlh

EXP Dlh

DATA REDUNDANCY → unnecessary duplication of data (leads to wastage of HD space)

Type here to search

US 22-Jul-20

*DBT - Notepad

File Edit Format View Help

```
dept -> driving table
emp -> driven table

select dname, ename from emp, dept
where dept.deptno = emp.deptno;

DNAME   ENAME
-----   -----
TRN     Arun
TRN     Ali
TRN     Kirun
EXP     Jack
EXP     Thomas
```

(IN ORDER FOR THE JOIN TO WORK FASTER, PREFERABLY THE DRIVING TABLE SHOULD BE TABLE WITH "LESSER" NUMBER OF ROWS)

Type here to search

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*DBT - Notepad

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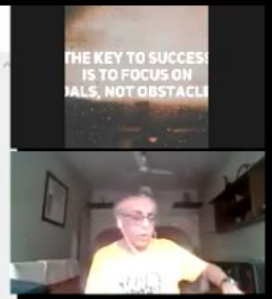
```
dept -> driving table (determined wrt FROM clause)
emp -> driven table (determined wrt FROM clause)

select dname, ename from emp, dept
where dept.deptno = emp.deptno
order by 1;
```



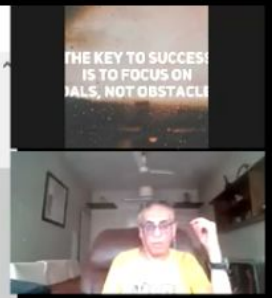
Type here to search

US 22-Jul-20

*DBT - Notepad

File Edit Format View Help

```
select dname, loc, ename, job, sal from emp, dept
where dept.deptno = emp.deptno
order by 1;

select * from emp, dept
where dept.deptno = emp.deptno
order by 1;

        (ERROR)
select deptno, dname, loc, empno, ename, job, sal from emp, dept
where dept.deptno = emp.deptno
order by 1;

select dept.deptno, dname, loc, empno, ename, job, sal from emp, dept
where dept.deptno = emp.deptno
order by 1;

select dept.deptno, dept.dname, dept.loc,
emp.empno, emp.e
```



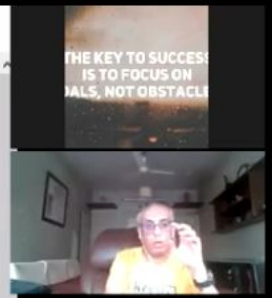
Type here to search

US 22-Jul-20

*DBT - Notepad

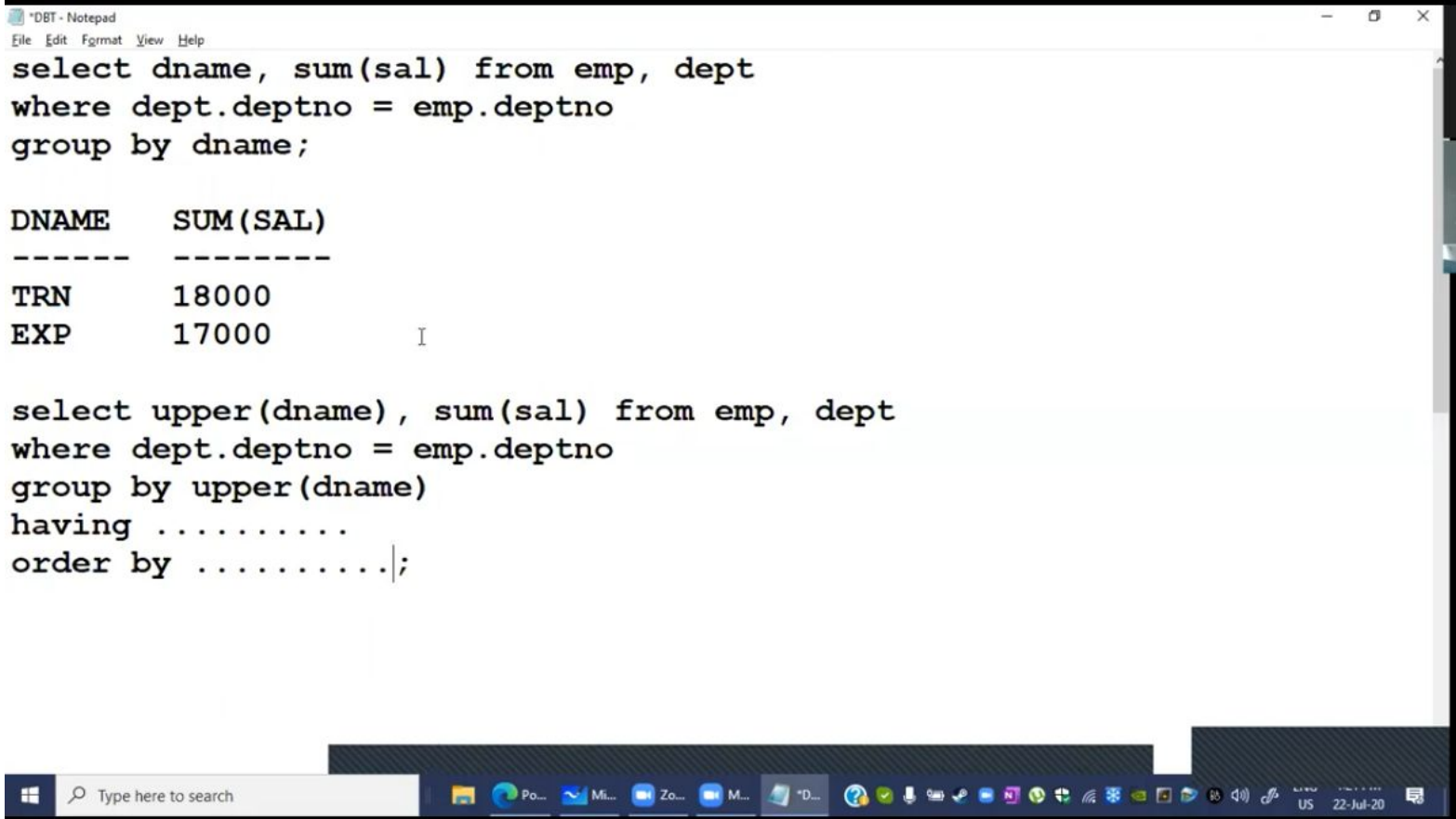
File Edit Format View Help

```
select deptno, sum(sal) from emp
group by deptno;

DEPTNO  SUM(SAL)
------  --------
1       18000
2       17000

select dname, sum(sal) from emp, dept
where dept.deptno = emp.deptno
group by dname;

DNAME   SUM(SAL)
------  --------
TRN     18000
EXP     17000
```



Type here to search

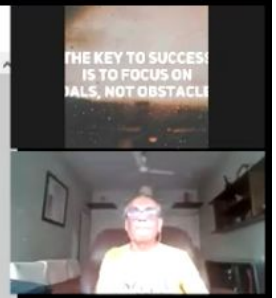
US 22-Jul-20


*DBT - Notepad
File Edit Format View Help
select dname, sum(sal) from emp, dept
where dept.deptno = emp.deptno
group by dname;
DNAME SUM(SAL)
TRN 18000
EXP 17000
select upper(dname), sum(sal) from emp, dept
where dept.deptno = emp.deptno
group by upper(dname)
having .....
order by .....;
Type here to search
22-Jul-20

*DBT - Notepad

File Edit Format View Help

```
Types of Joins:-
1. Equijoin (also known as Natural join)
*       join based on equality condition
*       shows matching rows of both the tables
*       most frequently used join (> 90%) hence it is also known as
        Natural join

select dname, ename from emp, dept
where dept.deptno = emp.deptno;

DNAME    ENAME
-----    -----
TRN      Arun
TRN      Ali
TRN      Kirun
EXP      Jack
EXP      Thomas
```



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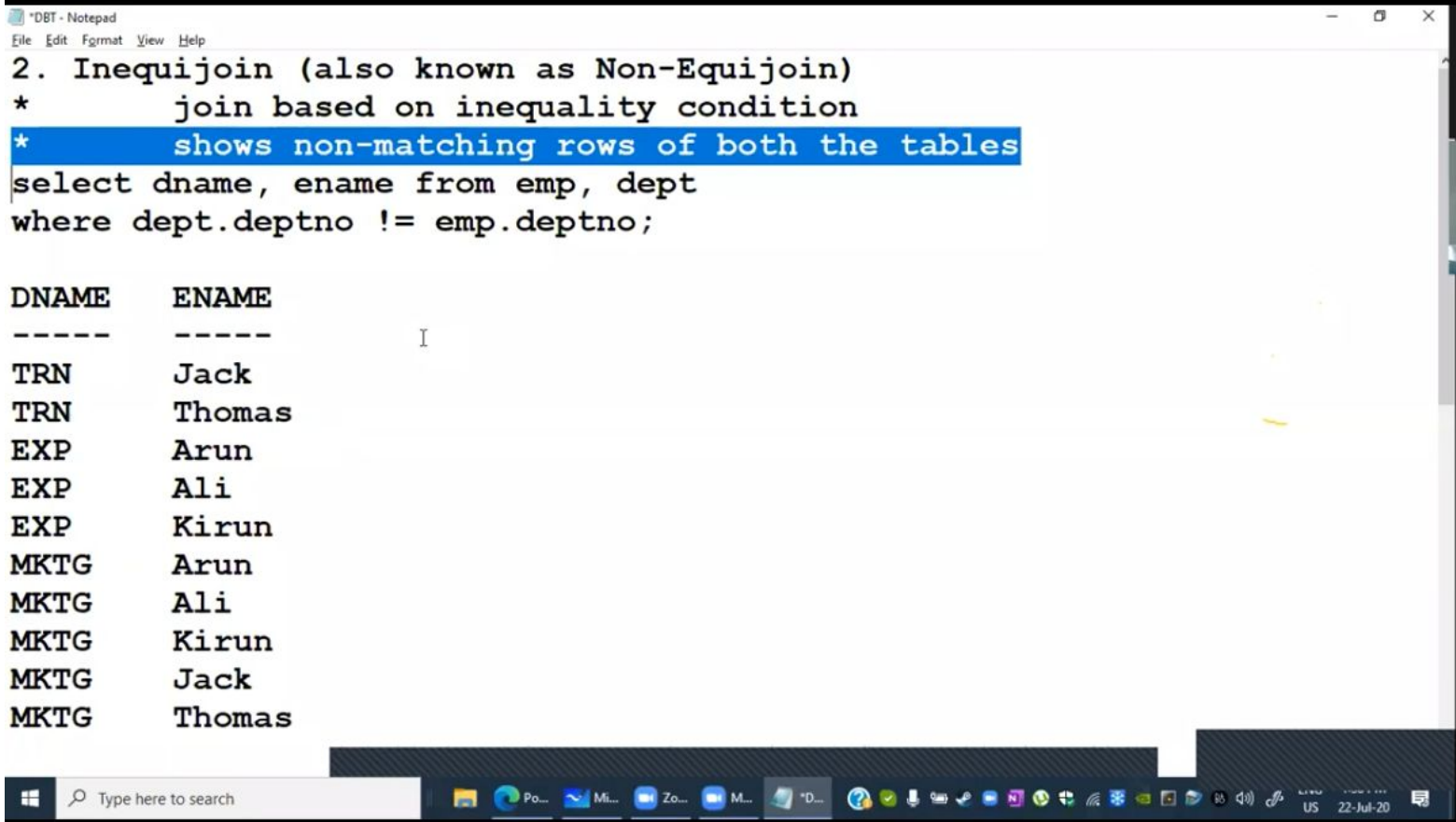
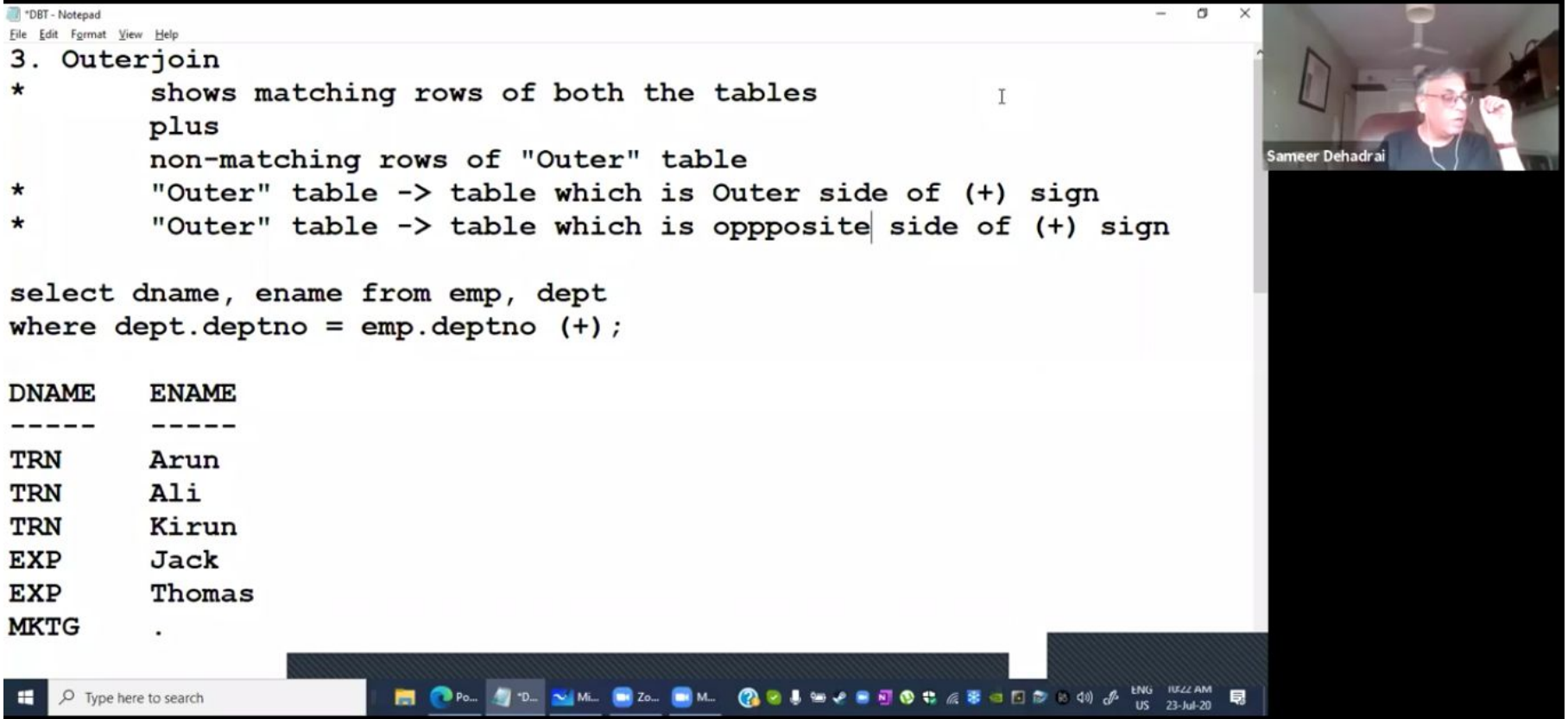
US 22-Jul-20


*DBT - Notepad
File Edit Format View Help
2. Inequijoin (also known as Non-Equijoin)
* join based on inequality condition
* shows non-matching rows of both the tables
select dname, ename from emp, dept
where dept.deptno != emp.deptno;
DNAME ENAME
----- -----
TRN Jack
TRN Thomas
EXP Arun
EXP Ali
EXP Kirun
MKTG Arun
MKTG Ali
MKTG Kirun
MKTG Jack
MKTG Thomas
Type here to search
22-Jul-20


*DBT - Notepad
File Edit Format View Help
3. Outerjoin
* shows matching rows of both the tables
plus
non-matching rows of "Outer" table
* "Outer" table -> table which is Outer side of (+) sign
* "Outer" table -> table which is oppposite side of (+) sign
select dname, ename from emp, dept
where dept.deptno = emp.deptno (+);
DNAME ENAME
----- -----
TRN Arun
TRN Ali
TRN Kirun
EXP Jack
EXP Thomas
MKTG .
Type here to search
ENG
US
23-Jul-20

Sameer Dehadrai

Microsoft Whiteboard

child table (dependent

EMP

EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

parent table

DEPT

DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal

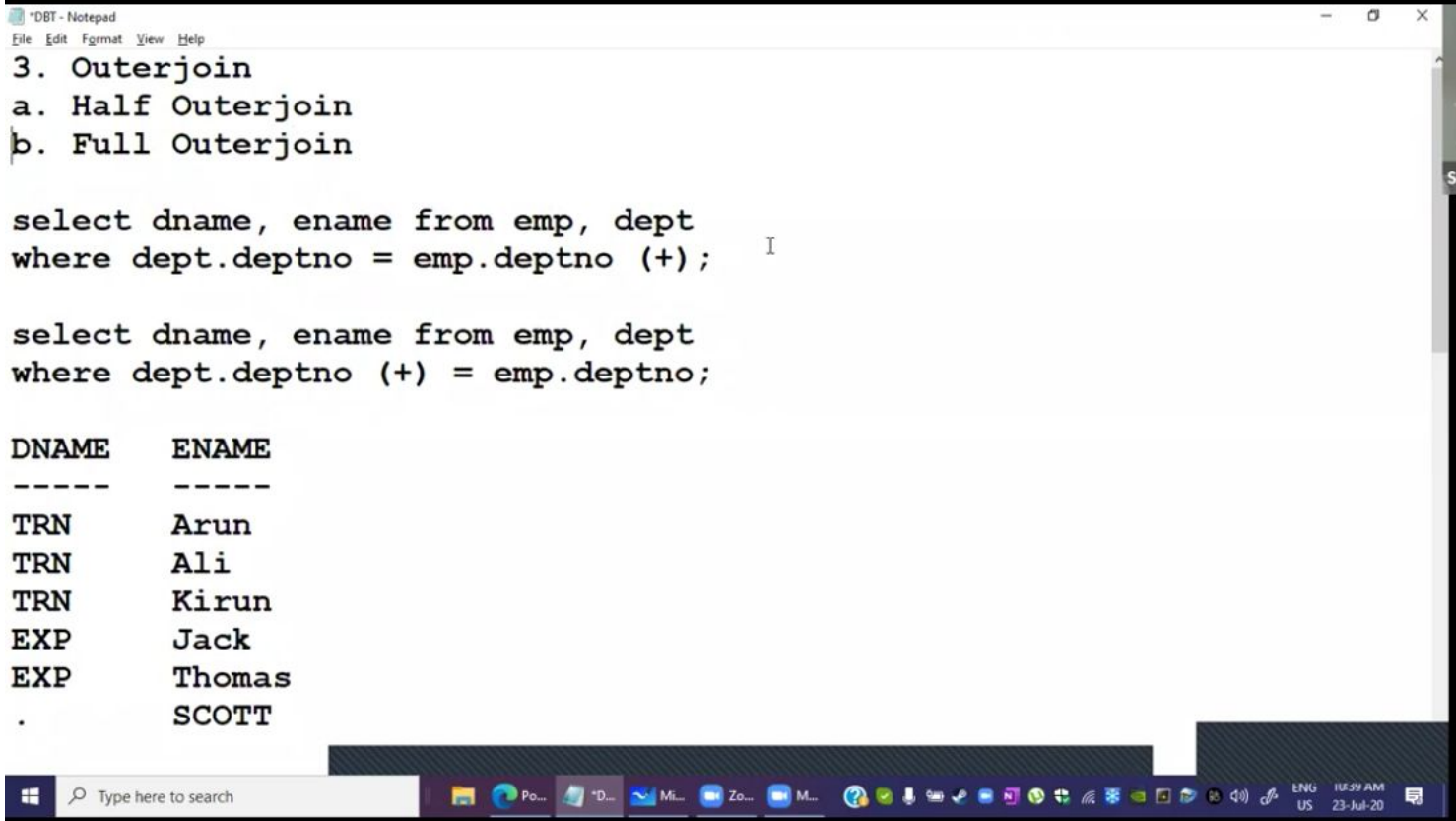
Select ___
where dept.deptno = emp.deptno(+)

Sameer Dehadrai

SD

Type here to search

ENG US 10:24 AM 23-Jul-20


*DBT - Notepad
File Edit Format View Help
3. Outerjoin
a. Half Outerjoin
b. Full Outerjoin
select dname, ename from emp, dept
where dept.deptno = emp.deptno (+);
select dname, ename from emp, dept
where dept.deptno (+) = emp.deptno;
DNAME ENAME
----- -----
TRN Arun
TRN Ali
TRN Kirun
EXP Jack
EXP Thomas
. SCOTT
Type here to search
ENG US
23-Jul-20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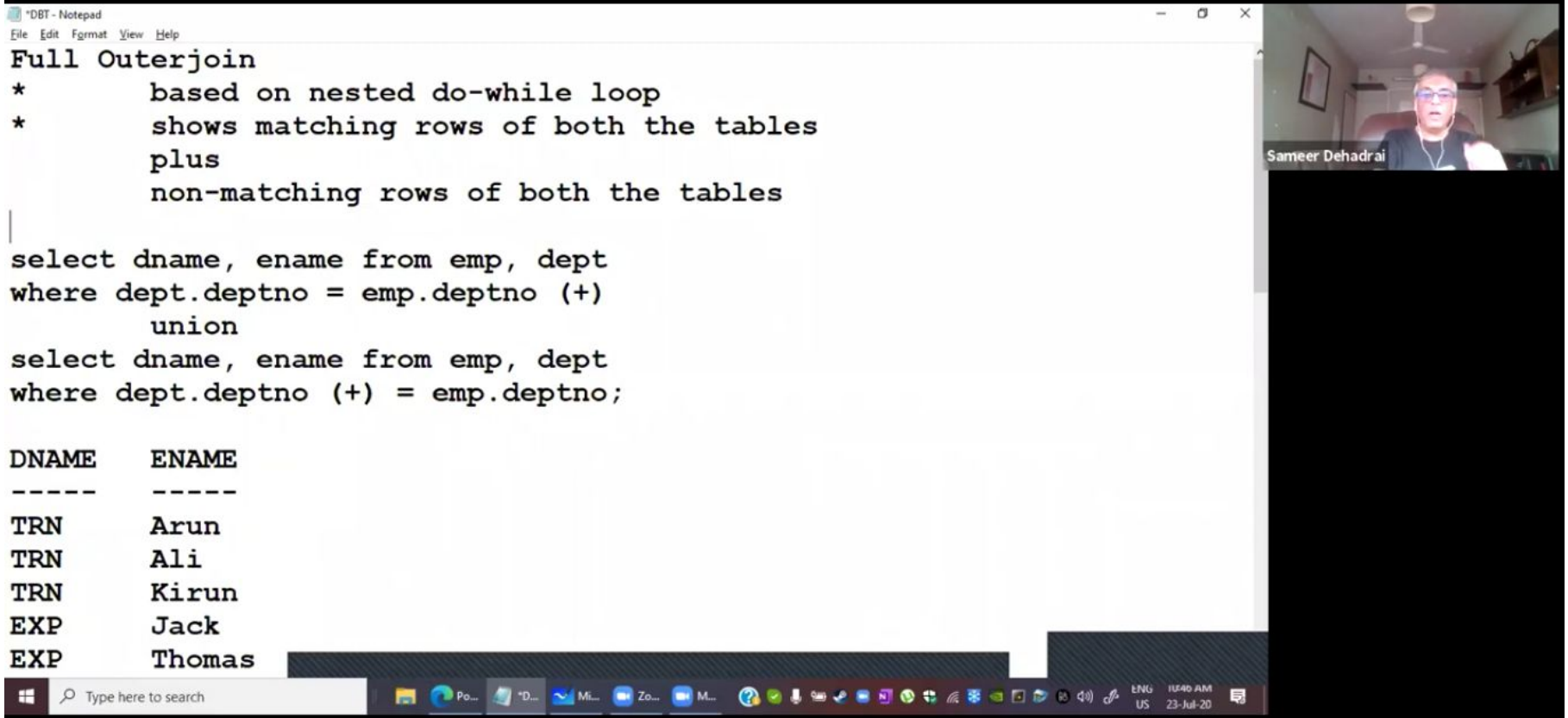
*DBT - Notepad
File Edit Format View Help
Full Outerjoin
* based on nested do-while loop
* shows matching rows of both the tables
plus
non-matching rows of both the tables
select dname, ename from emp, dept
where dept.deptno = emp.deptno (+)
union
select dname, ename from emp, dept
where dept.deptno (+) = emp.deptno;
DNAME ENAME
----- -----
TRN Arun
TRN Ali
TRN Kirun
EXP Jack
EXP Thomas
Type here to search
ENG US
10:46 AM 23-Jul-20

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*DBT - Notepad
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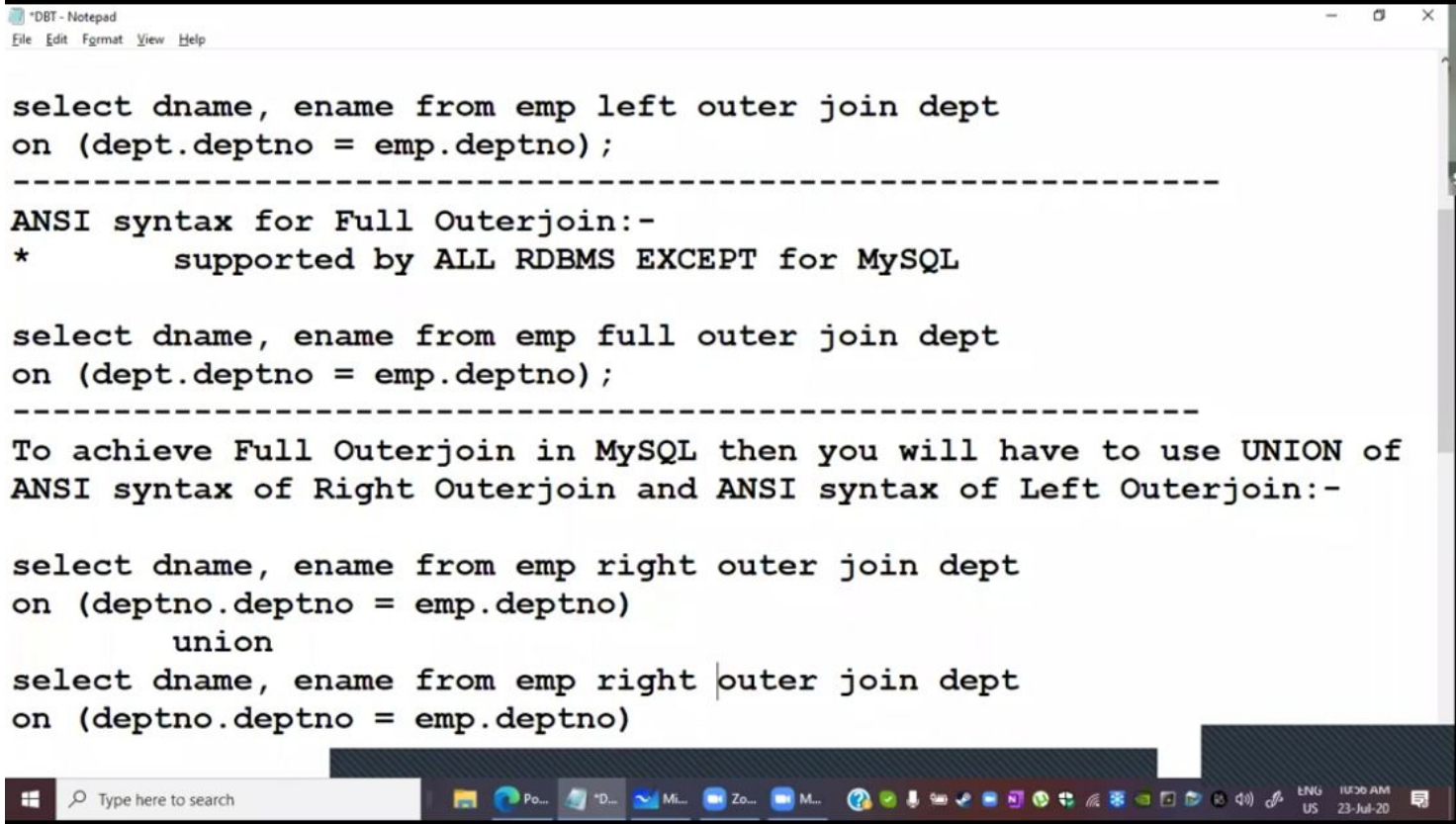
```
ANSI syntax for Full Outerjoin:-

select dname, ename from emp full outer join dept
on (dept.deptno = emp.deptno);
-------------------------------------------------------
ANSI syntax for Right Outerjoin:-

select dname, ename from emp right outer join dept
on (dept.deptno = emp.deptno);
-------------------------------------------------------
ANSI syntax for Left Outerjoin:-

select dname, ename from emp left outer join dept
on (dept.deptno = emp.deptno);
```

Type here to search

ENG US 10:20 AM 23-Jul-20


*DBT - Notepad
File Edit Format View Help
select dname, ename from emp left outer join dept
on (dept.deptno = emp.deptno);

ANSI syntax for Full Outerjoin:-
* supported by ALL RDBMS EXCEPT for MySQL
select dname, ename from emp full outer join dept
on (dept.deptno = emp.deptno);

To achieve Full Outerjoin in MySQL then you will have to use UNION of
ANSI syntax of Right Outerjoin and ANSI syntax of Left Outerjoin:-
select dname, ename from emp right outer join dept
on (deptno.deptno = emp.deptno)
union
select dname, ename from emp right outer join dept
on (deptno.deptno = emp.deptno)
Type here to search
ENG
US
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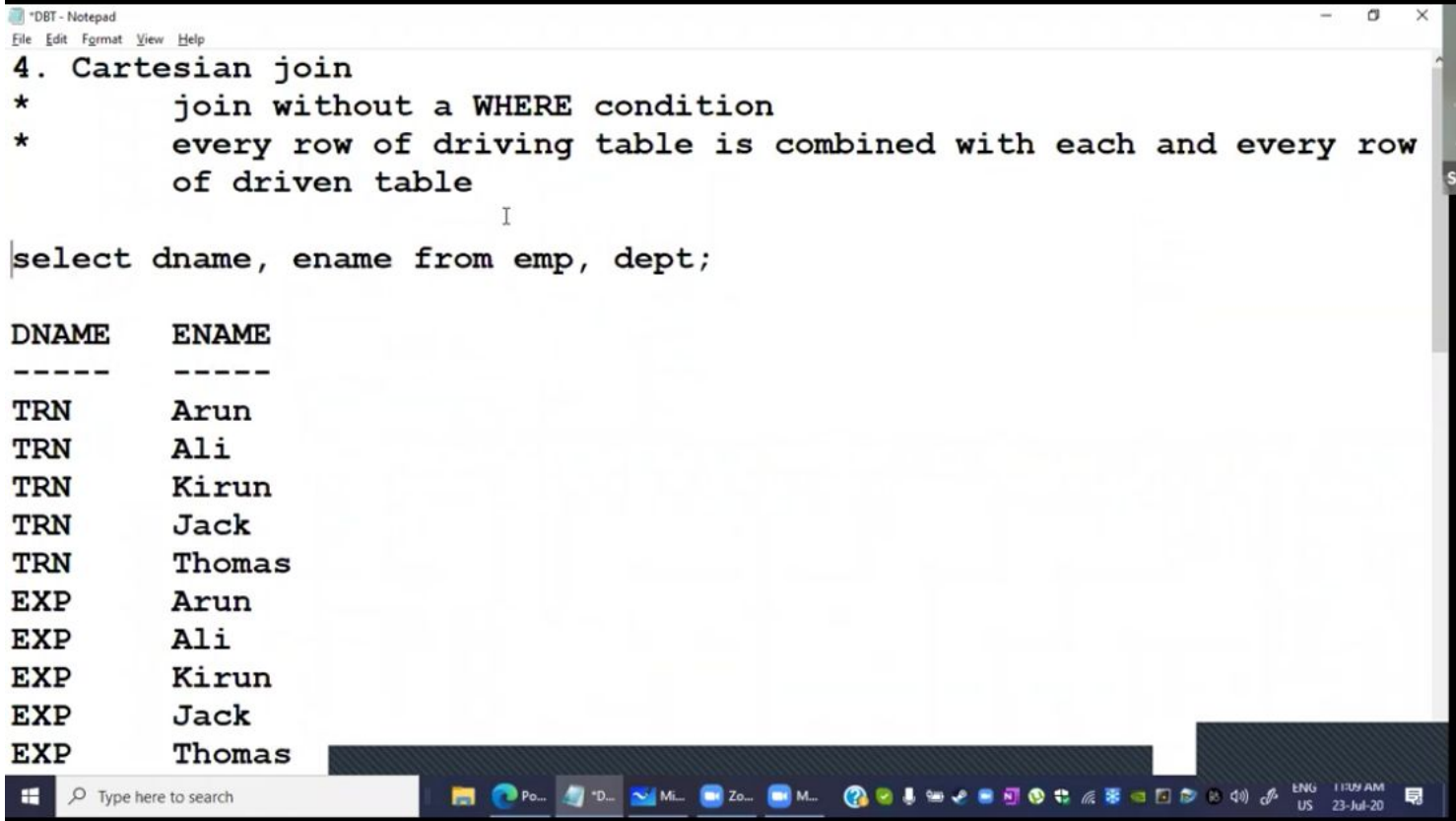
*DBT - Notepad
File Edit Format View Help
4. Cartesian join
* join without a WHERE condition
* every row of driving table is combined with each and every row of driven table
select dname, ename from emp, dept;
DNAME ENAME
----- -----
TRN Arun
TRN Ali
TRN Kirun
TRN Jack
TRN Thomas
EXP Arun
EXP Ali
EXP Kirun
EXP Jack
EXP Thomas
Type here to search
ENG US
11:09 AM
23-Jul-20


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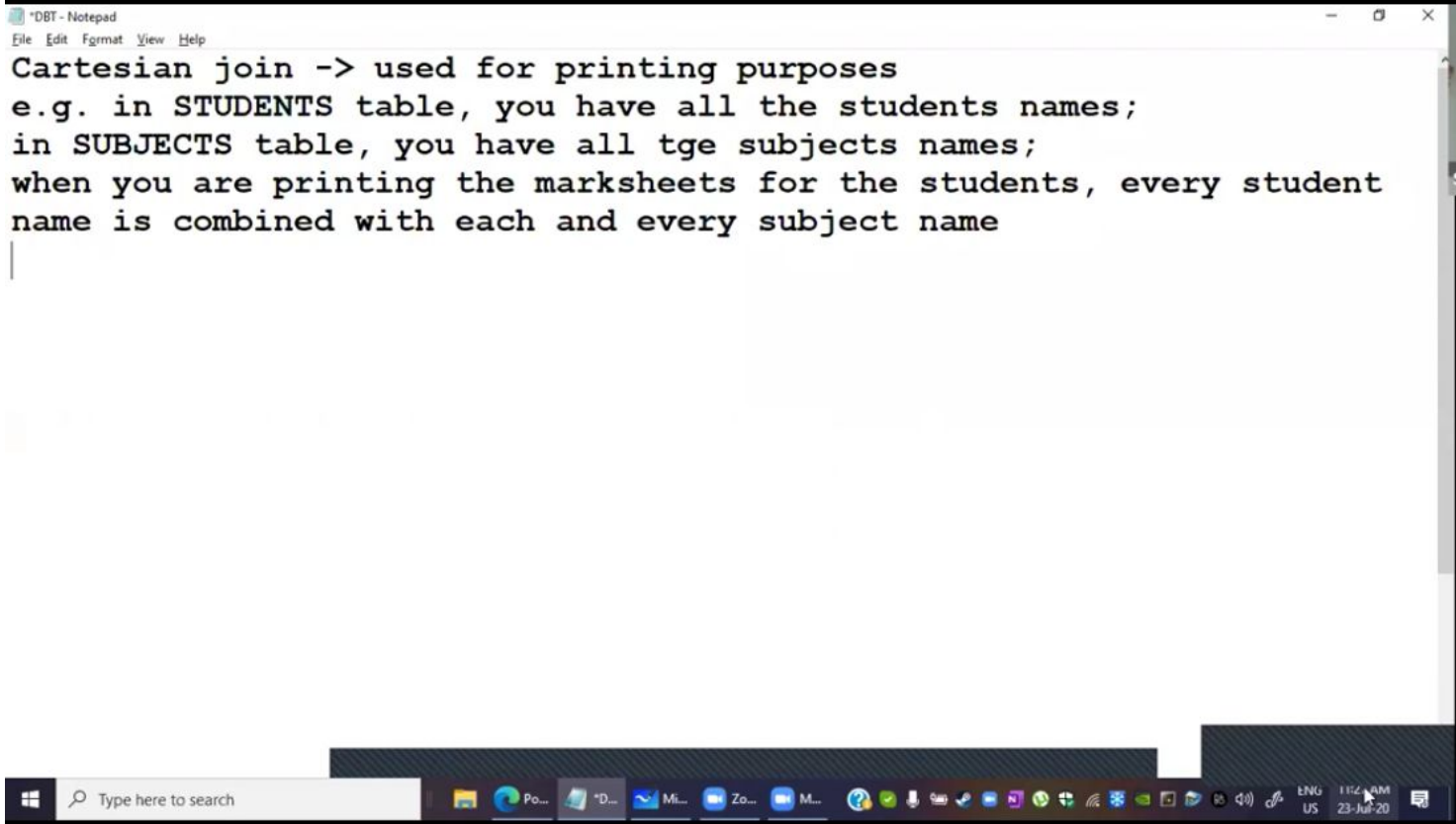
```
4. Cartesian join (also known as a Cross join)
*       join without a WHERE condition
*       every row of driving table is combined with each and every row
        of driven table

select dname, ename from emp, dept;      <- FAST (lesser I/O between
                                            server HD and server RAM)

select dname, ename from dept, emp;      <- SLOW (more I/O between
                                            server HD and server RAM)

DNAME    ENAME
-----    -----
TRN      Arun
TRN      Ali
TRN      Kirun
TRN      Jack
TRN      Thomas
EXP      Arun
```

Type here to search

ENG US 11:18 AM 23-Jul-20


*DBT - Notepad
File Edit Format View Help
Cartesian join -> used for printing purposes
e.g. in STUDENTS table, you have all the students names;
in SUBJECTS table, you have all tge subjects names;
when you are printing the marksheets for the students, every student
name is combined with each and every subject name
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```
5. Self join
*       joining a table to itself
*       used when parent-column and child-column; both are present in
        the same table
*       Self-join is the slowest join

select a.ename, b.ename from emp b, emp a
where a.mgr = b.empno;

A.ENAME         B.ENAME
-------         -------
Arun            Jack
Ali             Arun
Kirun           Arun
Thomas          Jack
```

Type here to search

ENG US 11:49 AM 23-Jul-20

database day8.mp4 - VLC media player

Media Playback Audio Video Subtitle Tools View Help

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File Edit Format View Help

5. Self join
* joining a table to itself
* used when parent-column and child-column; both are present in the same table
* Self-join is the slowest join

Which is the Fastest Join?
Cartesian join is the fastest join; there is no WHERE clause involved, hence there is no searching involved

Type here to search

ENG US 11:56 AM 23-Jul-20

1:55:05 3:40:08

120%

Microsoft Whiteboard

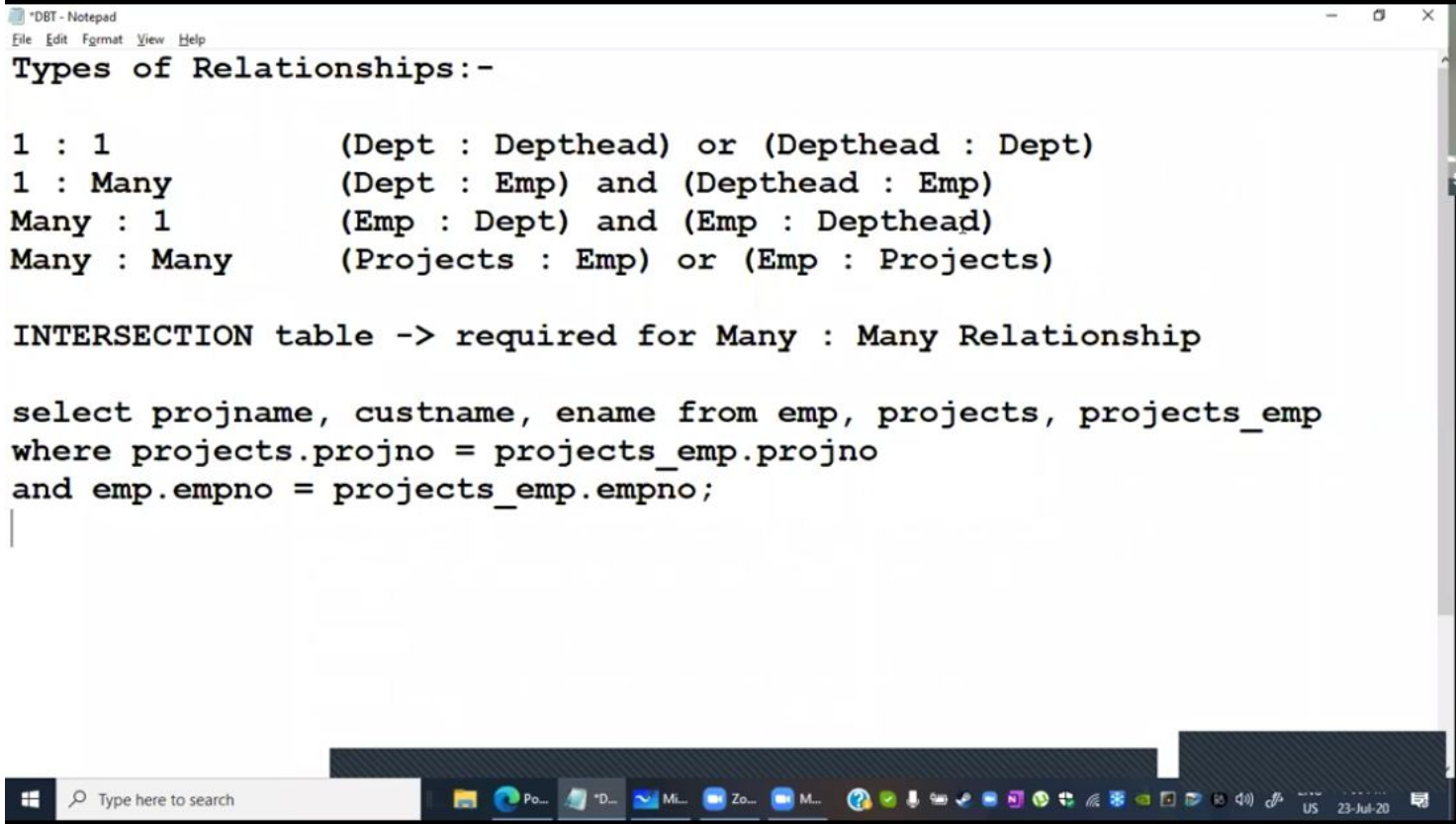
		EMP			
EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

	DEPT	
DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal

	DEPTHEAD
DEPTNO	DHEAD
1	Arun
2	Jack

Type here to search

US 23-Jul-20


*DBT - Notepad
File Edit Format View Help
Types of Relationships:-
1 : 1 (Dept : Depthead) or (Depthead : Dept)
1 : Many (Dept : Emp) and (Depthead : Emp)
Many : 1 (Emp : Dept) and (Emp : Depthead)
Many : Many (Projects : Emp) or (Emp : Projects)
INTERSECTION table -> required for Many : Many Relationship
select projname, custname, ename from emp, projects, projects_emp
where projects.projno = projects_emp.projno
and emp.empno = projects_emp.empno;
Type here to search
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EMP

EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

PROJECTS

PROJNO	PROJNAME	CUSTNAME
P1	CGS	Deloitte
P2	PPS	ICICI Bank
P3	AMS	MS
P4	Web Dev	AMFI
P5	Macros	BNP Paribas

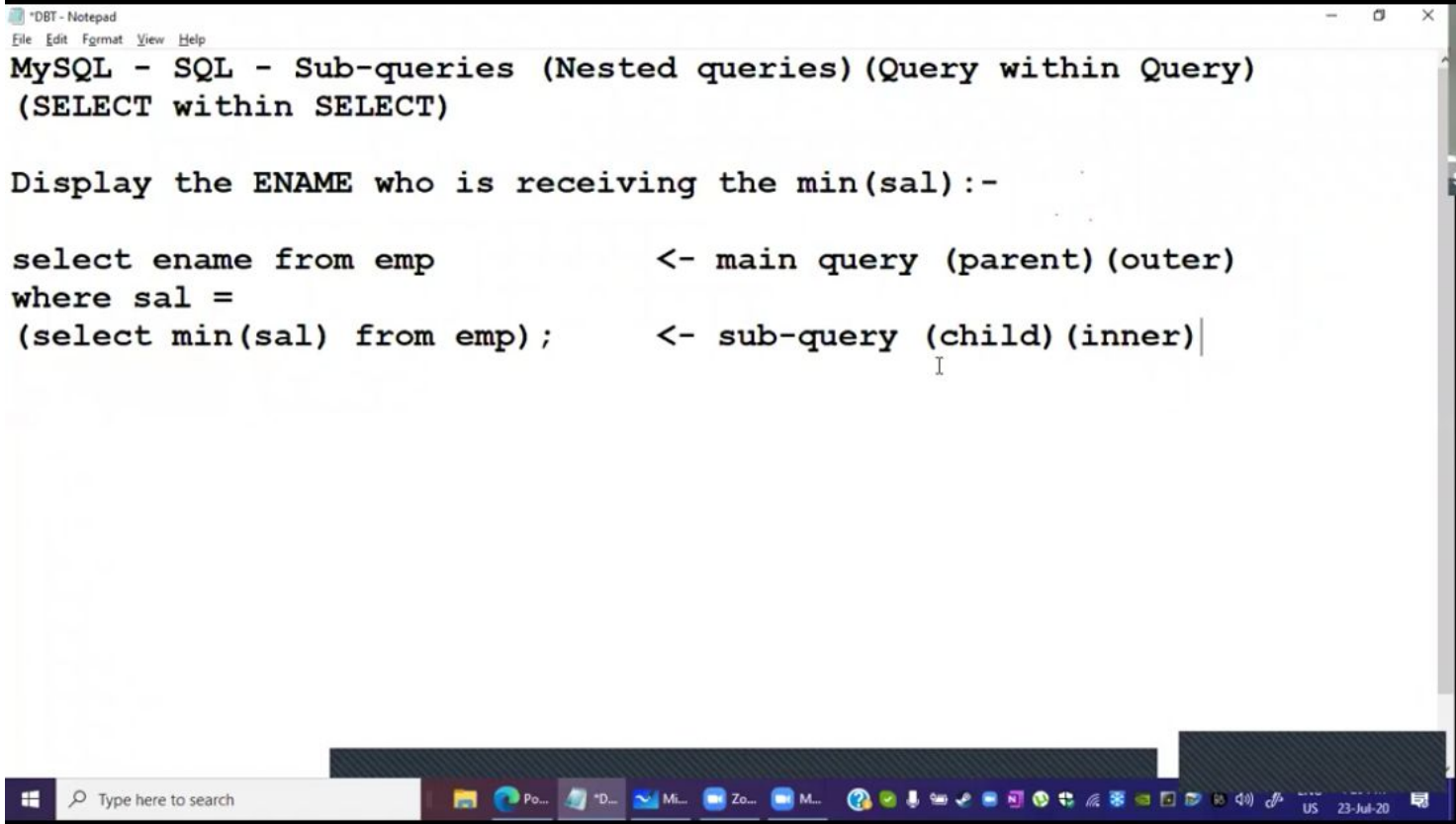
INTERSECTION TABLE

PROJECTS_EMP

PROJNO	EMPNO
P1	1
P1	2
P1	4
P2	2
P2	5
P3	1
P3	4
P3	5

Type here to search

US 23-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - Sub-queries (Nested queries)(Query within Query)
(SELECT within SELECT)
Display the ENAME who is receiving the min(sal):-
select ename from emp <- main query (parent)(outer)
where sal =
(select min(sal) from emp); <- sub-query (child)(inner)
Type here to search
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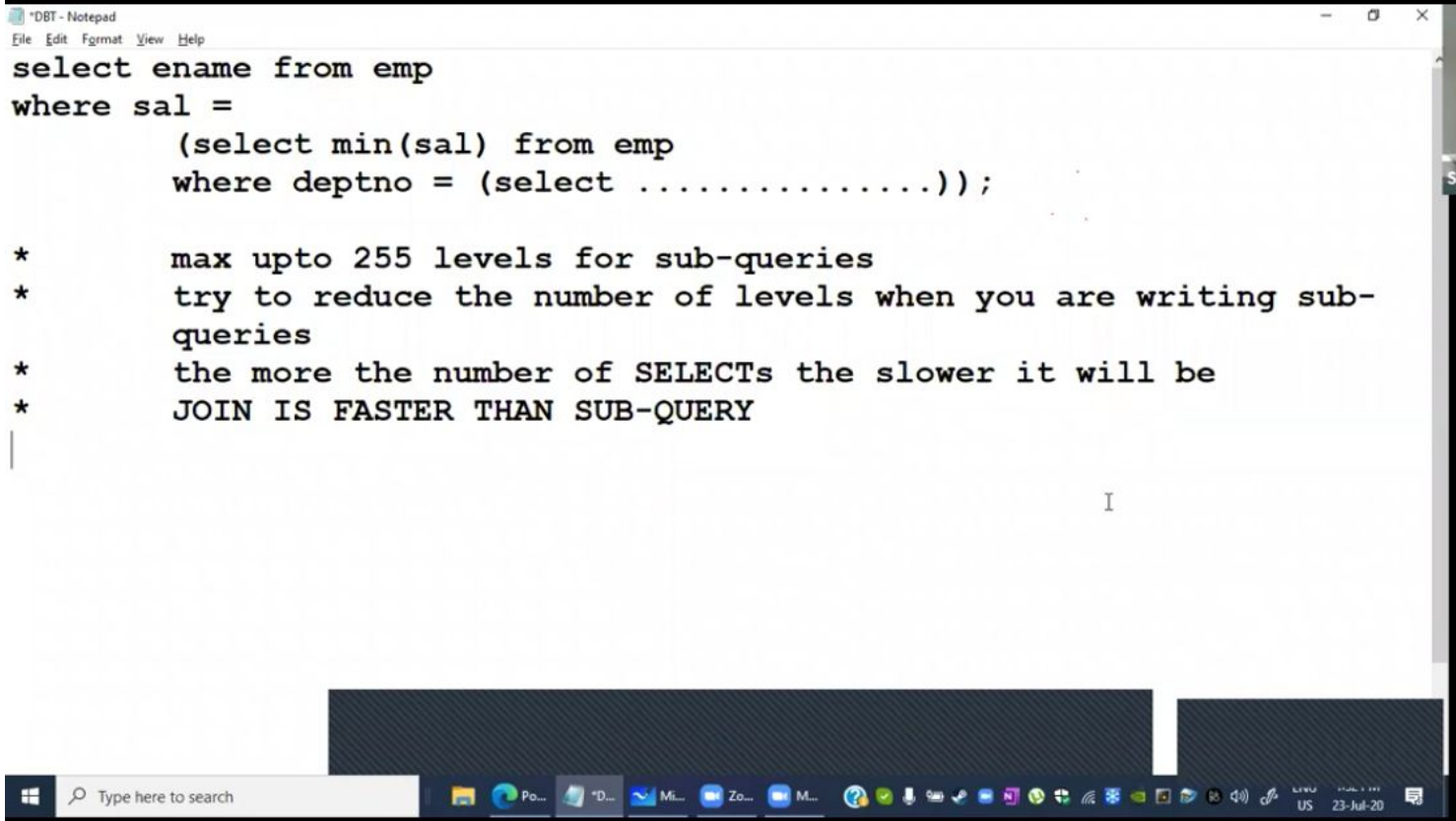
*DBT - Notepad
File Edit Format View Help
select ename from emp
where sal =
(select min(sal) from emp
where deptno = (select ....));
* max upto 255 levels for sub-queries
* try to reduce the number of levels when you are writing sub-queries
* the more the number of SELECTs the slower it will be
* JOIN IS FASTER THAN SUB-QUERY
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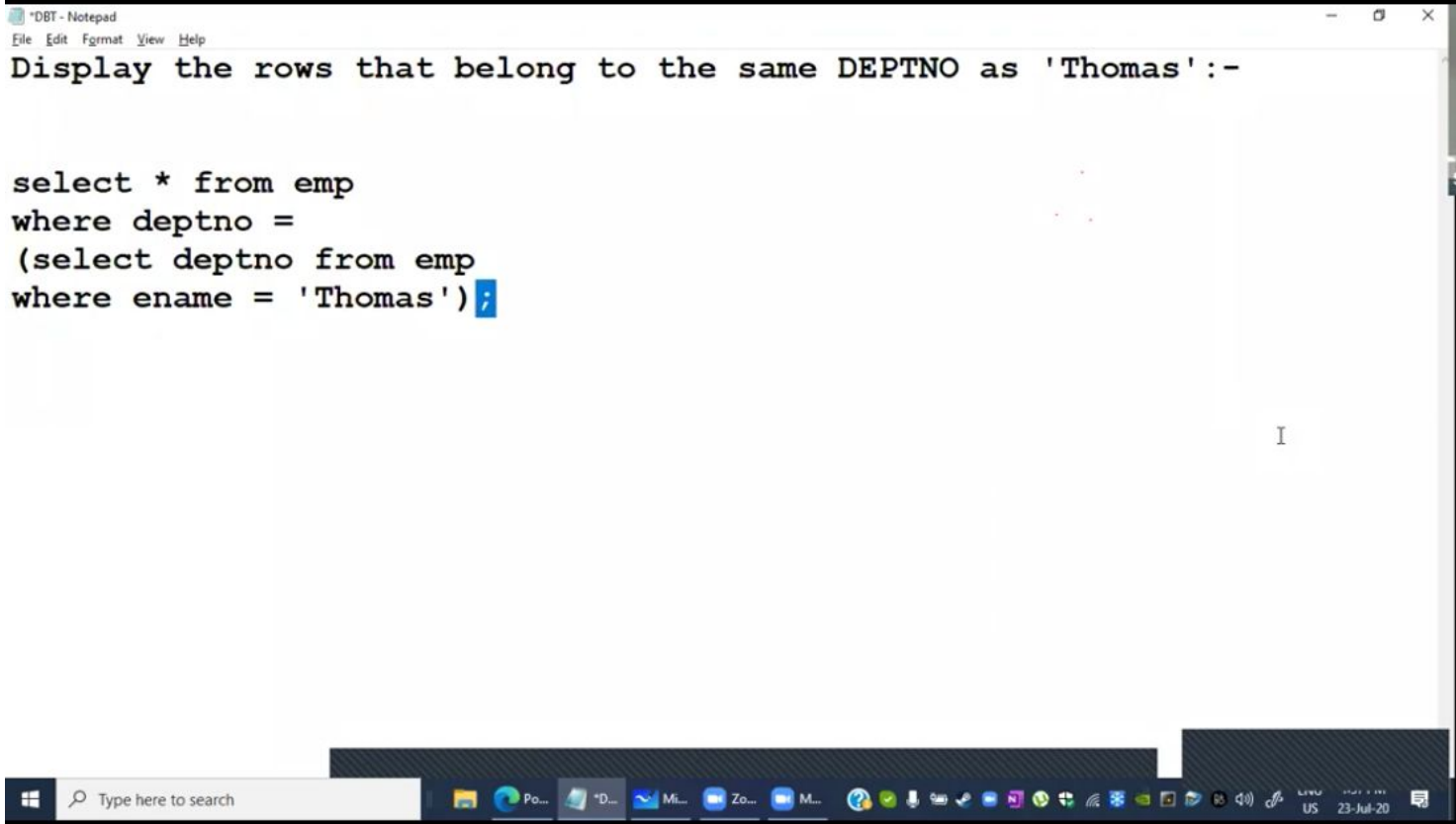
*DBT - Notepad
File Edit Format View Help
Display the rows that belong to the same DEPTNO as 'Thomas':-
select * from emp
where deptno =
(select deptno from emp
where ename = 'Thomas');
Type here to search
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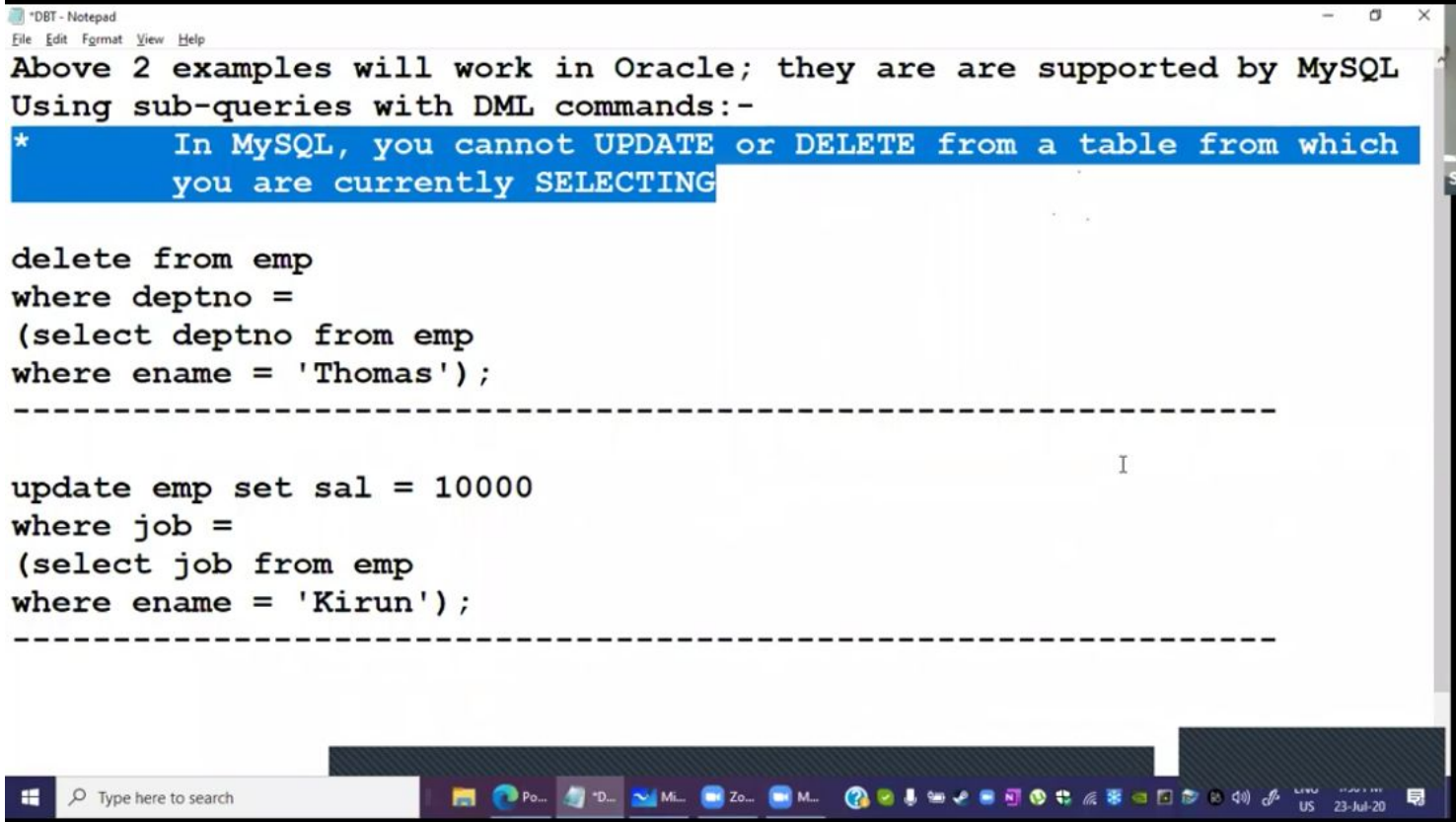
*DBT - Notepad
File Edit Format View Help
Above 2 examples will work in Oracle; they are are supported by MySQL
Using sub-queries with DML commands:-
* In MySQL, you cannot UPDATE or DELETE from a table from which you are currently SELECTING
delete from emp
where deptno =
(select deptno from emp
where ename = 'Thomas');
update emp set sal = 10000
where job =
(select job from emp
where ename = 'Kirun');
Type here to search
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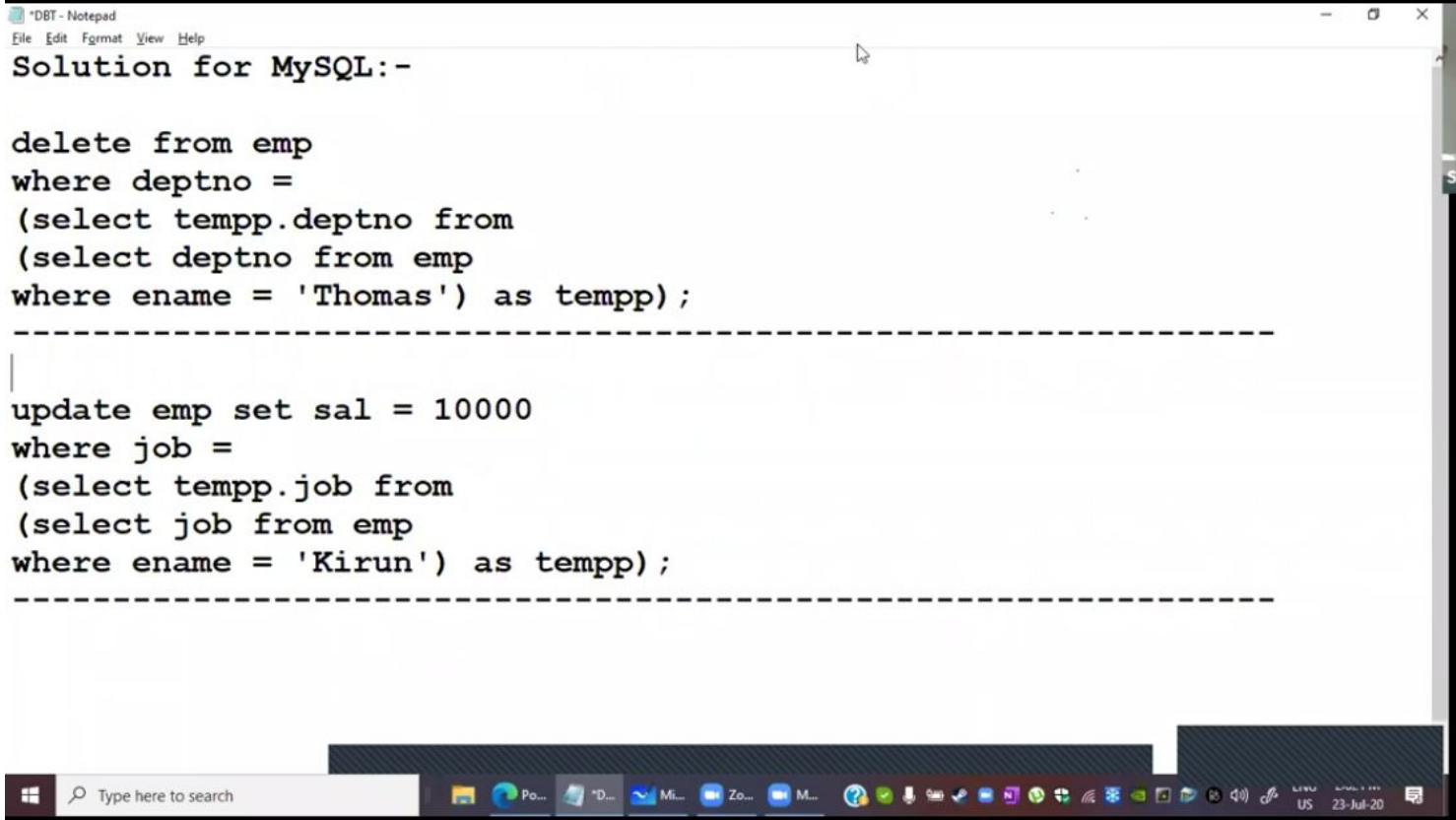
*DBT - Notepad
File Edit Format View Help
Solution for MySQL:-
delete from emp
where deptno =
(select tempp.deptno from
(select deptno from emp
where ename = 'Thomas') as tempp);
update emp set sal = 10000
where job =
(select tempp.job from
(select job from emp
where ename = 'Kirun') as tempp);
Type here to search
US
23-Jul-20


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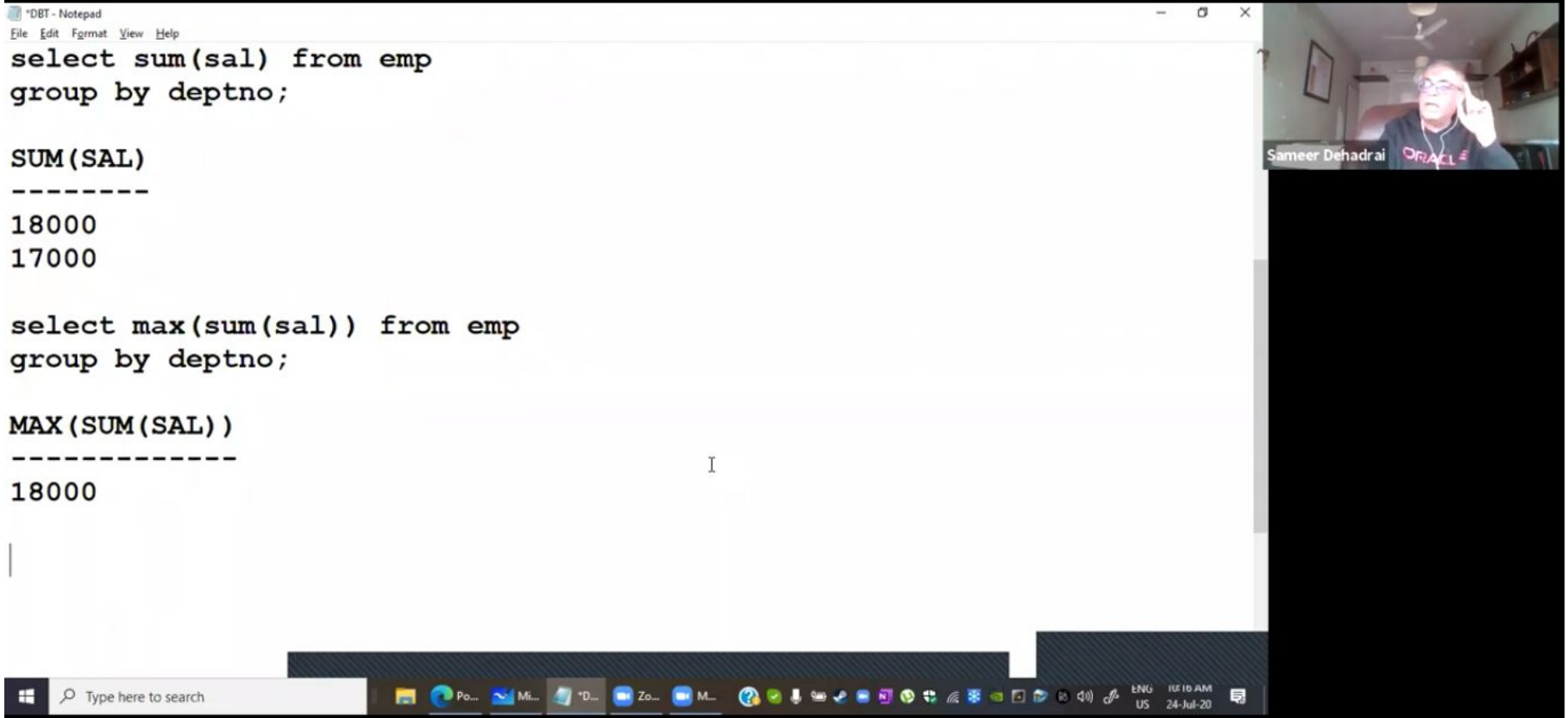
*DBT - Notepad
File Edit Format View Help
select sum(sal) from emp
group by deptno;
SUM(SAL)

18000
17000
select max(sum(sal)) from emp
group by deptno;
MAX(SUM(SAL))

18000
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Type here to search
ENG
US
24-Jul-20

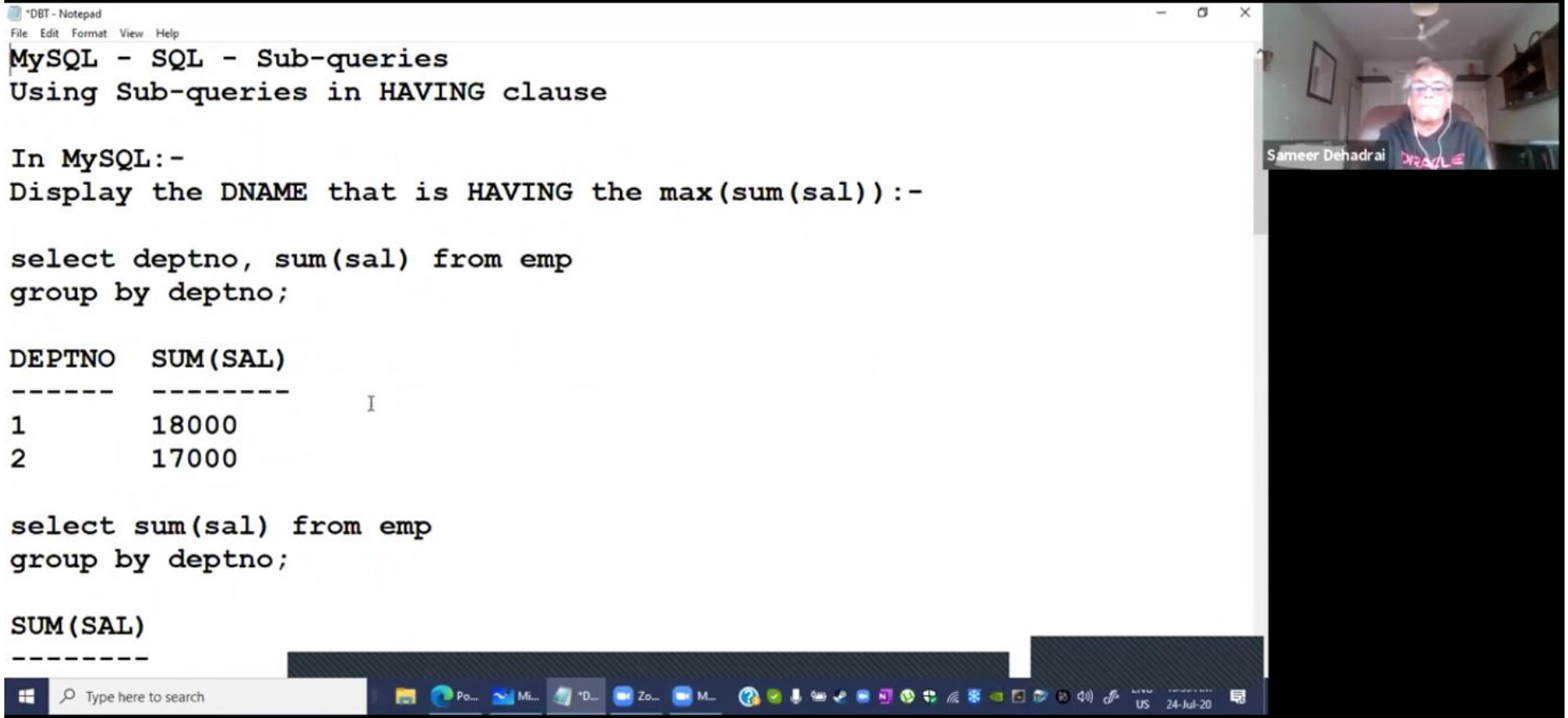
*DBT - Notepad

File Edit Format View Help

```
having sum(sal) =
(select max(sum(sal)) from emp
group by deptno);

DEPTNO   SUM(SAL)
------   --------
1        18000

select dname, sum(sal) from emp, dept
where dept.deptno = emp.deptno
group by dname
having sum(sal) =
(select max(sum(sal)) from emp
group by deptno);

DNAME    SUM(SAL)
------   --------
TRN      18000
```

Type here to search

ENG US 10:19 AM 24-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - Sub-queries
Using Sub-queries in HAVING clause
In MySQL:-
Display the DNAME that is HAVING the max(sum(sal)):-
select deptno, sum(sal) from emp
group by deptno;
DEPTNO SUM(SAL)
------ --------
1 18000
2 17000
select sum(sal) from emp
group by deptno;
SUM(SAL)

Type here to search
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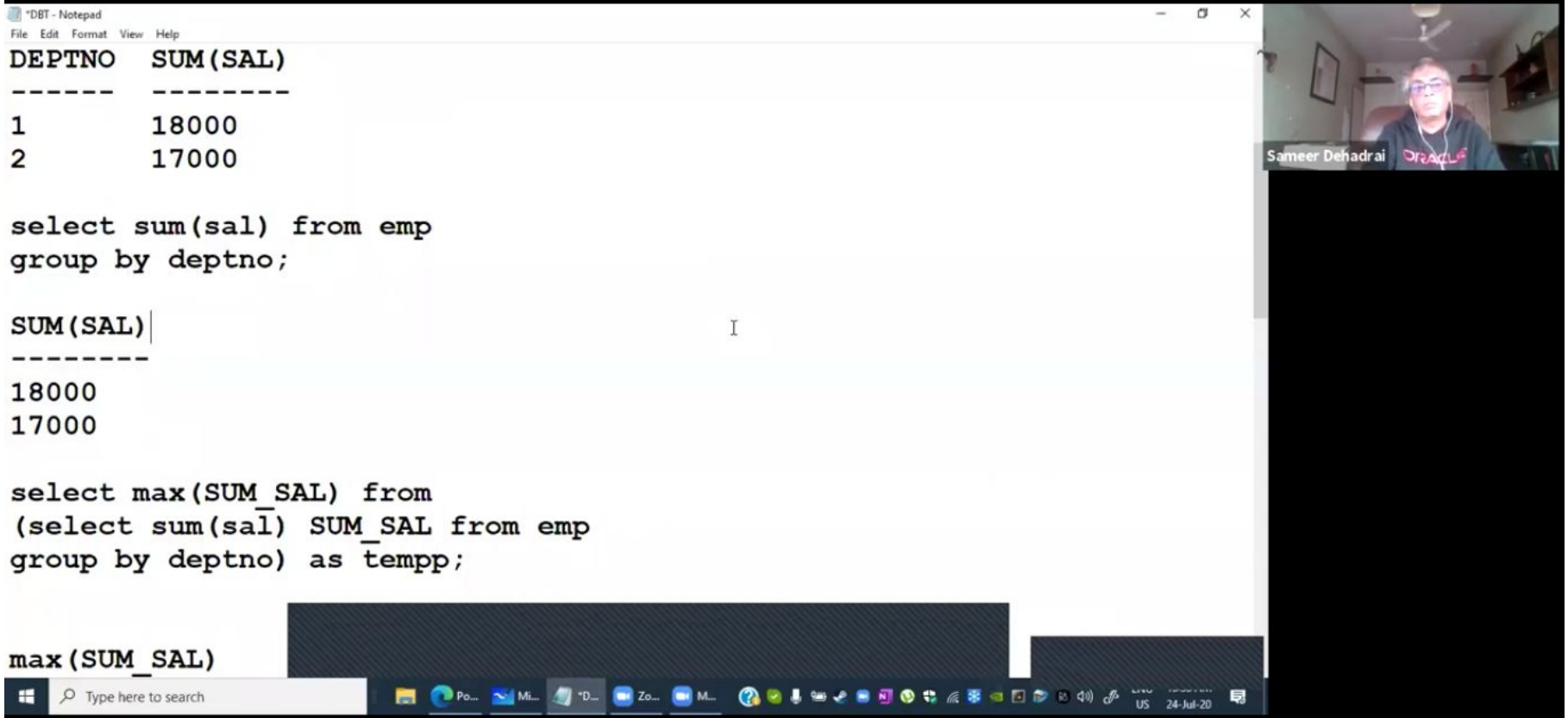
*DBT - Notepad
File Edit Format View Help
DEPTNO SUM(SAL)
1 18000
2 17000
select sum(sal) from emp
group by deptno;
SUM(SAL)
18000
17000
select max(SUM_SAL) from
(select sum(sal) SUM_SAL from emp
group by deptno) as tempp;
max(SUM_SAL)
Type here to search
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SD

EMP

EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

DEPT

DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal

Type here to search

US 24-Jul-20

*DBT - Notepad

File Edit Format View Help

```
(Sub-query returns multiple rows)

select * from emp
where sal <=any          (8000,9000)
(select sal from emp
where job = 'M');


select * from emp
where sal not in         (8000,9000)
(select sal from emp
where job = 'M');
-----------------------------------------------------

*       IN is faster than ANY
*       ANY is more powerful than IN operator
*       with IN operator, we can only check for IN, or NOT IN
*       with ANY operator, we can check for =ANY, !=ANY, >ANY,
        >=ANY,
```

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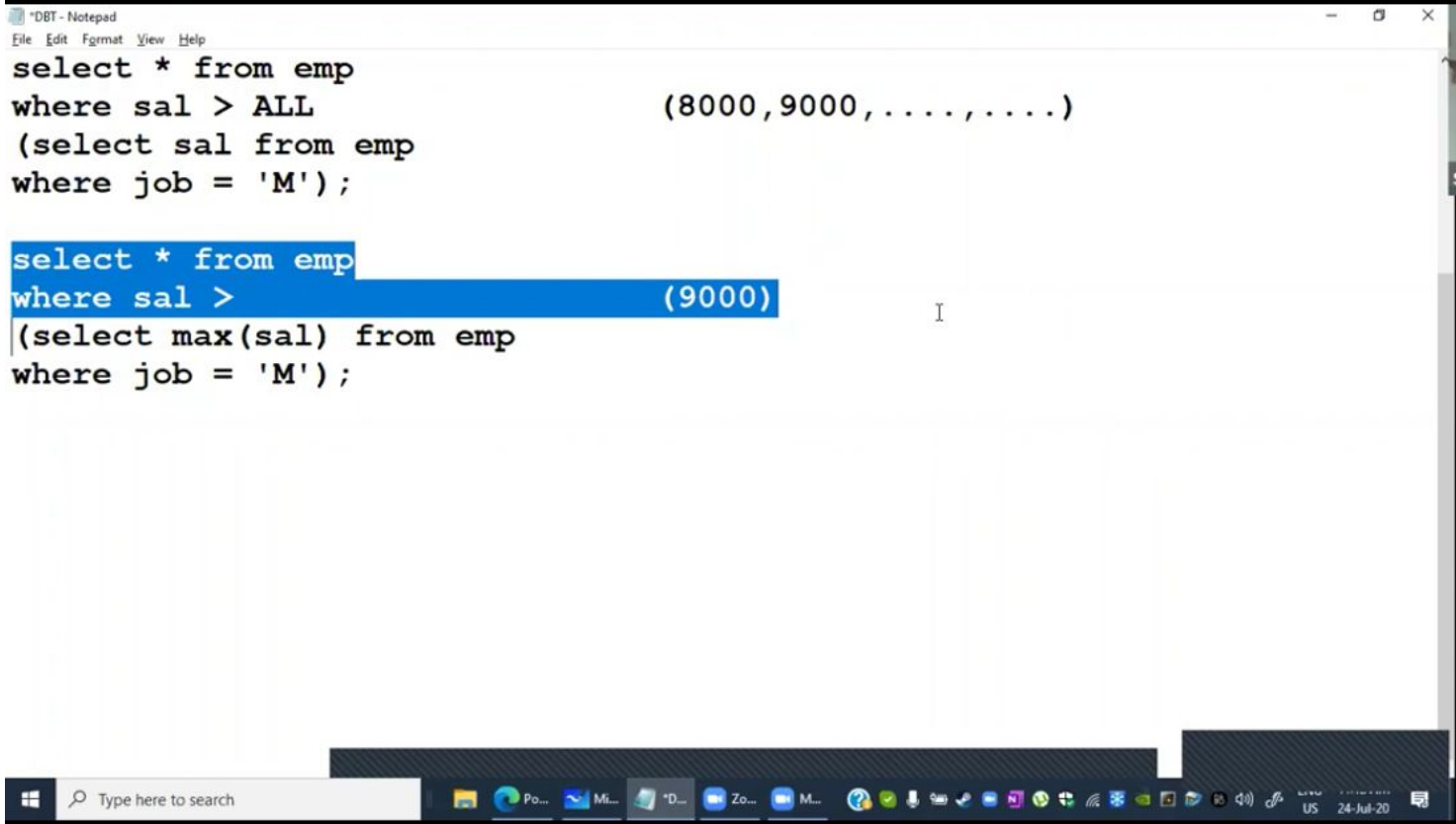
*DBT - Notepad
File Edit Format View Help
select * from emp
where sal > ALL (8000,9000,....,....)
(select sal from emp
where job = 'M');
select * from emp
where sal > (9000)
(select max(sal) from emp
where job = 'M');
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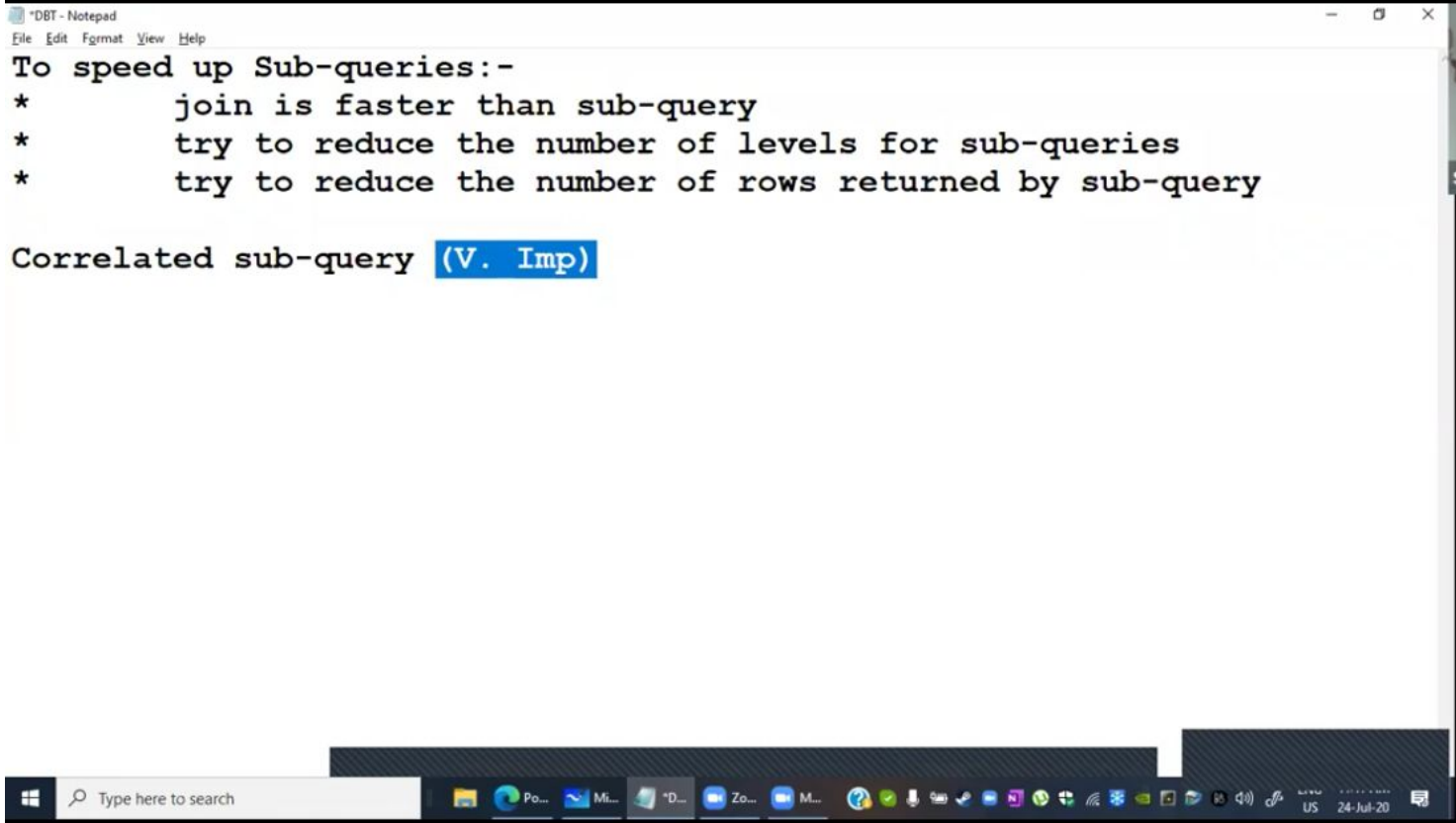
*DBT - Notepad
File Edit Format View Help
To speed up Sub-queries:-
* join is faster than sub-query
* try to reduce the number of levels for sub-queries
* try to reduce the number of rows returned by sub-query
Correlated sub-query (V. Imp)
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Co-related subquery

Display names of dept which donot have employes and which have employees

Microsoft Whiteboard

SD

EMP

EMPNO	ENAME	SAL	DEPTNO	JOB	MGR
1	Arun	8000	1	M	4
2	Ali	7000	1	C	1
3	Kirun	3000	1	C	1
4	Jack	9000	2	M	.
5	Thomas	8000	2	C	4

DEPT

DEPTNO	DNAME	LOC
1	TRN	Bby
2	EXP	Dlh
3	MKTG	Cal

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```
select distinct deptno from emp;

1
2

select dname from dept
where deptno =any                          (1,2)
(select distinct deptno from emp);

TRN
EXP

select dname from dept
where deptno in                      (1,2)
(select distinct deptno from emp);

TRN
EXP
```

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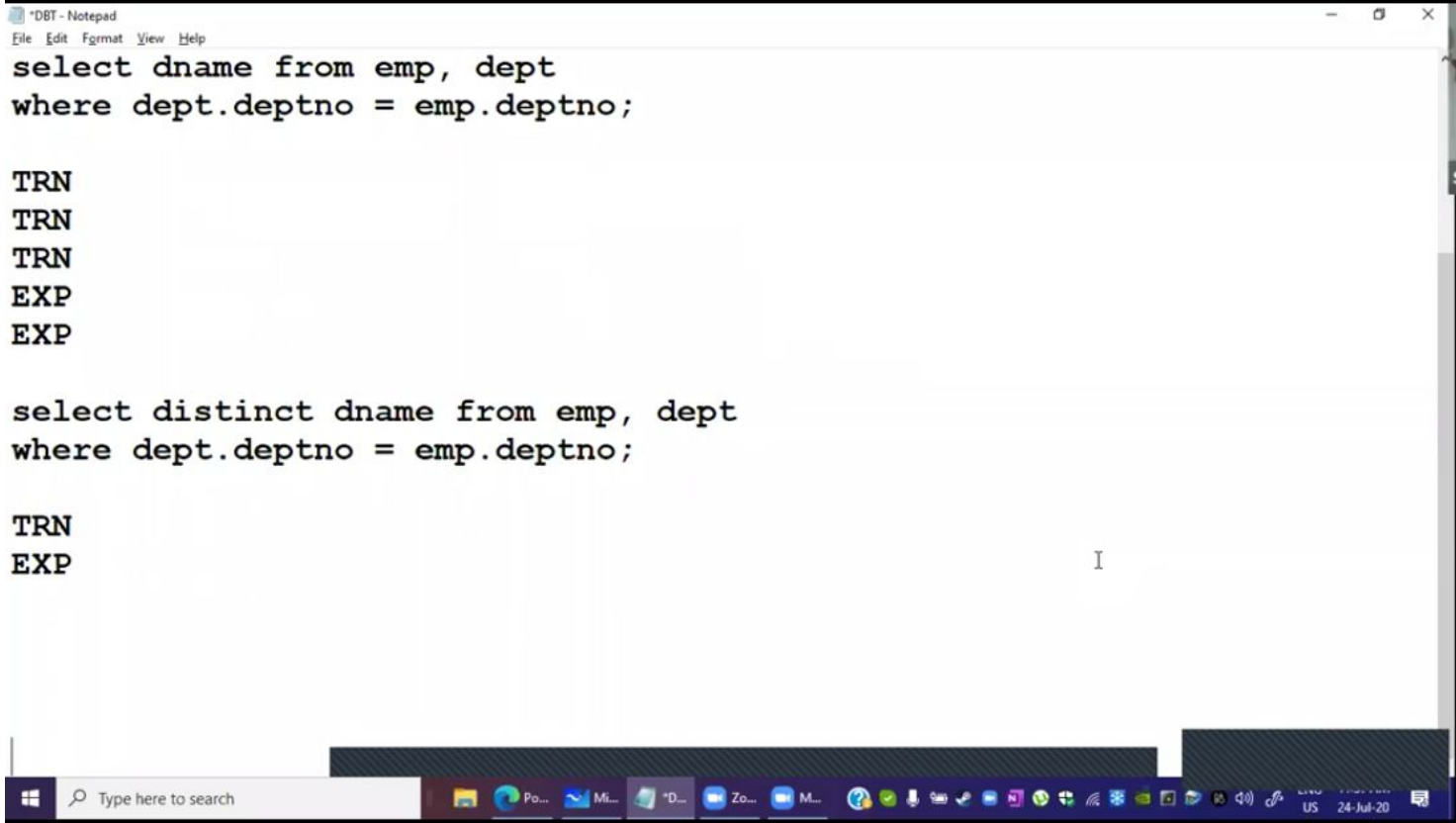
*DBT - Notepad
File Edit Format View Help
select dname from emp, dept
where dept.deptno = emp.deptno;
TRN
TRN
TRN
EXP
EXP
select distinct dname from emp, dept
where dept.deptno = emp.deptno;
TRN
EXP
Type here to search
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*DBT - Notepad

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```
select DISTINCT dname from emp, dept
where dept.deptno = emp.deptno;

TRN
EXP
-----------------------------------------------------------

select dname from dept where exists
        -> TRUE/FALSE
(select deptno from emp
where dept.deptno = emp.deptno);

TRN
EXP

*       first the main query is executed
*       for every row returned by main query, it will run the sub-
        query once
*       the sub-
```

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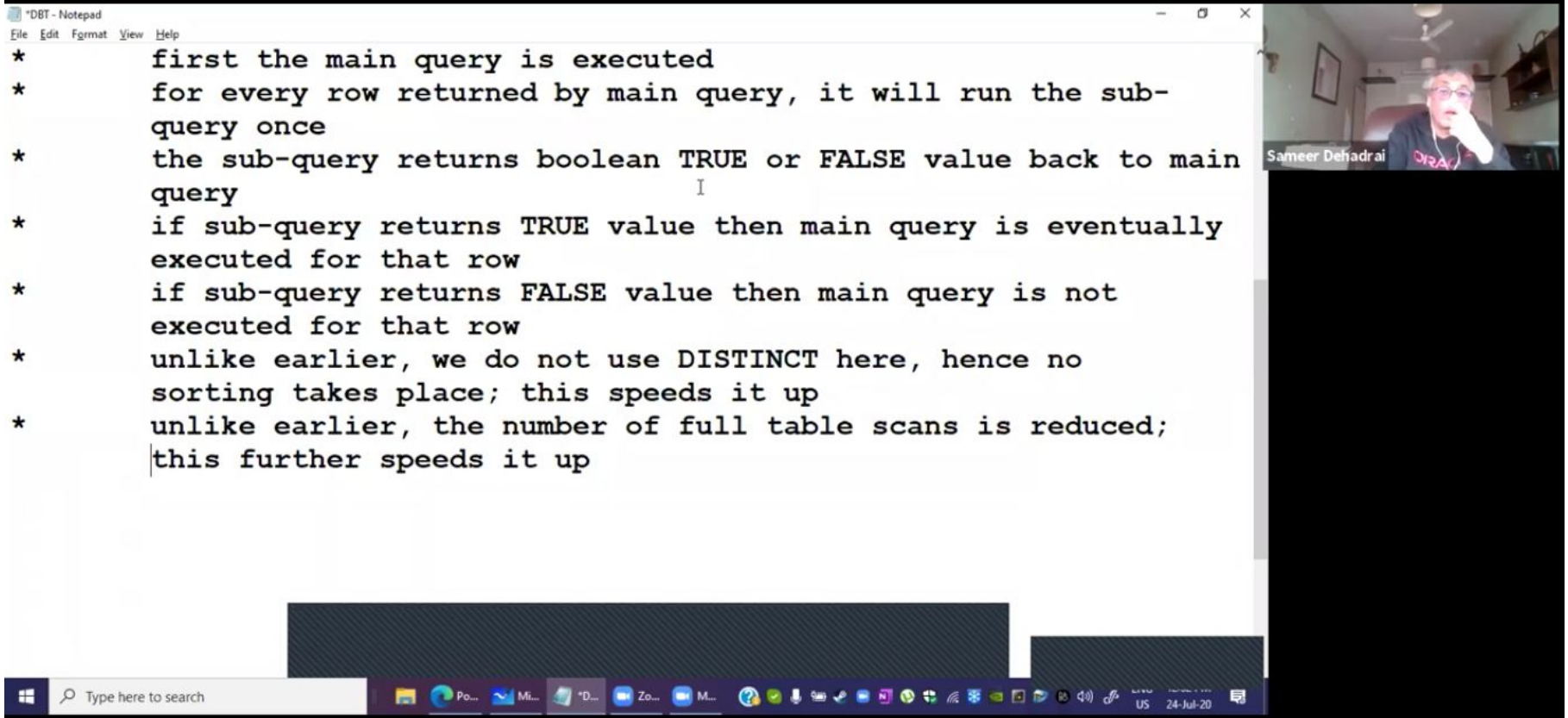
*DBT - Notepad
File Edit Format View Help
* first the main query is executed
* for every row returned by main query, it will run the sub-query once
* the sub-query returns boolean TRUE or FALSE value back to main query
* if sub-query returns TRUE value then main query is eventually executed for that row
* if sub-query returns FALSE value then main query is not executed for that row
* unlike earlier, we do not use DISTINCT here, hence no sorting takes place; this speeds it up
* unlike earlier, the number of full table scans is reduced; this further speeds it up
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sets

*DBT - Notepad

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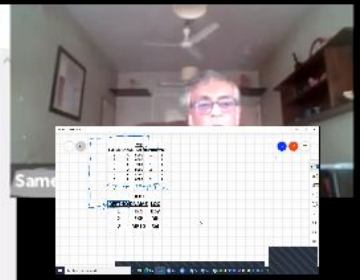
union -> will combine the output of both the SELECTs and it will suppress the duplicates

```
select empno, ename1 from emp1
        union
select empno, ename2 from emp2;
```

EMPNO	ENAME1
1	A
2	B
3	C
4	D
5	E

* if you want to use UNION, then the structure of both the SELECTs has to be the same



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```
select .....................
       union
select .....................
       minus
select .....................
       union all
select .....................
       intersect
select .....................
       union
select .....................
       order by x;

*      max upto 255 SELECTs
```

Type here to search

Po... Mi... *D... Zo... M...

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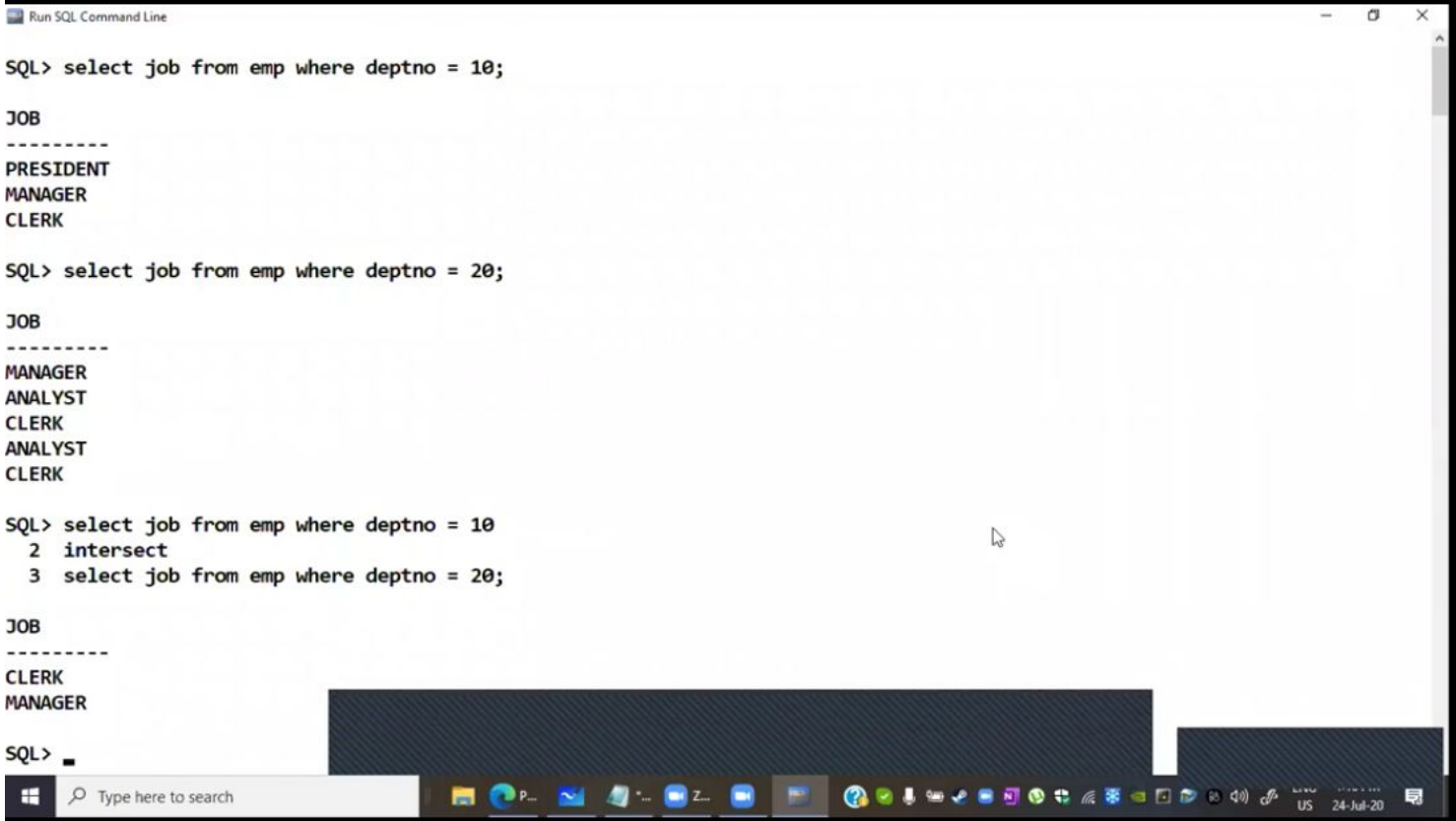
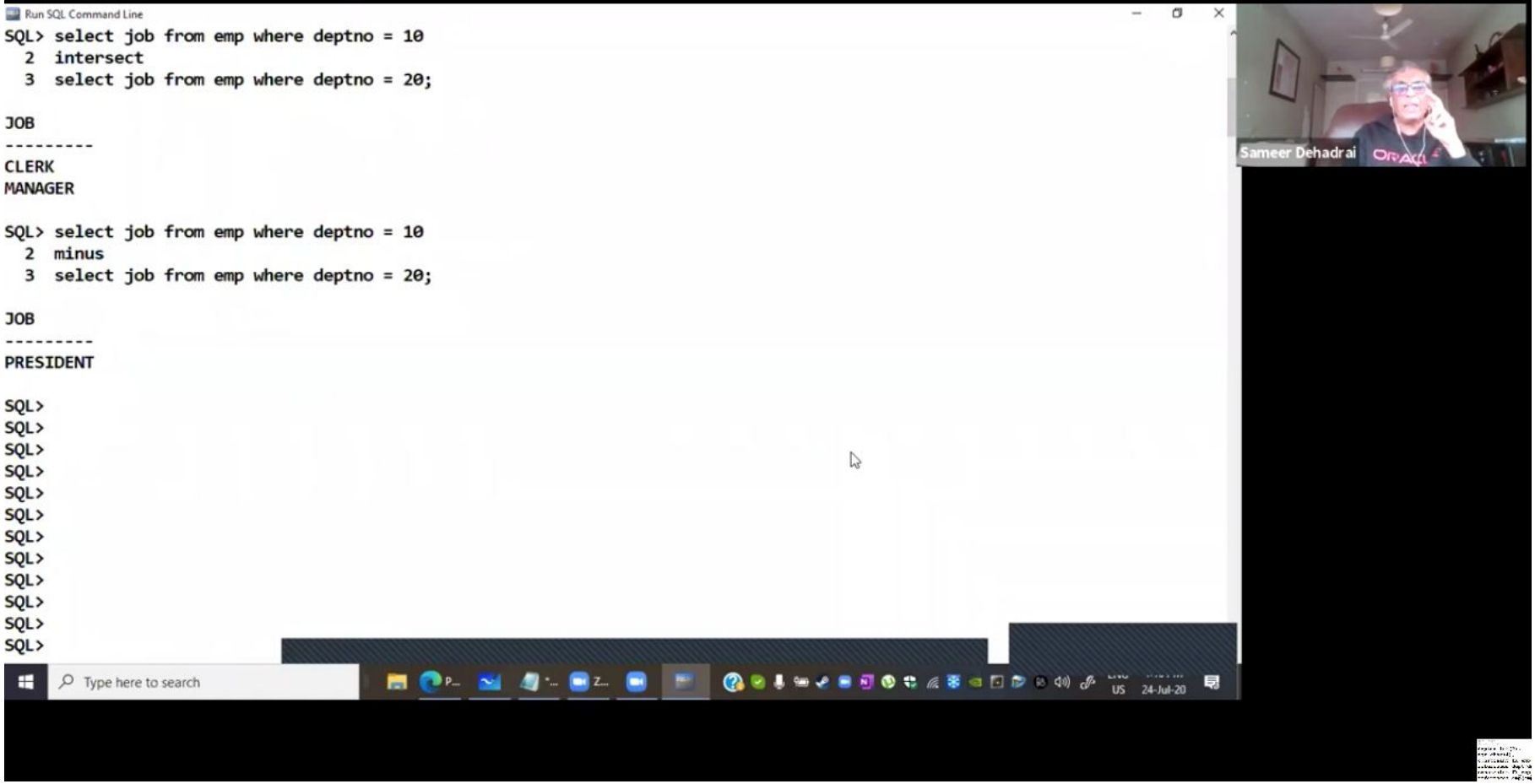

Run SQL Command Line
SQL> select job from emp where deptno = 10;
JOB

PRESIDENT
MANAGER
CLERK
SQL> select job from emp where deptno = 20;
JOB

MANAGER
ANALYST
CLERK
ANALYST
CLERK
SQL> select job from emp where deptno = 10
2 intersect
3 select job from emp where deptno = 20;
JOB

CLERK
MANAGER
SQL>
Type here to search
US
24-Jul-20


Run SQL Command Line
SQL> select job from emp where deptno = 10
2 intersect
3 select job from emp where deptno = 20;
JOB

CLERK
MANAGER
SQL> select job from emp where deptno = 10
2 minus
3 select job from emp where deptno = 20;
JOB

PRESIDENT
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
SQL>
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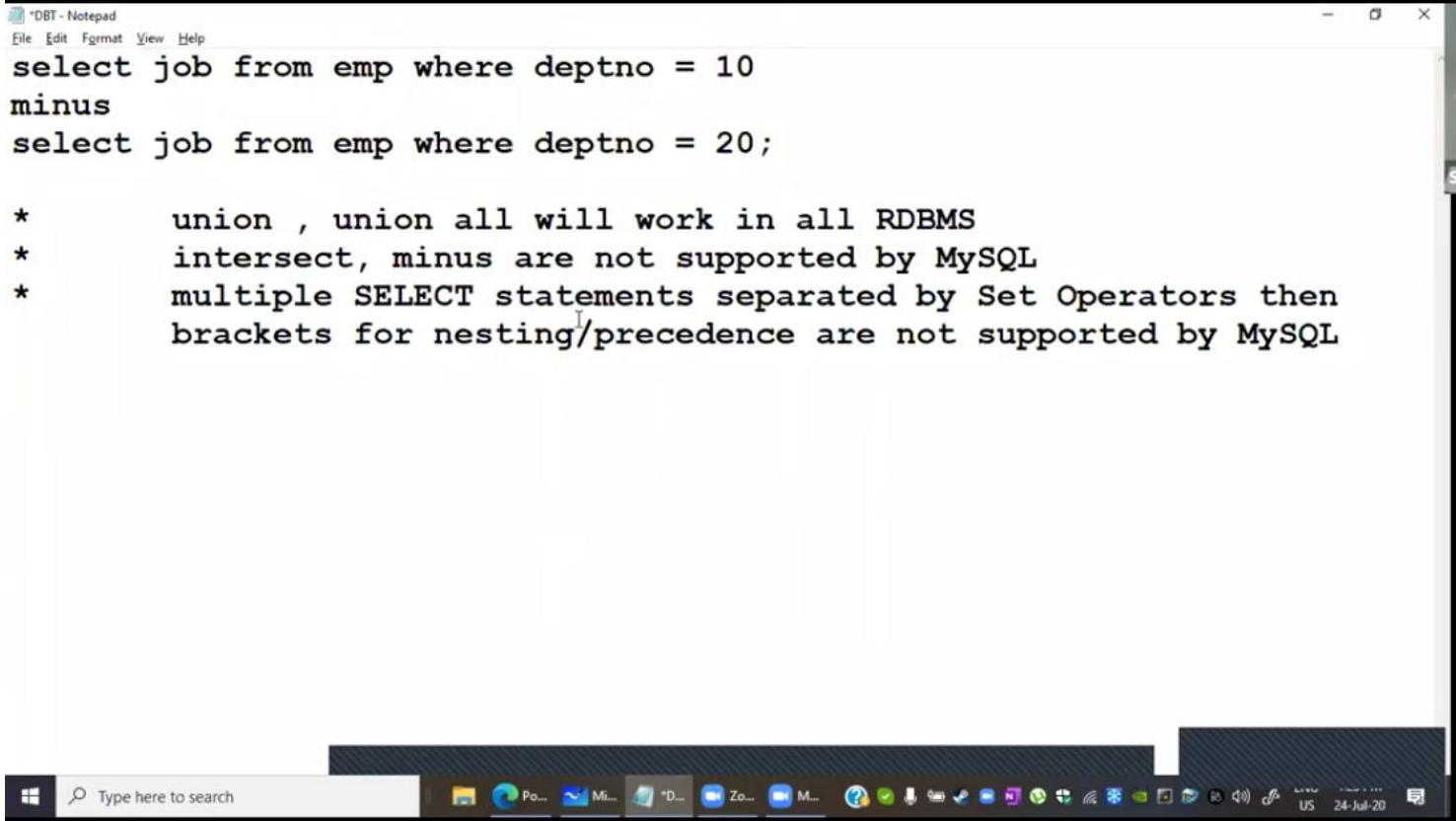
Type here to search
US
24-Jul-20


*DBT - Notepad
File Edit Format View Help
select job from emp where deptno = 10
minus
select job from emp where deptno = 20;
* union , union all will work in all RDBMS
* intersect, minus are not supported by MySQL
* multiple SELECT statements separated by Set Operators then
brackets for nesting/precedence are not supported by MySQL
Type here to search
US
24-Jul-20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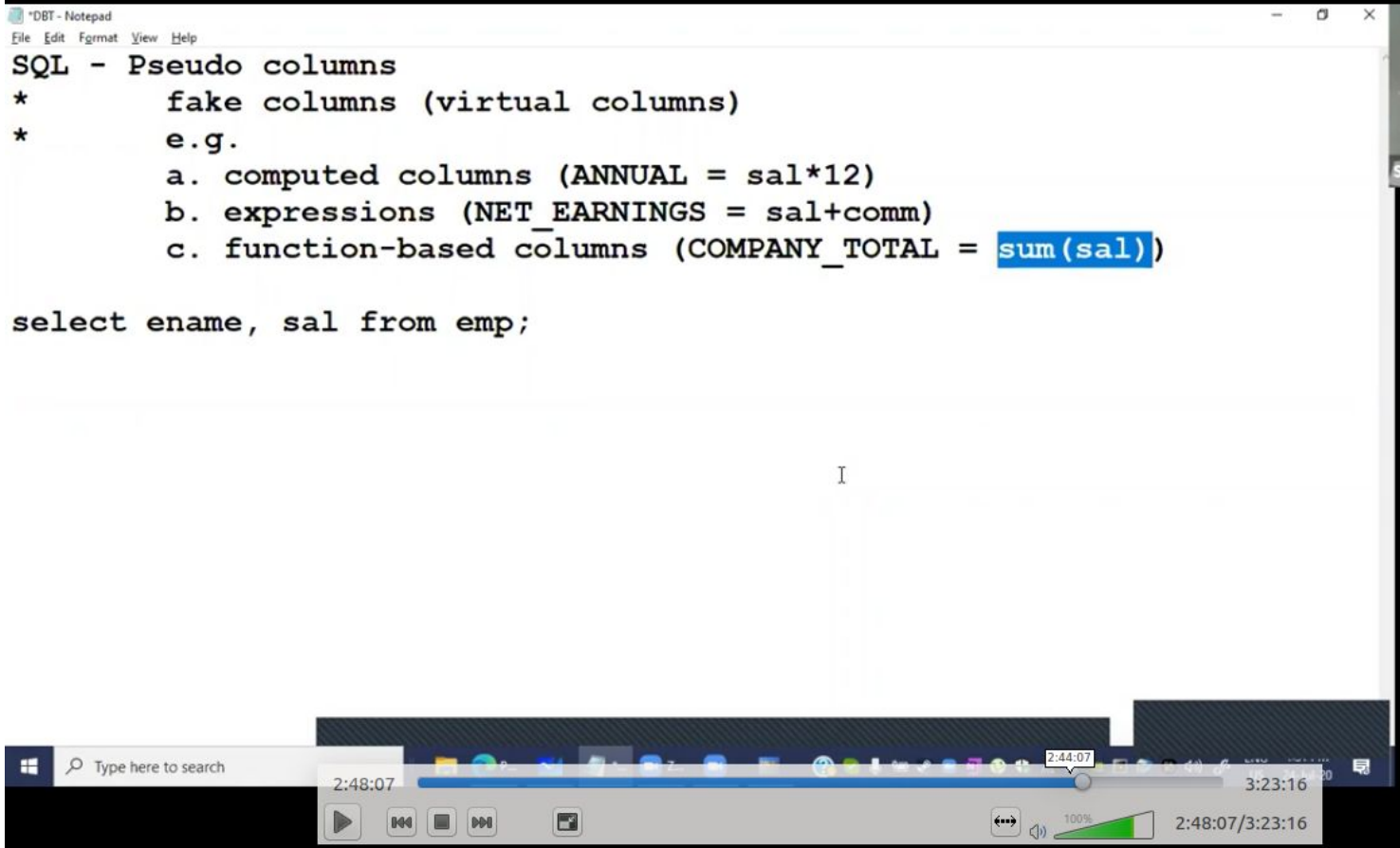
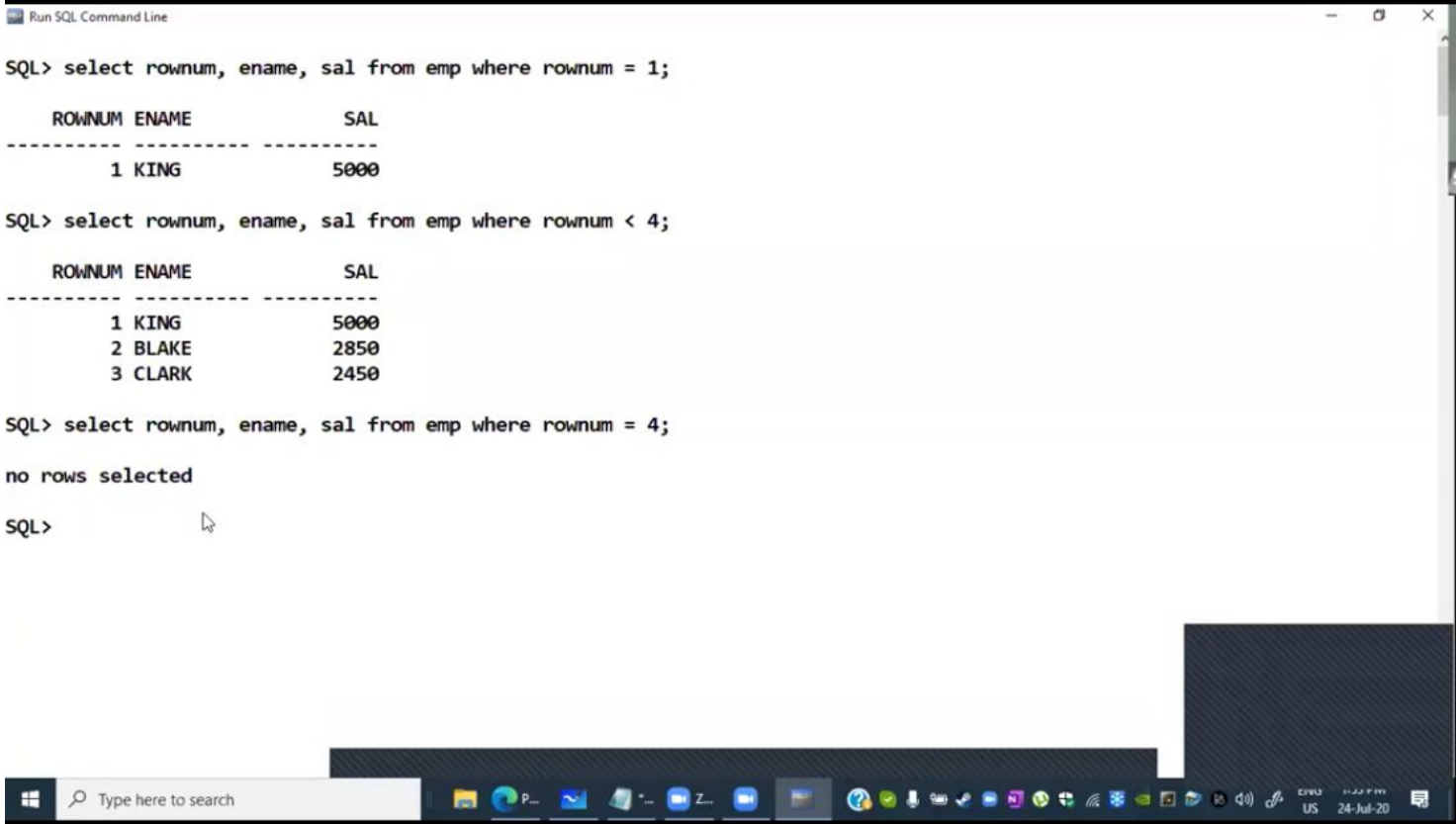
Pseudo columns


*DBT - Notepad
File Edit Format View Help
SQL - Pseudo columns
* fake columns (virtual columns)
* e.g.
a. computed columns (ANNUAL = sal*12)
b. expressions (NET_EARNINGS = sal+comm)
c. function-based columns (COMPANY_TOTAL = sum(sal))
select ename, sal from emp;
Type here to search
2:48:07
2:44:07
3:23:16
100%
2:48:07/3:23:16


Sameer Dehadrai


Run SQL Command Line
SQL> select rownum, ename, sal from emp where rownum = 1;
ROWNUM ENAME SAL
1 KING 5000
SQL> select rownum, ename, sal from emp where rownum < 4;
ROWNUM ENAME SAL
1 KING 5000
2 BLAKE 2850
3 CLARK 2450
SQL> select rownum, ename, sal from emp where rownum = 4;
no rows selected
SQL>
Type here to search
24-Jul-20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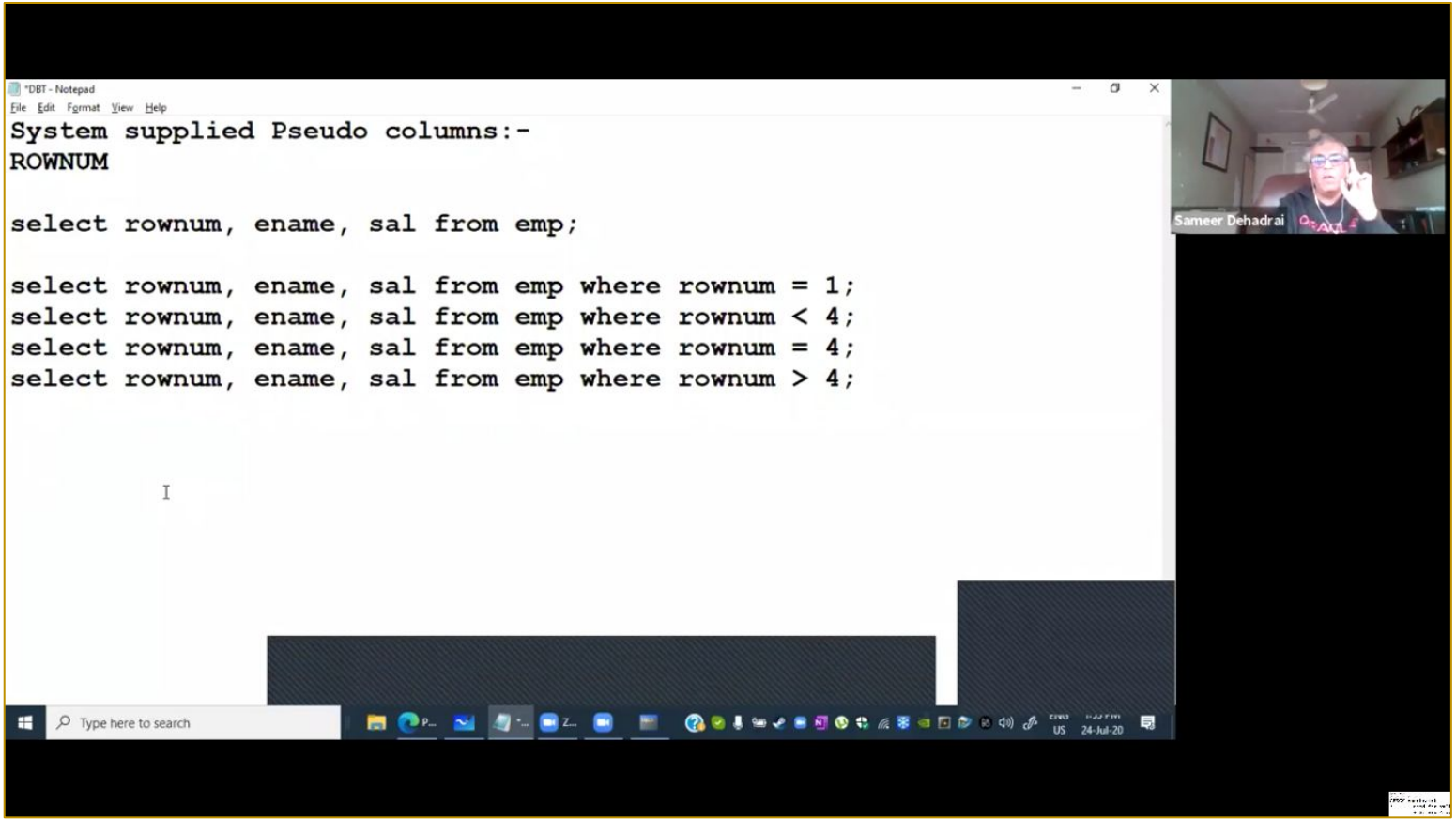
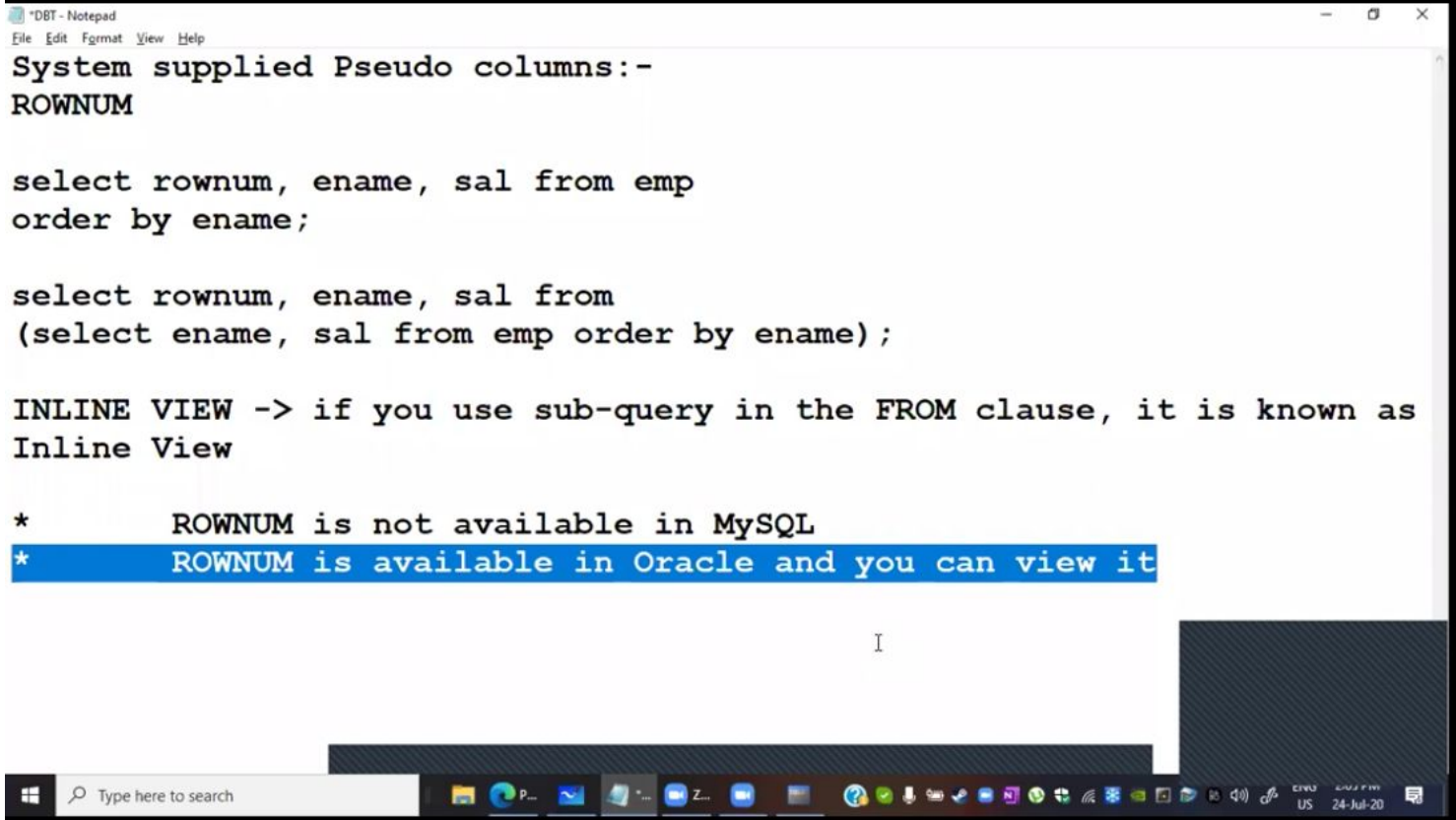
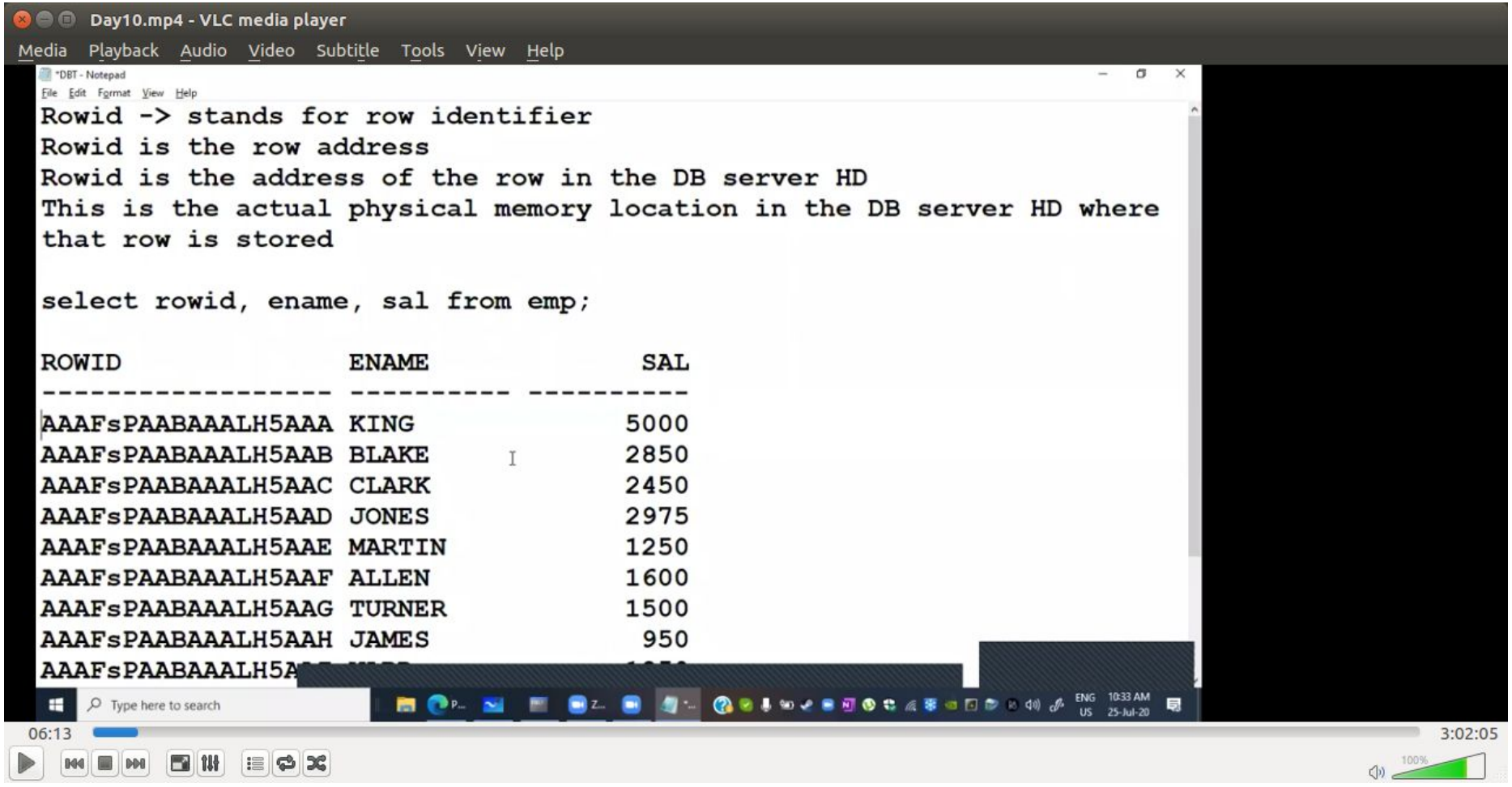
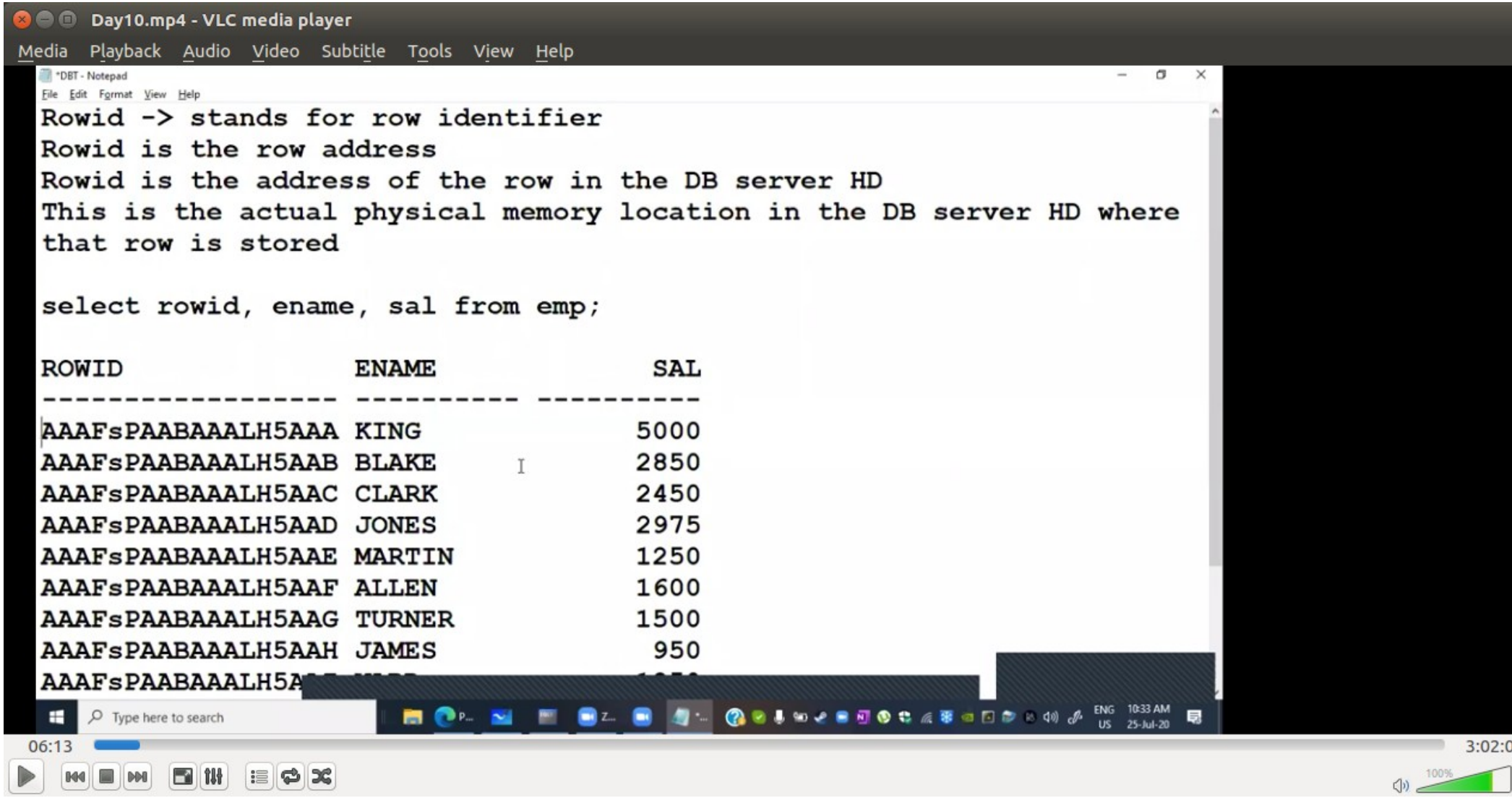
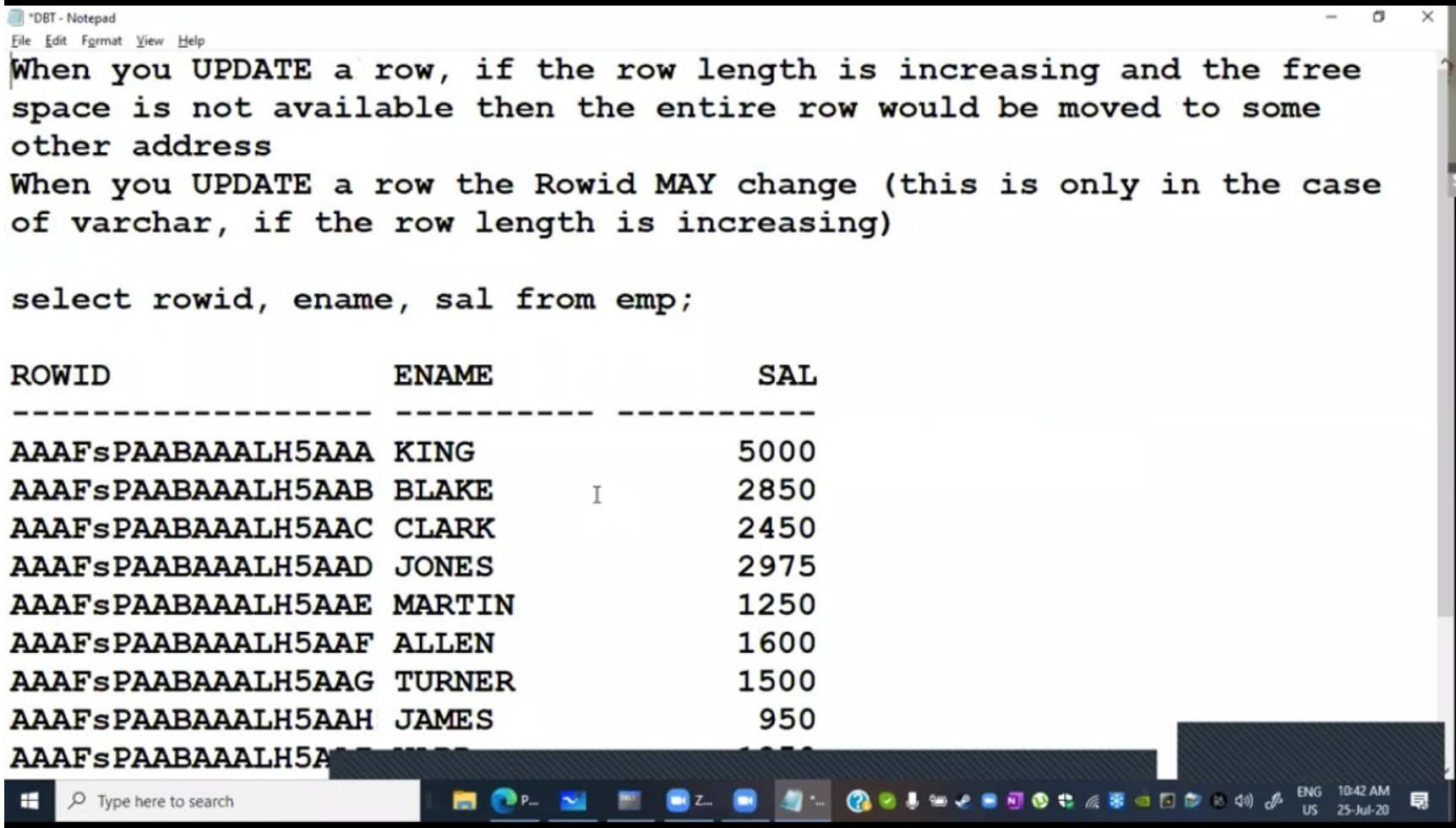


=4 and >4 will not work.
First 2 statements will work


*DBT - Notepad
File Edit Format View Help
System supplied Pseudo columns:-
ROWNUM
select rownum, ename, sal from emp
order by ename;
select rownum, ename, sal from
(select ename, sal from emp order by ename);
INLINE VIEW -> if you use sub-query in the FROM clause, it is known as
Inline View
* ROWNUM is not available in MySQL
* ROWNUM is available in Oracle and you can view it
Type here to search
24-Jul-20


Day10.mp4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
*DBT - Notepad
File Edit Format View Help
Rowid -> stands for row identifier
Rowid is the row address
Rowid is the address of the row in the DB server HD
This is the actual physical memory location in the DB server HD where
that row is stored
select rowid, ename, sal from emp;
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
AAAFsPAABAAALH5AAB BLAKE 2850
AAAFsPAABAAALH5AAC CLARK 2450
AAAFsPAABAAALH5AAD JONES 2975
AAAFsPAABAAALH5AAE MARTIN 1250
AAAFsPAABAAALH5AAF ALLEN 1600
AAAFsPAABAAALH5AAG TURNER 1500
AAAFsPAABAAALH5AAH JAMES 950
Type here to search
ENG US
10:33 AM 25-Jul-20
06:13
3:02:05
100%


Day10.mp4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
*DBT - Notepad
File Edit Format View Help
Rowid -> stands for row identifier
Rowid is the row address
Rowid is the address of the row in the DB server HD
This is the actual physical memory location in the DB server HD where that row is stored
select rowid, ename, sal from emp;
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
AAAFsPAABAAALH5AAB BLAKE 2850
AAAFsPAABAAALH5AAC CLARK 2450
AAAFsPAABAAALH5AAD JONES 2975
AAAFsPAABAAALH5AAE MARTIN 1250
AAAFsPAABAAALH5AAF ALLEN 1600
AAAFsPAABAAALH5AAG TURNER 1500
AAAFsPAABAAALH5AAH JAMES 950
Type here to search
ENG US
10:33 AM 25-Jul-20
06:13
3:02:0
100%


*DBT - Notepad
File Edit Format View Help
When you UPDATE a row, if the row length is increasing and the free space is not available then the entire row would be moved to some other address
When you UPDATE a row the Rowid MAY change (this is only in the case of varchar, if the row length is increasing)
select rowid, ename, sal from emp;
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
AAAFsPAABAAALH5AAB BLAKE 2850
AAAFsPAABAAALH5AAC CLARK 2450
AAAFsPAABAAALH5AAD JONES 2975
AAAFsPAABAAALH5AAE MARTIN 1250
AAAFsPAABAAALH5AAF ALLEN 1600
AAAFsPAABAAALH5AAG TURNER 1500
AAAFsPAABAAALH5AAH JAMES 950
Type here to search
ENG US
10:42 AM 25-Jul-20

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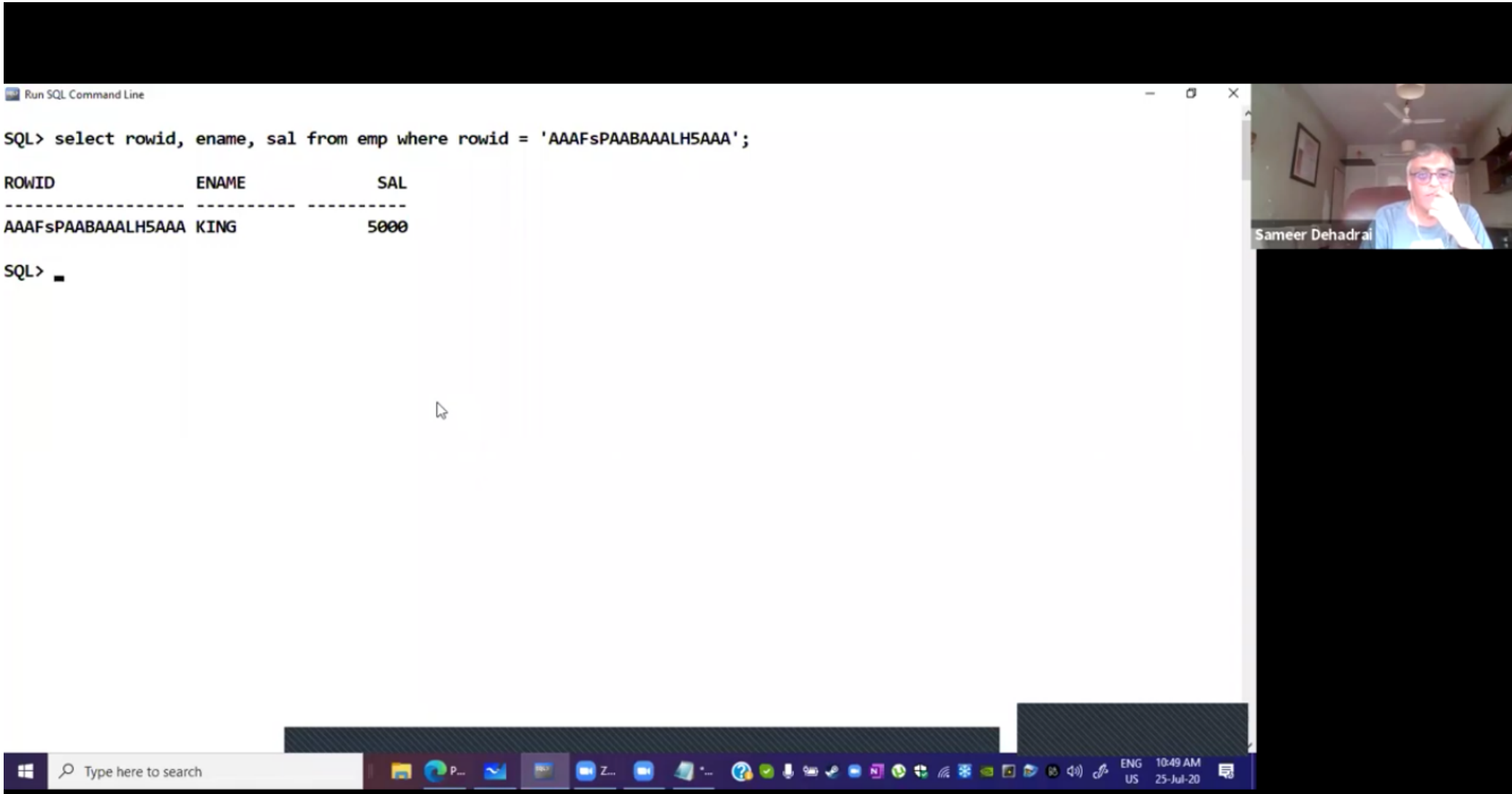
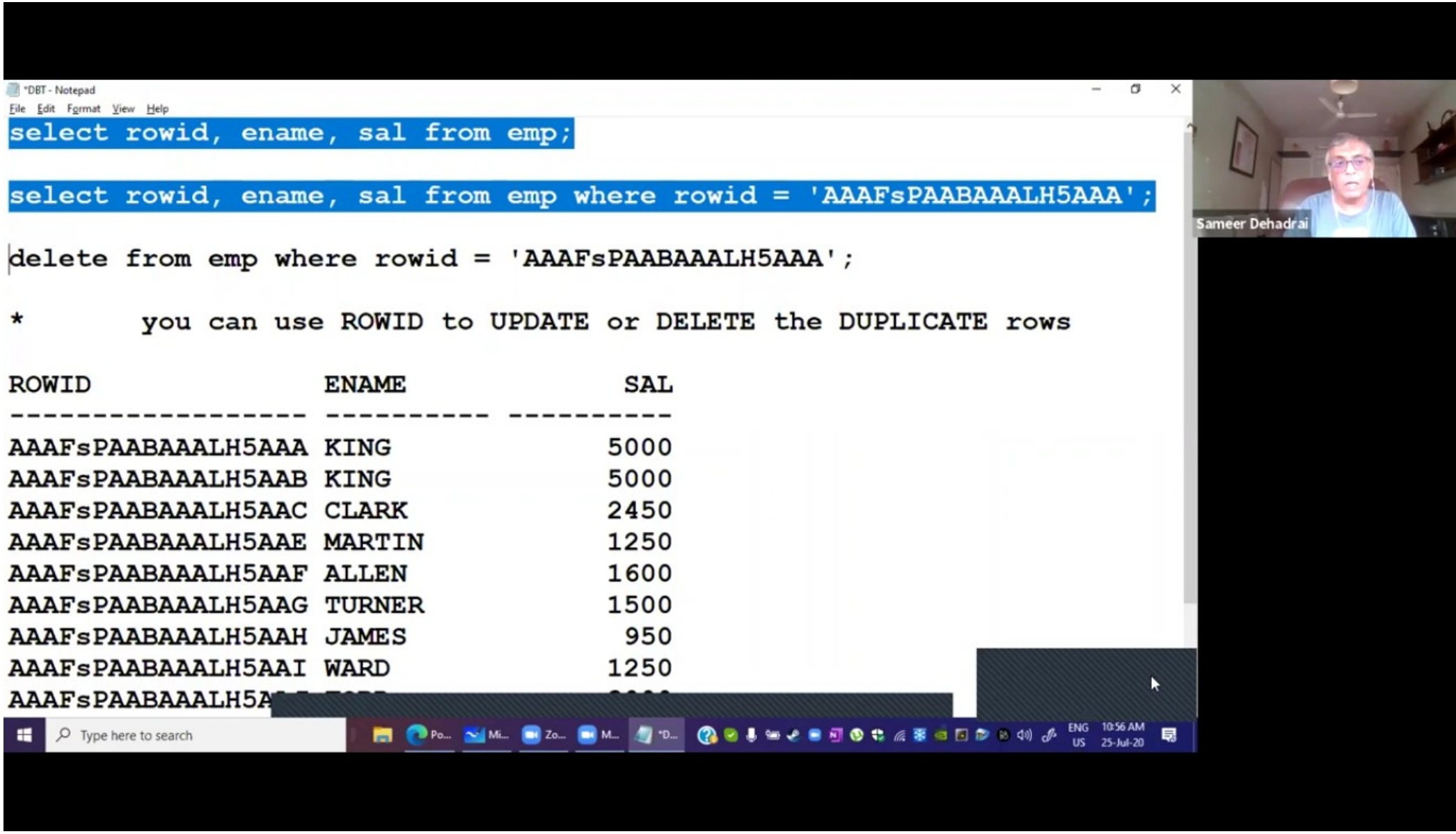
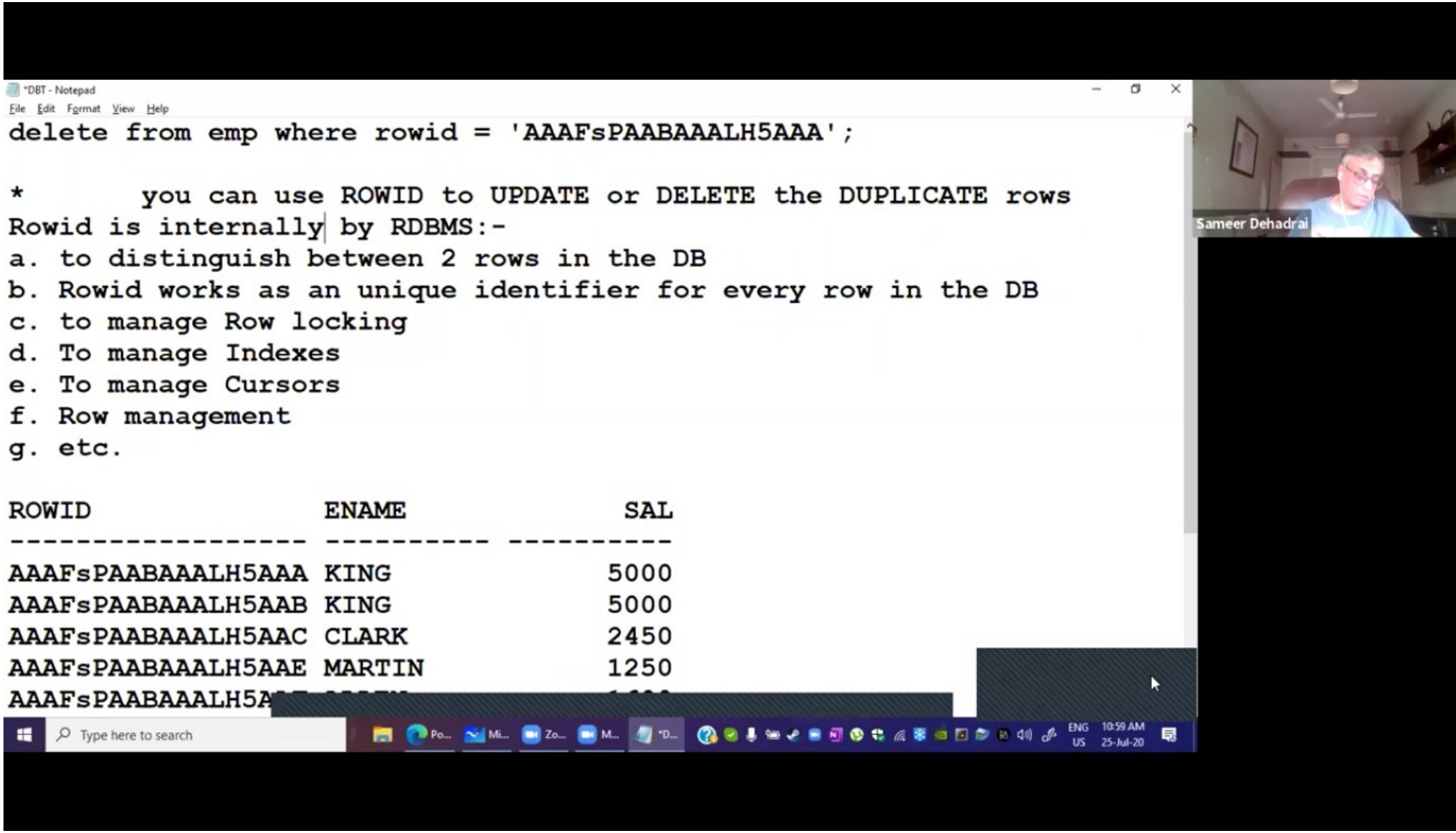

Run SQL Command Line
SQL> select rowid, ename, sal from emp where rowid = 'AAAFsPAABAAALH5AAA';
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
SQL>
Sameer Dehadrai
Type here to search
ENG US
10:49 AM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
select rowid, ename, sal from emp;
select rowid, ename, sal from emp where rowid = 'AAAFsPAABAAALH5AAA';
delete from emp where rowid = 'AAAFsPAABAAALH5AAA';
* you can use ROWID to UPDATE or DELETE the DUPLICATE rows
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
AAAFsPAABAAALH5AAB KING 5000
AAAFsPAABAAALH5AAC CLARK 2450
AAAFsPAABAAALH5AAE MARTIN 1250
AAAFsPAABAAALH5AAF ALLEN 1600
AAAFsPAABAAALH5AAG TURNER 1500
AAAFsPAABAAALH5AAH JAMES 950
AAAFsPAABAAALH5AAI WARD 1250
Sameer Dehadrai
Type here to search
ENG US
10:56 AM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
delete from emp where rowid = 'AAAFsPAABAAALH5AAA';
* you can use ROWID to UPDATE or DELETE the DUPLICATE rows
Rowid is internally by RDBMS:-
a. to distinguish between 2 rows in the DB
b. Rowid works as an unique identifier for every row in the DB
c. to manage Row locking
d. To manage Indexes
e. To manage Cursors
f. Row management
g. etc.
ROWID ENAME SAL
AAAFsPAABAAALH5AAA KING 5000
AAAFsPAABAAALH5AAB KING 5000
AAAFsPAABAAALH5AAC CLARK 2450
AAAFsPAABAAALH5AAE MARTIN 1250
Sameer Dehadrai
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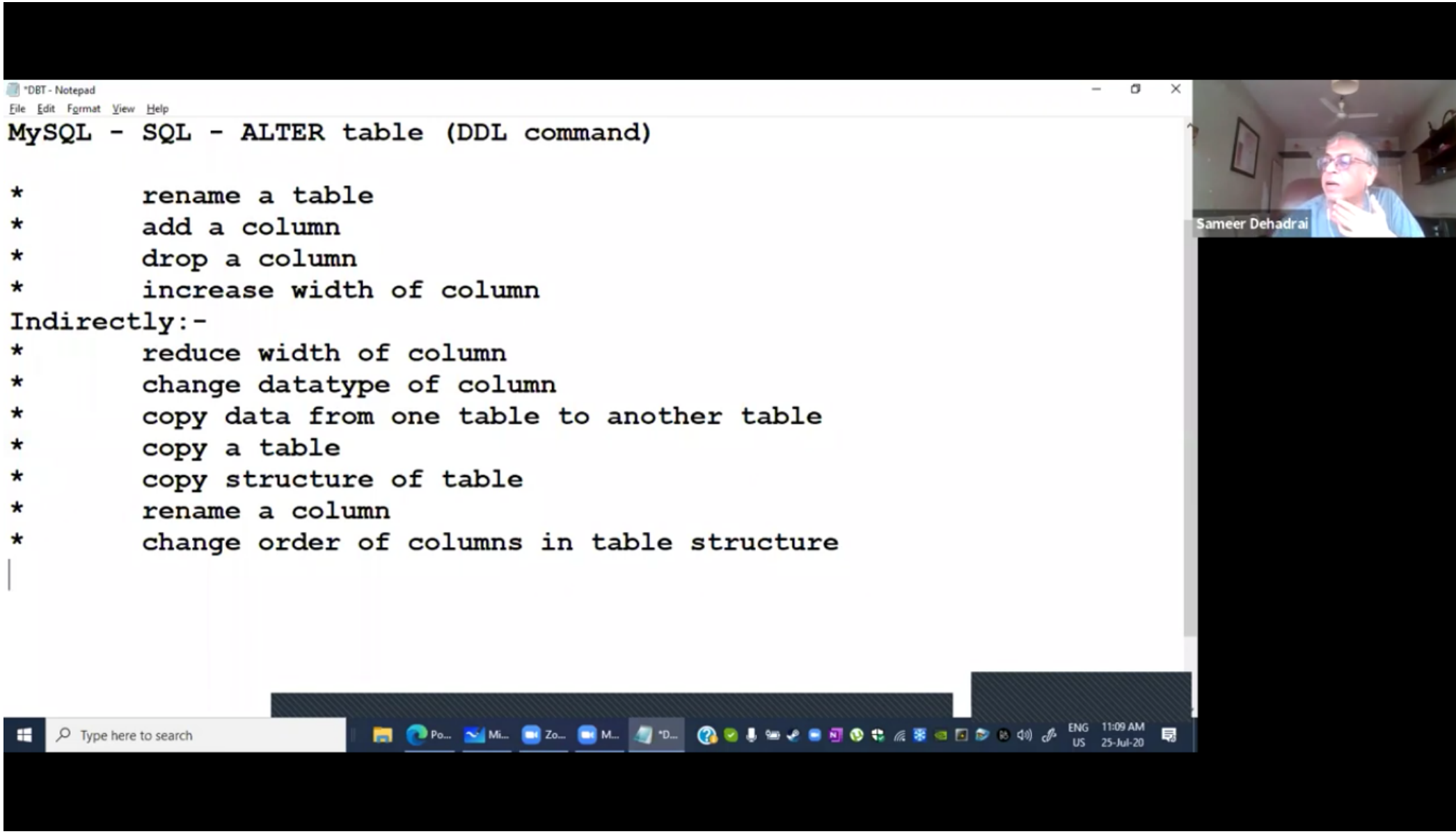
ENG US
10:59 AM 25-Jul-20

ALTER TABLE


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - ALTER table (DDL command)
* rename a table
* add a column
* drop a column
* increase width of column
Indirectly:-
* reduce width of column
* change datatype of column
* copy data from one table to another table
* copy a table
* copy structure of table
* rename a column
* change order of columns in table structure
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11:09 AM 25-Jul-20

*DBT - Notepad

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```
*       reduce width of column

In Oracle:-
alter table emp modify ename varchar(20);
*       you can reduce the width provided the contents are null

alter table emp add x varchar(25);
update emp set x = ename, ename = null;
alter table emp modify ename varchar(20);
/* Data testing, ask user and make corrections */
update emp set ename = x;
alter table emp drop column x;
-----------------------------------------------
*       change datatype of column
*       copy data from one table to another table
*       copy a table
*       copy structure of table
*       rename a column
*       change c
```

Type here to search

ENG US 11:39 AM 25-Jul-20

1. rename a table
2. add a column
3. drop a column
4. increase width of a column

indirectly:-
1. reduce width of a column
2. change datatype of a column
3. copy data from 1 table to other table
4. copy a table
5. copy structure of table
6. rename a column
7. change order of columns in table structure

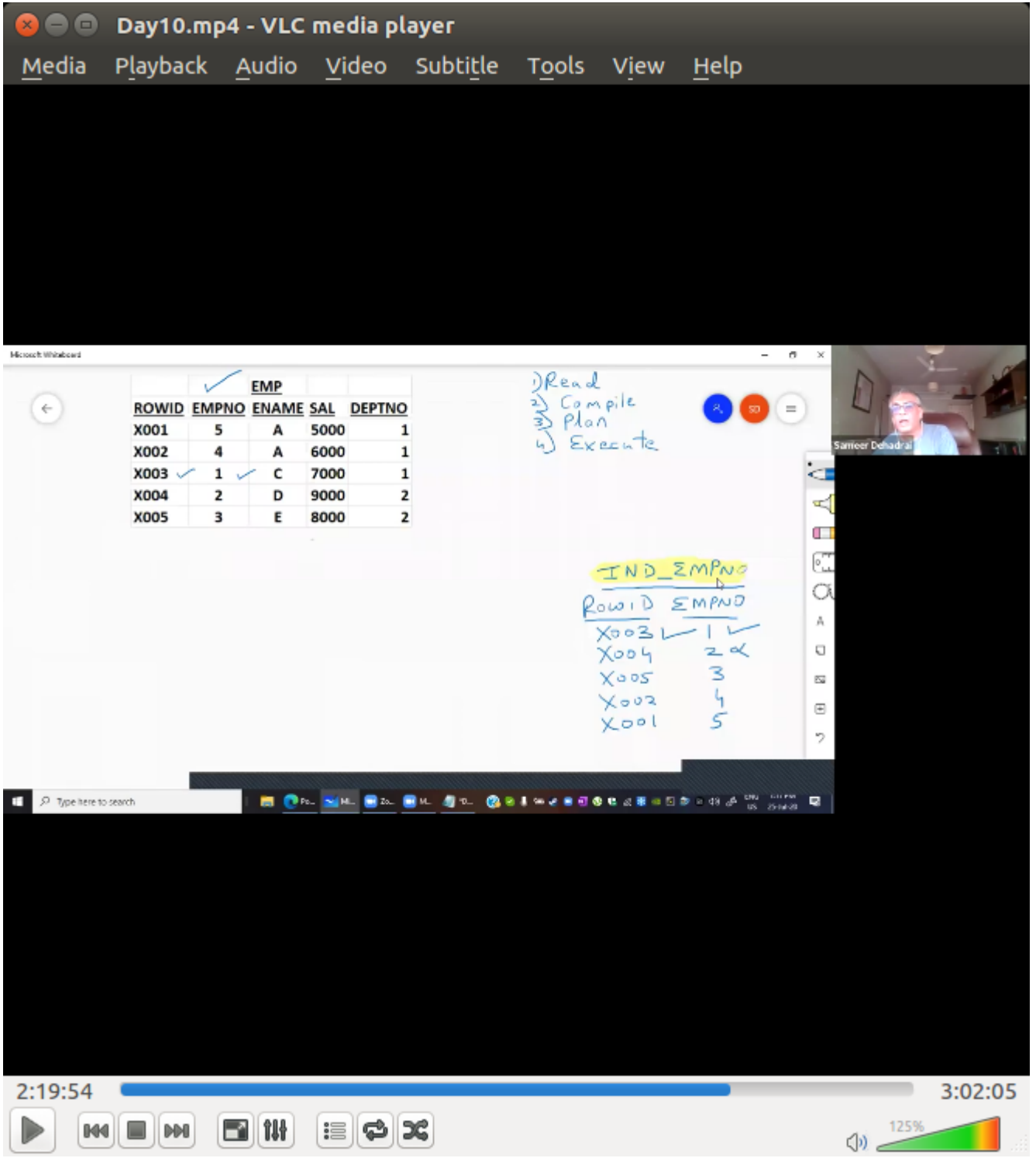
1. RENAME A TABLE
oracle: rename emp to employees;
mysql: rename table emp to employees;

2. ADD COLUMN
alter table <tablename> add <columnname> <datatype>;
e.g alter table emp add gst float(7,2);

3. DROP COLUMN
alter table <tablename> drop column <columnname>;
e.g: alter table emp drop column gst;

4. INCREASE WIDTH OF A COLUMN

INDEXES very important


Day10.mp4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
EMP
ROWID EMPNO ENAME SAL DEPTNO
X001 5 A 5000 1
X002 4 A 6000 1
X003 1 C 7000 1
X004 2 D 9000 2
X005 3 E 8000 2
1) Read
2) Compile
3) Plan
4) Execute
IND_EMPNO
ROWID EMPNO
X003 1
X004 2
X005 3
X002 4
X001 5
Sameer Dehadrai
2:19:54
3:02:05
125%

*DBT - Notepad

File Edit Format View Help

MySQL - SQL - INDEXES

* present in all DBMS, RDBMS, and some of the programming languages
* to speed up the search operations (for faster access)
* to speed up SELECT statement with a WHERE clause
* indexes are automatically invoked as and when required (in MySQL and Oracle)

In other RDBMS:-

```
use index ind_empno;
select * from emp where empno = 1;
```

Type here to search

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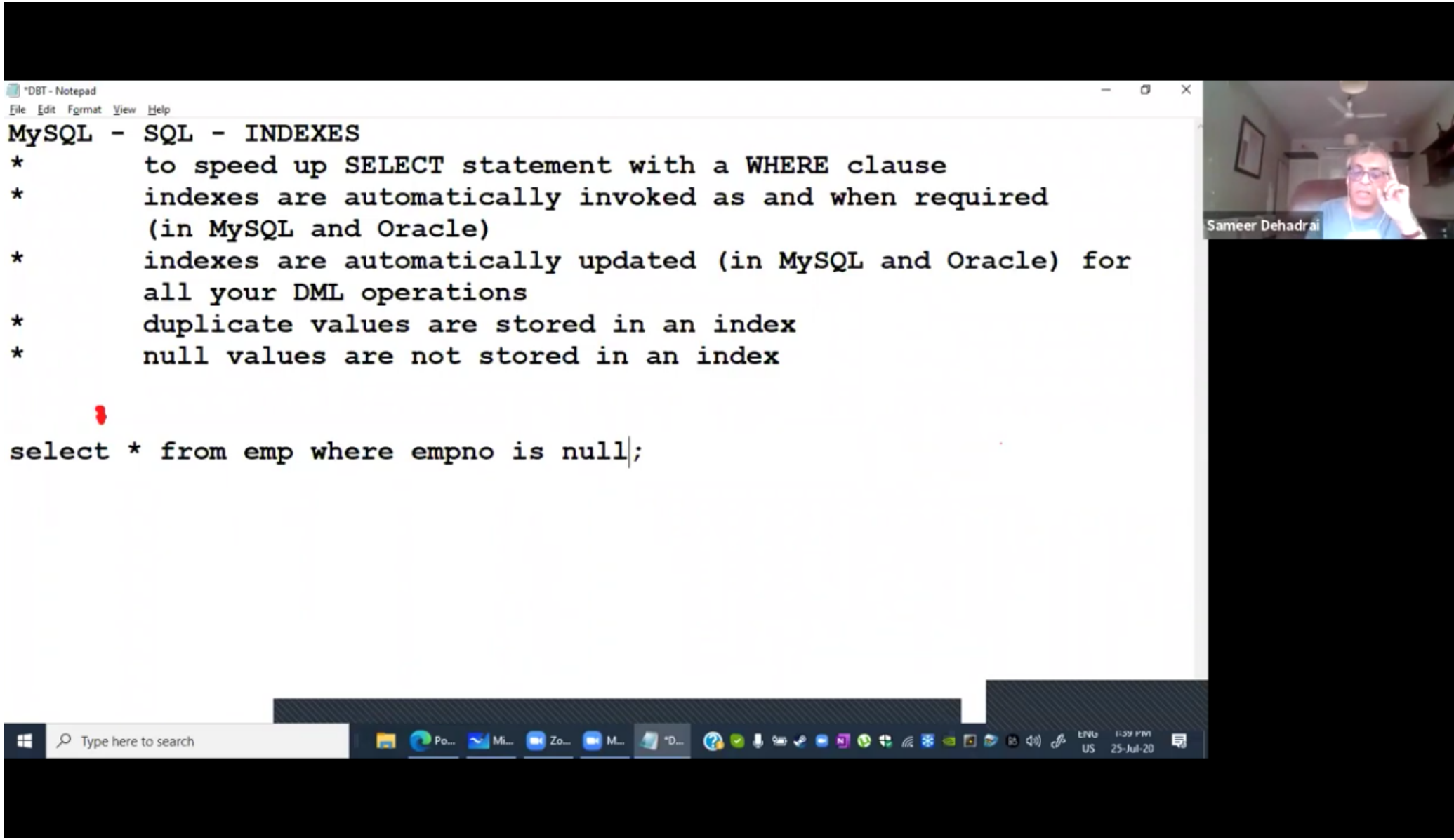
*DBT - Notepad
File Edit Format View Help
MySQL - SQL - INDEXES
* to speed up SELECT statement with a WHERE clause
* indexes are automatically invoked as and when required
(in MySQL and Oracle)
* indexes are automatically updated (in MySQL and Oracle) for
all your DML operations
* duplicate values are stored in an index
* null values are not stored in an index
select * from emp where empno is null;
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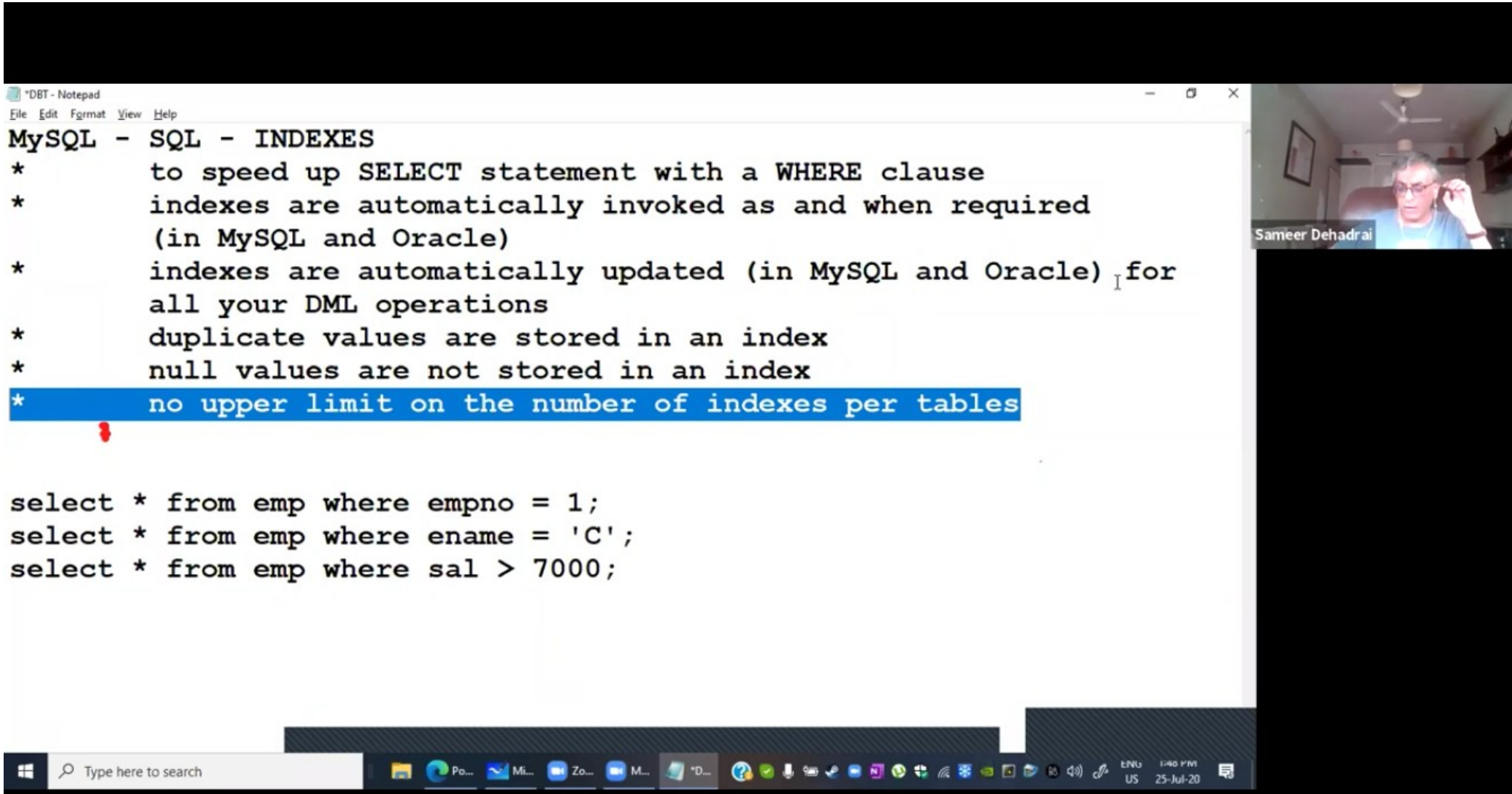
Type here to search
ENG
US
25-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - INDEXES
* to speed up SELECT statement with a WHERE clause
* indexes are automatically invoked as and when required
(in MySQL and Oracle)
* indexes are automatically updated (in MySQL and Oracle) for
all your DML operations
* duplicate values are stored in an index
* null values are not stored in an index
* no upper limit on the number of indexes per tables
select * from emp where empno = 1;
select * from emp where ename = 'C';
select * from emp where sal > 7000;
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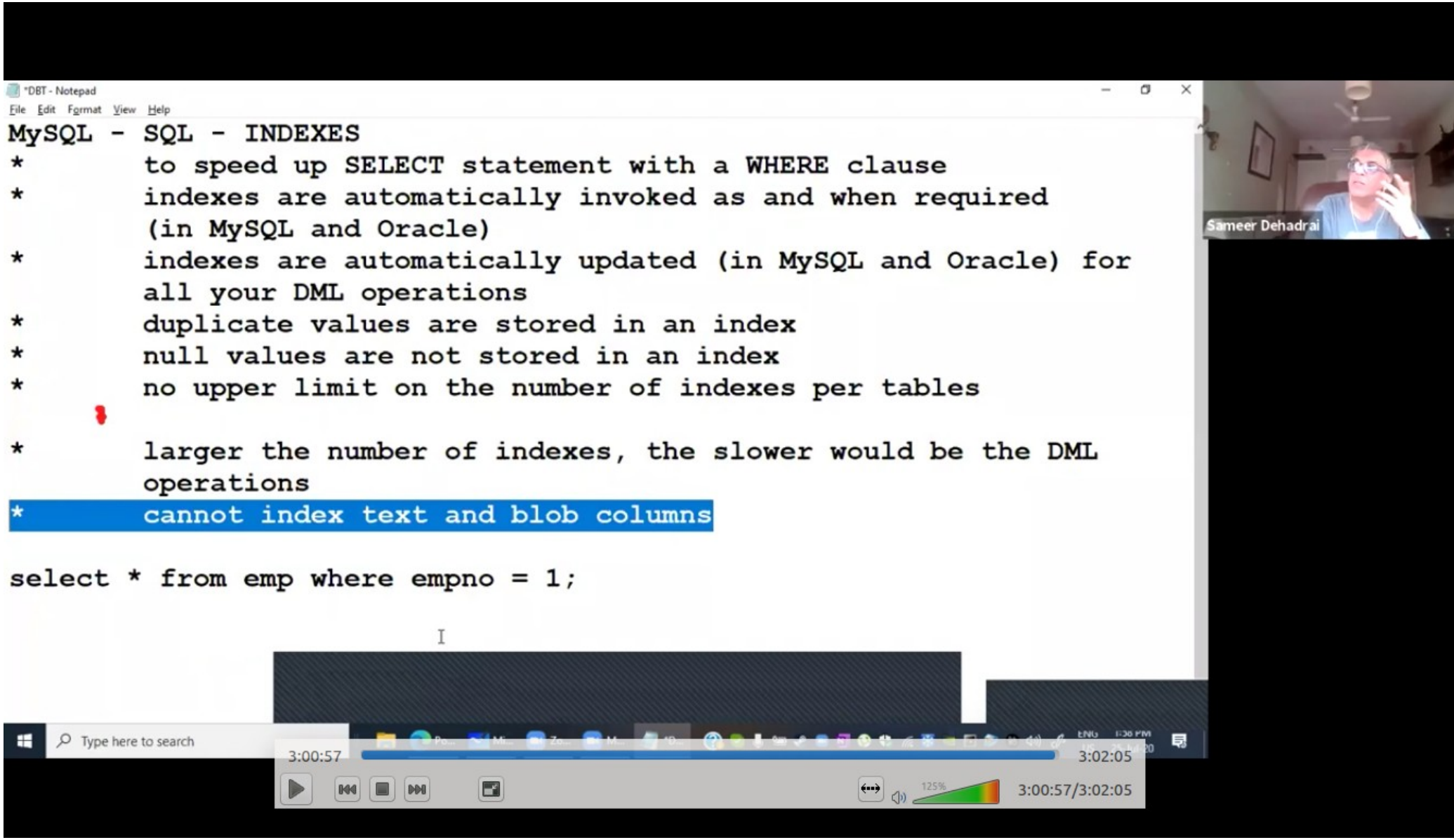
Type here to search
ENG
US
25-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - INDEXES
* to speed up SELECT statement with a WHERE clause
* indexes are automatically invoked as and when required (in MySQL and Oracle)
* indexes are automatically updated (in MySQL and Oracle) for all your DML operations
* duplicate values are stored in an index
* null values are not stored in an index
* no upper limit on the number of indexes per tables
* larger the number of indexes, the slower would be the DML operations
* cannot index text and blob columns
select * from emp where empno = 1;
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Type here to search
3:00:57
3:02:05
125%
3:00:57/3:02:05

*DBT - Notepad

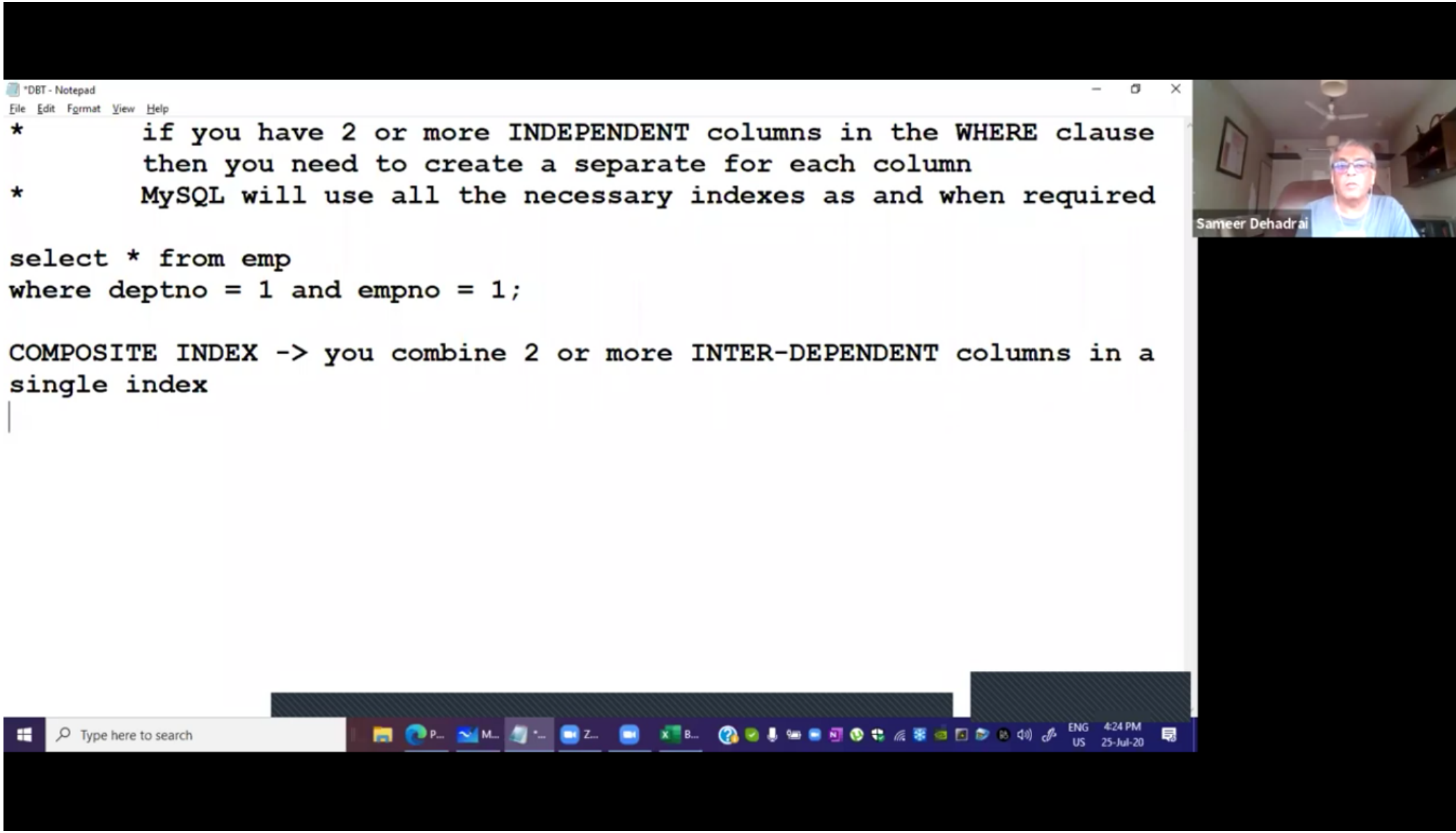
File Edit Format View Help

```
select * from emp
where empno = 2;

select * from emp
where sal > 5000;

select * from emp
where empno = 2 and sal > 5000;
```

* if you have 2 or more INDEPENDENT columns in the WHERE clause then you need to create a separate for each column
* MySQL will use all the necessary indexes as and when required

Type here to search

ENG US 4:16 PM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
* if you have 2 or more INDEPENDENT columns in the WHERE clause
then you need to create a separate for each column
* MySQL will use all the necessary indexes as and when required
select * from emp
where deptno = 1 and empno = 1;
COMPOSITE INDEX -> you combine 2 or more INTER-DEPENDENT columns in a
single index
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ENG
US
4:24 PM
25-Jul-20

Microsoft Whiteboard

		EMP		
ROWID	EMPNO	ENAME	SAL	DEPTNO
X001	1	A	5000	1
X002	2	B	6000	1
X003	3	C	7000	1
X004	1	D	9000	2
X005	2	E	8000	2

IND_DNO_ENO

ROWID	DEPTNO	EMPNO
X001	1	1
X002	1	2
X003	1	3
X004	2	1
X005	2	2

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Type here to search

ENG US 4:25 PM 25-Jul-20

*DBT - Notepad

File Edit Format View Help

Conditions when an index should be created:-

* SELECT statement with WHERE clause, ORDER BY clause, GROUP BY clause, DISTINCT/UNIQUE, UNION, INTERSECT, MINUS

* if the SELECT statement retrieves < 25% of table data

```
select * from emp where empno = 1;
select * from emp where empno = 5;
select * from emp where empno < 2;
-----------------------------------
select * from emp where empno > 1;
```

Type here to search

ENG US 4:46 PM 25-Jul-20

*DBT - Notepad

File Edit Format View Help

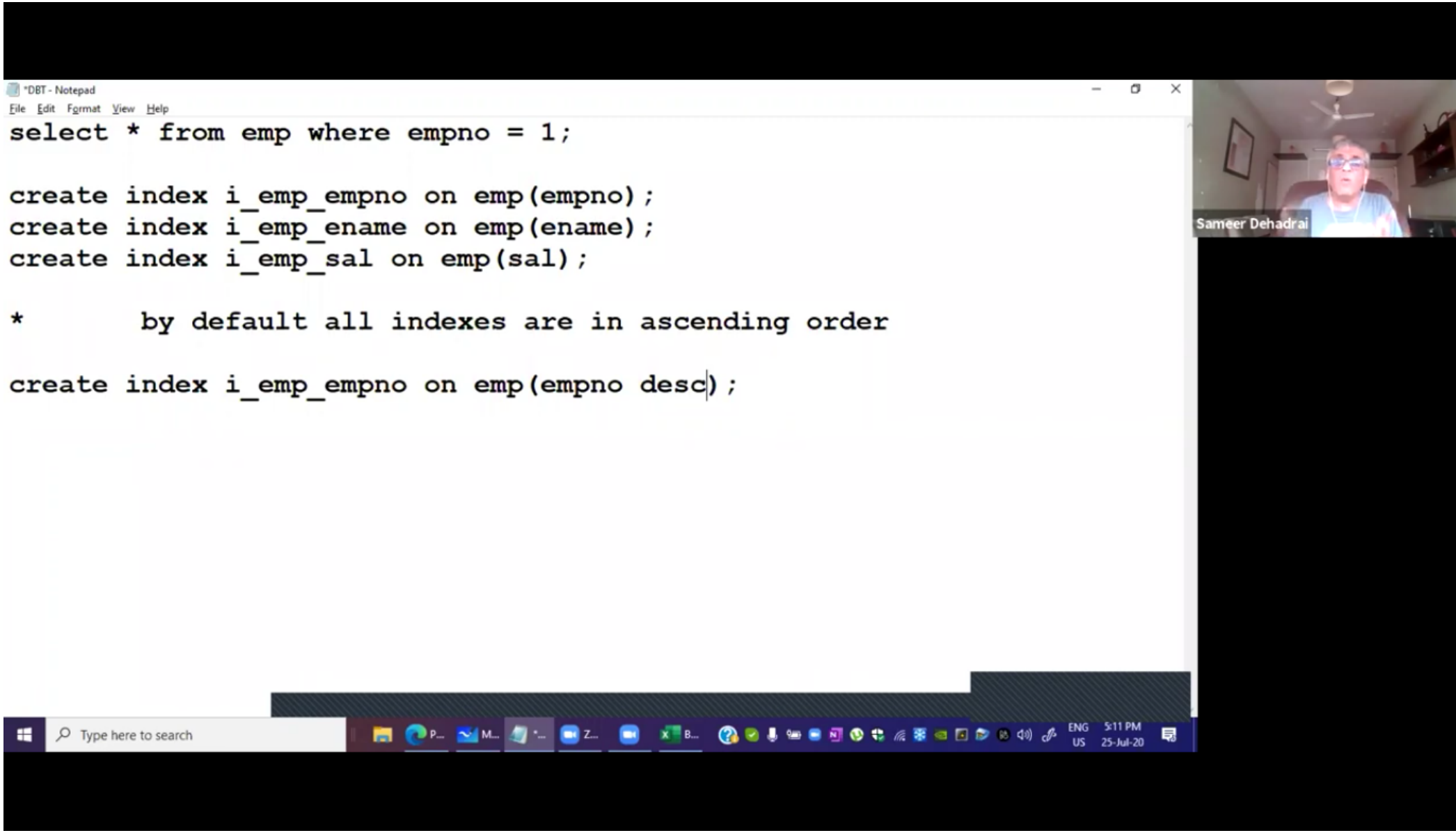
Conditions when an index should be created:-

* SELECT statement with WHERE clause, ORDER BY clause, GROUP BY clause, DISTINCT/UNIQUE, UNION, INTERSECT, MINUS
* if the SELECT statement retrieves < 25% of table data
* Primary key and Unique columns should always be indexed
* common columns in join operations should always be indexed

Oracle Query Optimizer (product from Oracle Corporation) (works only with Oracle RDBMS)

Type here to search

ENG US 5:03 PM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
select * from emp where empno = 1;
create index i_emp_empno on emp(empno);
create index i_emp_ename on emp(ename);
create index i_emp_sal on emp(sal);
* by default all indexes are in ascending order
create index i_emp_empno on emp(empno desc);
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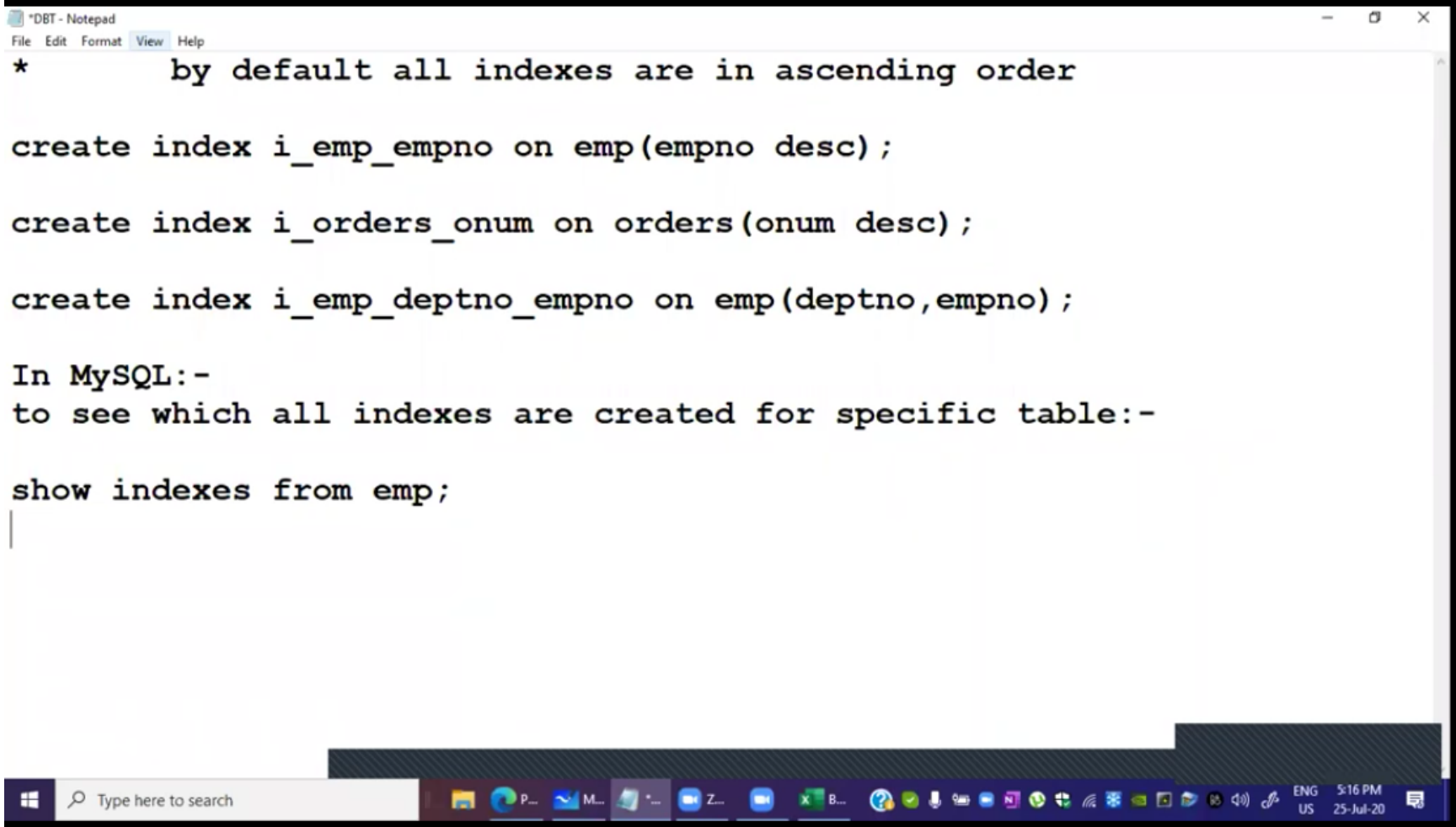
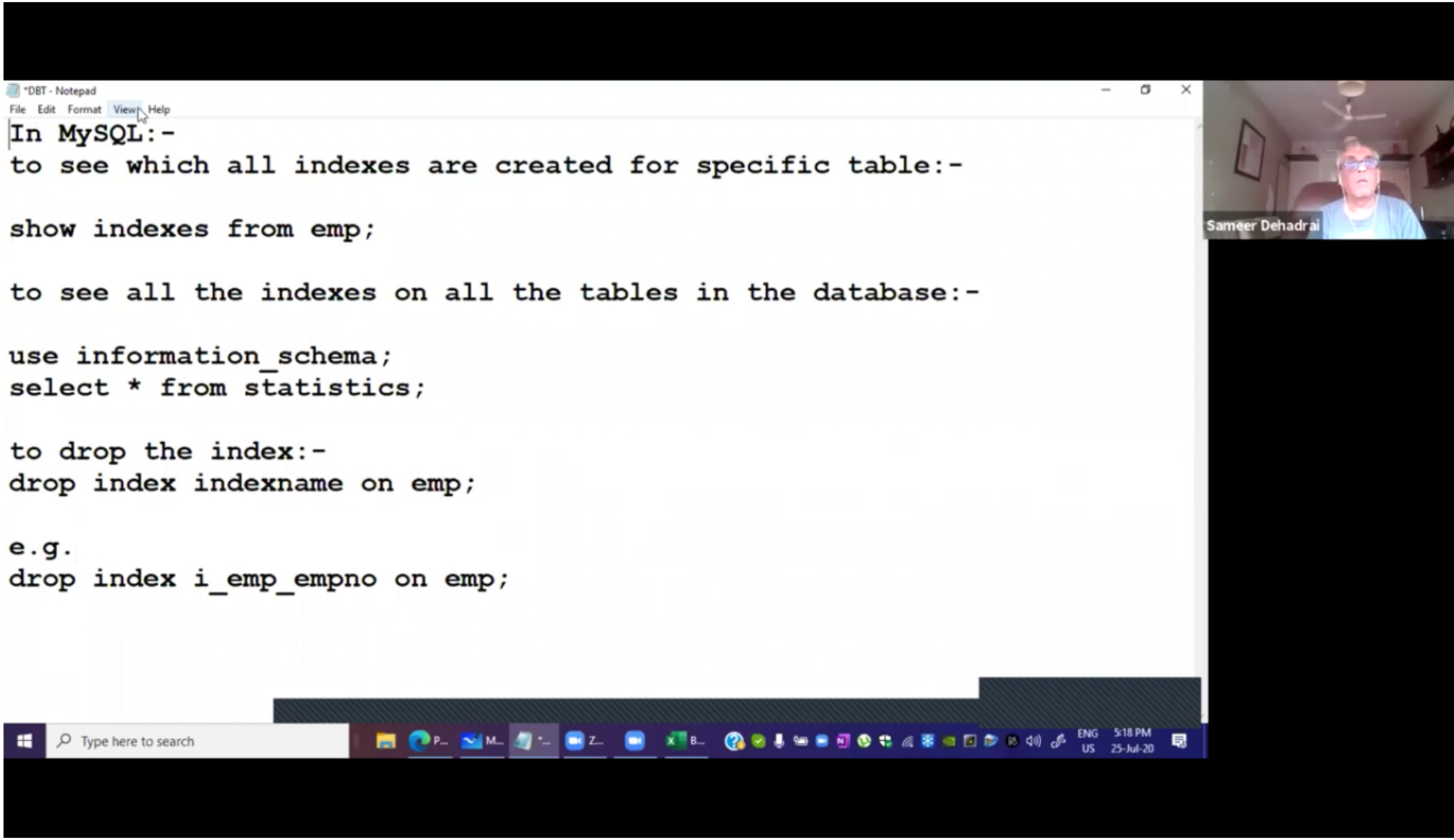
Type here to search
ENG US
5:11 PM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
* by default all indexes are in ascending order
create index i_emp_empno on emp(empno desc);
create index i_orders_onum on orders(onum desc);
create index i_emp_deptno_empno on emp(deptno,empno);
In MySQL:-
to see which all indexes are created for specific table:-
show indexes from emp;
Type here to search
ENG
US
5:16 PM
25-Jul-20


*DBT - Notepad
File Edit Format View Help
In MySQL:-
to see which all indexes are created for specific table:-
show indexes from emp;
to see all the indexes on all the tables in the database:-
use information_schema;
select * from statistics;
to drop the index:-
drop index indexname on emp;
e.g.
drop index i_emp_empno on emp;
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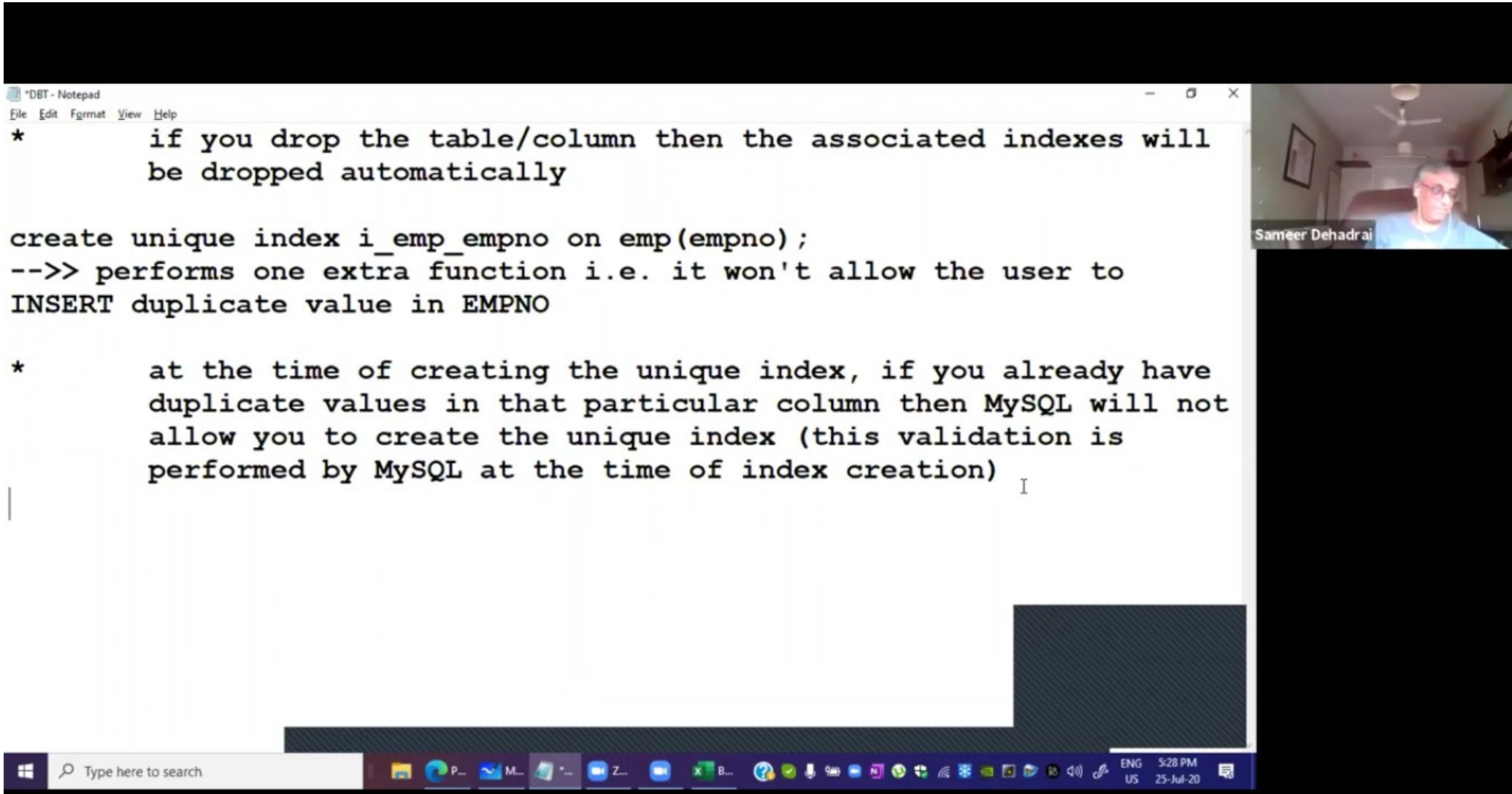
Type here to search
ENG US
5:18 PM 25-Jul-20


*DBT - Notepad
File Edit Format View Help
* if you drop the table/column then the associated indexes will be dropped automatically
create unique index i_emp_empno on emp(empno);
-->> performs one extra function i.e. it won't allow the user to INSERT duplicate value in EMPNO
* at the time of creating the unique index, if you already have duplicate values in that particular column then MySQL will not allow you to create the unique index (this validation is performed by MySQL at the time of index creation)
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ENG US
5:28 PM 25-Jul-20

*DBT - Notepad

File Edit Format View Help

```
*       if you drop the table/column then the associated indexes will
        be dropped automatically

create unique index i_emp_empno on emp(empno);
-->> performs one extra function i.e. it won't allow the user to
INSERT duplicate value in EMPNO

*       at the time of creating the unique index, if you already have
        duplicate values in that particular column then MySQL will not
        allow you to create the unique index (this validation is
        performed by MySQL at the time of index creation)

Types of Indexes:-
1. Normal Index
2. Unique Index
3. Clustered Index
4. Bitmap Index
5. etc.
```

Type here to search

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Constraints(data integrity)

*DBT - Notepad

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PRIMARY KEY (Primary column)

* column or set of columns that uniquely identifies a row
* duplicate values are not allowed (has to be unique)
* null values are not allowed (this is a mandatory column)
* having a Primary key is not compulsory; but it's recommended that every table should have a Primary key
* purpose of Primary key is row uniqueness (with the help of Primary key we can distinguish between 2 rows of a table)
* Text and Blob cannot be Primary key
* unique index is automatically created

COMPOSITE PRIMARY KEY -> combine 2 or more columns together to serve the purpose of Primary key

* in Oracle, you can combine upto 16 columns in a composite Primary key
* in MySQL, you can combine upto 32 columns in a composite Primary key

Type here to search

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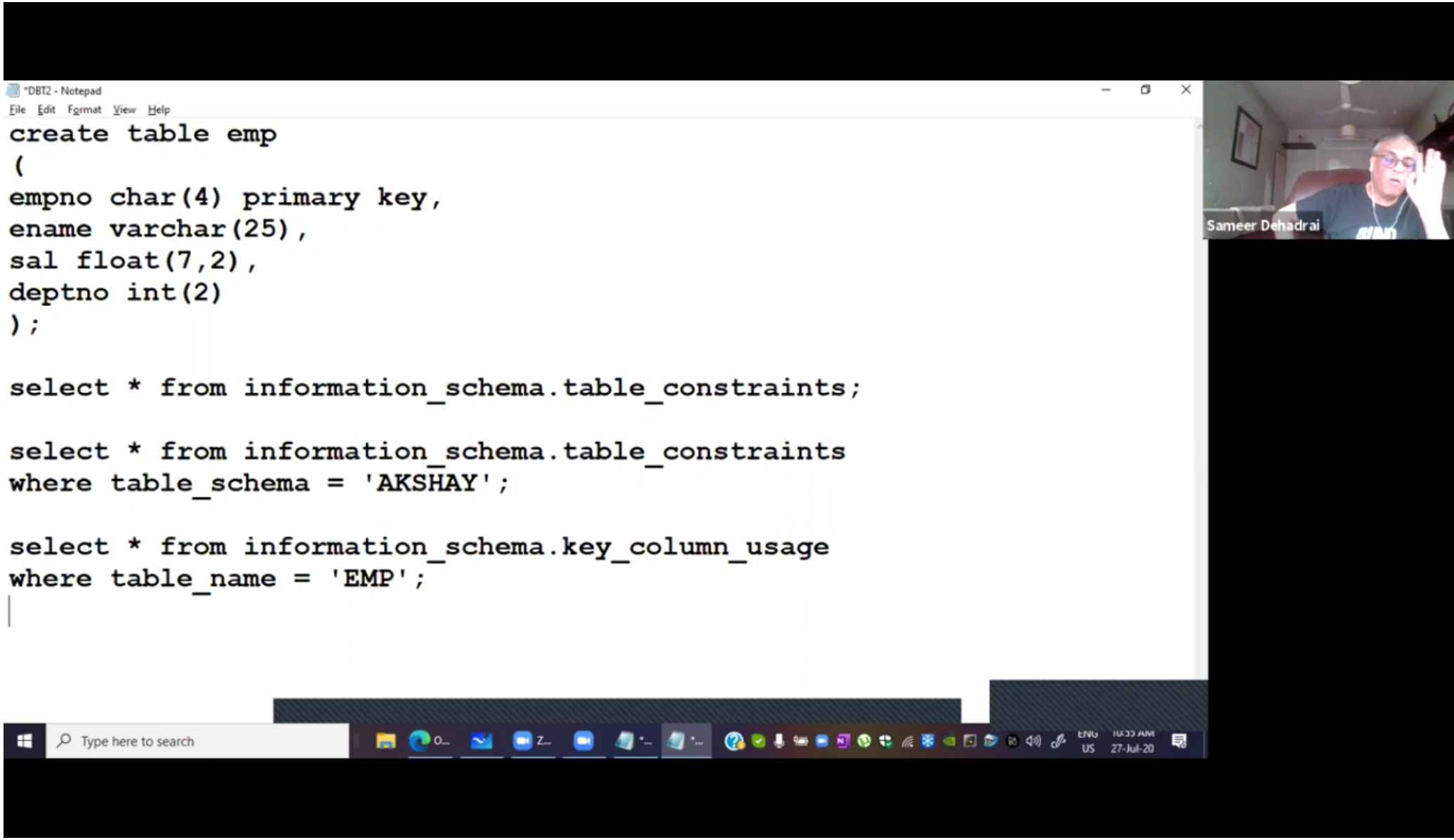
*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2)
);
select * from information_schema.table_constraints;
select * from information_schema.table_constraints
where table_schema = 'AKSHAY';
select * from information_schema.key_column_usage
where table_name = 'EMP';
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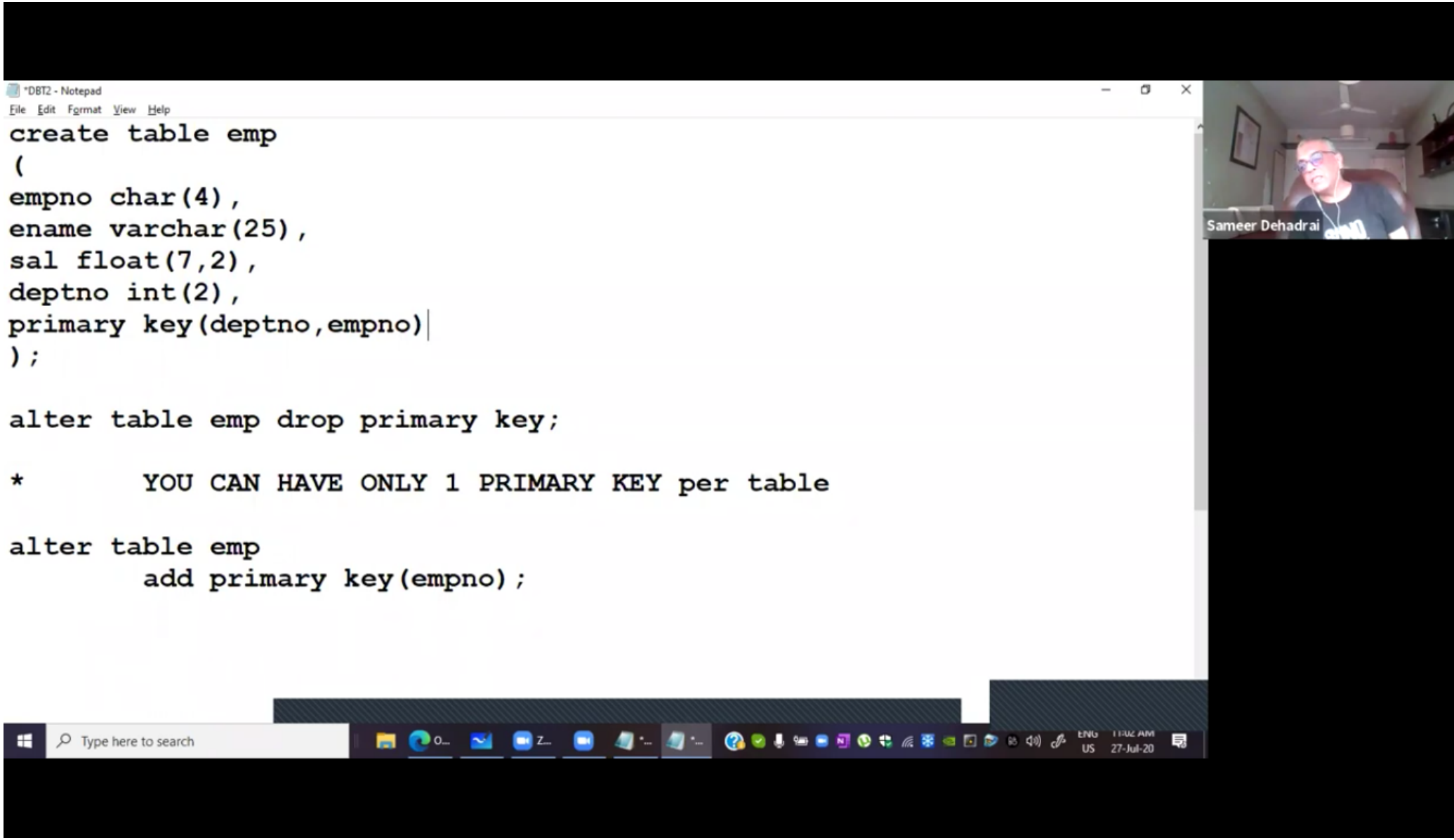
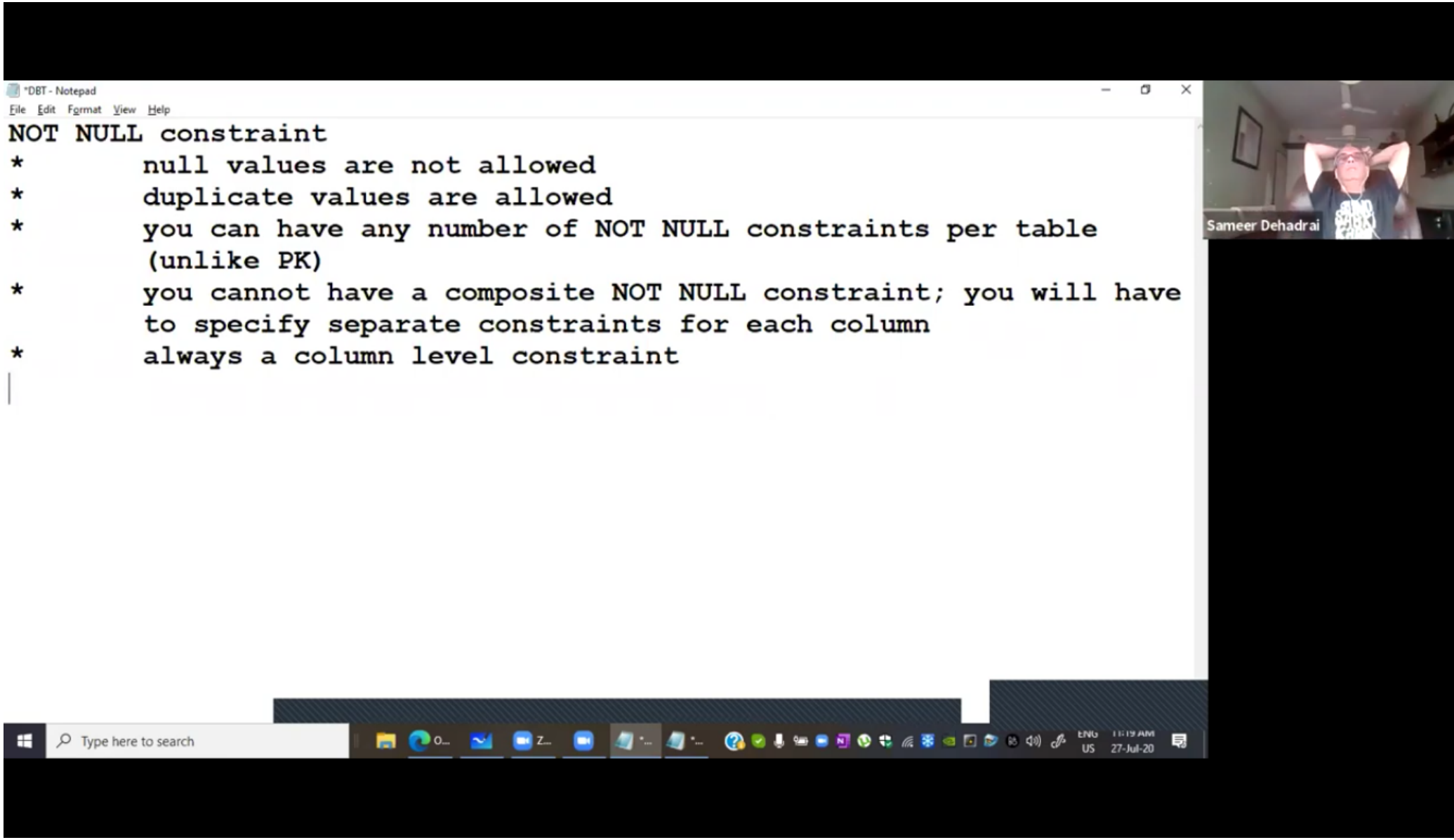
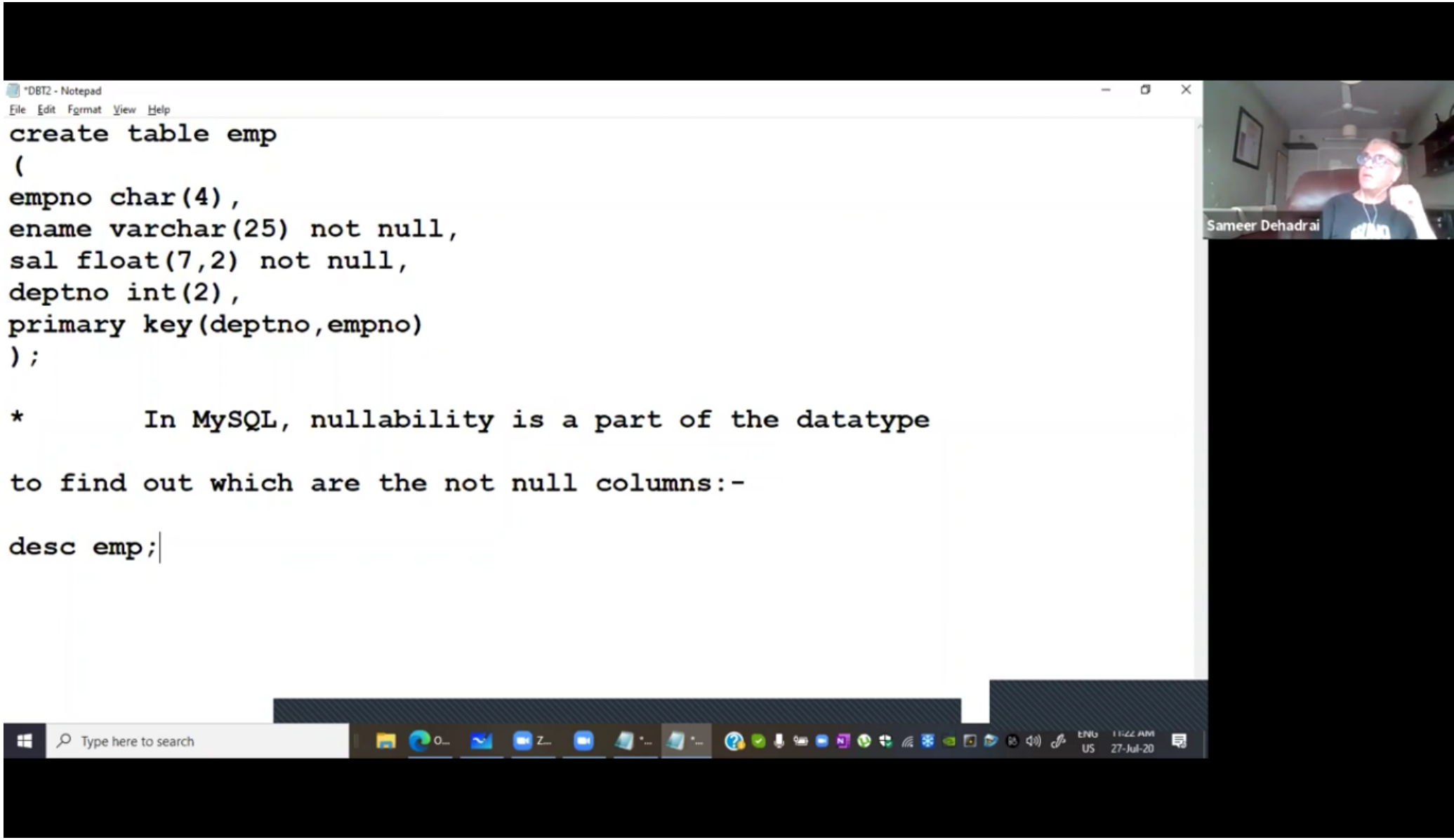
Type here to search
ENG
US
27-Jul-20


*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4),
ename varchar(25),
sal float(7,2),
deptno int(2),
primary key(deptno,empno)
);
alter table emp drop primary key;
* YOU CAN HAVE ONLY 1 PRIMARY KEY per table
alter table emp
add primary key(empno);
Sameer Dehadrai
Type here to search
ENG
US
27-Jul-20


*DBT - Notepad
File Edit Format View Help
NOT NULL constraint
* null values are not allowed
* duplicate values are allowed
* you can have any number of NOT NULL constraints per table (unlike PK)
* you cannot have a composite NOT NULL constraint; you will have to specify separate constraints for each column
* always a column level constraint
Sameer Dehadrai
Type here to search
ENG US
27-Jul-20


*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4),
ename varchar(25) not null,
sal float(7,2) not null,
deptno int(2),
primary key(deptno,empno)
);
* In MySQL, nullability is a part of the datatype
to find out which are the not null columns:-
desc emp;
Sameer Dehadrai
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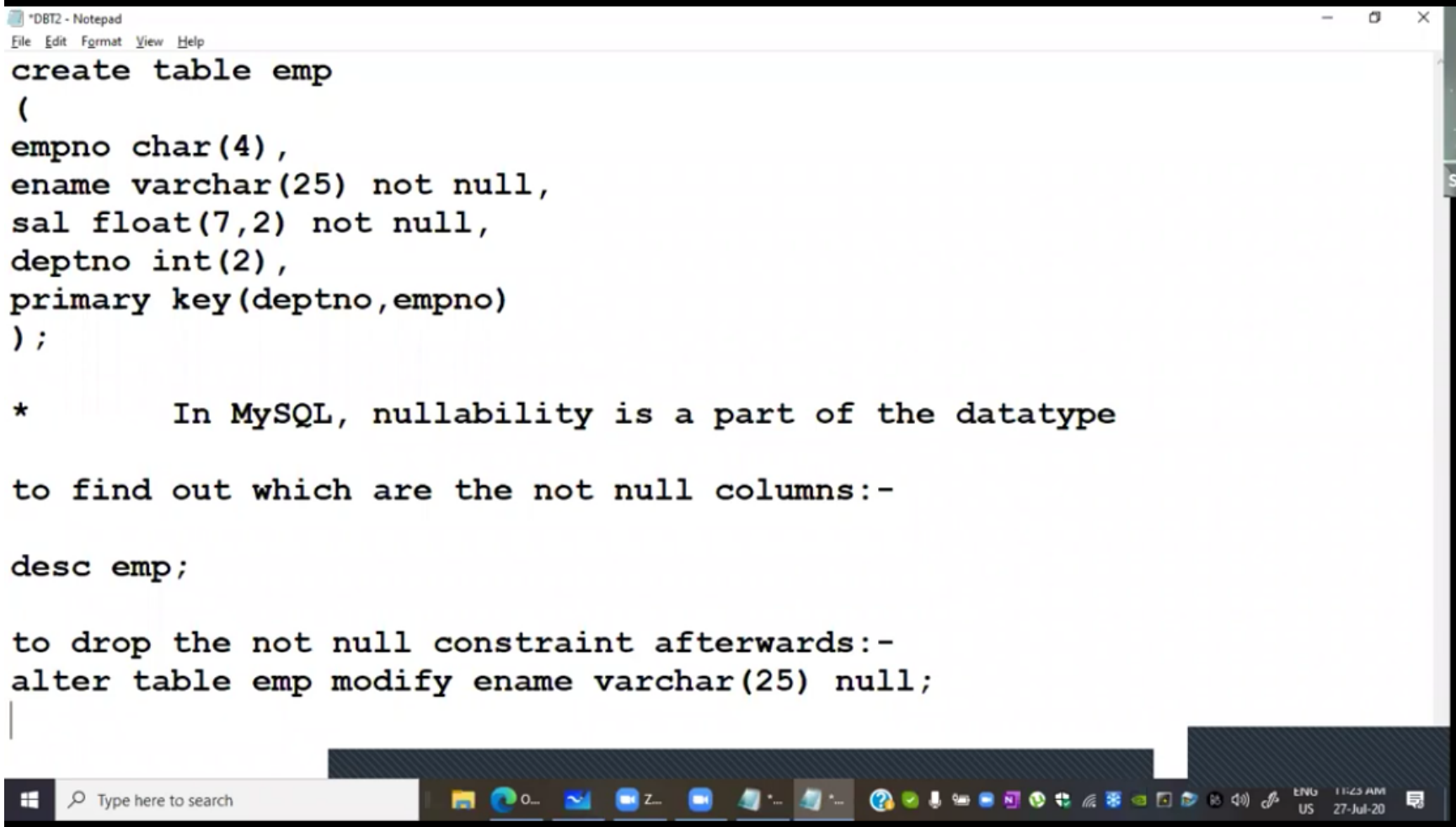
*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4),
ename varchar(25) not null,
sal float(7,2) not null,
deptno int(2),
primary key(deptno,empno)
);
* In MySQL, nullability is a part of the datatype
to find out which are the not null columns:-
desc emp;
to drop the not null constraint afterwards:-
alter table emp modify ename varchar(25) null;
Type here to search
ENG
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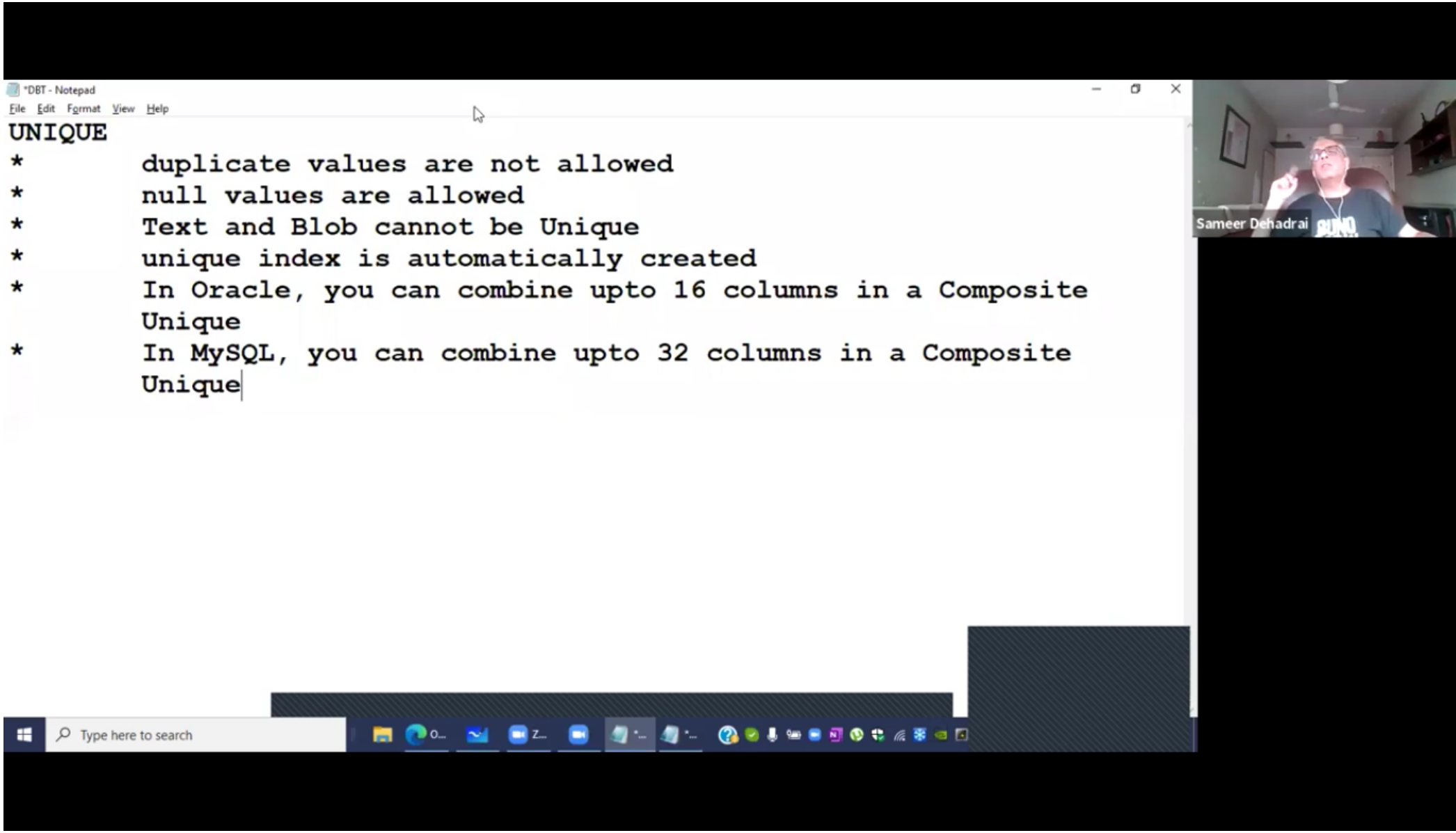
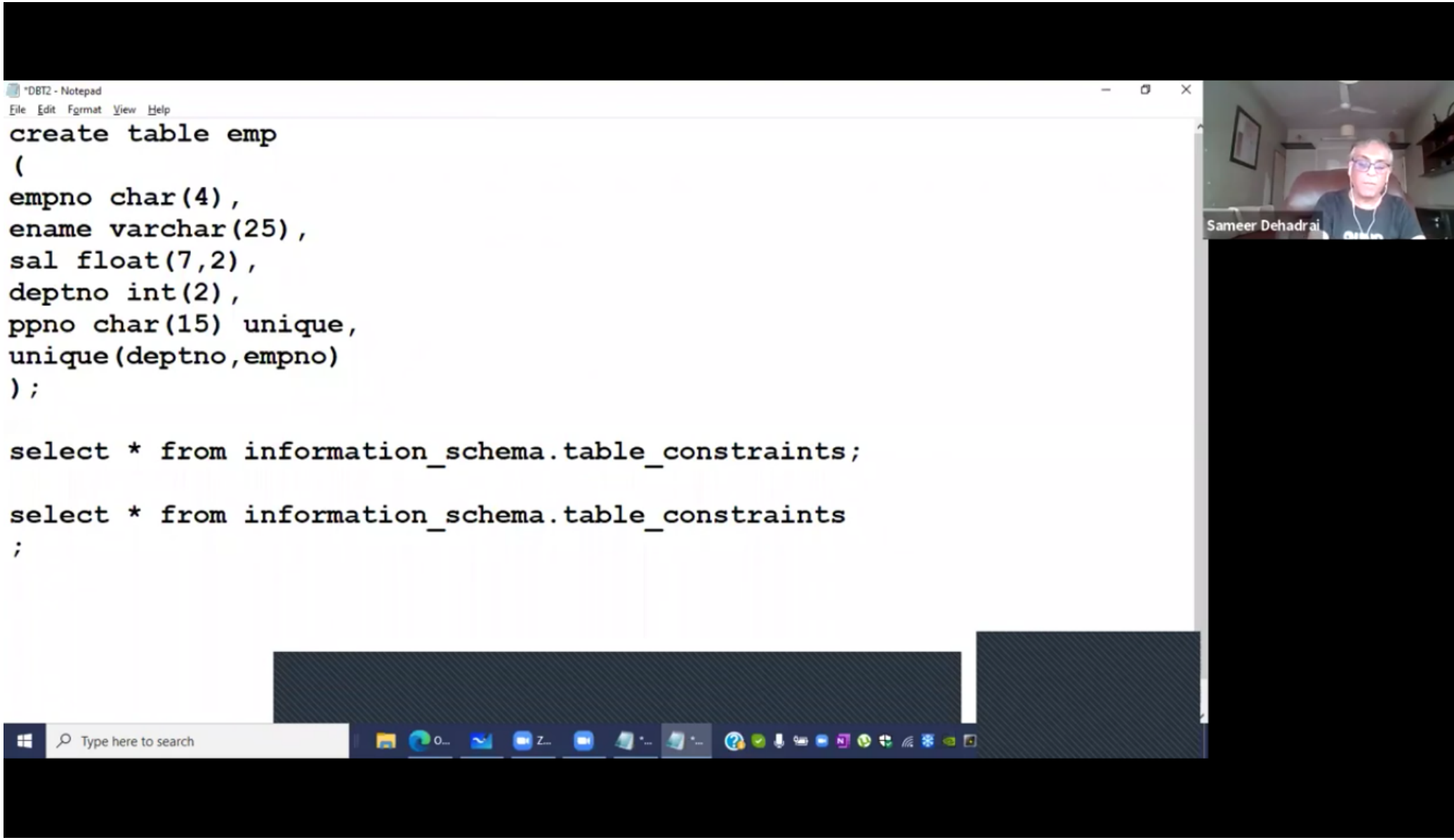
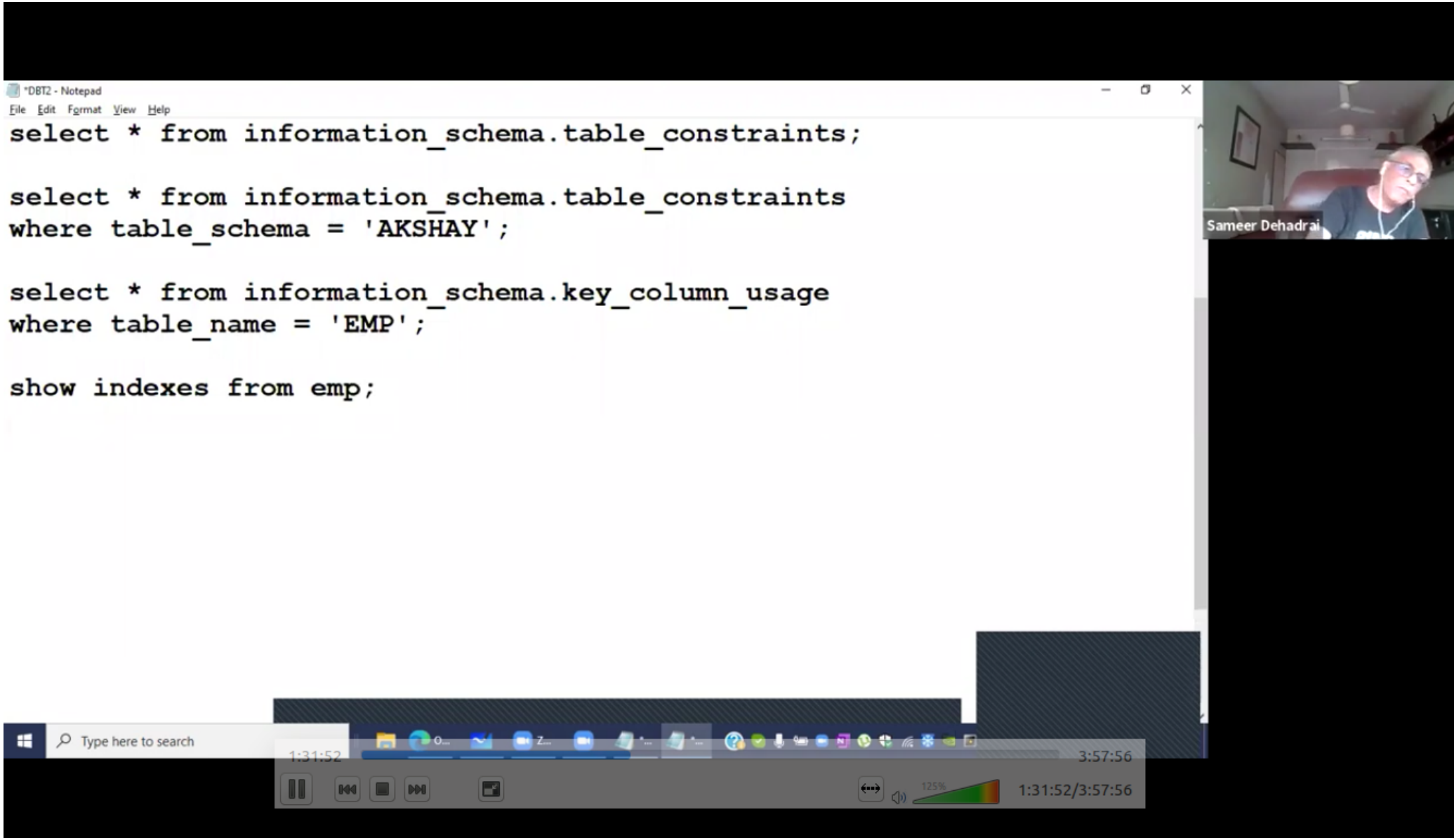
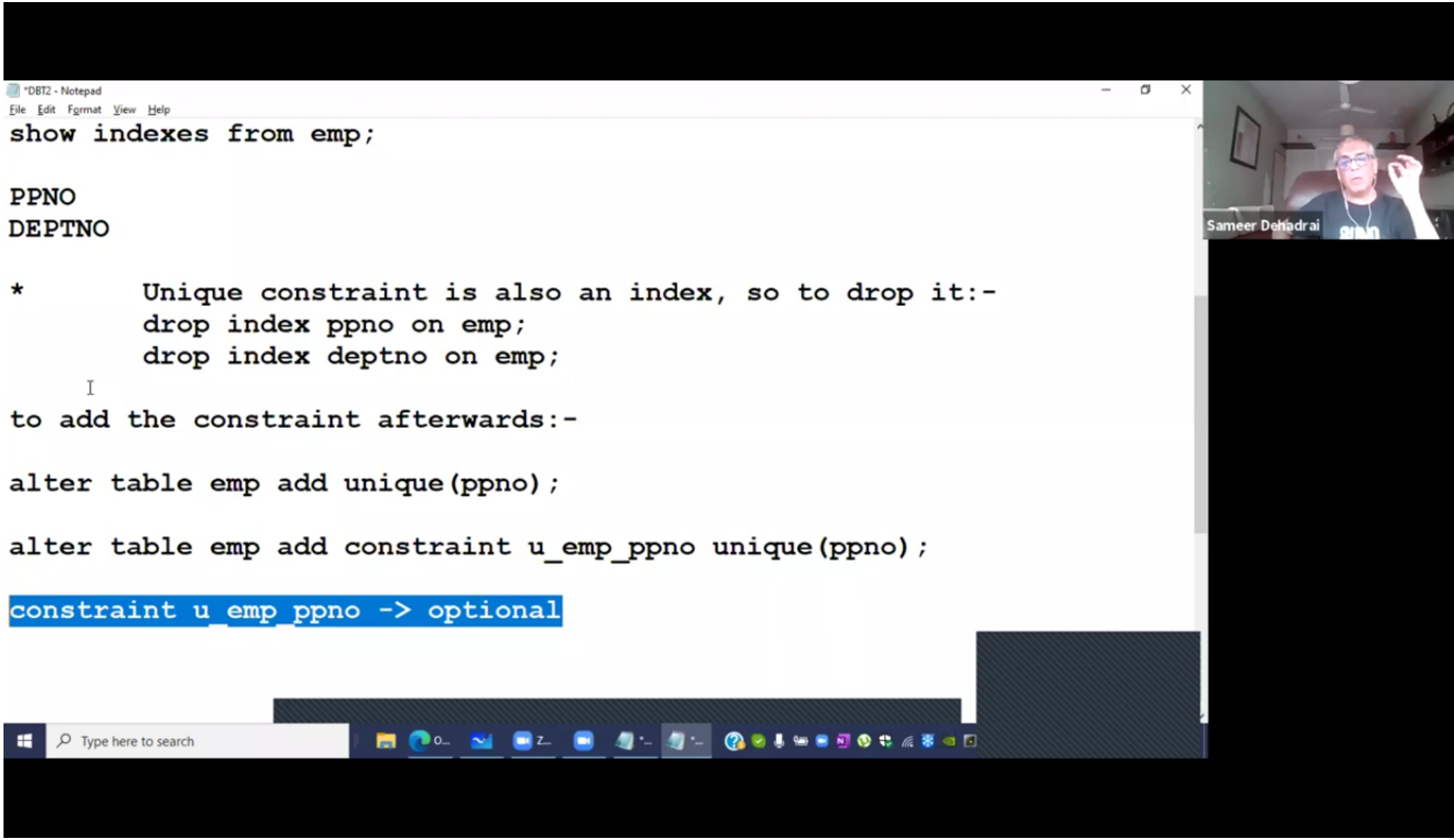
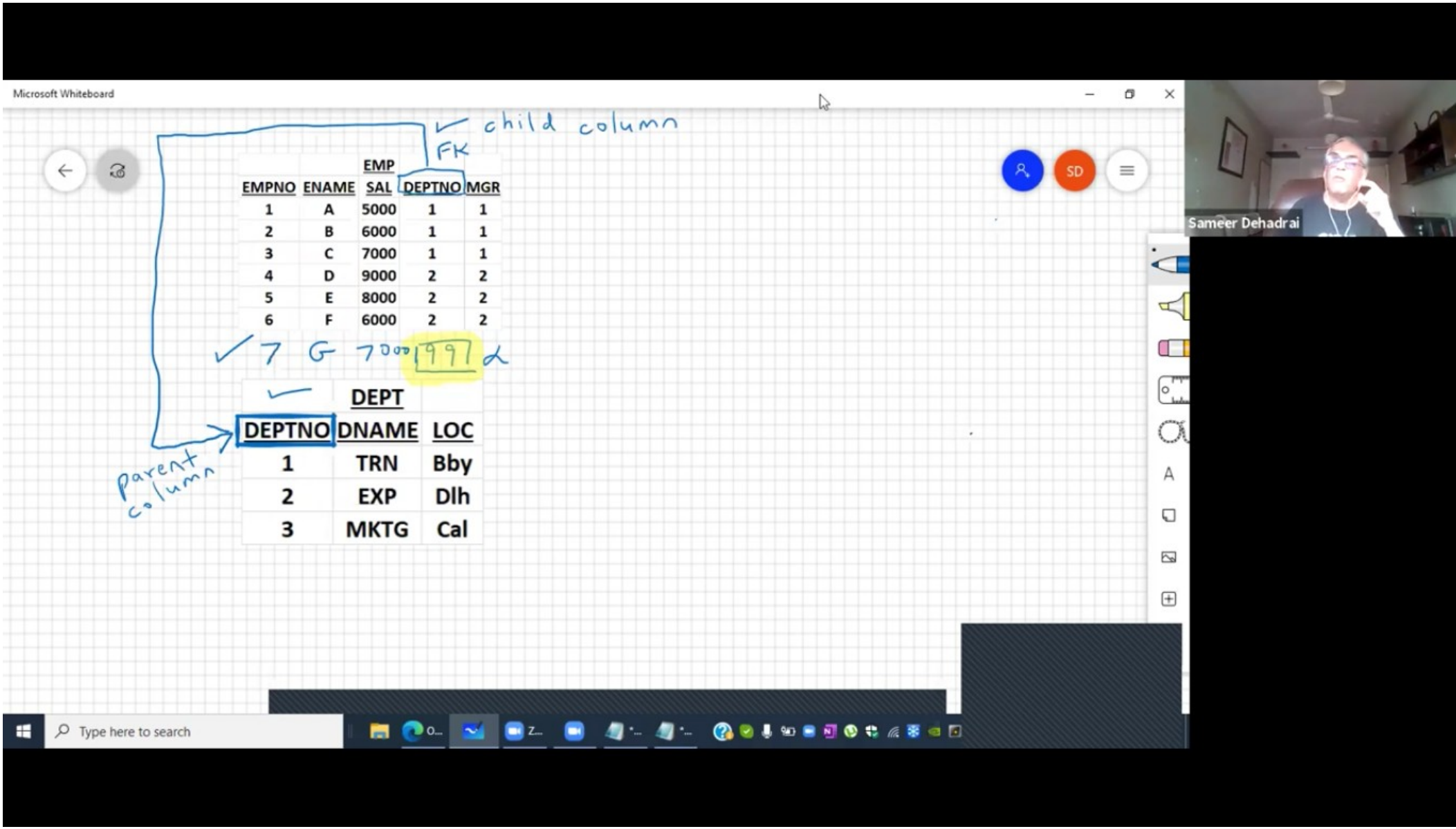

*DBT - Notepad
File Edit Format View Help
UNIQUE
* duplicate values are not allowed
* null values are allowed
* Text and Blob cannot be Unique
* unique index is automatically created
* In Oracle, you can combine upto 16 columns in a Composite Unique
* In MySQL, you can combine upto 32 columns in a Composite Unique
Sameer Dehadrai
Type here to search

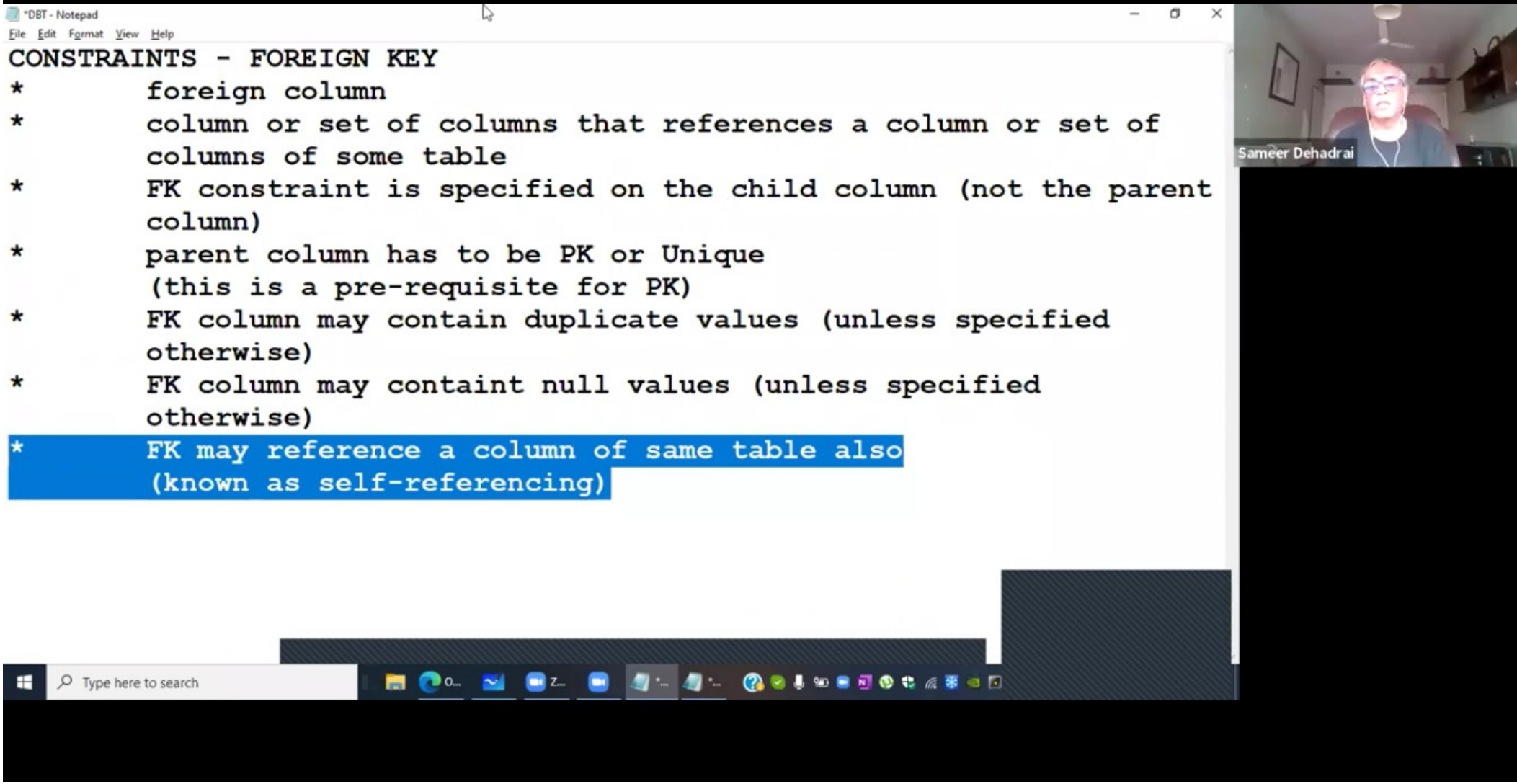

*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4),
ename varchar(25),
sal float(7,2),
deptno int(2),
ppno char(15) unique,
unique(deptno,empno)
);
select * from information_schema.table_constraints;
select * from information_schema.table_constraints
;
Sameer Dehadrai
Type here to search

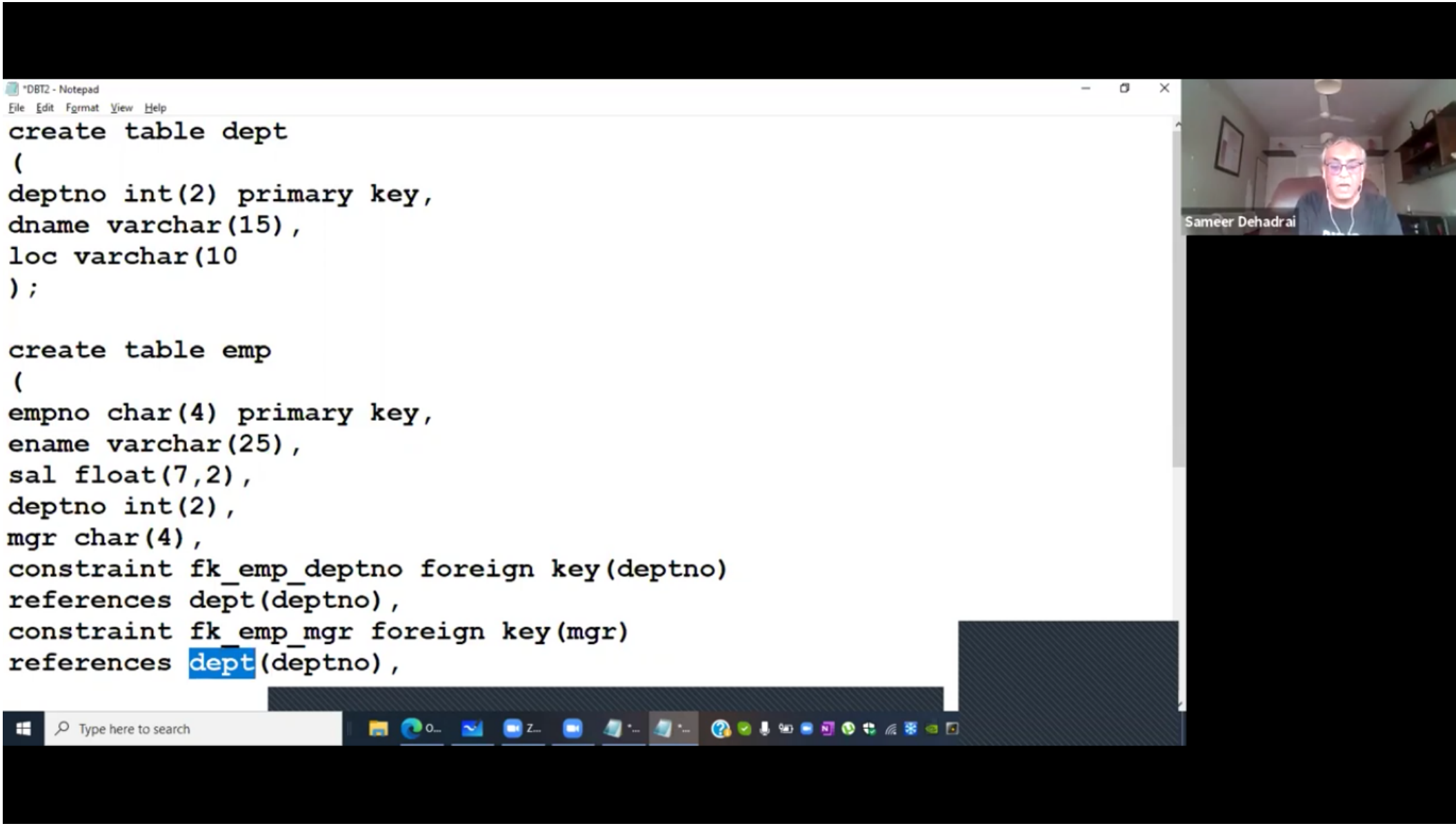

*DBT2 - Notepad
File Edit Format View Help
select * from information_schema.table_constraints;
select * from information_schema.table_constraints
where table_schema = 'AKSHAY';
select * from information_schema.key_column_usage
where table_name = 'EMP';
show indexes from emp;
Sameer Dehadrai
Type here to search
1:31:52
3:57:56
125%
1:31:52/3:57:56

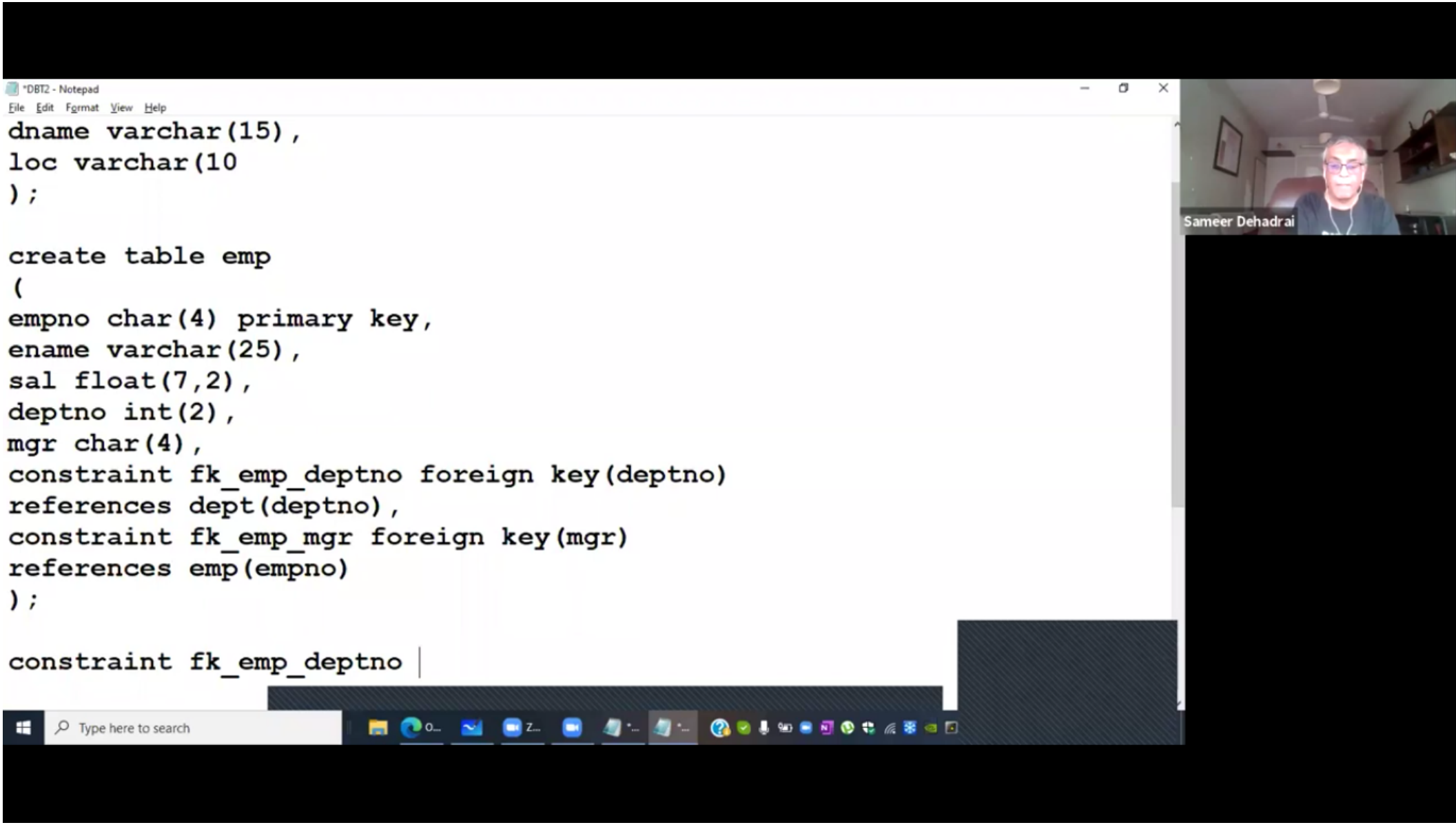

*DBT2 - Notepad
File Edit Format View Help
show indexes from emp;
PPNO
DEPTNO
* Unique constraint is also an index, so to drop it:-
drop index ppno on emp;
drop index deptno on emp;
to add the constraint afterwards:-
alter table emp add unique(ppno);
alter table emp add constraint u_emp_ppno unique(ppno);
constraint u_emp_ppno -> optional
Type here to search
Sameer Dehadrai

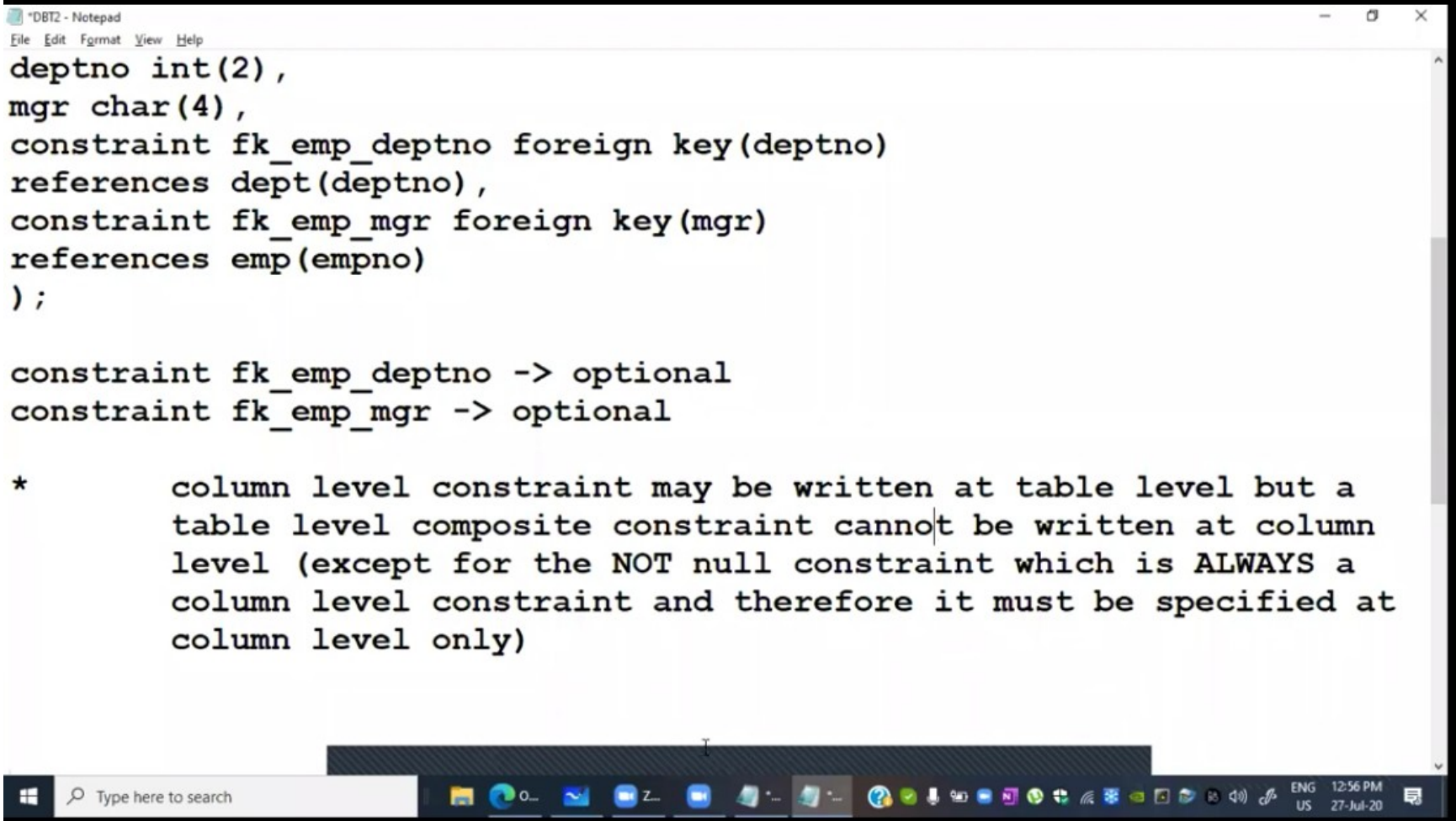
Foreign key

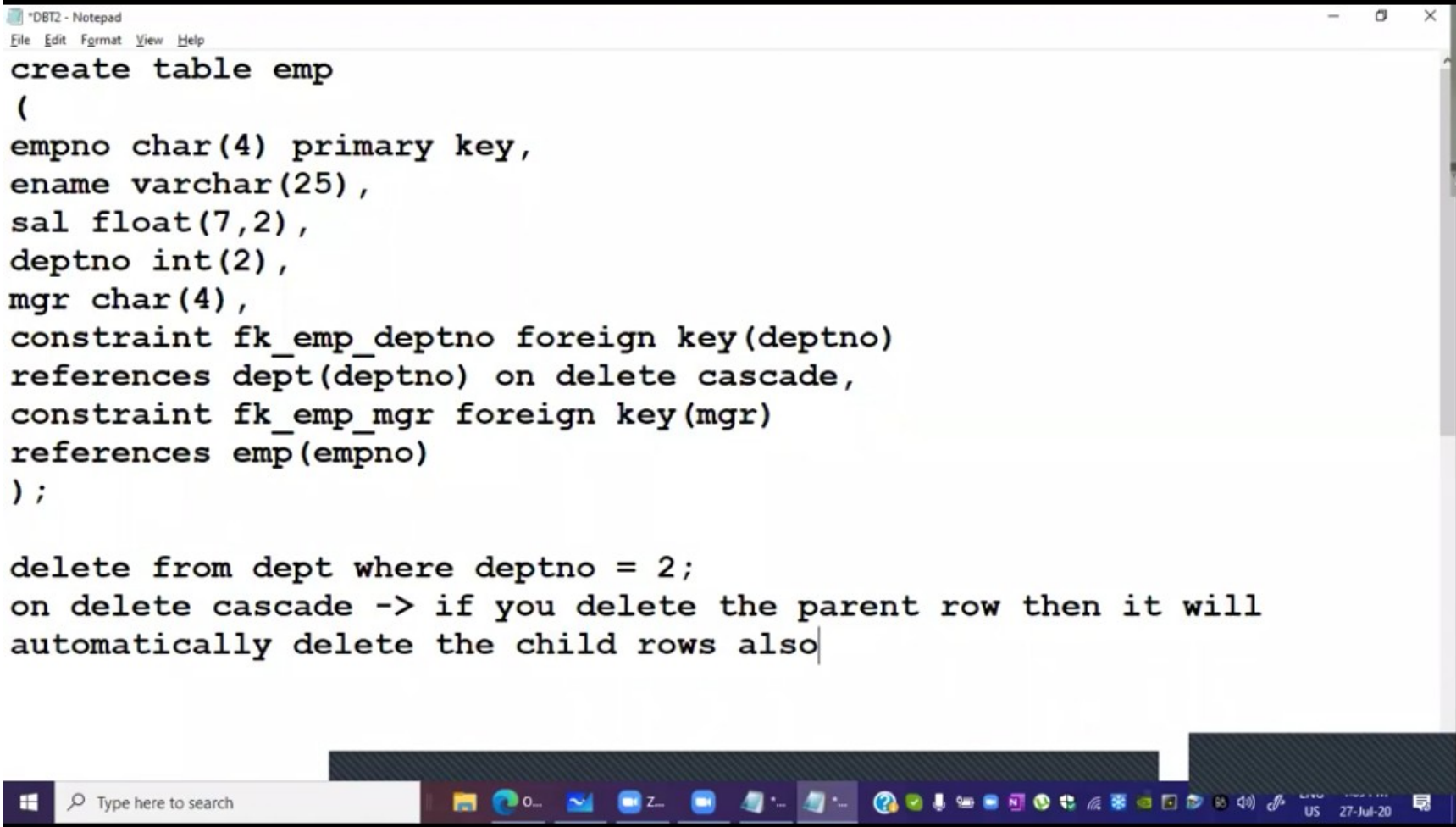

Microsoft Whiteboard
child column
FK
EMP
EMPNO ENAME SAL DEPTNO MGR
1 A 5000 1 1
2 B 6000 1 1
3 C 7000 1 1
4 D 9000 2 2
5 E 8000 2 2
6 F 6000 2 2
7 G 7000 1997 2
DEPT
DEPTNO DNAME LOC
1 TRN Bby
2 EXP Dlh
3 MKTG Cal
Parent column
Sameer Dehadrai
SD
Type here to search


*DBT - Notepad
File Edit Format View Help
CONSTRAINTS - FOREIGN KEY
* foreign column
* column or set of columns that references a column or set of columns of some table
* FK constraint is specified on the child column (not the parent column)
* parent column has to be PK or Unique (this is a pre-requisite for PK)
* FK column may contain duplicate values (unless specified otherwise)
* FK column may contaiint null values (unless specified otherwise)
* FK may reference a column of same table also (known as self-referencing)
Sameer Dehadrai
Type here to search


*DBT2 - Notepad
File Edit Format View Help
create table dept
(
deptno int(2) primary key,
dname varchar(15),
loc varchar(10
);
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno),
constraint fk_emp_mgr foreign key(mgr)
references dept(deptno),
Sameer Dehadrai
Type here to search


*DBT2 - Notepad
File Edit Format View Help
dname varchar(15),
loc varchar(10
);
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno),
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);
constraint fk_emp_deptno
Sameer Dehadrai
Type here to search


*DBT2 - Notepad
File Edit Format View Help
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno),
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);
constraint fk_emp_deptno -> optional
constraint fk_emp_mgr -> optional
* column level constraint may be written at table level but a table level composite constraint cannot be written at column level (except for the NOT null constraint which is ALWAYS a column level constraint and therefore it must be specified at column level only)
Type here to search
ENG US
12:56 PM 27-Jul-20


*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno) on delete cascade,
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);
delete from dept where deptno = 2;
on delete cascade -> if you delete the parent row then it will
automatically delete the child rows also
Type here to search
US
27-Jul-20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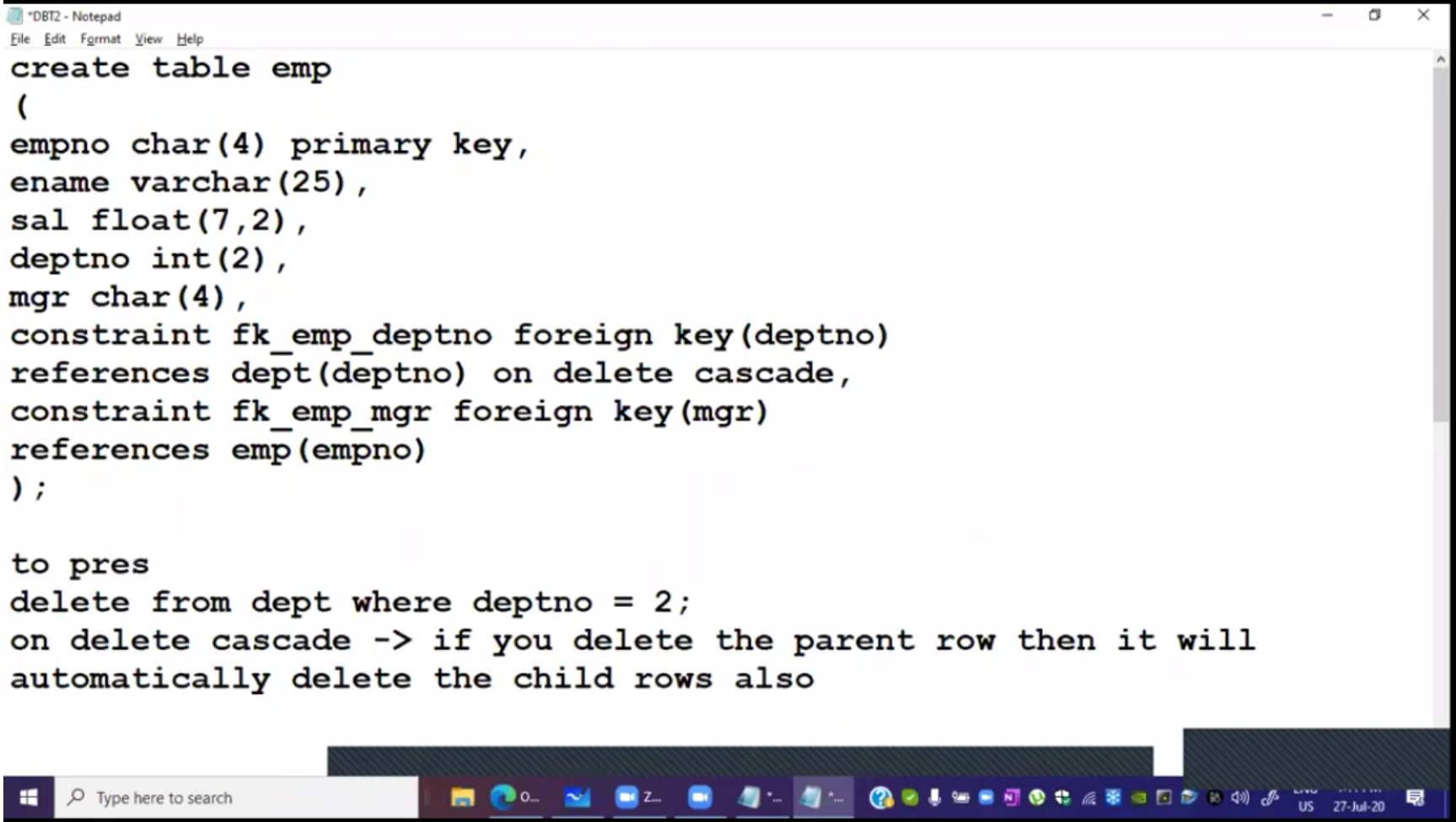
*DBT2 - Notepad
File Edit Format View Help
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno) on delete cascade,
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);
to pres
delete from dept where deptno = 2;
on delete cascade -> if you delete the parent row then it will
automatically delete the child rows also
Type here to search
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*DBT2 - Notepad

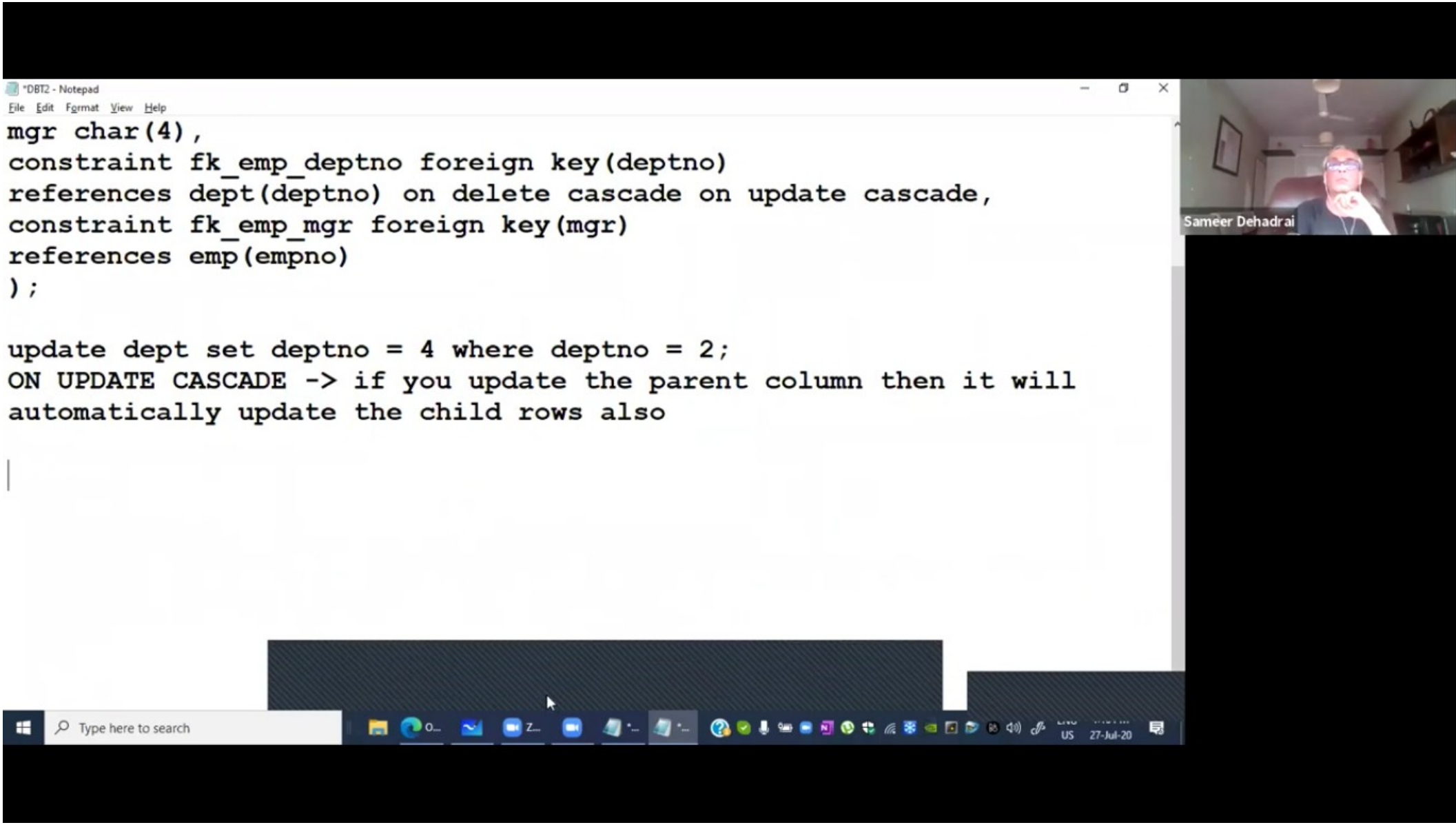
File Edit Format View Help

```
create table emp
(
empno char(4) primary key,
ename varchar(25),
sal float(7,2),
deptno int(2),
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno) on delete cascade,
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);

to preserve the child rows:-
update emp set deptno = null where deptno = 2;
delete from dept where deptno = 2;
```

Type here to search

US 27-Jul-20


*DBT2 - Notepad
File Edit Format View Help
mgr char(4),
constraint fk_emp_deptno foreign key(deptno)
references dept(deptno) on delete cascade on update cascade,
constraint fk_emp_mgr foreign key(mgr)
references emp(empno)
);
update dept set deptno = 4 where deptno = 2;
ON UPDATE CASCADE -> if you update the parent column then it will
automatically update the child rows also
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Type here to search
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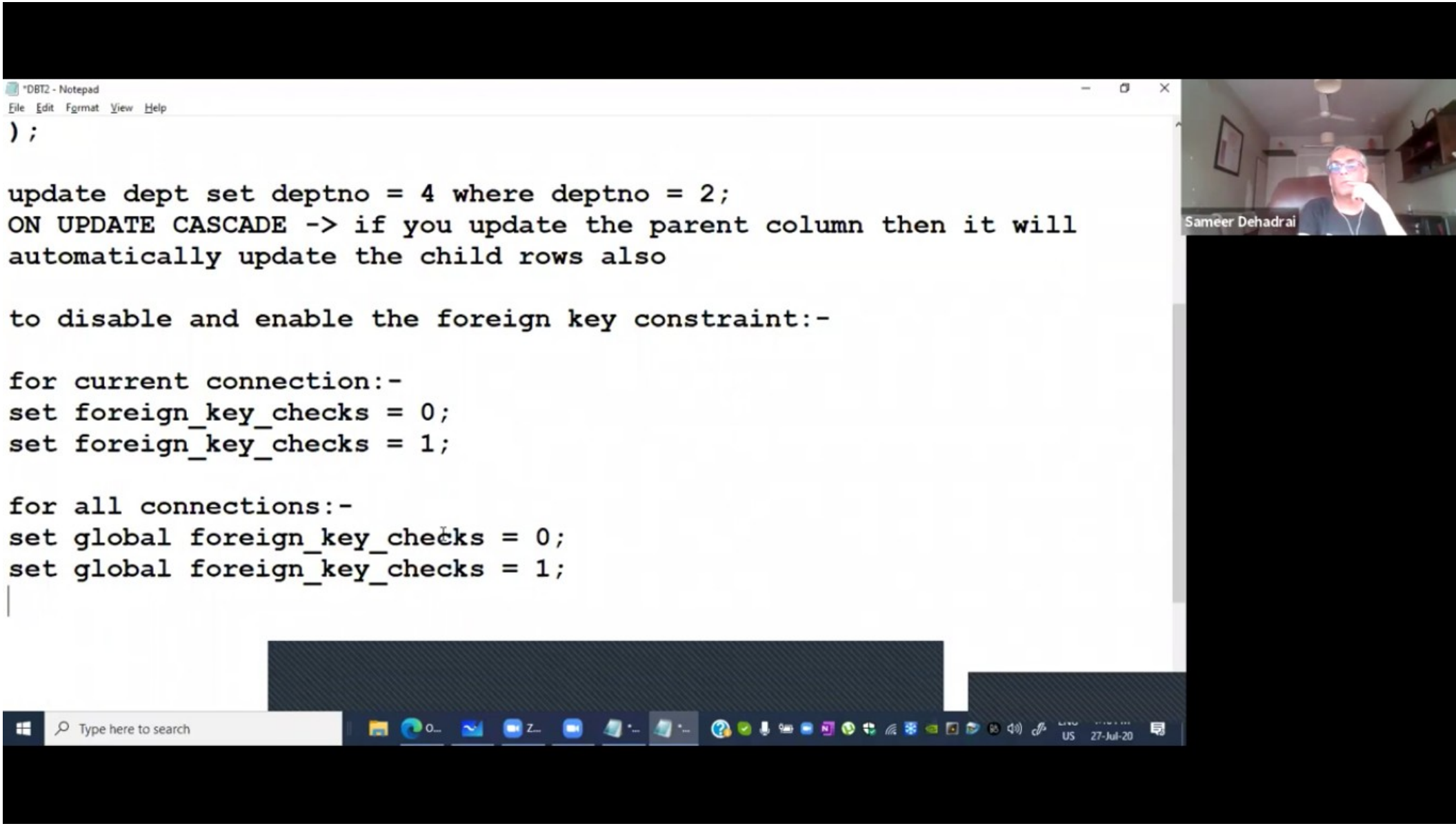
*DBT2 - Notepad
File Edit Format View Help
);
update dept set deptno = 4 where deptno = 2;
ON UPDATE CASCADE -> if you update the parent column then it will
automatically update the child rows also
to disable and enable the foreign key constraint:-
for current connection:-
set foreign_key_checks = 0;
set foreign_key_checks = 1;
for all connections:-
set global foreign_key_checks = 0;
set global foreign_key_checks = 1;
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Type here to search
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Microsoft Whiteboard

Relational Operators

Logical "

Arithmetic "

Special "

eg Between, IN, like, etc.

Can even call

Single Row functions

T → Temporary

P → Permanent

R → Retired

Type here to search

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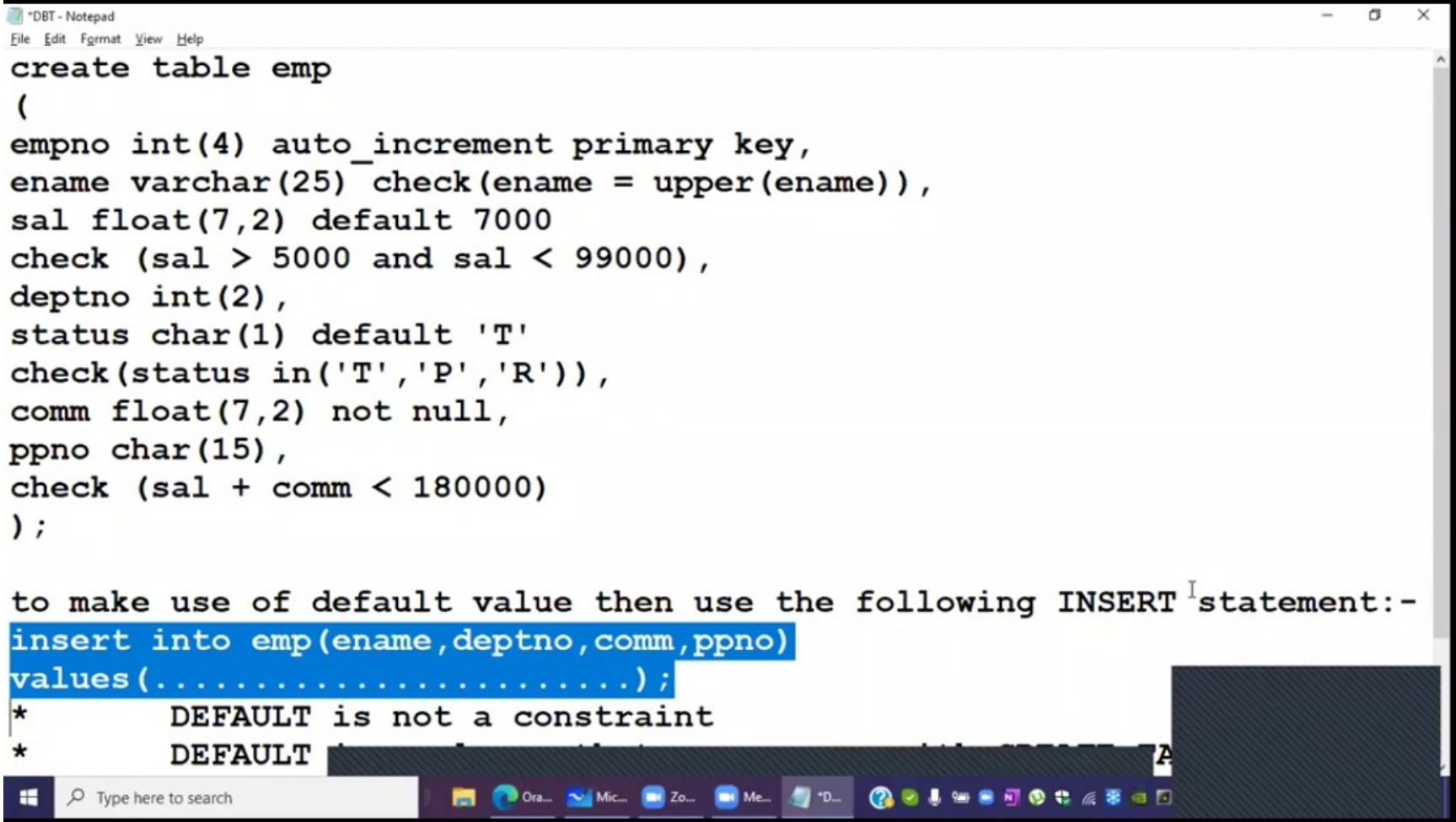
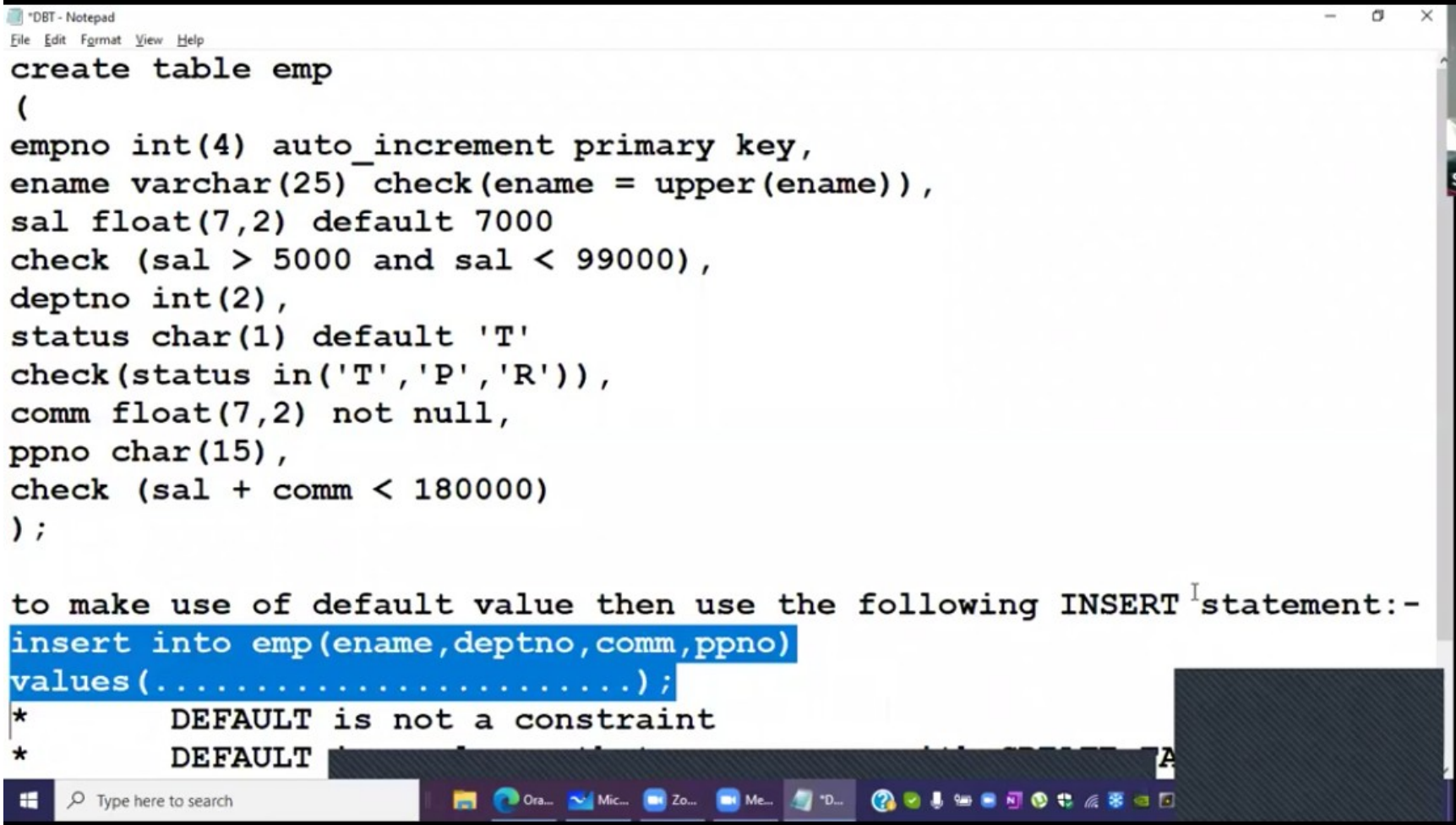

*DBT - Notepad
File Edit Format View Help
create table emp
(
empno int(4) auto_increment primary key,
ename varchar(25) check(ename = upper(ename)),
sal float(7,2) default 7000
check (sal > 5000 and sal < 99000),
deptno int(2),
status char(1) default 'T'
check(status in('T','P','R')),
comm float(7,2) not null,
ppno char(15),
check (sal + comm < 180000)
);
to make use of default value then use the following INSERT statement:-
insert into emp(ename,deptno,comm,ppno)
values(.....);
* DEFAULT is not a constraint
* DEFAULT
Type here to search


*DBT - Notepad
File Edit Format View Help
create table emp
(
empno int(4) auto_increment primary key,
ename varchar(25) check(ename = upper(ename)),
sal float(7,2) default 7000
check (sal > 5000 and sal < 99000),
deptno int(2),
status char(1) default 'T'
check(status in('T','P','R')),
comm float(7,2) not null,
ppno char(15),
check (sal + comm < 180000)
);
to make use of default value then use the following INSERT statement:-
insert into emp(ename,deptno,comm,ppno)
values(.....);
* DEFAULT is not a constraint
* DEFAULT
Type here to search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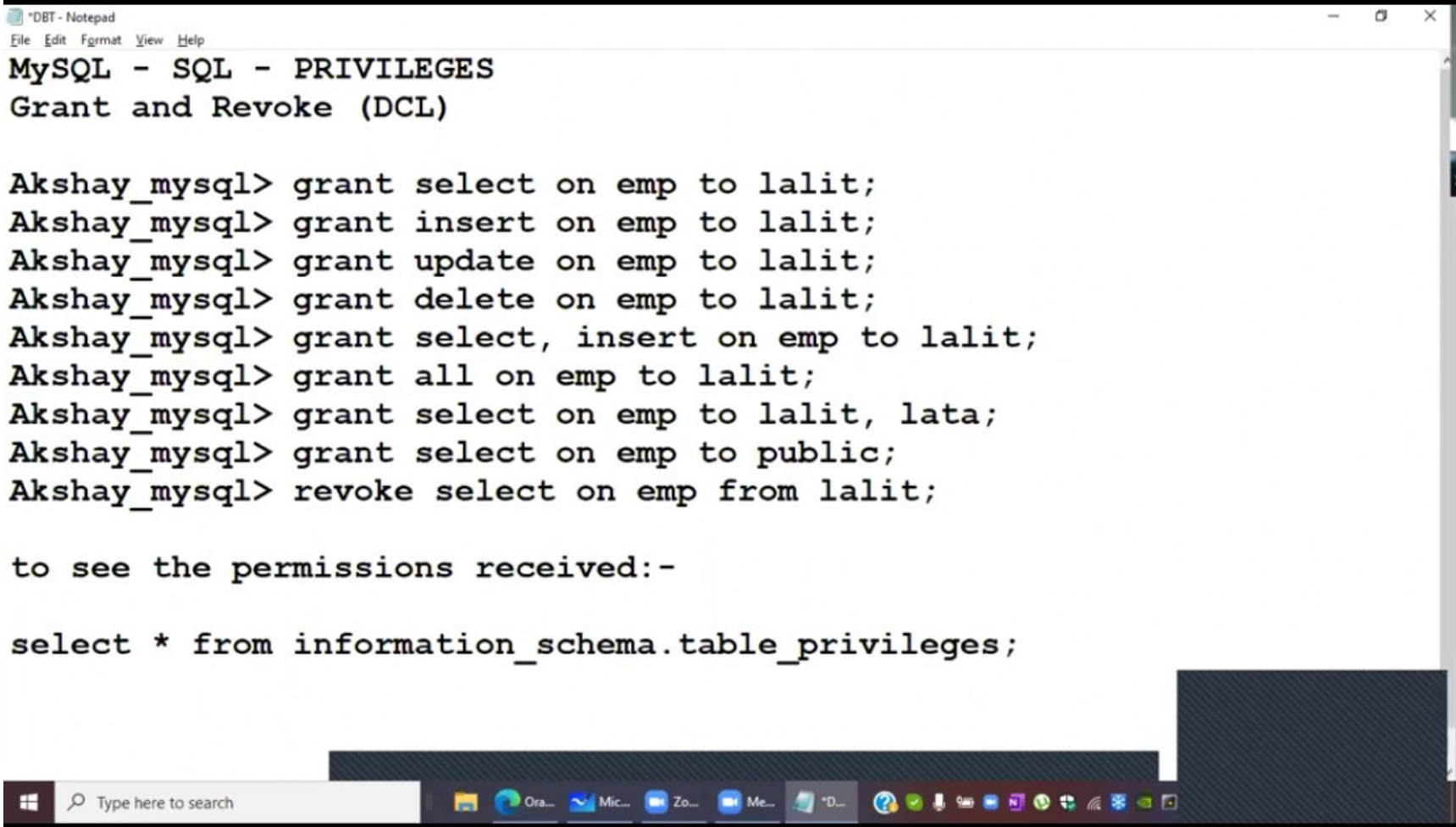
Privileges grant and revoke DCL


*DBT - Notepad
File Edit Format View Help
MySQL - SQL - PRIVILEGES
Grant and Revoke (DCL)
Akshay_mysql> grant select on emp to lalit;
Akshay_mysql> grant insert on emp to lalit;
Akshay_mysql> grant update on emp to lalit;
Akshay_mysql> grant delete on emp to lalit;
Akshay_mysql> grant select, insert on emp to lalit;
Akshay_mysql> grant all on emp to lalit;
Akshay_mysql> grant select on emp to lalit, lata;
Akshay_mysql> grant select on emp to public;
Akshay_mysql> revoke select on emp from lalit;
to see the permissions received:-
select * from information_schema.table_privileges;
Type here to search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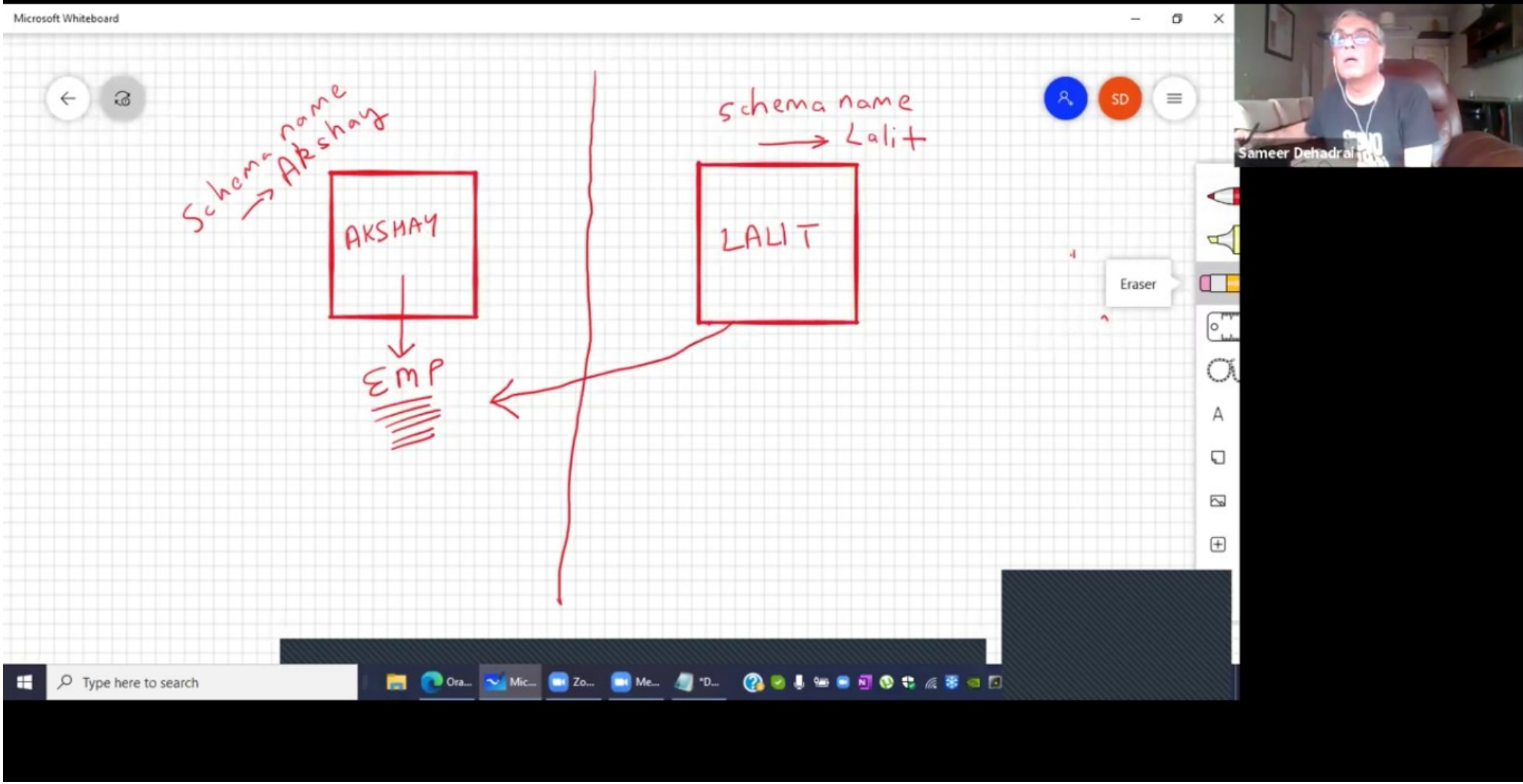
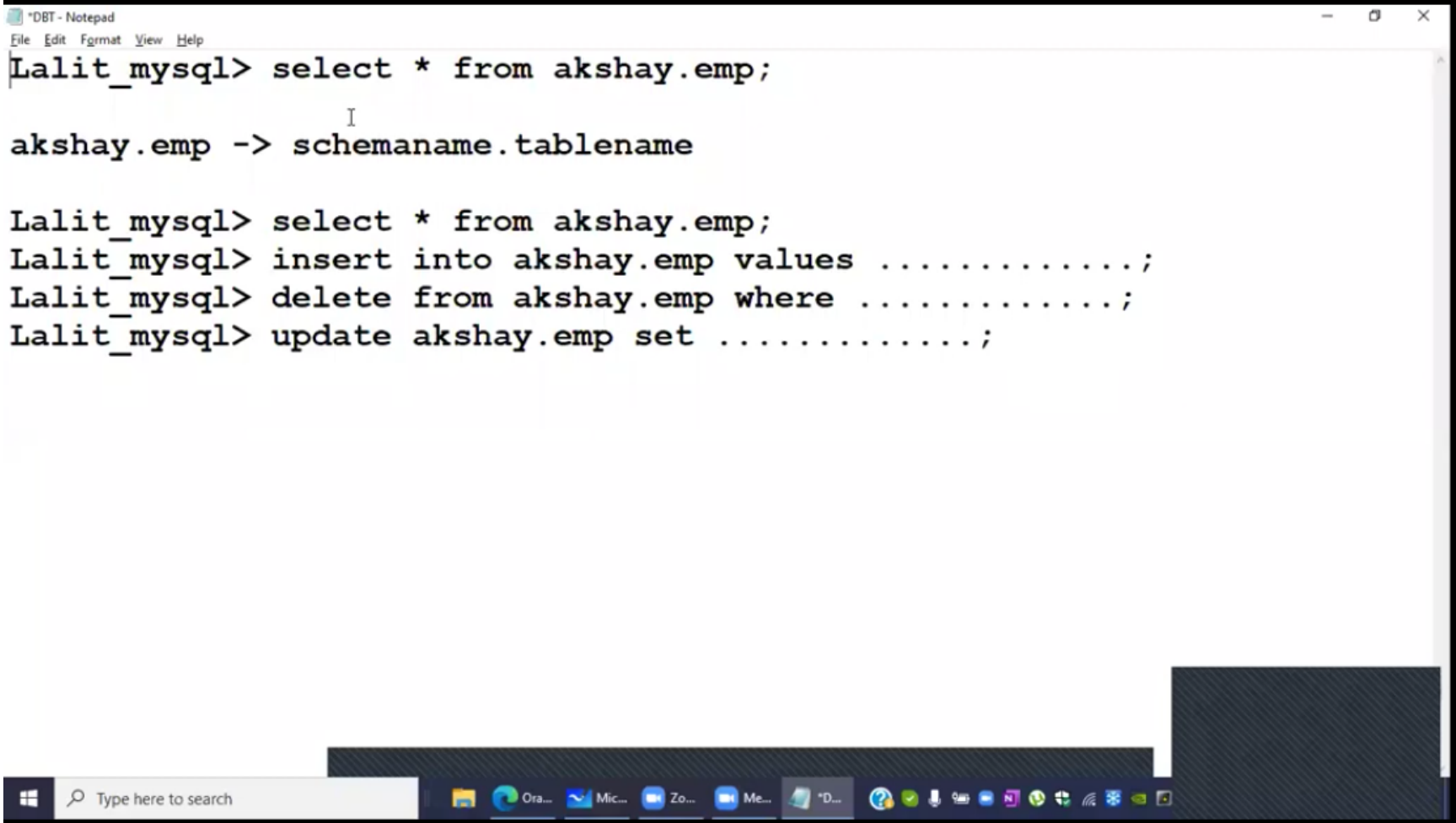
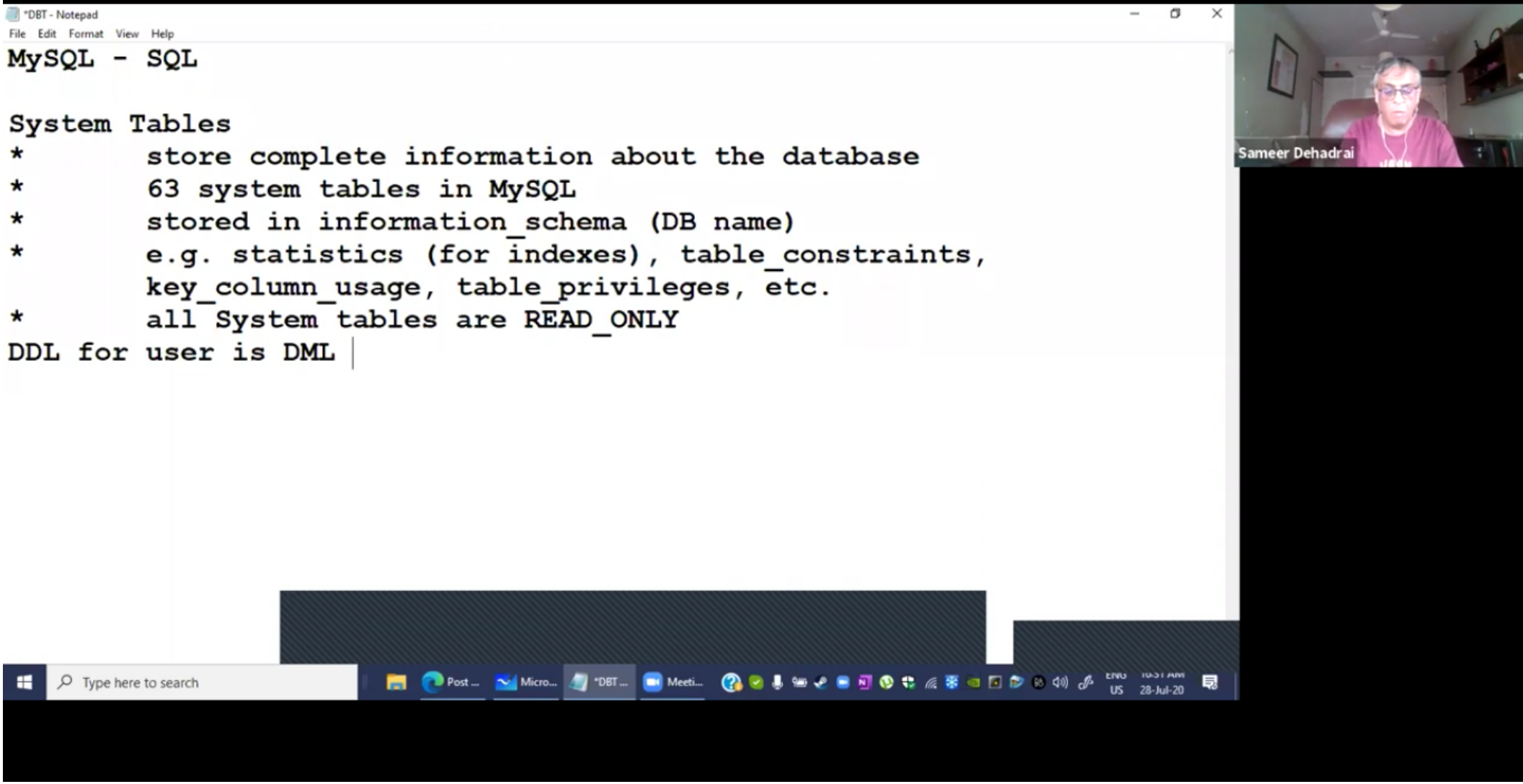
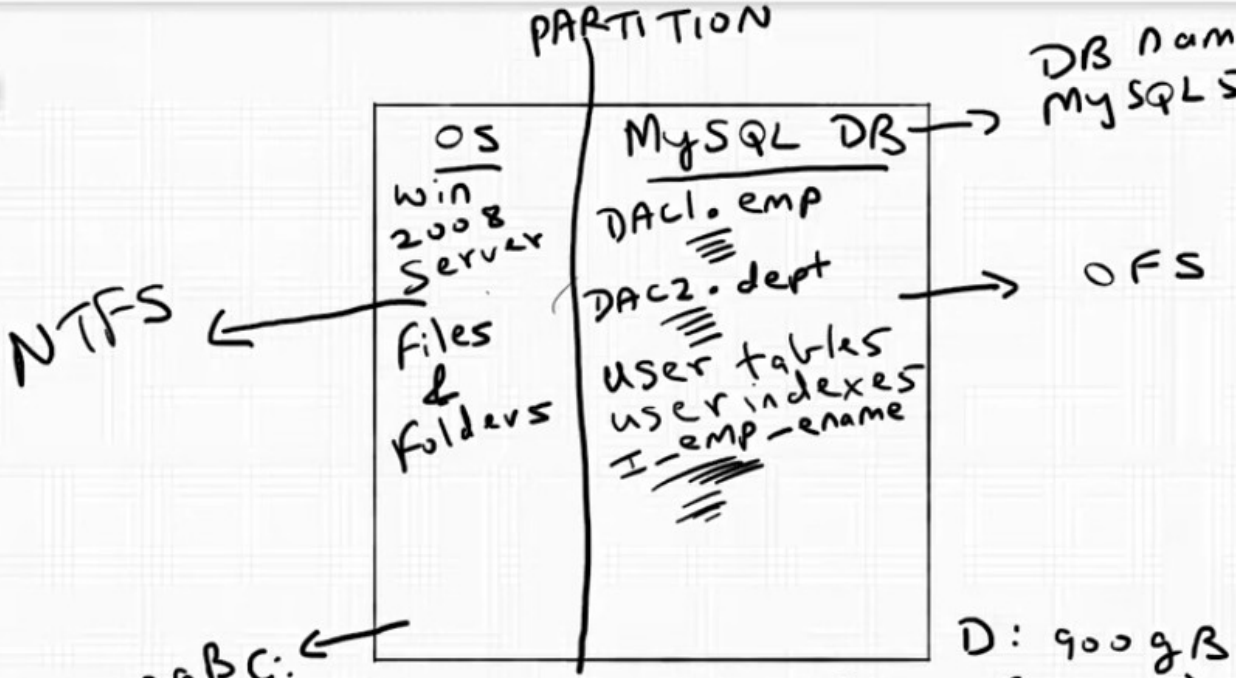

Microsoft Whiteboard
Schema name → Akshay
AKSHAY
EMP
schema name → Lalit
LALIT
SD
Eraser
Sameer Dehadrai
Type here to search


*DBT - Notepad
File Edit Format View Help
Lalit_mysql> select * from akshay.emp;
akshay.emp -> schemaname.tablename
Lalit_mysql> select * from akshay.emp;
Lalit_mysql> insert into akshay.emp values ....;
Lalit_mysql> delete from akshay.emp where ....;
Lalit_mysql> update akshay.emp set ....;
Type here to search


*DBT - Notepad
File Edit Format View Help
MySQL - SQL
System Tables
* store complete information about the database
* 63 system tables in MySQL
* stored in information_schema (DB name)
* e.g. statistics (for indexes), table_constraints,
key_column_usage, table_privileges, etc.
* all System tables are READ_ONLY
DDL for user is DML
Sameer Dehadrai
Type here to search
Post ...
Micro...
*DBT ...
Meeti...
ENG
US
28-Jul-20



*DBT - Notepad

File Edit Format View Help

MySQL - STORED OBJECTS

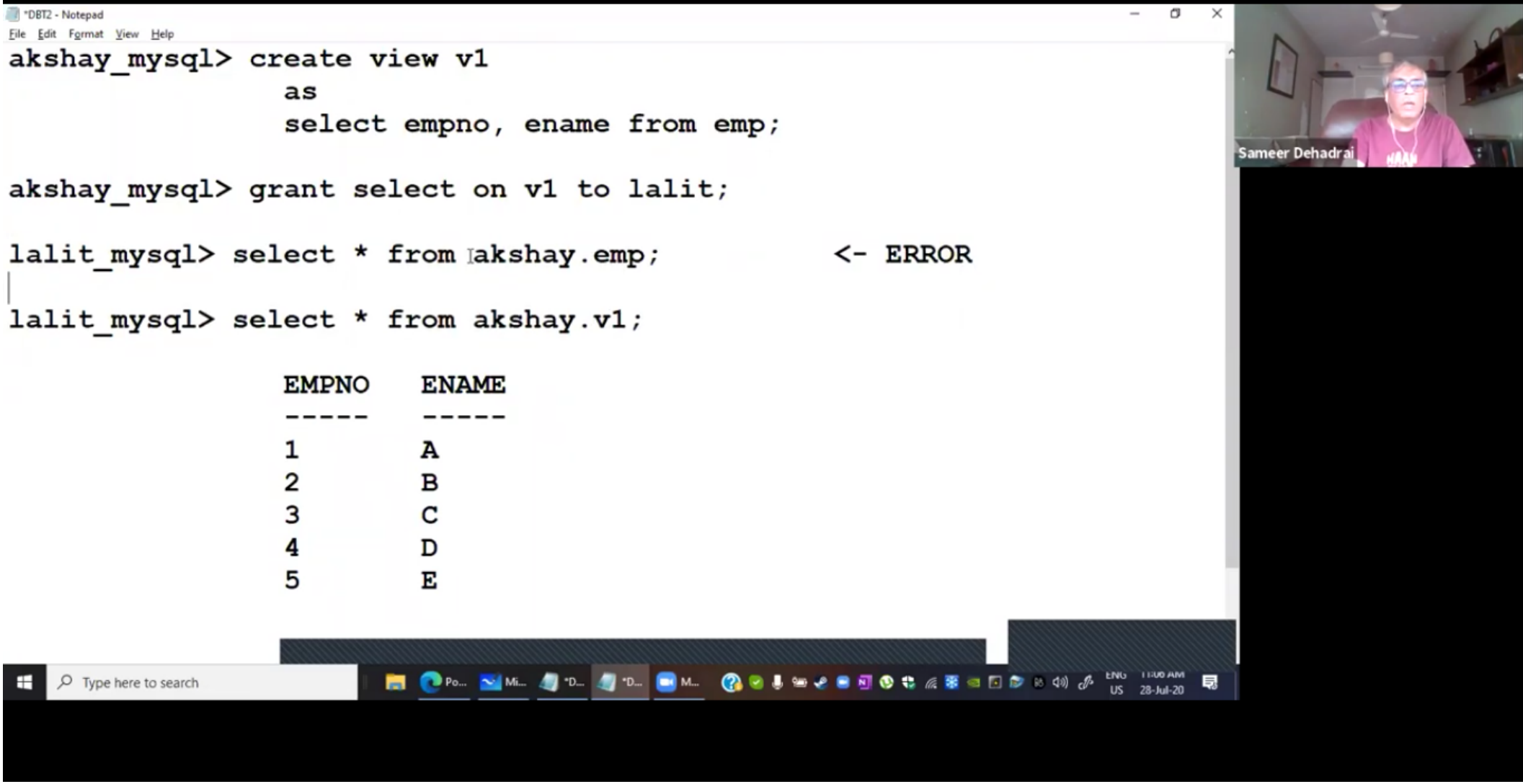
* objects that are stored in the database
* e.g. tables, indexes

VIEWS

* present in all RDBMS and some DBMS
* handle to a table
* stores the address of table
* view is a HD pointer
* used for indirect access to the table
* used for SECURITY purposes
* used to restrict the access of users

Type here to search

ENG US 28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v1
as
select empno, ename from emp;
akshay_mysql> grant select on v1 to lalit;
lalit_mysql> select * from akshay.emp; <- ERROR
lalit_mysql> select * from akshay.v1;
EMPNO ENAME
1 A
2 B
3 C
4 D
5 E
Sameer Dehadrai
Type here to search

*DBT2 - Notepad

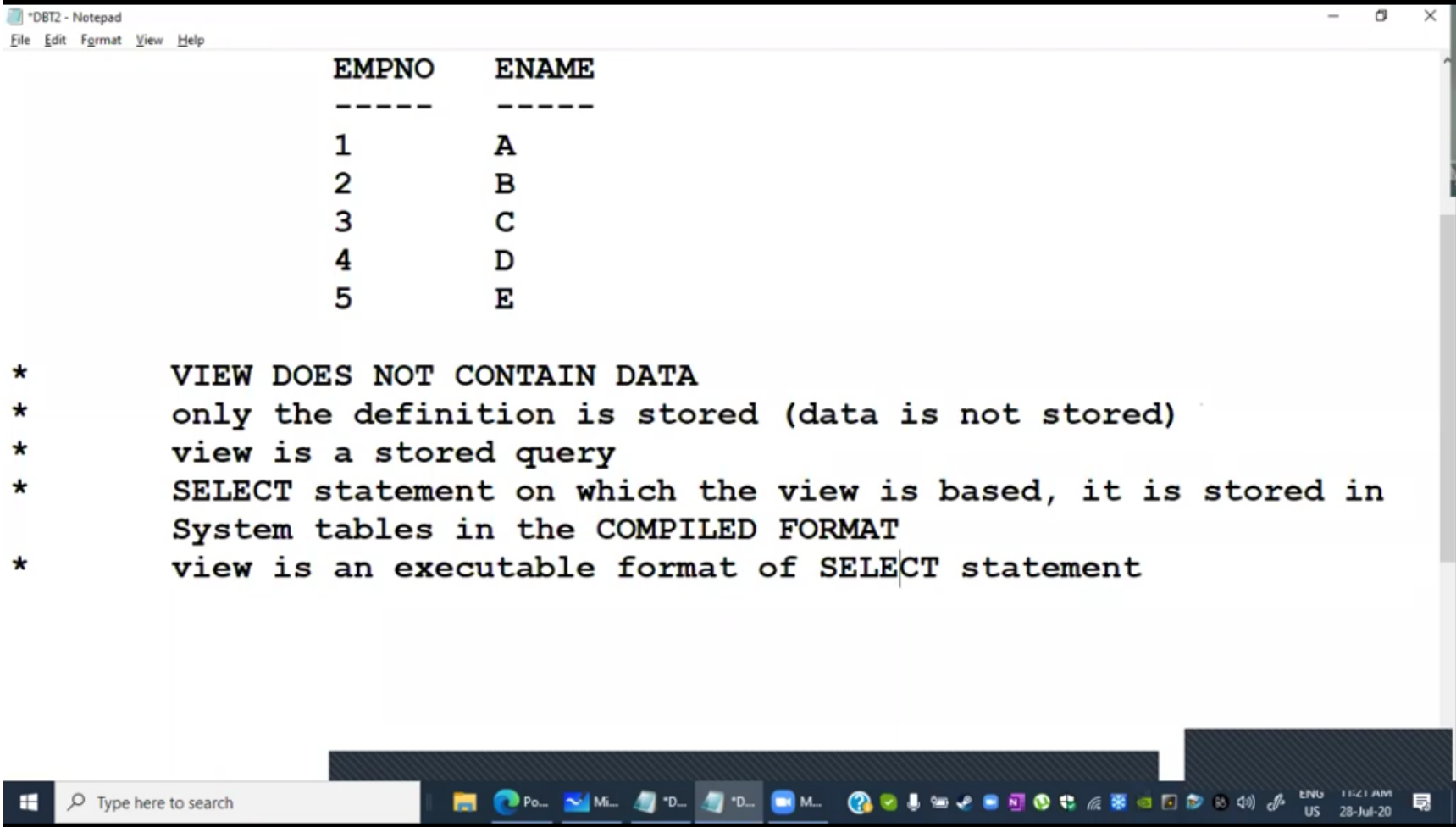
File Edit Format View Help

EMPNO	ENAME
1	A
2	B
3	C
4	D
5	E

* used to restrict the column access
* VIEW DOES NOT CONTAIN DATA
* only the definition is stored (data is not stored)
* view is a stored query
* SELECT statement on which the view is based, it is stored in System tables

Type here to search

ENG US 28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
EMPNO ENAME
1 A
2 B
3 C
4 D
5 E
* VIEW DOES NOT CONTAIN DATA
* only the definition is stored (data is not stored)
* view is a stored query
* SELECT statement on which the view is based, it is stored in
System tables in the COMPILED FORMAT
* view is an executable format of SELECT statement
Type here to search
ENG
US
28-Jul-20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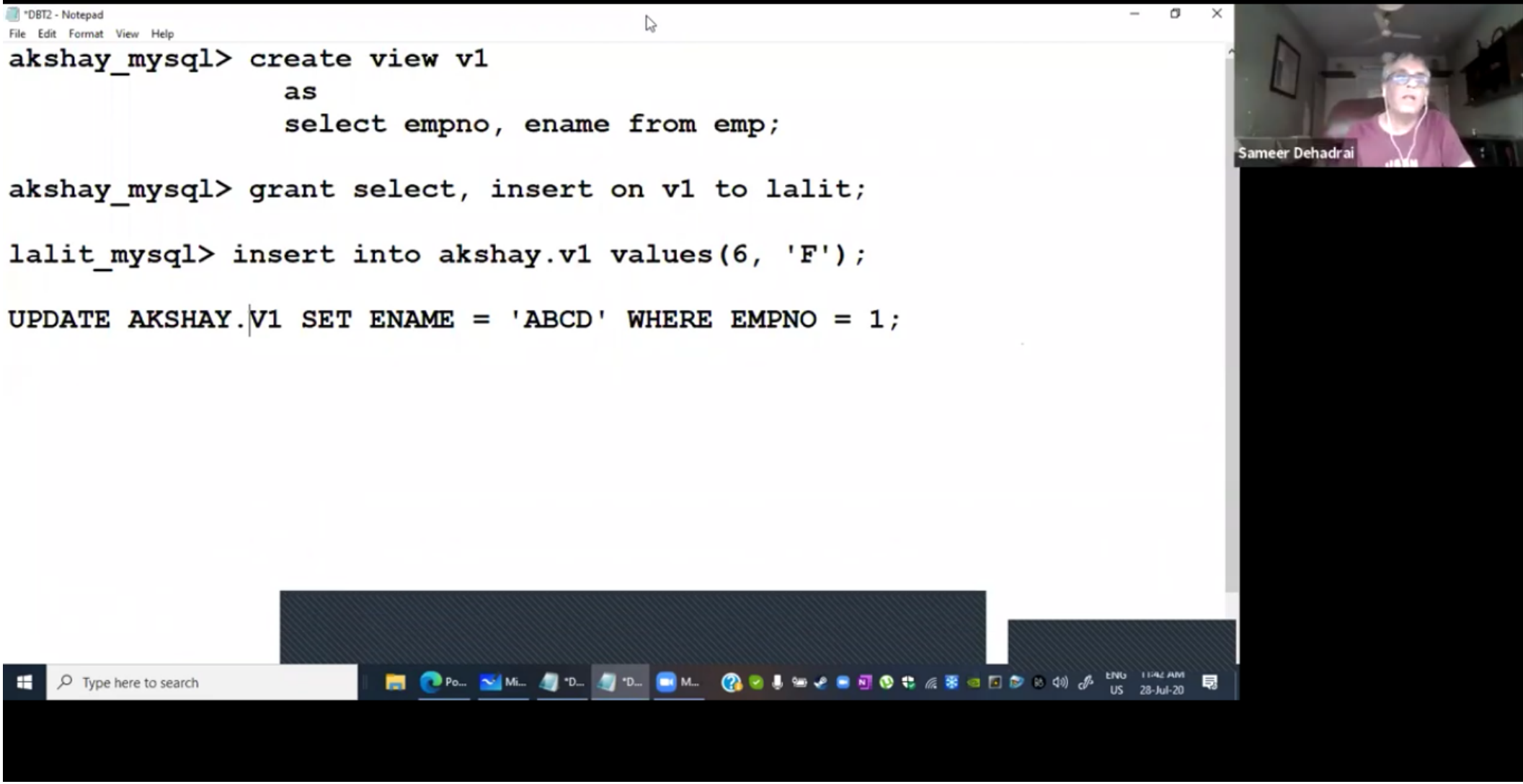
*DBT2 - Notepad

File Edit Format View Help

```
akshay_mysql> create view v1
                as
                select empno, ename from emp;

akshay_mysql> grant select, insert on v1 to lalit;

lalit_mysql> insert into akshay.v1 values(6, 'F');

*       DML operations can be performed on a view
*       VIEW DOES NOT CONTAIN DATA
*       view is a HD pointer to the table
*       DML operations done on a view will affect the base table
*       constraints that have been specified on the table; they will
        be enforced even when insert via the view
```

Type here to search

ENG US 28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v1
as
select empno, ename from emp;
akshay_mysql> grant select, insert on v1 to lalit;
lalit_mysql> insert into akshay.v1 values(6, 'F');
UPDATE AKSHAY.V1 SET ENAME = 'ABCD' WHERE EMPNO = 1;
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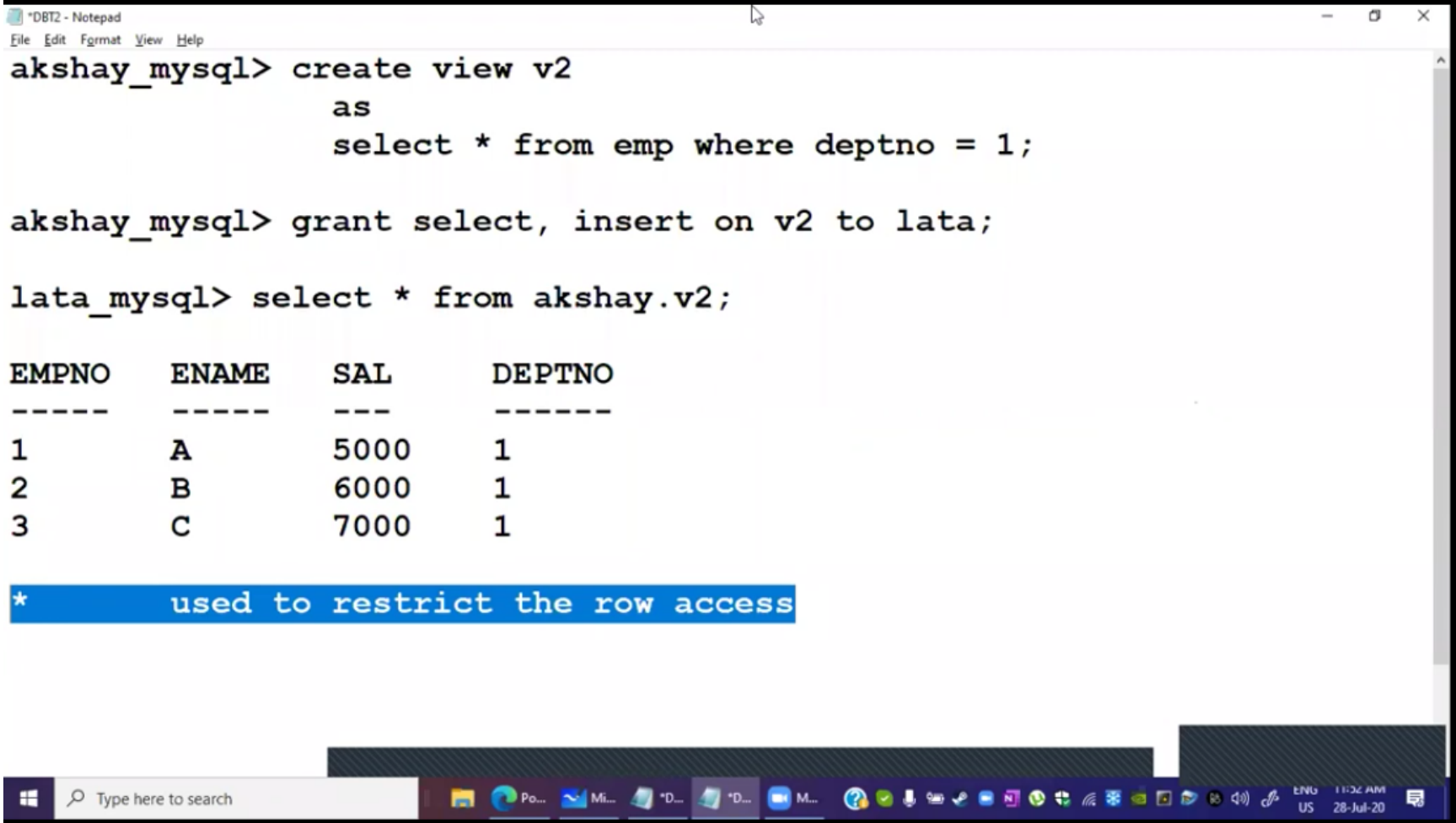
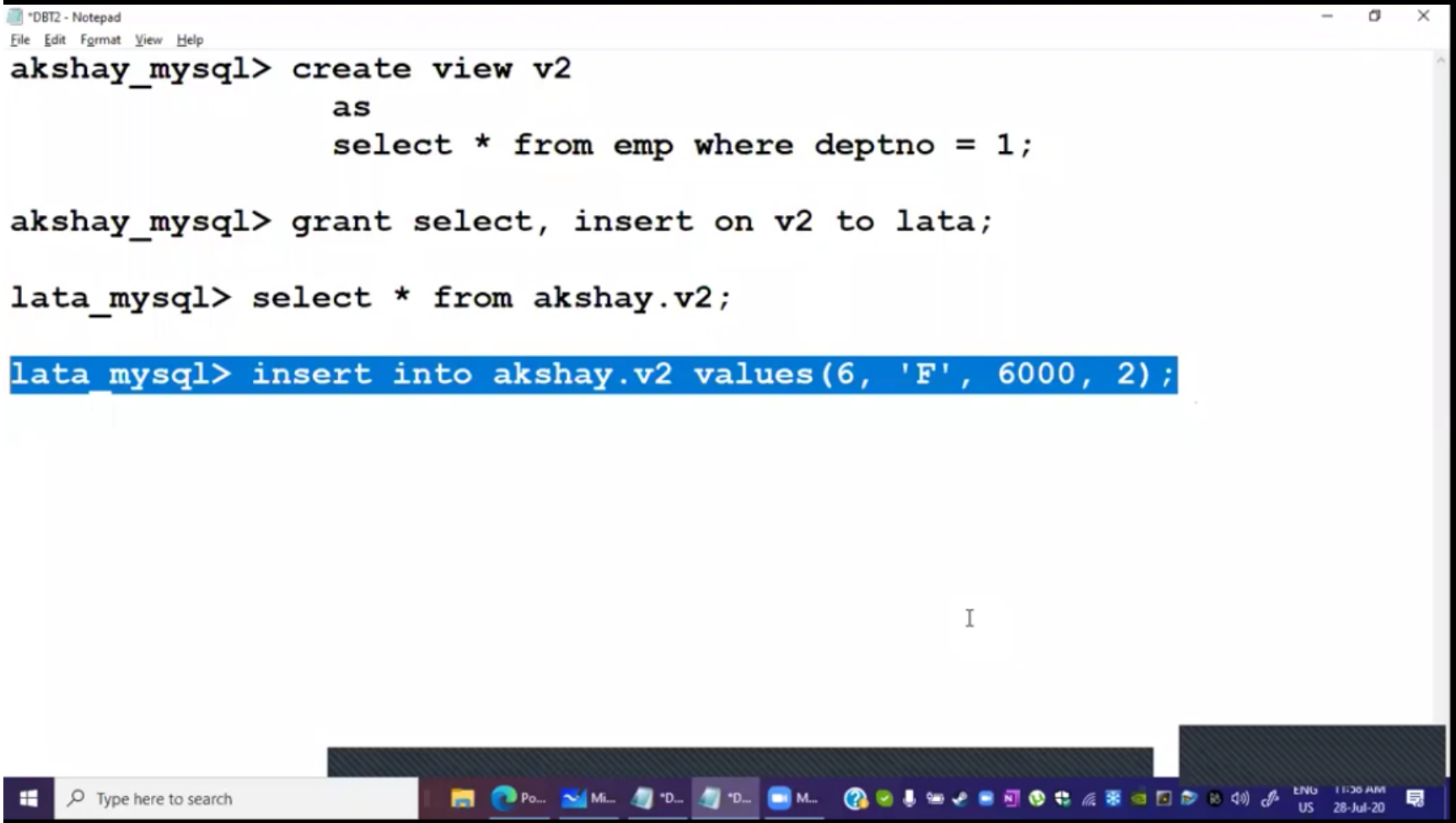
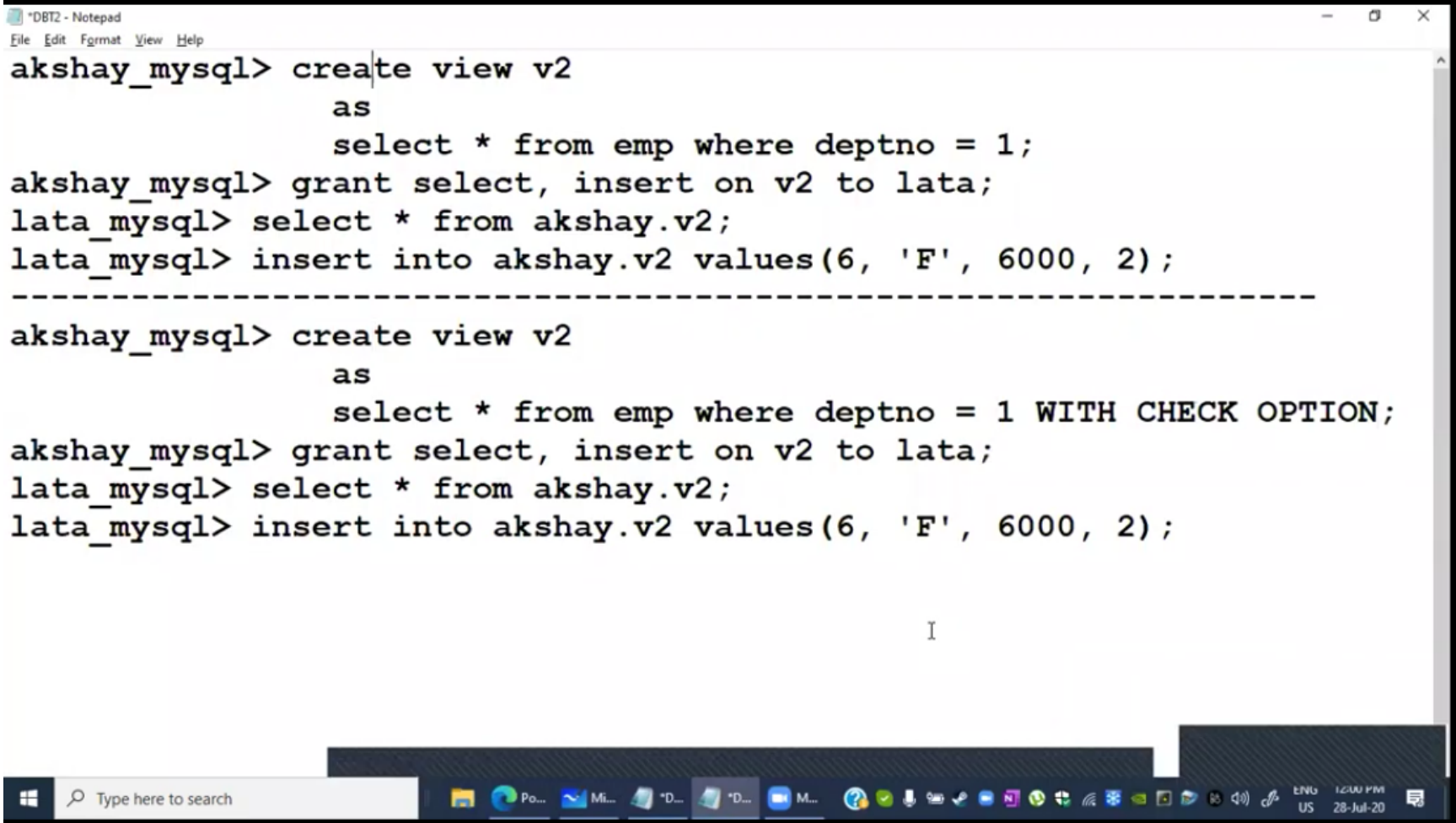
Type here to search
ENG
US
28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v2
as
select * from emp where deptno = 1;
akshay_mysql> grant select, insert on v2 to lata;
lata_mysql> select * from akshay.v2;
EMPNO ENAME SAL DEPTNO
----- ----- --- ------
1 A 5000 1
2 B 6000 1
3 C 7000 1
* used to restrict the row access
Type here to search
28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v2
as
select * from emp where deptno = 1;
akshay_mysql> grant select, insert on v2 to lata;
lata_mysql> select * from akshay.v2;
lata_mysql> insert into akshay.v2 values(6, 'F', 6000, 2);
Type here to search
ENG
US
28-Jul-20


*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v2
as
select * from emp where deptno = 1;
akshay_mysql> grant select, insert on v2 to lata;
lata_mysql> select * from akshay.v2;
lata_mysql> insert into akshay.v2 values(6, 'F', 6000, 2);
akshay_mysql> create view v2
as
select * from emp where deptno = 1 WITH CHECK OPTION;
akshay_mysql> grant select, insert on v2 to lata;
lata_mysql> select * from akshay.v2;
lata_mysql> insert into akshay.v2 values(6, 'F', 6000, 2);
Type here to search
ENG
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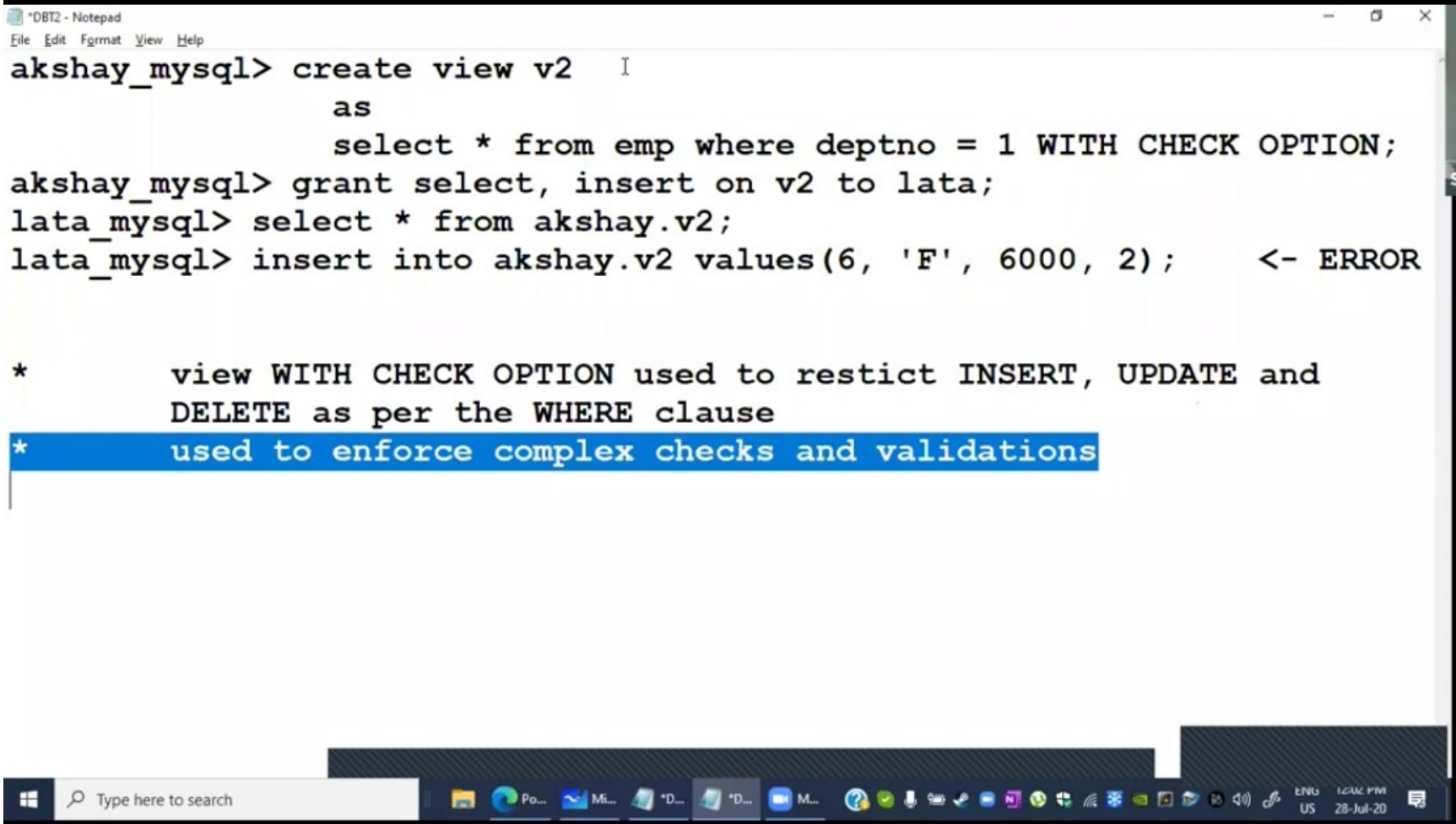
*DBT2 - Notepad
File Edit Format View Help
akshay_mysql> create view v2
as
select * from emp where deptno = 1 WITH CHECK OPTION;
akshay_mysql> grant select, insert on v2 to lata;
lata_mysql> select * from akshay.v2;
lata_mysql> insert into akshay.v2 values(6, 'F', 6000, 2); <- ERROR
* view WITH CHECK OPTION used to restict INSERT, UPDATE and DELETE as per the WHERE clause
* used to enforce complex checks and validations
Type here to search
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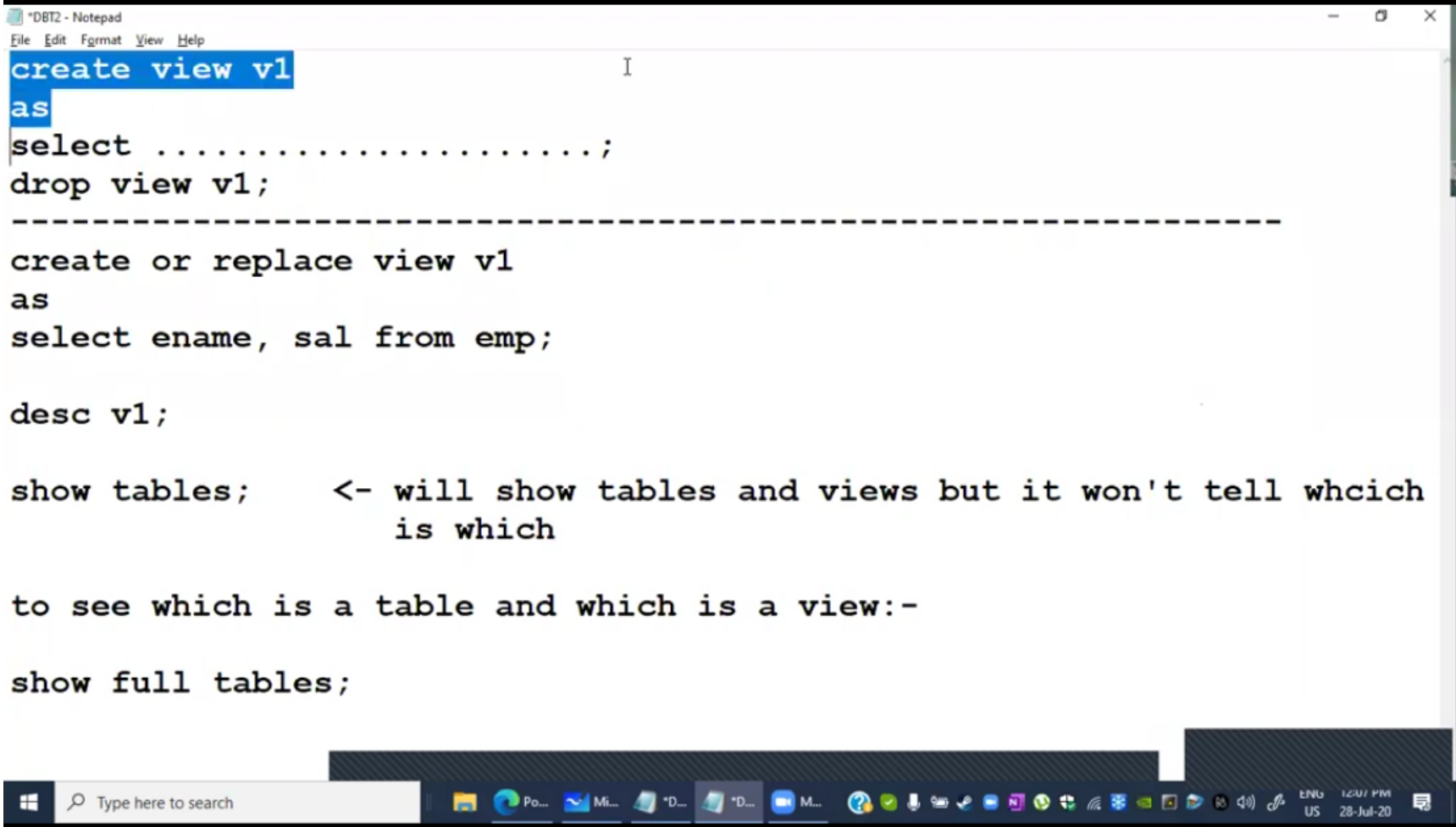
*DBT2 - Notepad
File Edit Format View Help
create view v1
as
select .....;
drop view v1;
---
create or replace view v1
as
select ename, sal from emp;
desc v1;
show tables; <- will show tables and views but it won't tell whcich is which
to see which is a table and which is a view:-
show full tables;
Type here to search
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*DBT2 - Notepad

File Edit Format View Help

```
desc v1;

show tables;     <- will show tables and views but it won't tell whcich
                    is which

to see which is a table and which is a view:-

show full tables;

to see the SELECT statement on which the view is based:-

show create view v1;
```

Type here to search

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*DBT2 - Notepad

File Edit Format View Help

to see which is a table and which is a view:-

```
show full tables;
```

to see the SELECT statement on which the view is based:-

```
show create view v1;
```

* if you ALTER or drop and recreate the table; then the associated views will have to be recreated in MySQL

* if you drop the table then the views REMAIN

Type here to search

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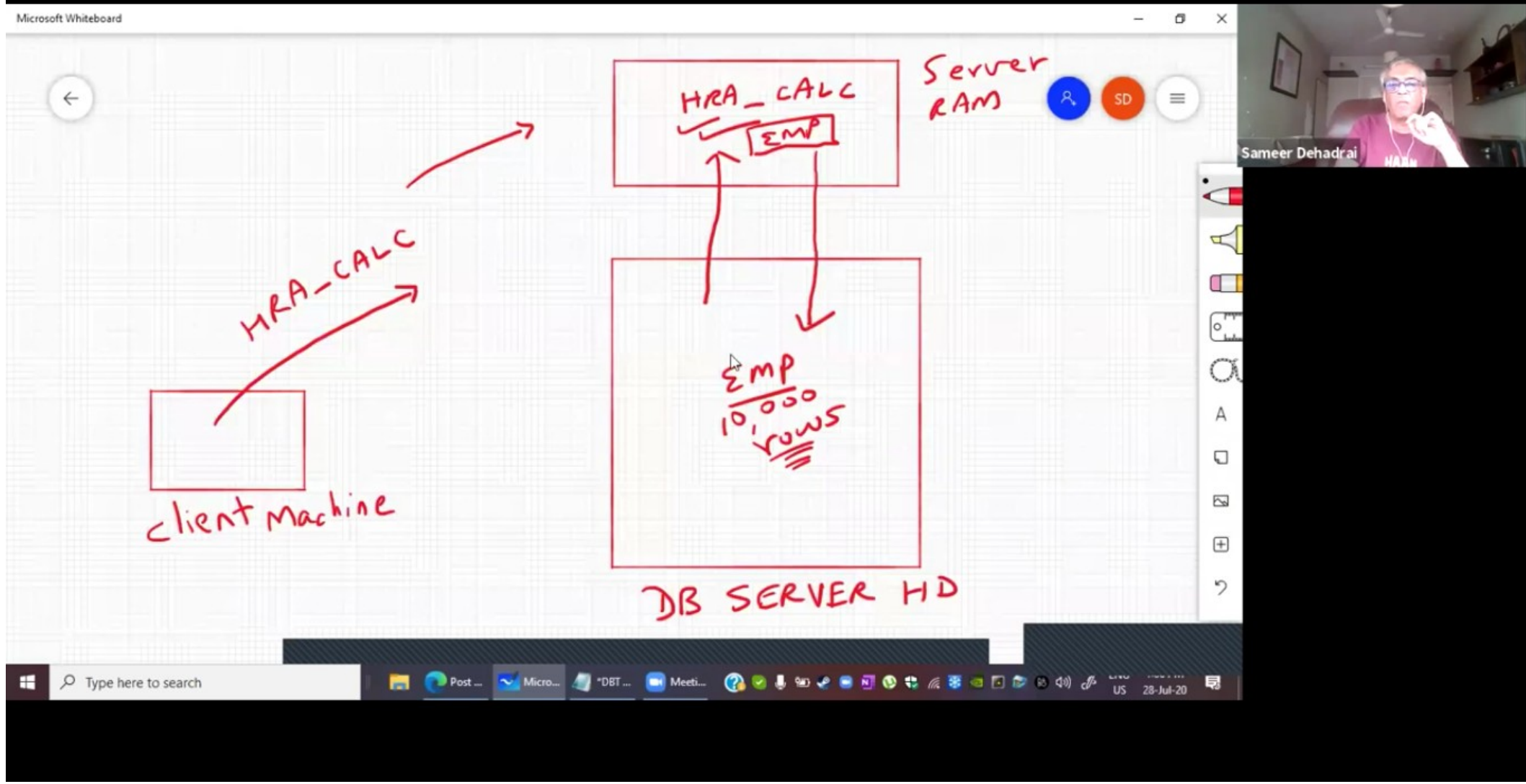
*DBT2 - Notepad

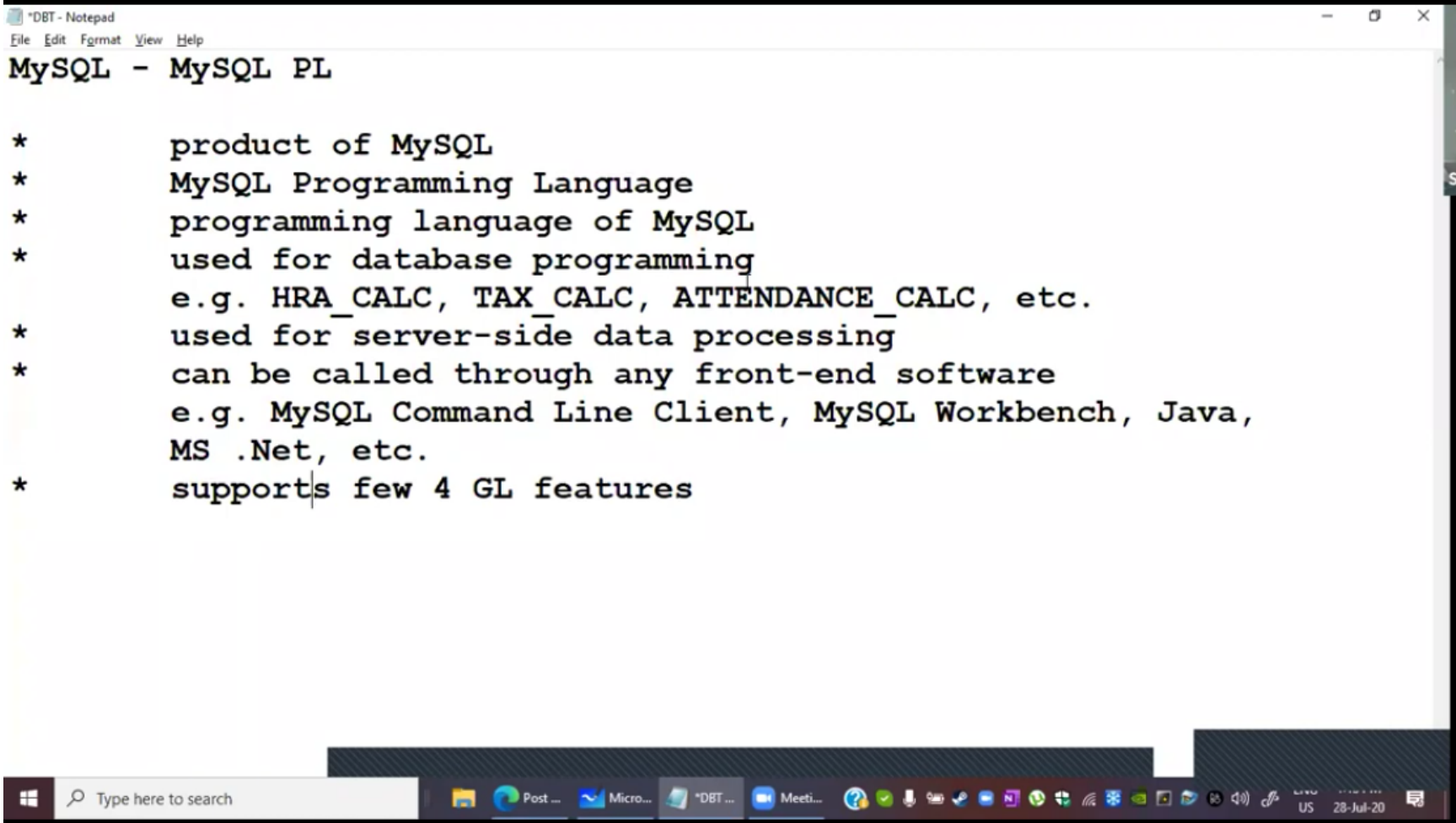
File Edit Format View Help

```
*       if you drop the table then the views REMAIN

*       view based on view is allowed
*       to exceed the limits of SQL
        e.g.
        UNION of > 255 SELECTs
        Subqueries > 255 levels

*       view based on view
        to simplify the writing of complex SELECT statements
        e.g. join of 20 tables
```

Type here to search

MYSQL PL


Microsoft Whiteboard
HRA_CALC
EMP
Server RAM
SD
HRA_CALC
client machine
EMP
10,000 rows
DB SERVER HD
Sameer Dehadrai
Type here to search
Post ...
Micro...
*DBT ...
Meeti...
US
28-Jul-20


*DBT - Notepad
File Edit Format View Help
MySQL - MySQL PL
* product of MySQL
* MySQL Programming Language
* programming language of MySQL
* used for database programming
e.g. HRA_CALC, TAX_CALC, ATTENDANCE_CALC, etc.
* used for server-side data processing
* can be called through any front-end software
e.g. MySQL Command Line Client, MySQL Workbench, Java,
MS .Net, etc.
* supports few 4 GL features
Type here to search
Post ...
Micro...
*DBT ...
Meeti...
US
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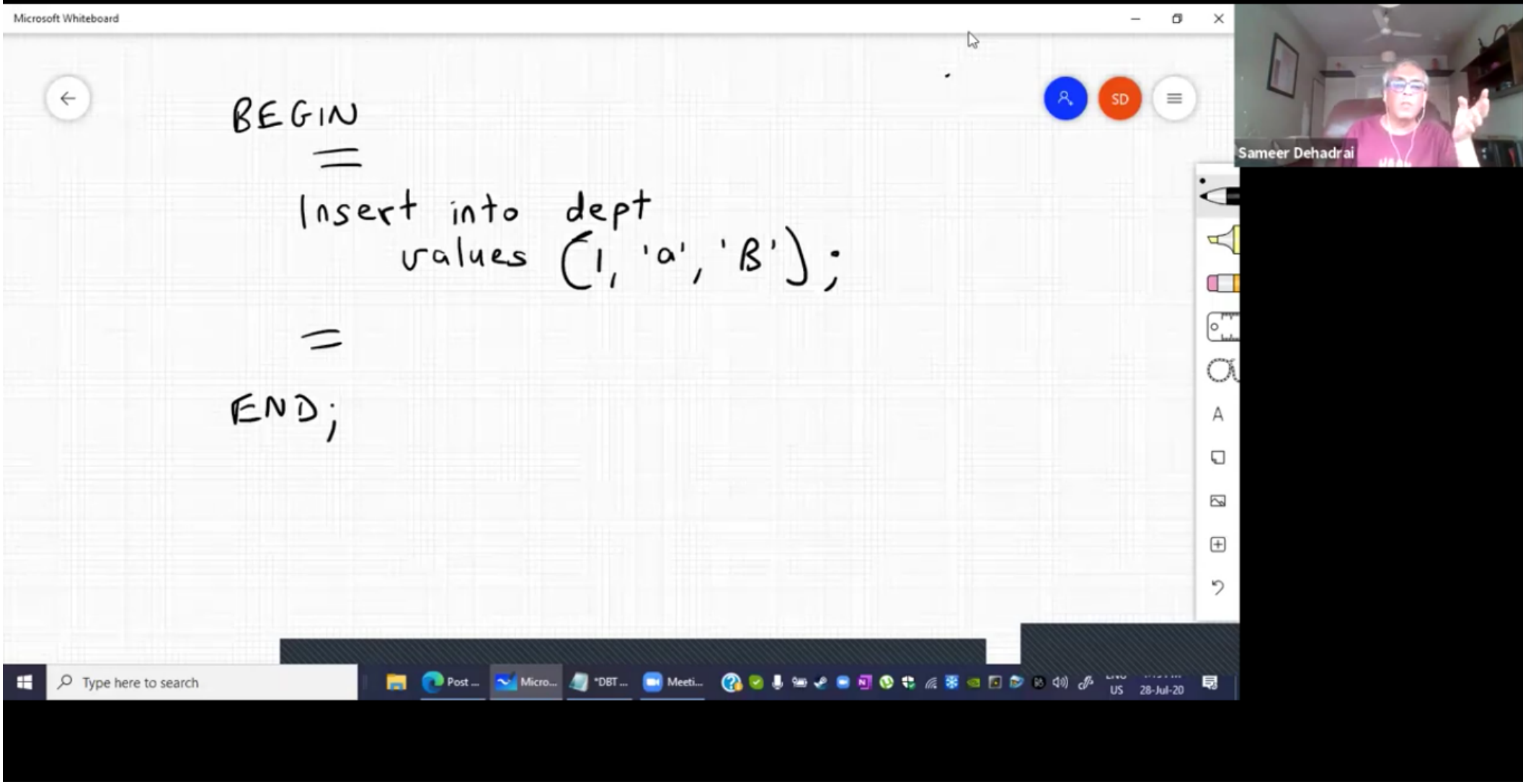
Microsoft Whiteboard
BEGIN
=
Insert into dept
values (1, 'a', 'B');
=
END;
SD
Sameer Dehadrai
Type here to search
Post ...
Micro...
*DBT ...
Meeti...
US
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*DBT - Notepad

File Edit Format View Help

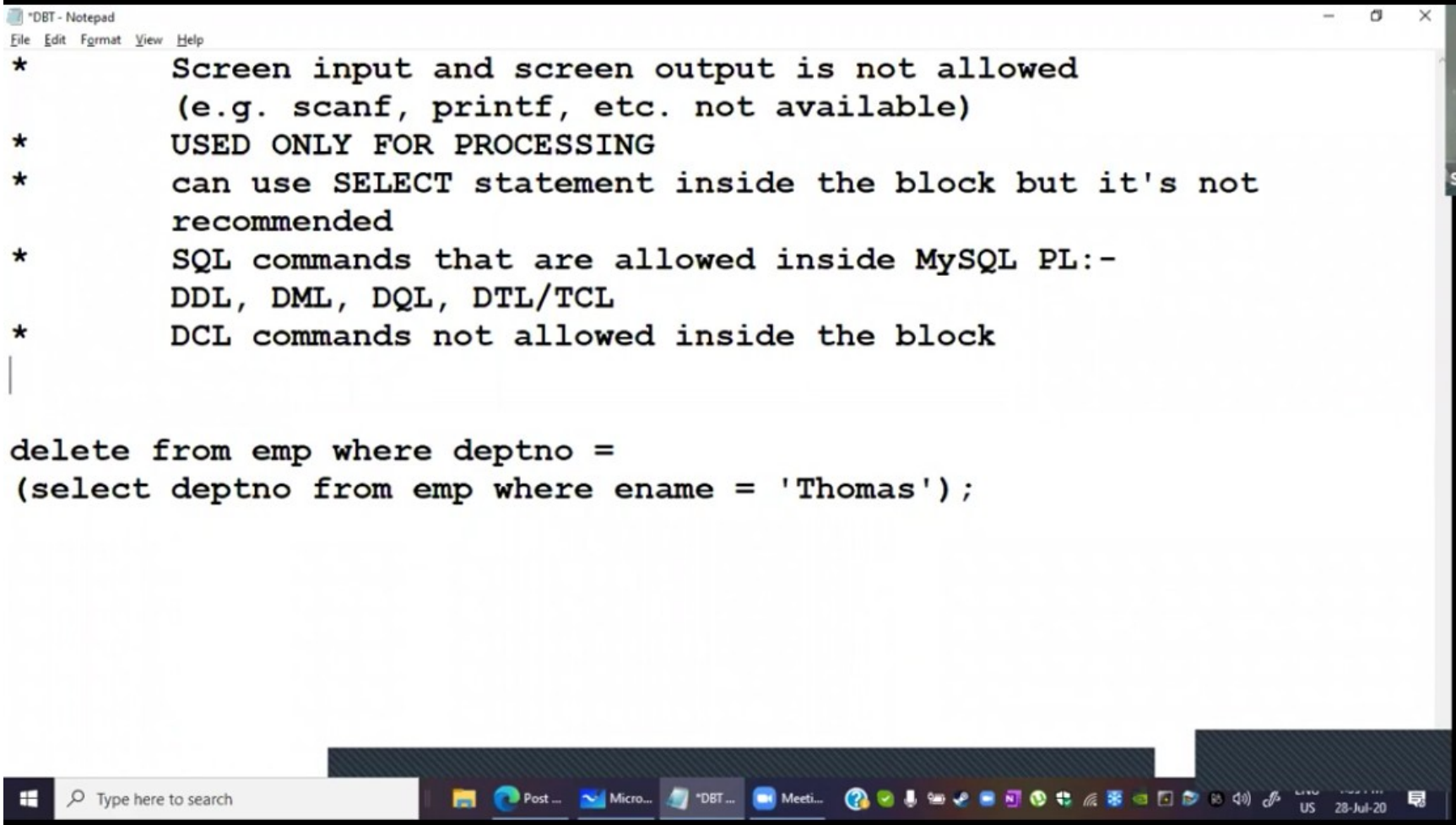
MySQL - MySQL PL

* used for server-side data processing
* can be called through any front-end software
  e.g. MySQL Command Line Client, MySQL Workbench, Java,
  MS .Net, etc.
* supports few 4 GL features
* Block level language
* Benefits of block level language:-
  a. Modularity
  b. Control scope of variables (form of Encapsulation)
     (form of data hiding)
  c. Efficient error management (localize the error in the case
     of Exceptions)
* Screen input and screen output is not allowed
  (e.g. scanf, printf, etc. not available)
* USED ONLY FOR PROCESSING

Type here to search

Post ... Micro... *DBT ... Meeti...

US 28-Jul-20


*DBT - Notepad
File Edit Format View Help
* Screen input and screen output is not allowed
(e.g. scanf, printf, etc. not available)
* USED ONLY FOR PROCESSING
* can use SELECT statement inside the block but it's not
recommended
* SQL commands that are allowed inside MySQL PL:-
DDL, DML, DQL, DTL/TCL
* DCL commands not allowed inside the block
delete from emp where deptno =
(select deptno from emp where ename = 'Thomas');
Type here to search
Post ...
Micro...
*DBT ...
Meeti...
US
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*DBT - Notepad

File Edit Format View Help

STORED PROCEDURES

* stored object
* objects that are stored in the database
* MySQL PL programs are written in the form of stored procedures
* Routine (set of commands) that has to be called explicitly (procedure is a void function)
* global procedures
* can be called through MySQL Command Line CLient, MySQL Workbench, Java, MS .Net, etc.
* can be called through any front-end software
* stored in the database in the COMPILED FORMAT
* hence the execution will be very fast
* hiding source from end user

Type here to search

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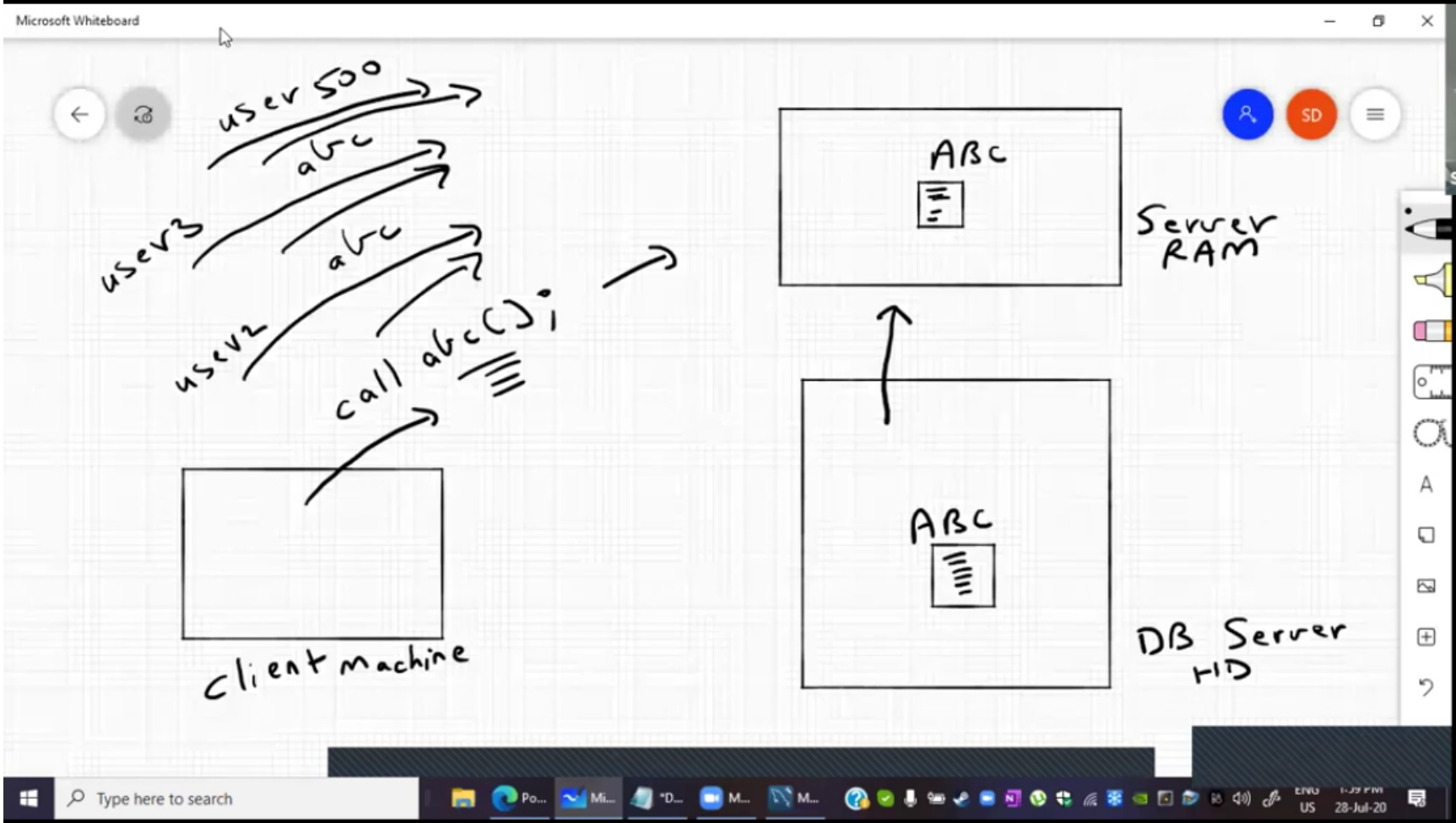
Microsoft Whiteboard
user 500
abc
user3
abc
user2
call abc();
client machine
ABC
Server RAM
ABC
DB Server HD
SD
Sameer Dehadrai
Type here to search
28-Jul-20

*DBT - Notepad

File Edit Format View Help

* can be called through MySQL Command Line CLient, MySQL Workbench, Java, MS .Net, etc.
* can be called through any front-end software
* stored in the database in the COMPILED FORMAT
* hence the execution will be very fast
* hiding source code from end user
* in a multi-user environment, if multiple users are calling the same stored procedure simultaneously, then only a single copy of the procedure code is brought into server RAM; the procedure code will be shared by all the users
* procedure can have LOCAL variables
* inside the procedure, you can have any processing (full MySQL/PL is allowed)
* one procedure can call another procedure
* procedure can call itself (known as Recursion)

Type here to search

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*DBT - Notepad

File Edit Format View Help

```
*       in a multi-user environment, if multiple users are calling the
        same stored procedure simultaneously, then only a single copy
        of the procedure code is brought into server RAM; the
        procedure code will be shared by all the users
*       procedure can have LOCAL variables
*       inside the procedure, you can have any processing
        (full MySQL/PL is allowed)
*       one procedure can call another procedure
*       procedure can call itself (known as Recursion)
*       you can pass parameters to a procedure
*       OVERLOADING OF STORED PROCEDURES IS NOT ALLOWED
```

Type here to search

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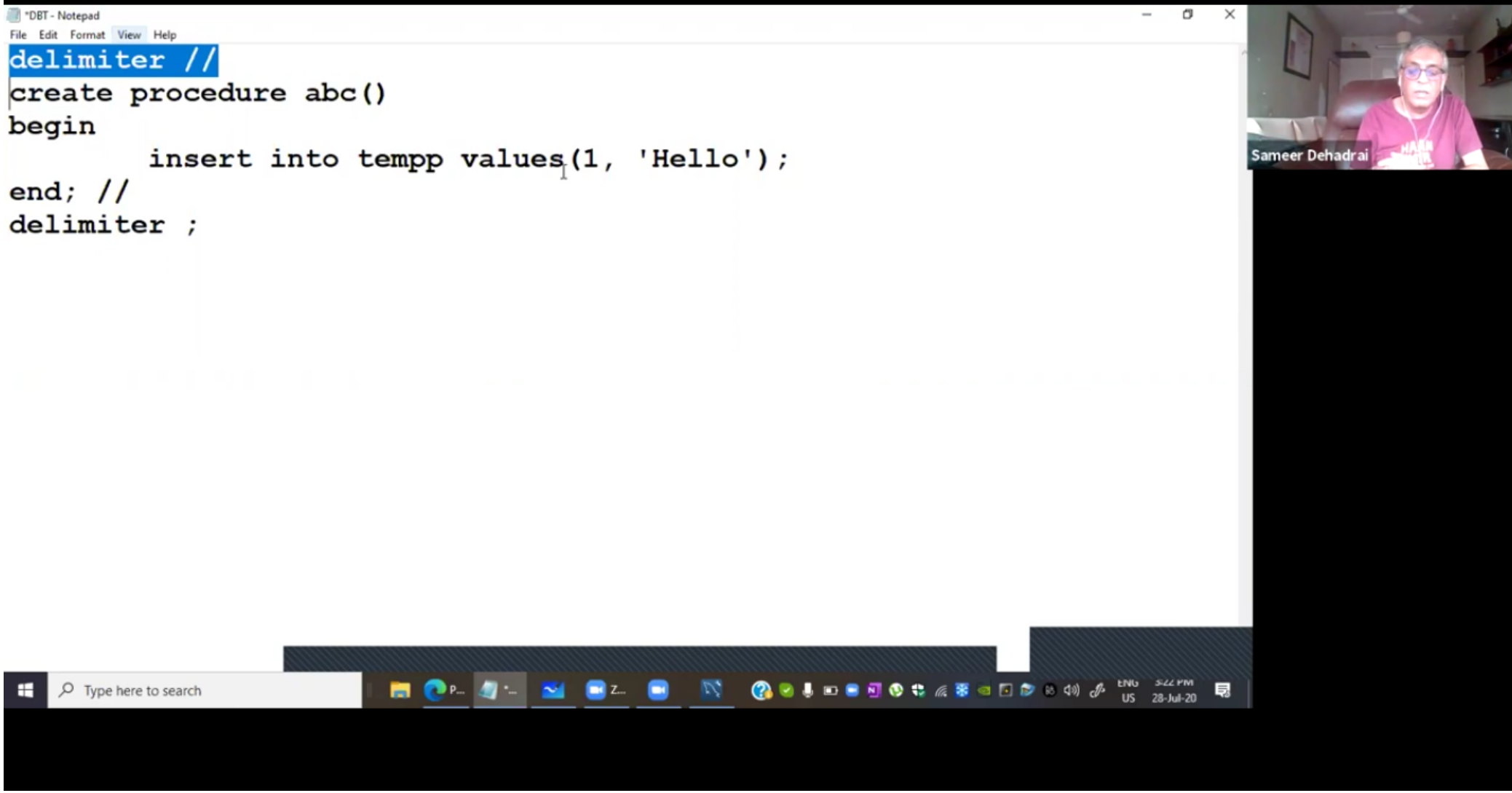
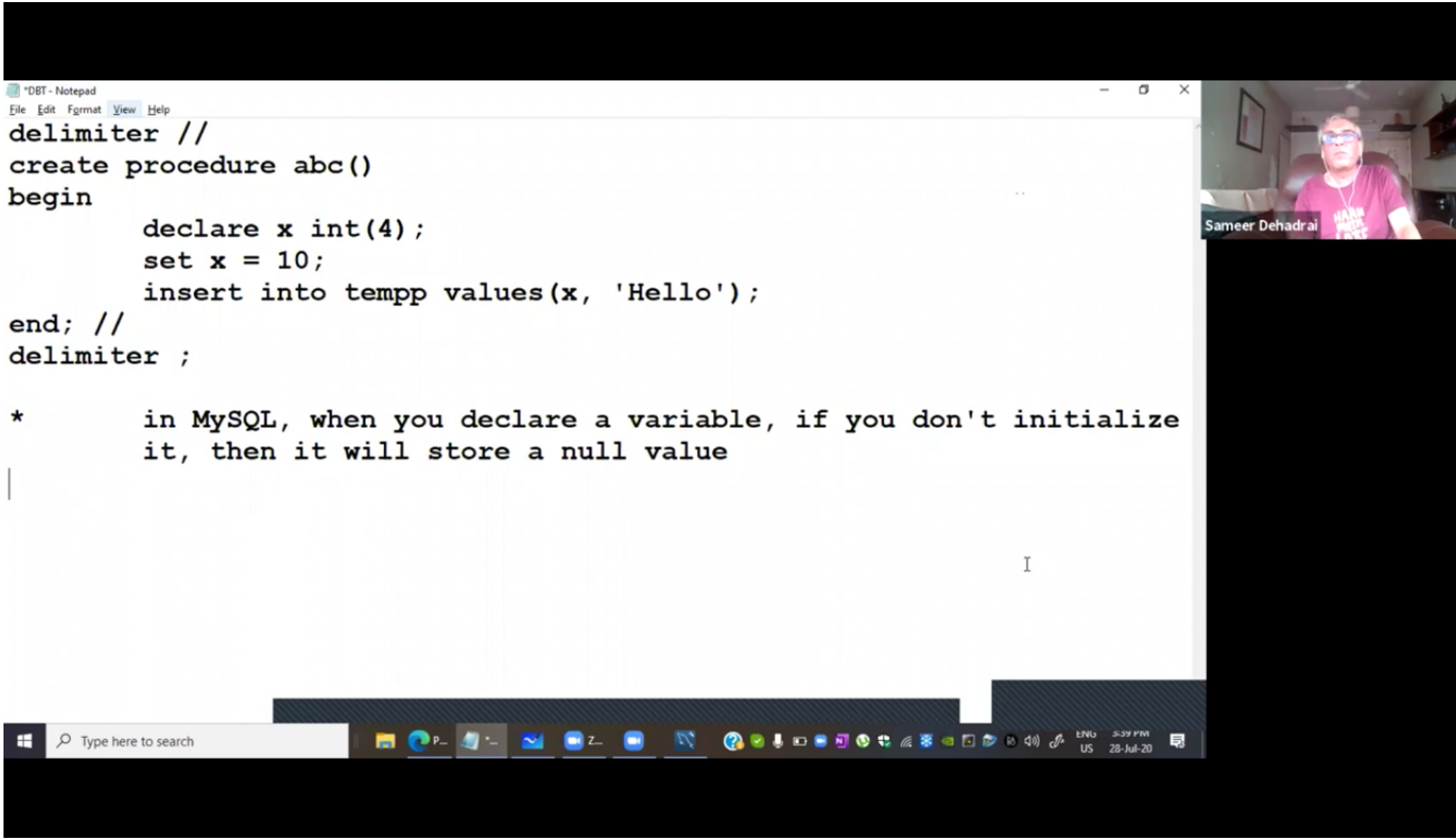
STORED PROCEDURES AND MYSQL PL


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
insert into tempp values(1, 'Hello');
end; //
delimiter ;
Sameer Dehadrai
Type here to search
ENG
US
28-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4);
set x = 10;
insert into tempp values(x, 'Hello');
end; //
delimiter ;
* in MySQL, when you declare a variable, if you don't initialize it, then it will store a null value
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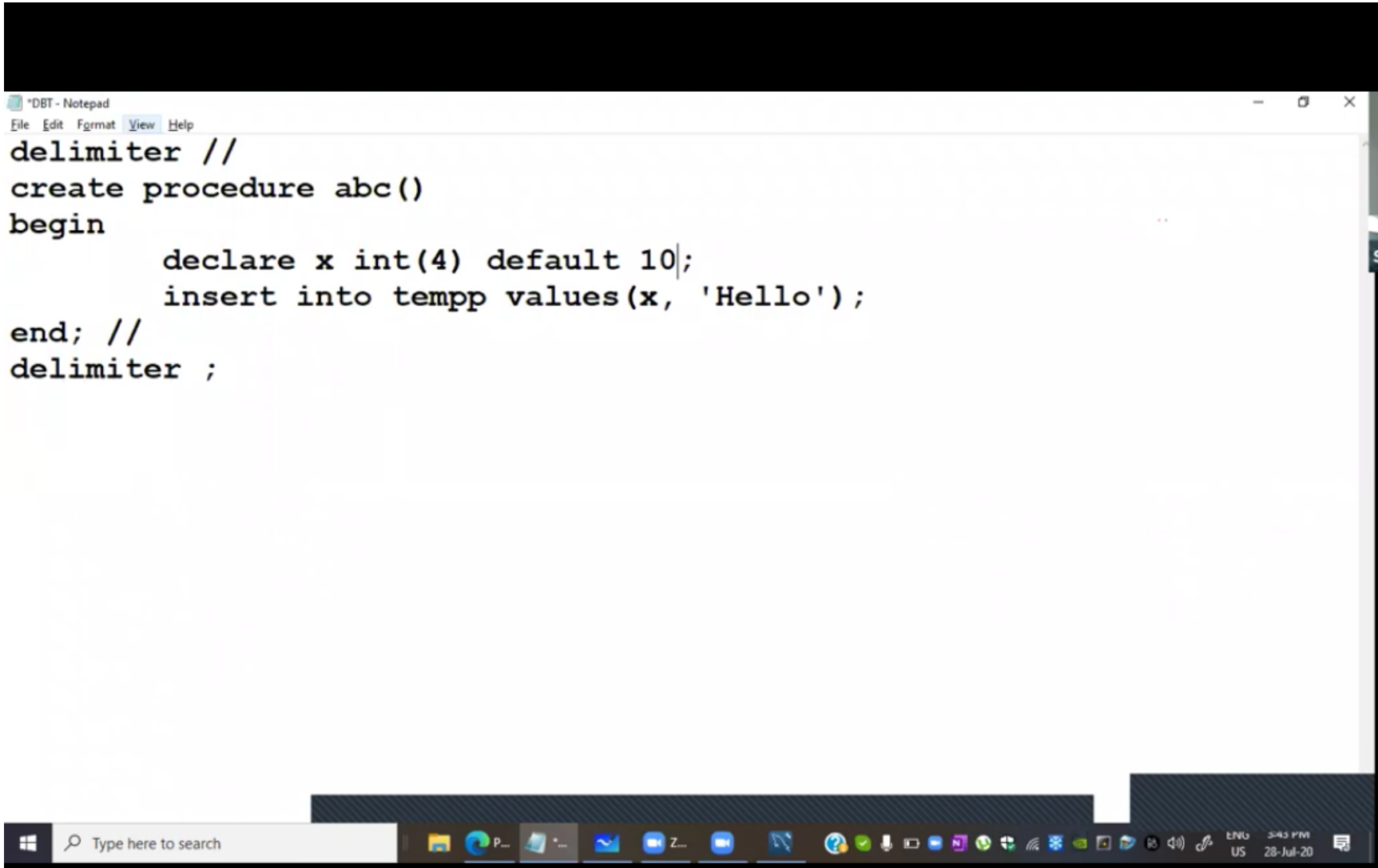
Type here to search
ENG
US
28-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4) default 10;
insert into tempp values(x, 'Hello');
end; //
delimiter ;
Type here to search
ENG
US
28-Jul-20


Sameer Dehadrai

*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x char(15) default 'CDAC';
        insert into tempp values(1, x);
end; //
delimiter ;
```

Type here to search

ENG US 5:40 PM 28-Jul-20

*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x char(15) default 'KING';
        declare y float(7,2) default 3000;
        declare z float(2,1) default 0.4;
        declare hra float(7,2);
        set hra = y*z;
        insert into tempp values(y, x);
        insert into tempp values(hra, 'HRA');
end; //
delimiter ;
```

Type here to search

ENG US 5:51 PM 28-Jul-20

*DBT - Notepad

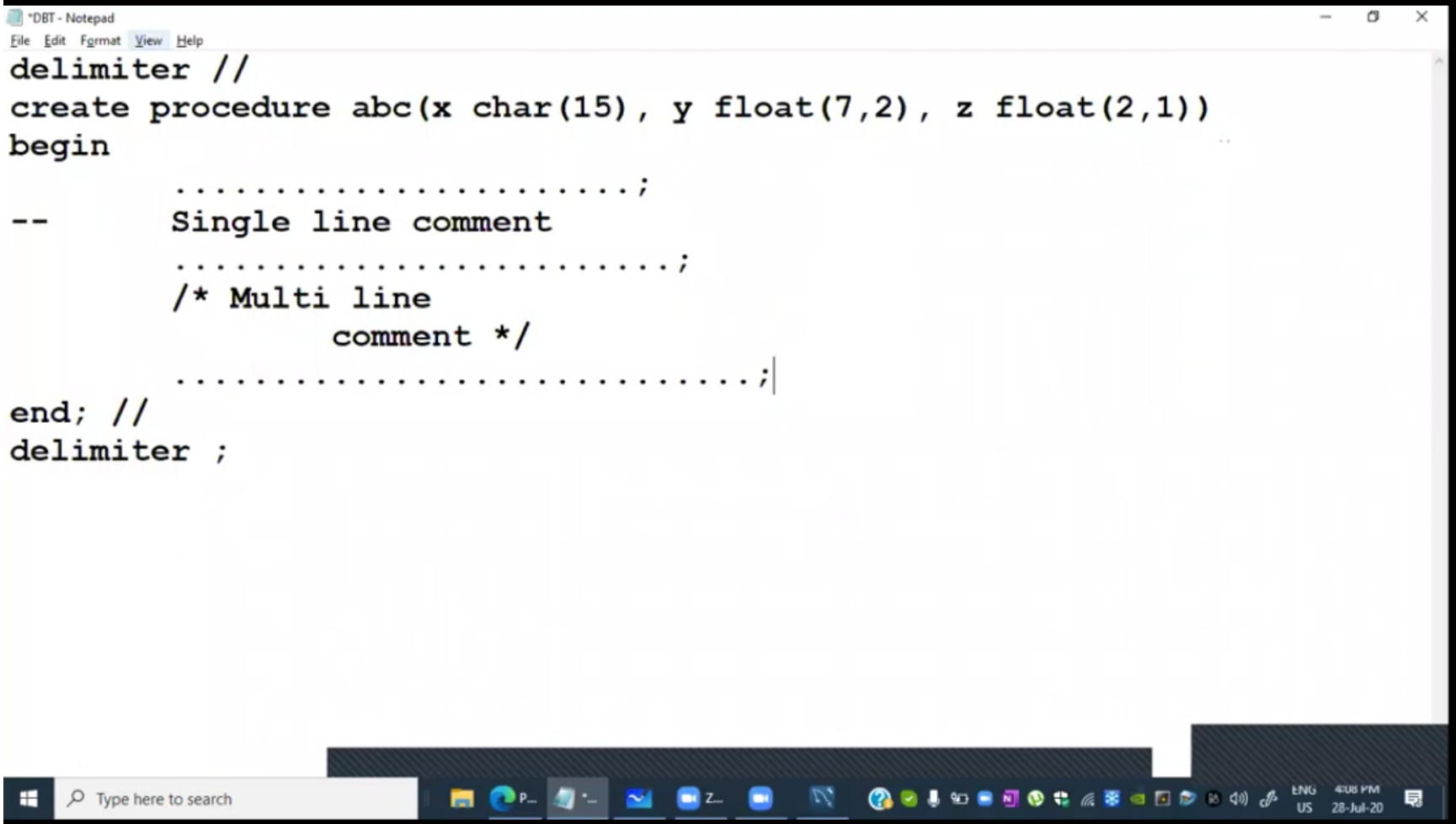
File Edit Format View Help

```
delimiter //
create procedure abc(x char(15), y float(7,2), z float(2,1))
begin
        declare hra float(7,2);
        set hra = y*z;
        insert into tempp values(y, x);
        insert into tempp values(hra, 'HRA');
end; //
delimiter ;

call abc('KING',3000,0.4);
call abc('SCOTT',2500,0.3);
```

Type here to search

ENG US 28-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc(x char(15), y float(7,2), z float(2,1))
begin
.....;
-- Single line comment
.....;
/* Multi line
comment */
.....;
end; //
delimiter ;
Type here to search
ENG
US
4:08 PM
28-Jul-20

*DBT - Notepad

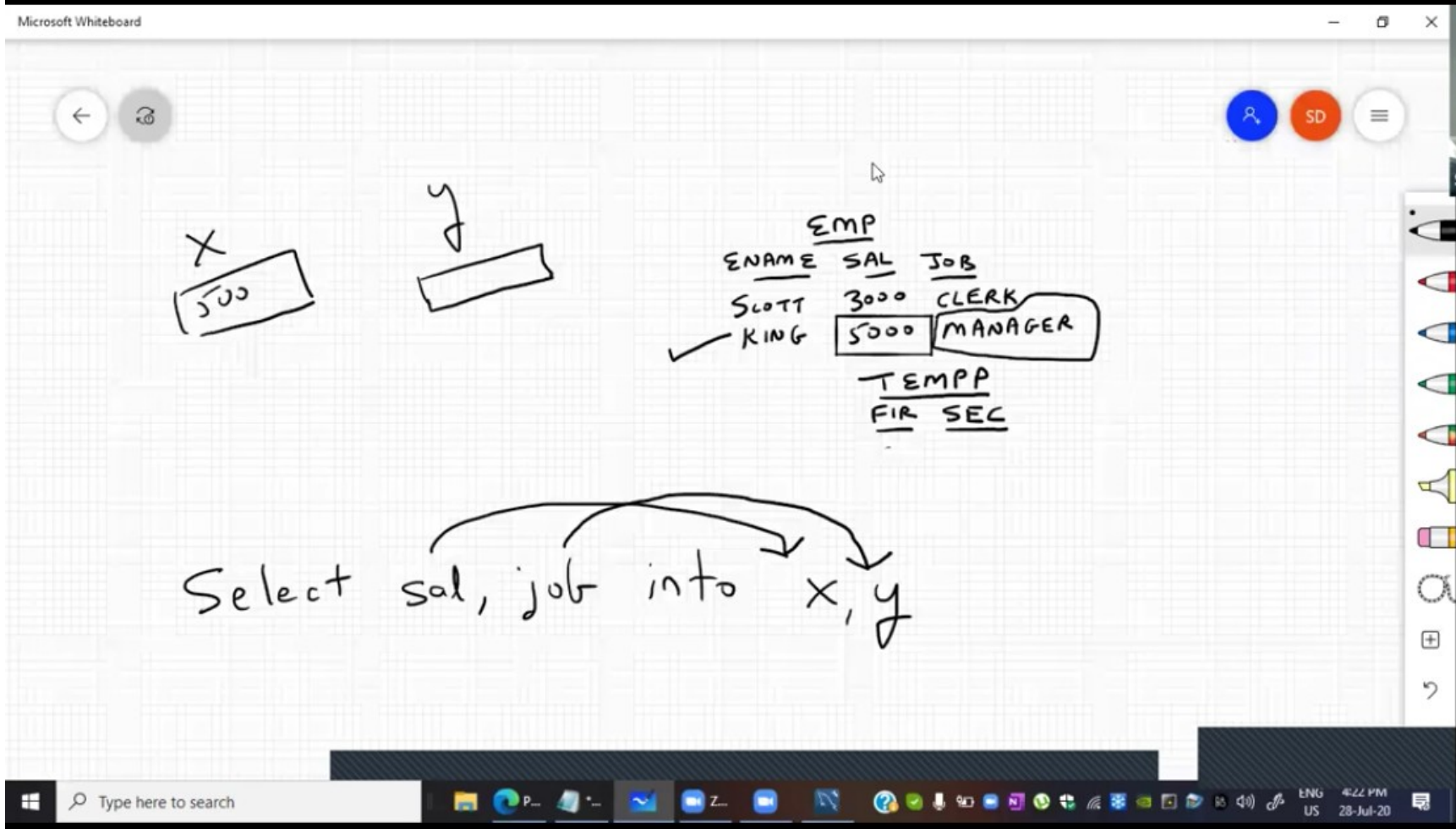
File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4);
        select sal into x from emp
        where ename = 'KING';
        /* processing, e.g. set hra = x*0.4, etc. */
        insert into tempp values(x, 'KING');
end; //
delimiter ;
```

Type here to search

ENG US 4:10 PM 28-Jul-20

Microsoft Whiteboard



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Type here to search

ENG US 4:22 PM 28-Jul-20

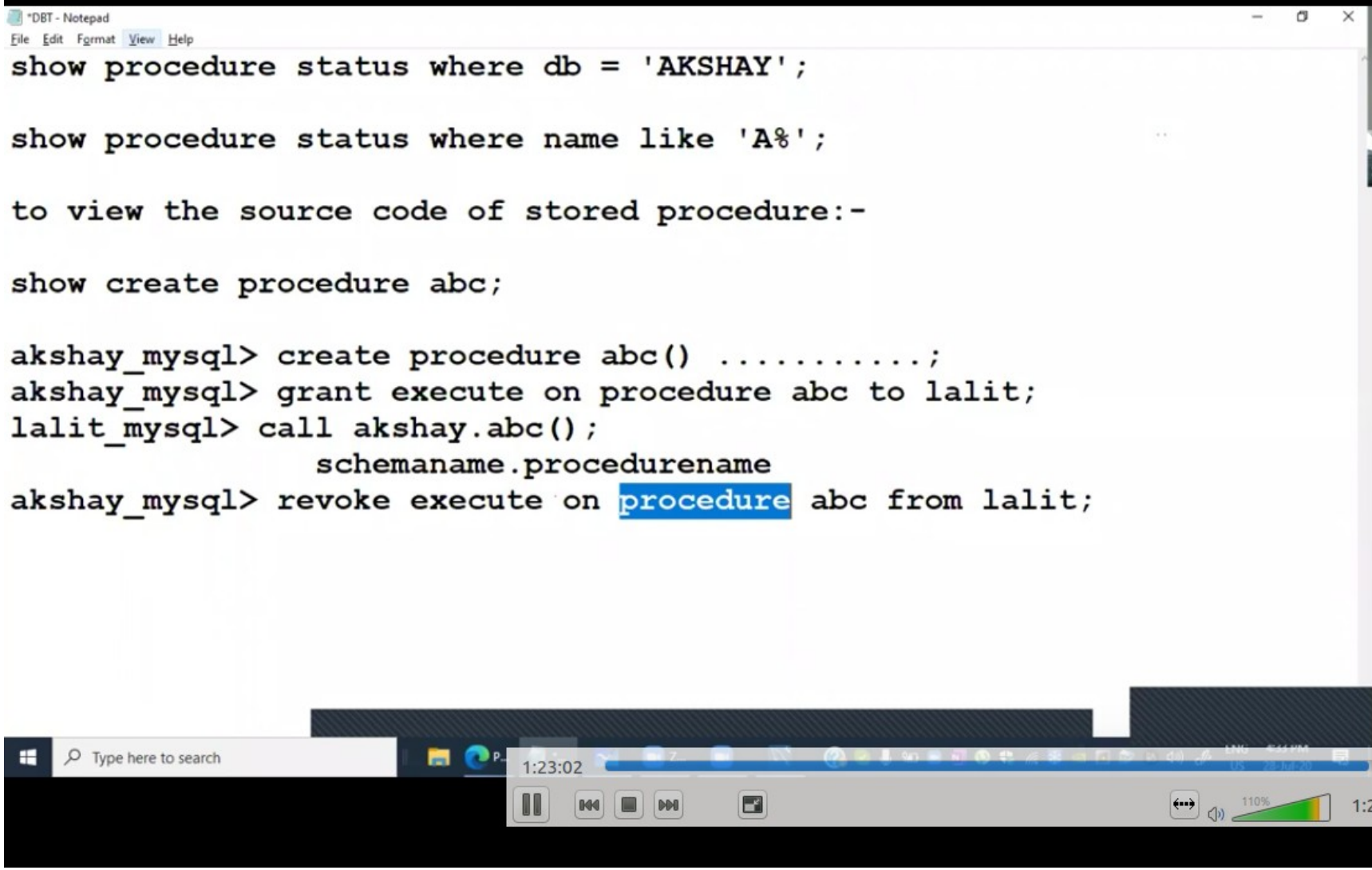
*DBT - Notepad

File Edit Format View Help

```
to see which all procedures you have created:-

show procedure status;          <- shows all procedures in all
                                   databases

show procedure status where db = 'AKSHAY';

show procedure status where name like 'A%';

to view the source code of stored procedure:-

show create procedure abc;
```

Type here to search

ENG US 4:28 PM 28-Jul-20


*DBT - Notepad
File Edit Format View Help
show procedure status where db = 'AKSHAY';
show procedure status where name like 'A%';
to view the source code of stored procedure:-
show create procedure abc;
akshay_mysql> create procedure abc() ....;
akshay_mysql> grant execute on procedure abc to lalit;
lalit_mysql> call akshay.abc();
schemaname.procedurename
akshay_mysql> revoke execute on procedure abc from lalit;
Type here to search
1:23:02
1:26:13
110%
1:23:02/1:26:13

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*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4);
        select sal into x from emp where ename = 'KING';
        if x > 4000 then
                insert into tempp values(x, 'High sal');
        end if;
end; //
delimiter ;

if x between 4000 and 6000 then
        ....................;
        ....................;
        ....................;
end if;
```

Type here to search

ENG US 29-Jul-20

*DBT - Notepad

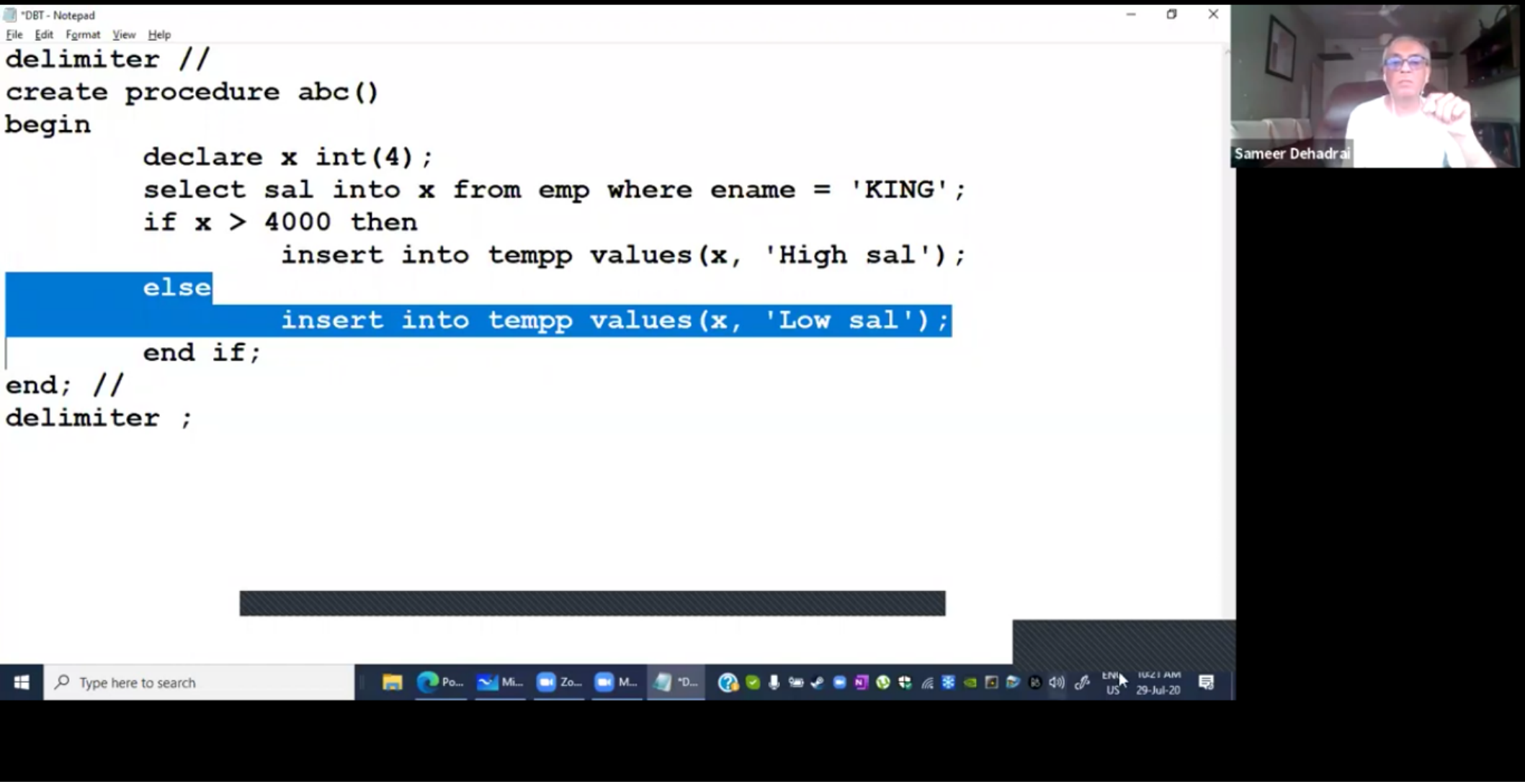
File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4);
        select sal into x from emp where ename = 'KING';
        if x > 4000 then
                insert into tempp values(x, 'High sal');
        end if;
end; //
delimiter ;

if x between 4000 and 6000 then
        ....................;
        ....................;
        ....................;
end if;
```

Type here to search

ENG US 29-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4);
select sal into x from emp where ename = 'KING';
if x > 4000 then
insert into tempp values(x, 'High sal');
else
insert into tempp values(x, 'Low sal');
end if;
end; //
delimiter ;
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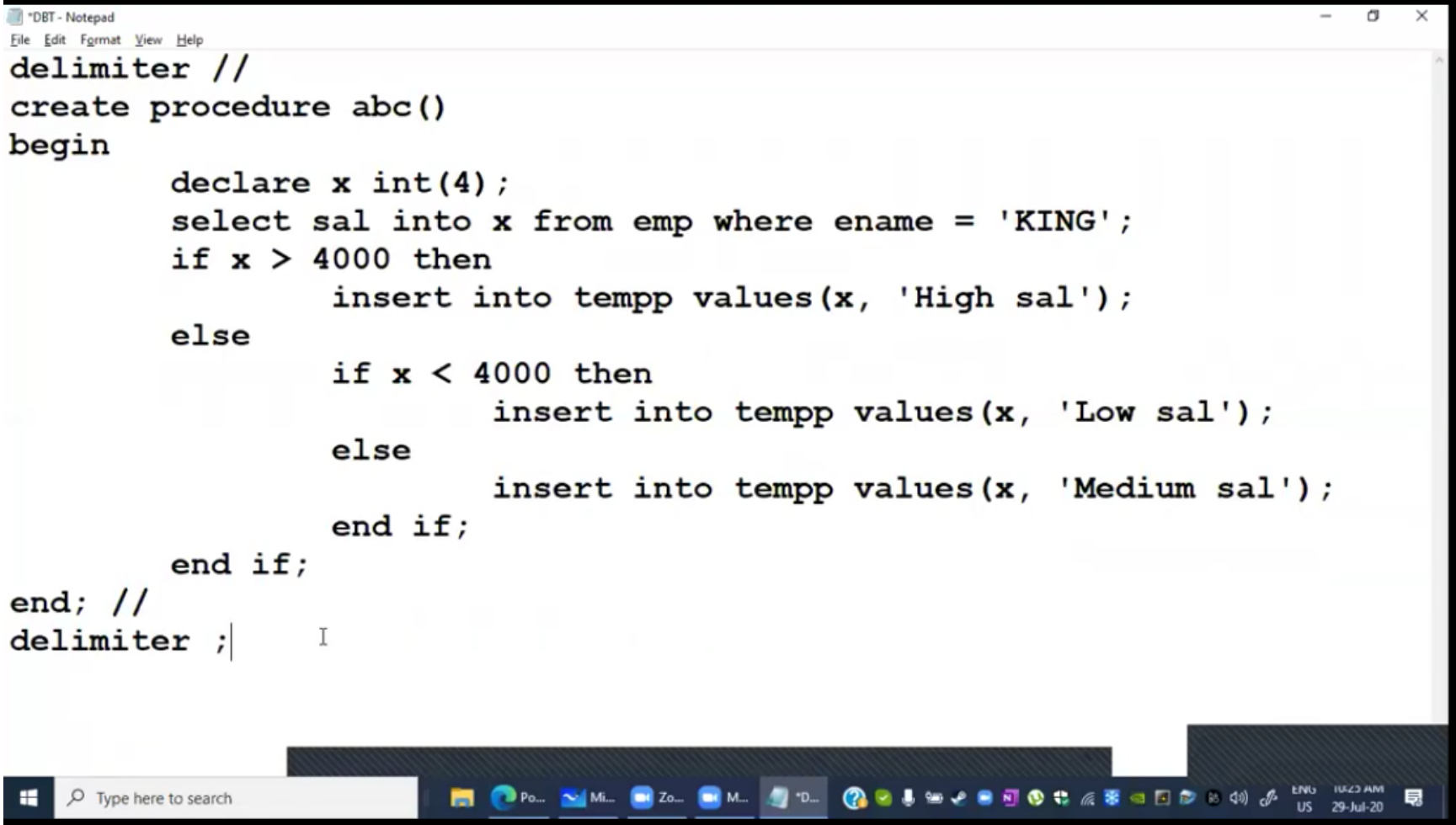
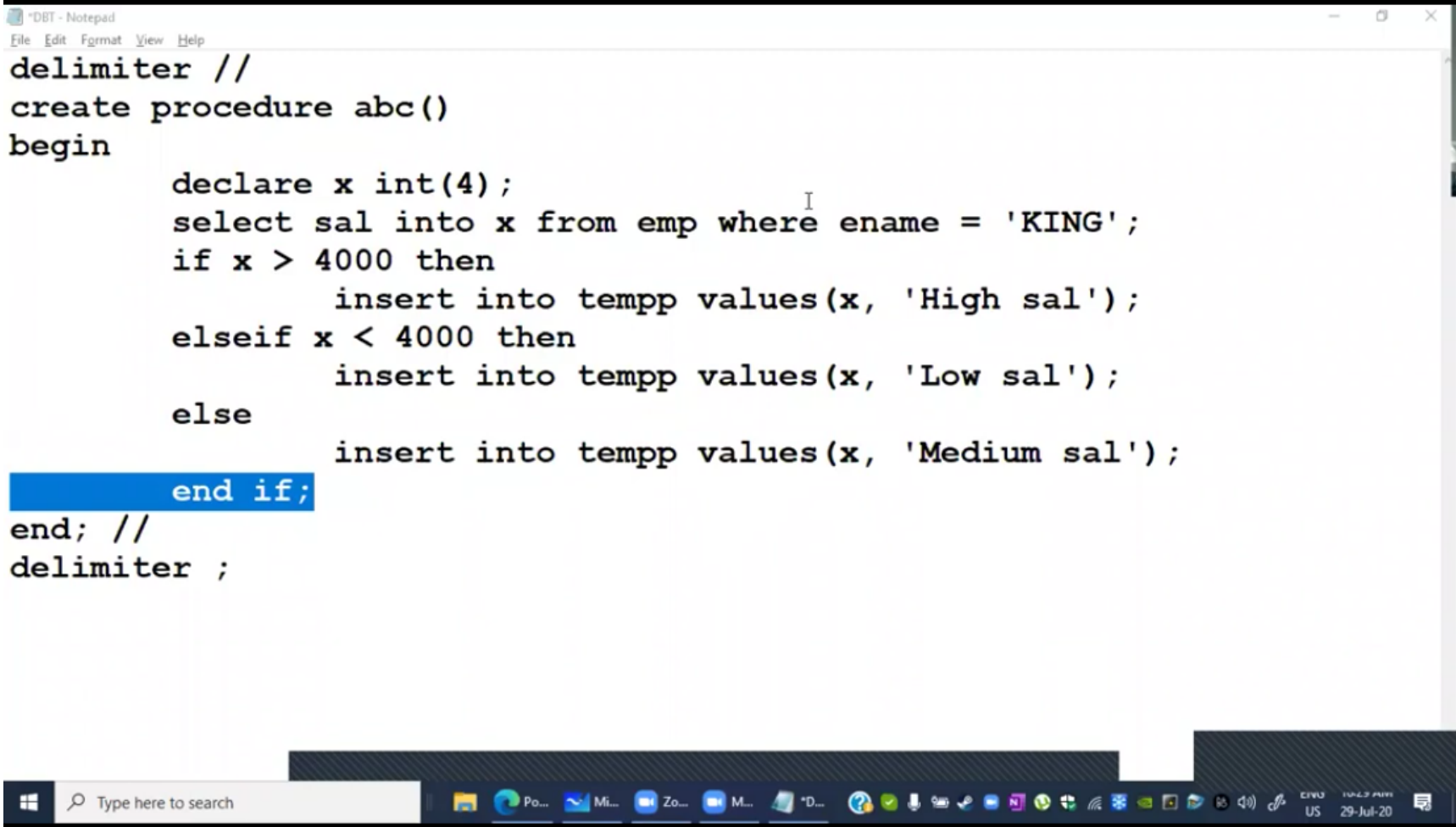
Type here to search
29-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4);
select sal into x from emp where ename = 'KING';
if x > 4000 then
insert into tempp values(x, 'High sal');
else
if x < 4000 then
insert into tempp values(x, 'Low sal');
else
insert into tempp values(x, 'Medium sal');
end if;
end if;
end; //
delimiter ;
Type here to search
ENG
US
29-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4);
select sal into x from emp where ename = 'KING';
if x > 4000 then
insert into tempp values(x, 'High sal');
elseif x < 4000 then
insert into tempp values(x, 'Low sal');
else
insert into tempp values(x, 'Medium sal');
end if;
end; //
delimiter ;
Type here to search
29-Jul-20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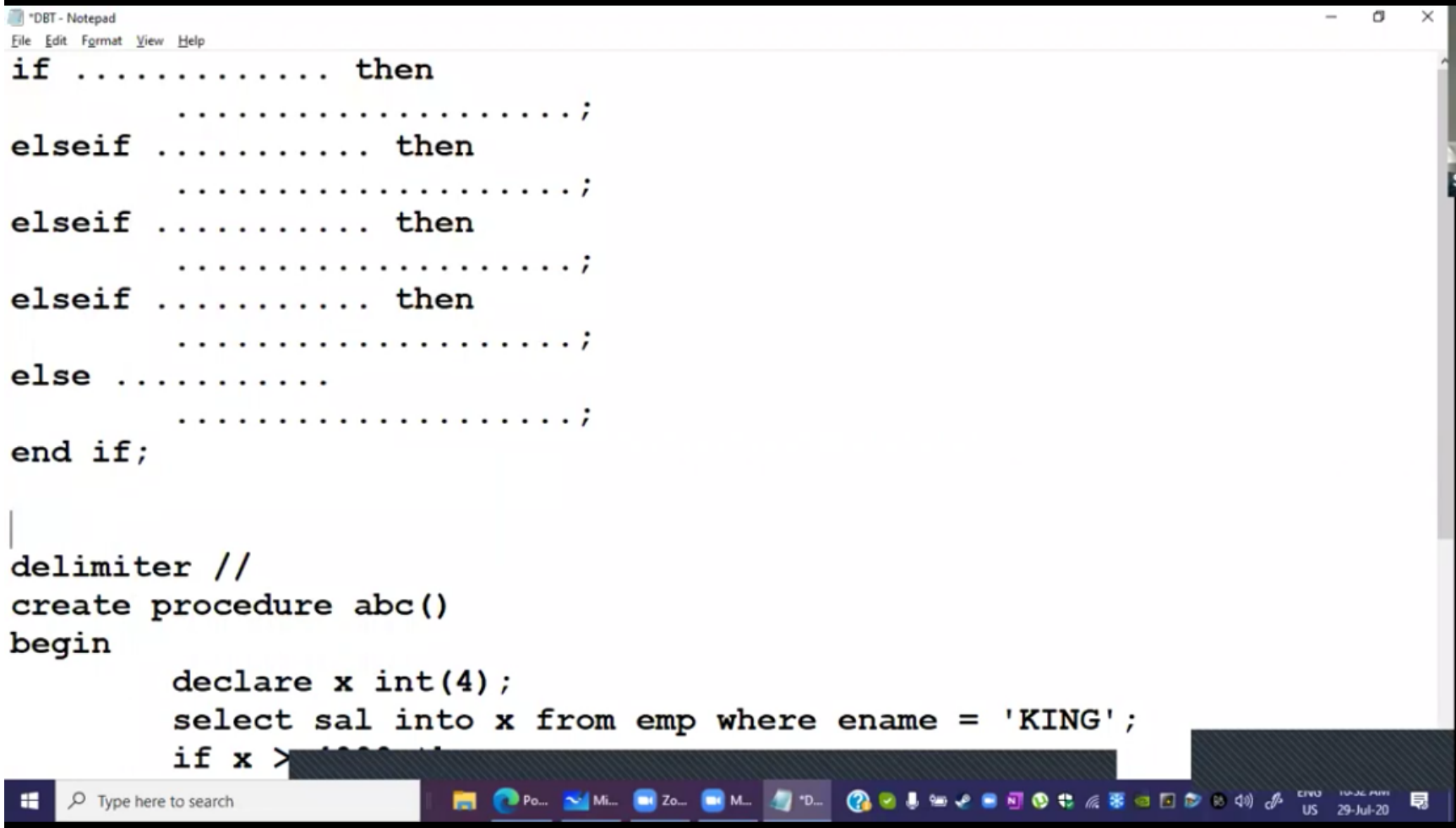
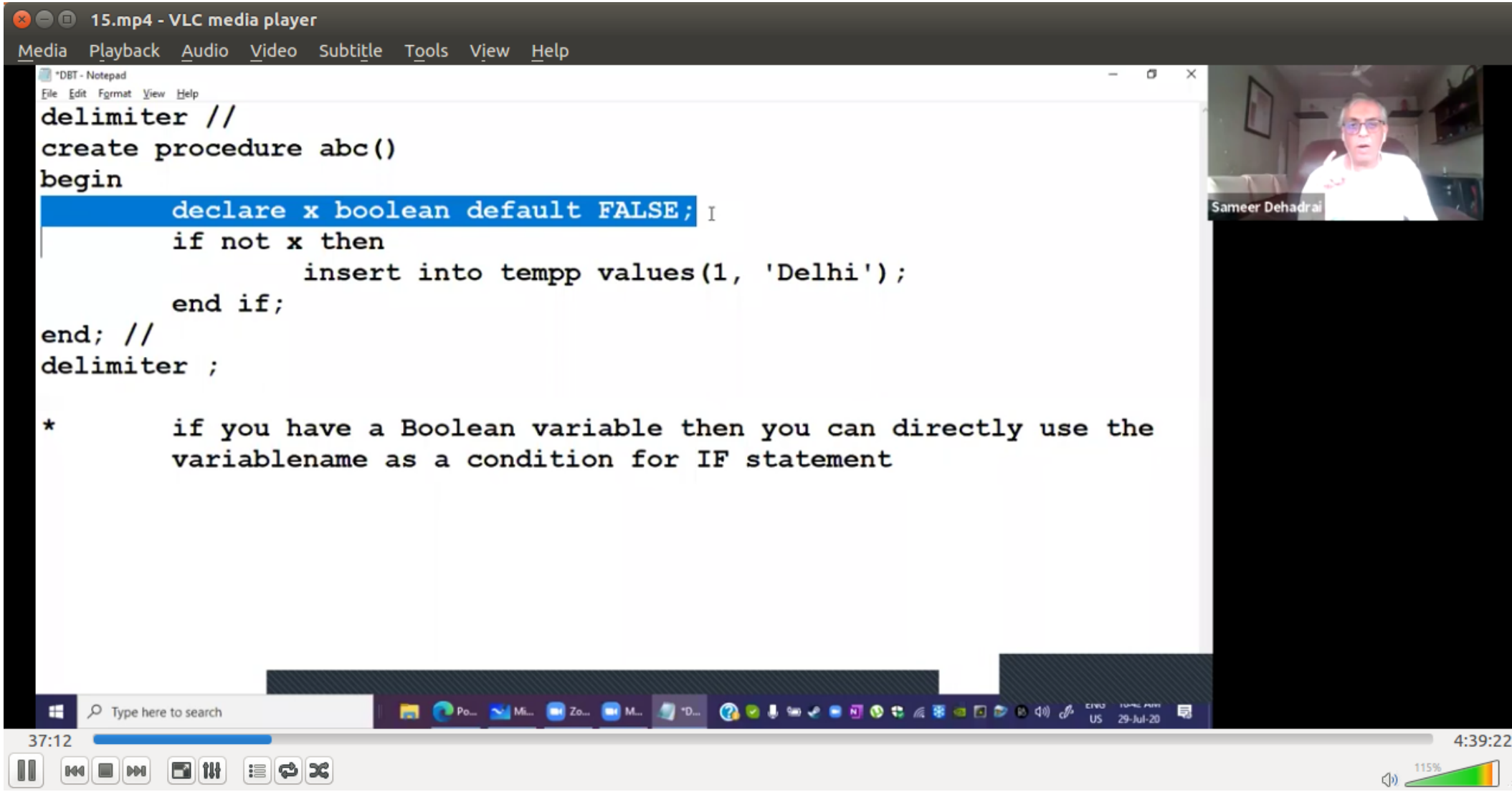

*DBT - Notepad
File Edit Format View Help
if ..... then
.....;
elseif ..... then
.....;
elseif ..... then
.....;
elseif ..... then
.....;
else .....
.....;
end if;
delimiter //
create procedure abc()
begin
declare x int(4);
select sal into x from emp where ename = 'KING';
if x >
Type here to search
29-Jul-20


Sameer Dehadrai


15.mp4 - VLC media player
Media Playback Audio Video Subtitle Tools View Help
*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x boolean default FALSE;
if not x then
insert into tempp values(1, 'Delhi');
end if;
end; //
delimiter ;
* if you have a Boolean variable then you can directly use the variablename as a condition for IF statement
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Type here to search
37:12
4:39:22
115%

*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4);
        select sal into x from emp where ename = 'KING';
        case
        when x > 4000 then
                insert into tempp values(x, 'High sal');
        when x < 4000 then
                insert into tempp values(x, 'Low sal');
        else
                insert into tempp values(x, 'Medium sal');
        end case;
end; //
delimiter ;

*       CASE statement is FASTER than IF statement
```

Type here to search

ENG US 29-Jul-20

*DBT - Notepad

File Edit Format View Help

```
        case
        when x > 4000 then
                insert into tempp values(x, 'High sal');
        when x < 4000 then
                insert into tempp values(x, 'Low sal');
        else
                Begin
                End;
        end case;
end; //
delimiter ;

*       in the CASE statement; ELSE is optional
*       if ELSE is not provided and if none of the cases are satisfied then
        MySQL will give an error message
*       if you want to skip the ELSE and avoid the error message then you
        supply ELSE with an empty Begin and End block
```

Type here to search

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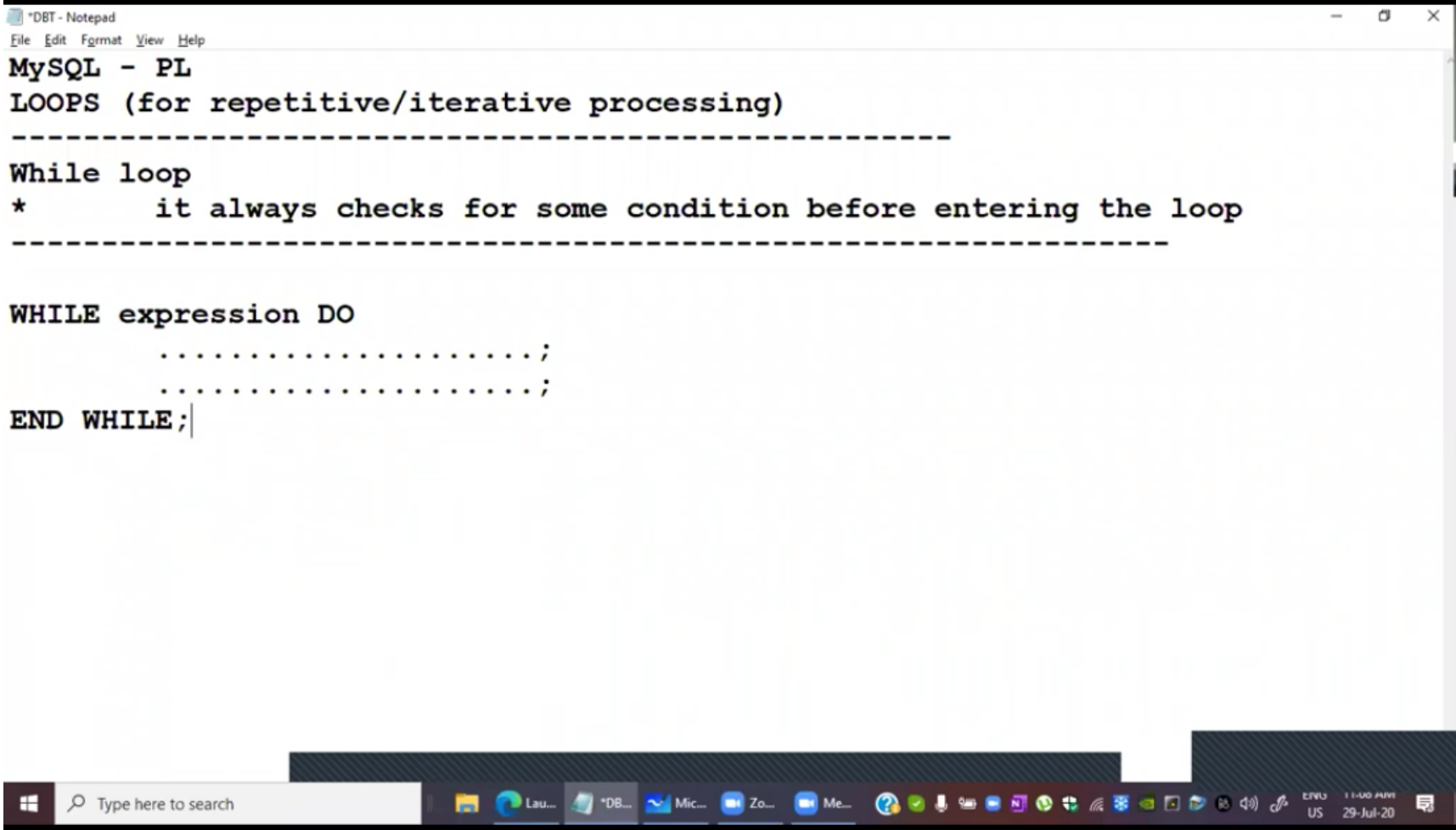
*DBT - Notepad
File Edit Format View Help
MySQL - PL
LOOPS (for repetitive/iterative processing)

While loop
* it always checks for some condition before entering the loop
---
WHILE expression DO
.....;
.....;
END WHILE;
Type here to search
29-Jul-20


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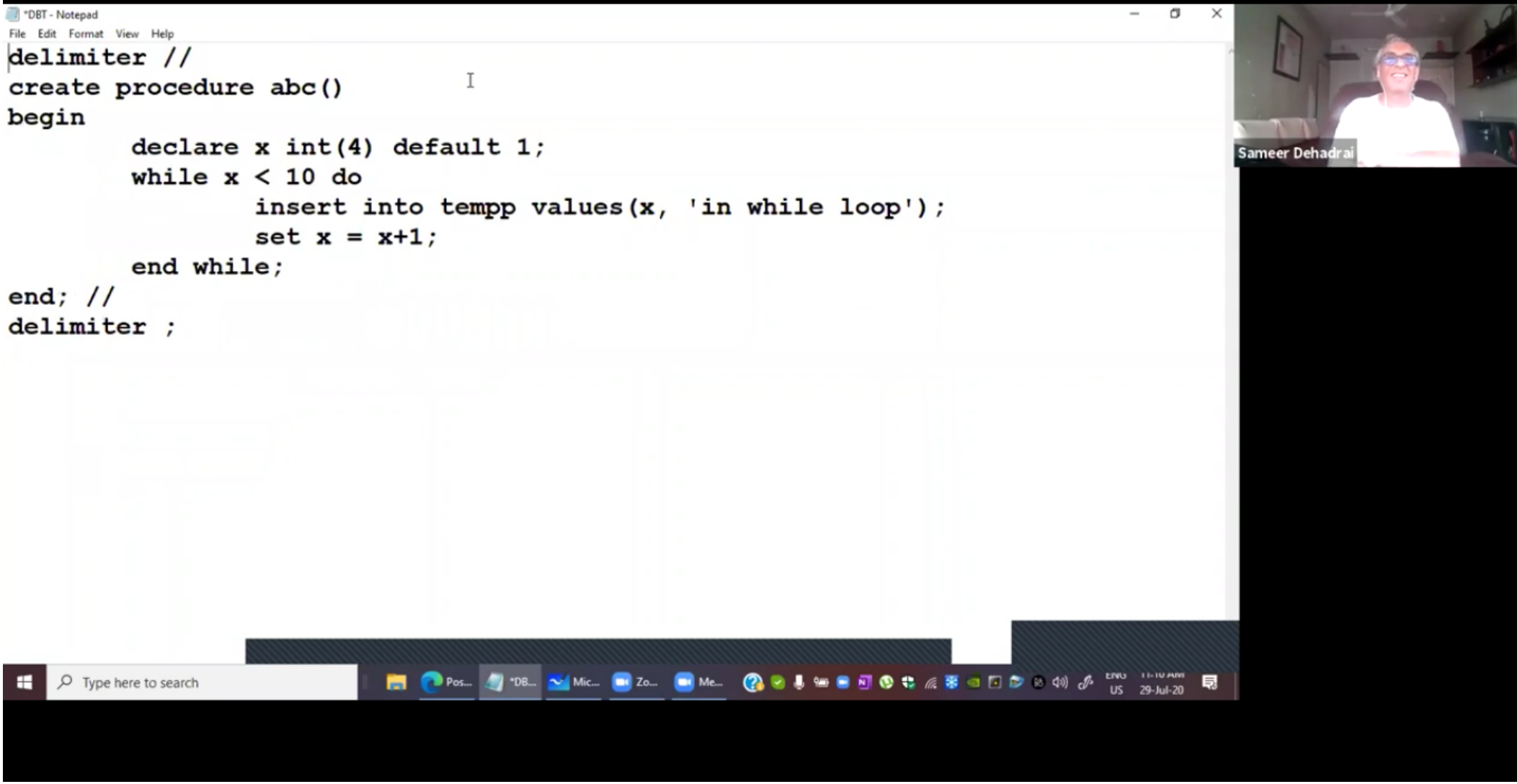
*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4) default 1;
while x < 10 do
insert into tempp values(x, 'in while loop');
set x = x+1;
end while;
end; //
delimiter ;
Sameer Dehadrai
Type here to search
29-Jul-20

*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4) default 1;
        declare y int(4) default 1;
        while x < 10 do
                while y < 10 do
                        insert into tempp values(y, 'in y loop');
                        set y = y+1;
                end while;
                insert into tempp values(x, 'in x loop');
                set x = x+1;
        end while;
end; //
delimiter ;
```

Type here to search

ENG US 29-Jul-20

*DBT - Notepad

File Edit Format View Help

```
Repeat Loop (similar to Do .. While loop):-



REPEAT
        ......................;
        ......................;
UNTIL expression is not satisfied
END REPEAT;
```

Type here to search

ENG US 29-Jul-20

*DBT - Notepad

File Edit Format View Help

```
delimiter //
create procedure abc()
begin
        declare x int(4) default 1;
        repeat
                insert into tempp values(x,'in loop');
                set x = x+1;
        until x > 5
        end repeat;
end; //
delimiter ;

*       there's no criteria to enter the loop, but there is a condition to
        end the loop
*       it will execute at least once
```

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4:39:22

1:21:52/4:39:22

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Loop, Leave, and Iterate statements:-

* Leave statement allows you to exit the loop (similar to break statement of 'C' programming)
* Iterate statement allows you to skip the entire code under it and start a new iteration (similar to continue statement of 'C' programming)
* Loop statement executes a block of code repeatedly with an additional flexibility of using a loop label

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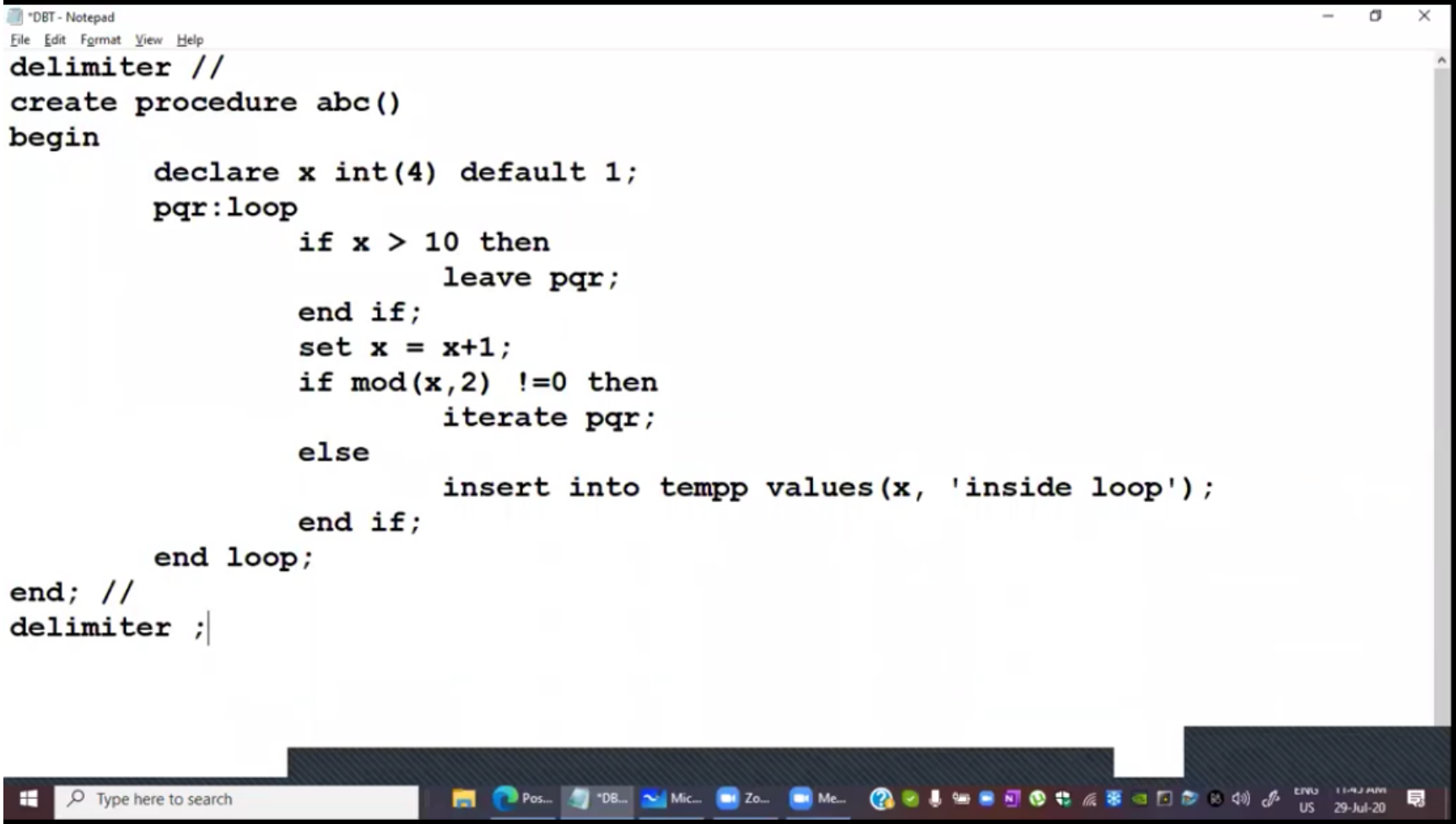
*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare x int(4) default 1;
pqr:loop
if x > 10 then
leave pqr;
end if;
set x = x+1;
if mod(x,2) !=0 then
iterate pqr;
else
insert into tempp values(x, 'inside loop');
end if;
end loop;
end; //
delimiter ;
Type here to search
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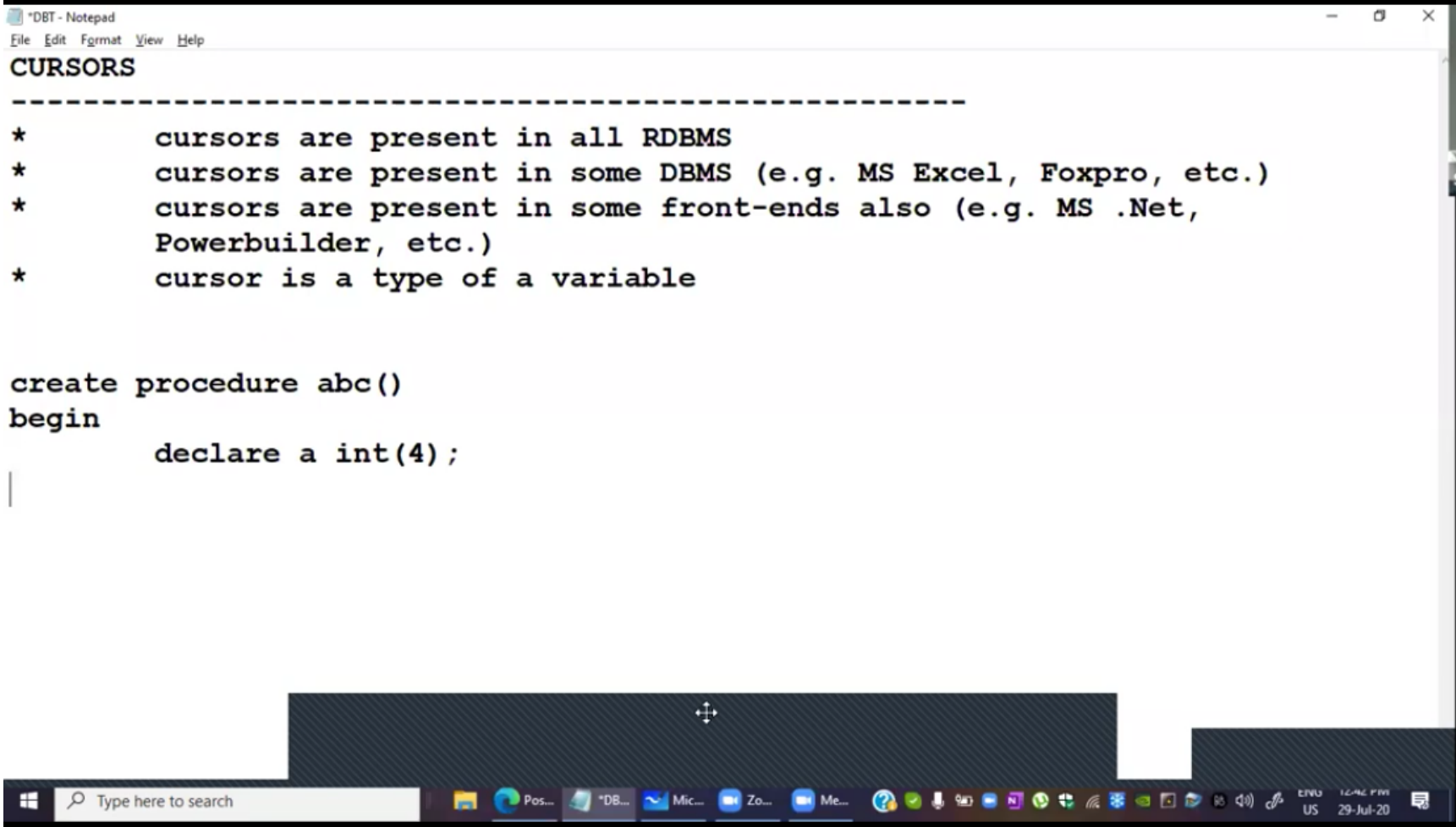
*DBT - Notepad
File Edit Format View Help
CURSORS
---
* cursors are present in all RDBMS
* cursors are present in some DBMS (e.g. MS Excel, Foxpro, etc.)
* cursors are present in some front-ends also (e.g. MS .Net, Powerbuilder, etc.)
* cursor is a type of a variable
create procedure abc()
begin
declare a int(4);
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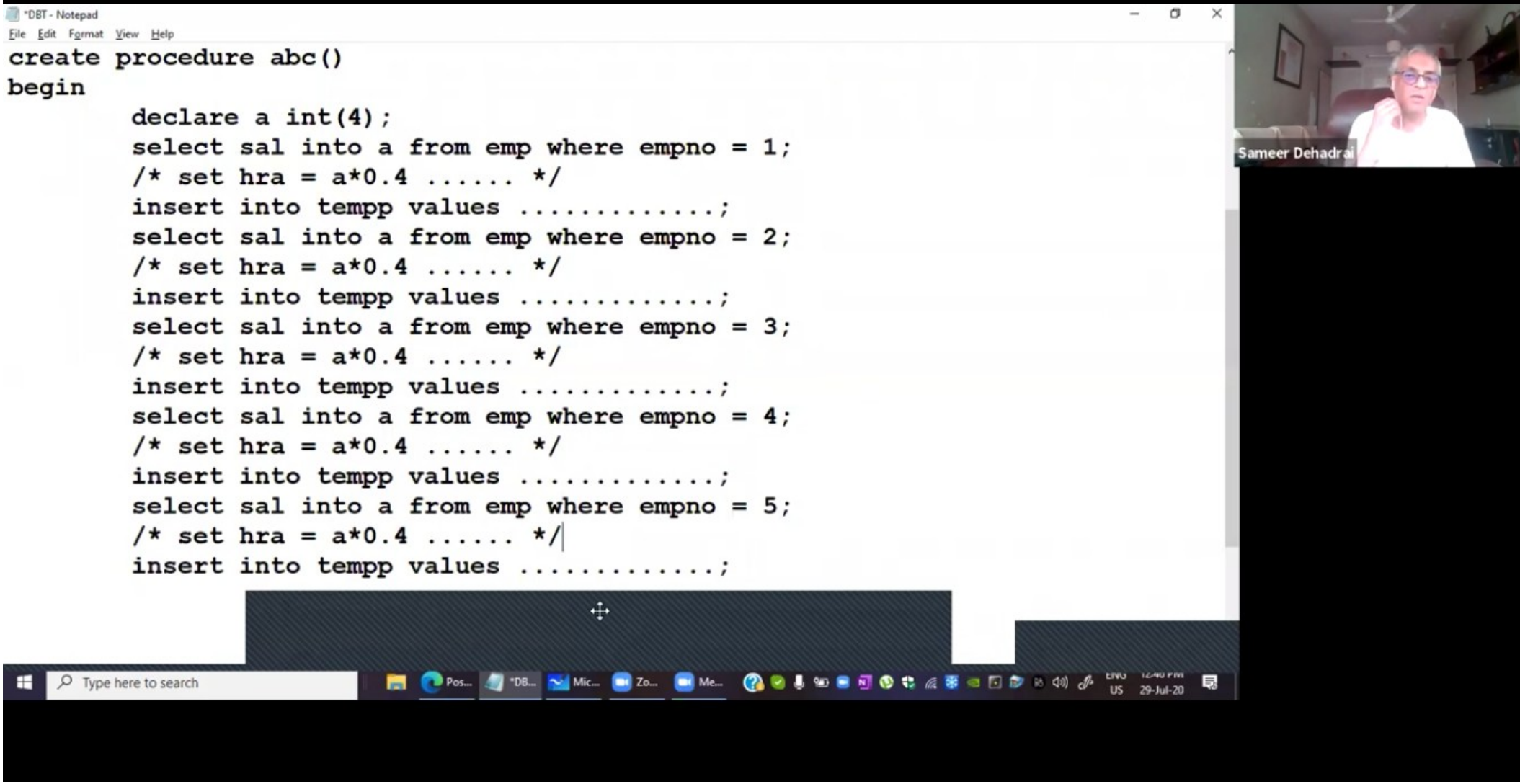
*DBT - Notepad
File Edit Format View Help
create procedure abc()
begin
declare a int(4);
select sal into a from emp where empno = 1;
/* set hra = a*0.4 ..... */
insert into tempp values .....;
select sal into a from emp where empno = 2;
/* set hra = a*0.4 ..... */
insert into tempp values .....;
select sal into a from emp where empno = 3;
/* set hra = a*0.4 ..... */
insert into tempp values .....;
select sal into a from emp where empno = 4;
/* set hra = a*0.4 ..... */
insert into tempp values .....;
select sal into a from emp where empno = 5;
/* set hra = a*0.4 ..... */
insert into tempp values .....;
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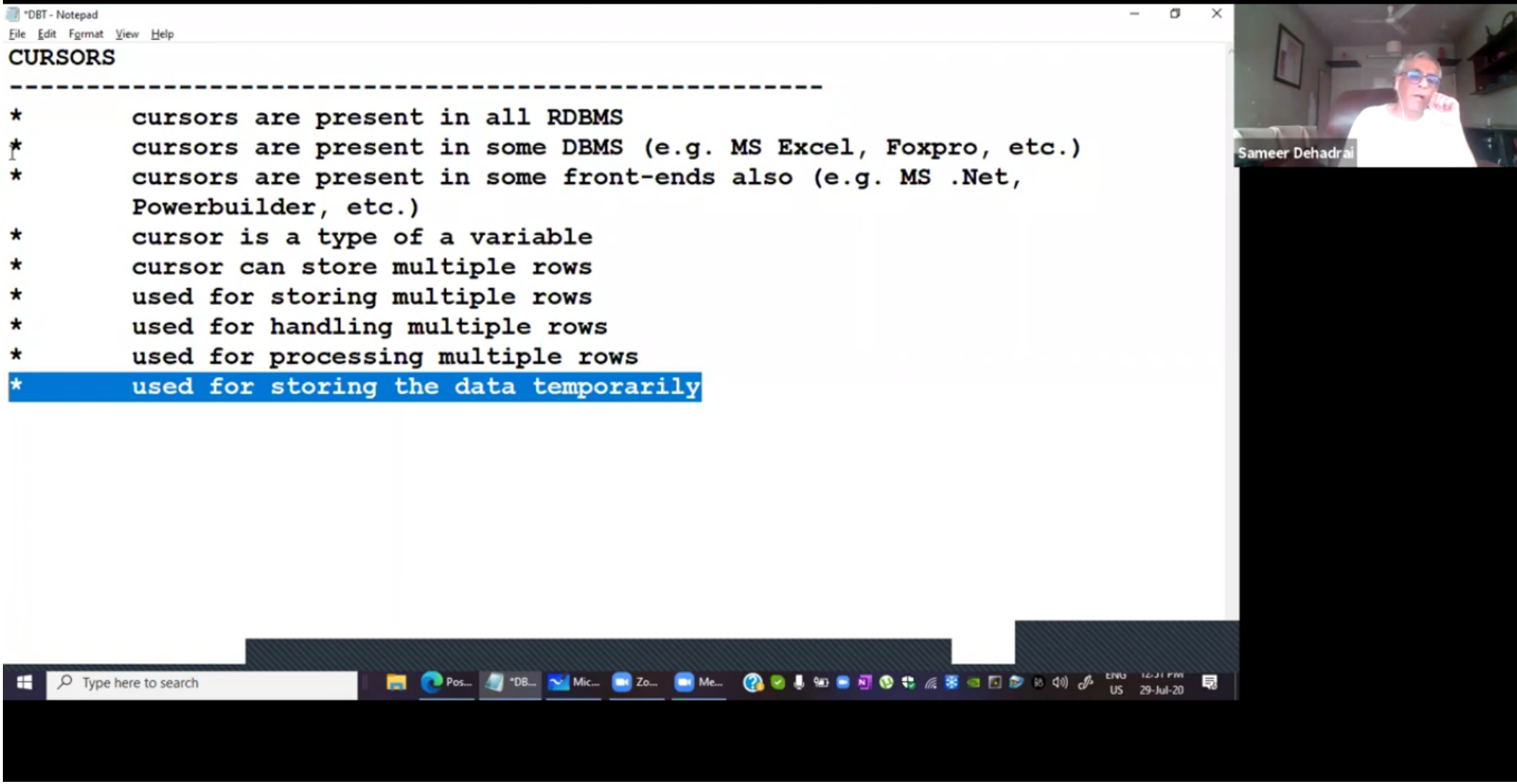
*DBT - Notepad
File Edit Format View Help
CURSORS
---
* cursors are present in all RDBMS
* cursors are present in some DBMS (e.g. MS Excel, Foxpro, etc.)
* cursors are present in some front-ends also (e.g. MS .Net, Powerbuilder, etc.)
* cursor is a type of a variable
* cursor can store multiple rows
* used for storing multiple rows
* used for handling multiple rows
* used for processing multiple rows
* used for storing the data temporarily
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*DBT - Notepad

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```
CURSORS
-------------------------------------------------------
*       cursor is a type of a variable
*       cursor can store multiple rows
*       used for storing multiple rows
*       used for handling multiple rows
*       used for processing multiple rows
*       used for storing the data temporarily
*       similar to 2D array
*       cursor is based on SELECT statement

create procedure abc()
begin
        declare pqr cursor for select * from emp;
```

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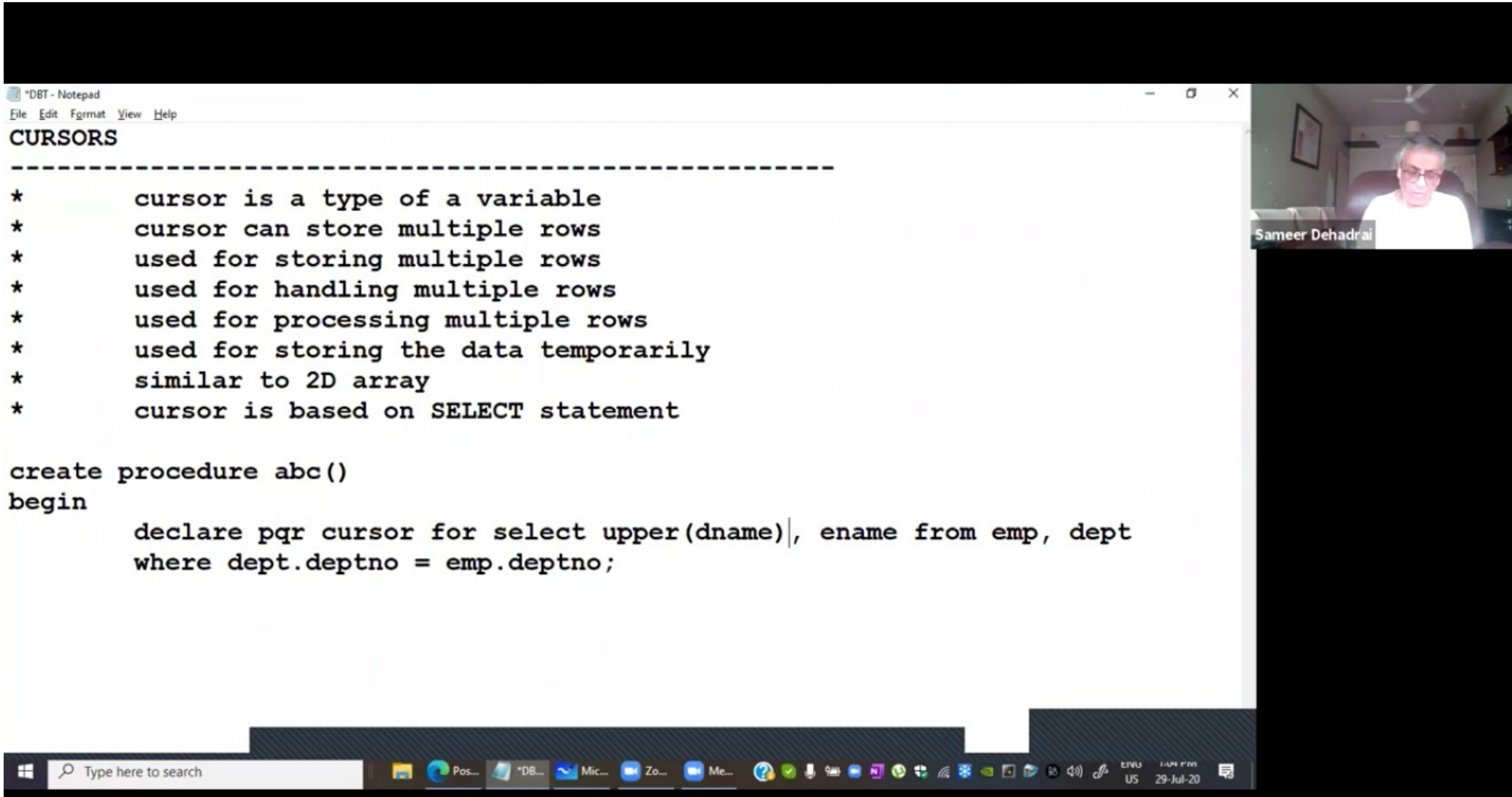
File Edit Format View Help

```
CURSORS
-------------------------------------------------------
*       cursor is a type of a variable
*       cursor can store multiple rows
*       used for storing multiple rows
*       used for handling multiple rows
*       used for processing multiple rows
*       used for storing the data temporarily
*       similar to 2D array
*       cursor is based on SELECT statement

create procedure abc()
begin
        declare pqr cursor for select * from emp where deptno = 1;
```


*DBT - Notepad
File Edit Format View Help
CURSORS
---
* cursor is a type of a variable
* cursor can store multiple rows
* used for storing multiple rows
* used for handling multiple rows
* used for processing multiple rows
* used for storing the data temporarily
* similar to 2D array
* cursor is based on SELECT statement
create procedure abc()
begin
declare pqr cursor for select upper(dname), ename from emp, dept
where dept.deptno = emp.deptno;
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```
delimiter //
create procedure abc()
begin
        declare a int(4);
        declare b varchar(15);
        declare c int(4);
        declare d int(2);
        declare x int(4) default 1;
        declare c1 cursor for select * from emp;
        open c1;
        while x < 6 do
                fetch c1 into a,b,c,d;
                /* processing, e.g. set hra = c*0.4, etc. */
                insert into tempp values(a,b);
                set x = x+1;
        end while;
        close c1;
end; //
delimiter ;
```

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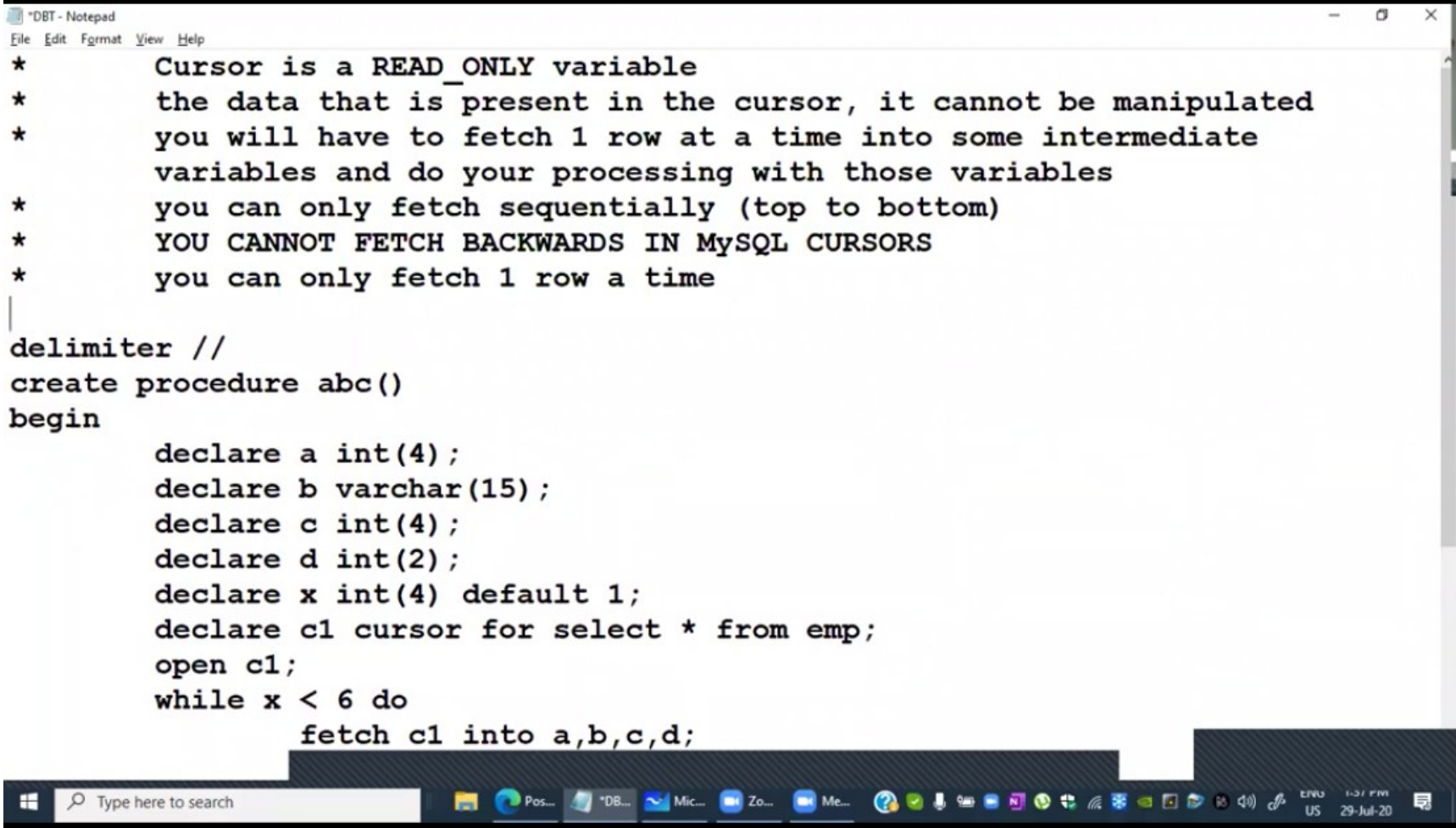
*DBT - Notepad
File Edit Format View Help
* Cursor is a READ_ONLY variable
* the data that is present in the cursor, it cannot be manipulated
* you will have to fetch 1 row at a time into some intermediate
   variables and do your processing with those variables
* you can only fetch sequentially (top to bottom)
* YOU CANNOT FETCH BACKWARDS IN MySQL CURSORS
* you can only fetch 1 row a time
delimiter //
create procedure abc()
begin
  declare a int(4);
  declare b varchar(15);
  declare c int(4);
  declare d int(2);
  declare x int(4) default 1;
  declare c1 cursor for select * from emp;
  open c1;
  while x < 6 do
    fetch c1 into a,b,c,d;
Type here to search
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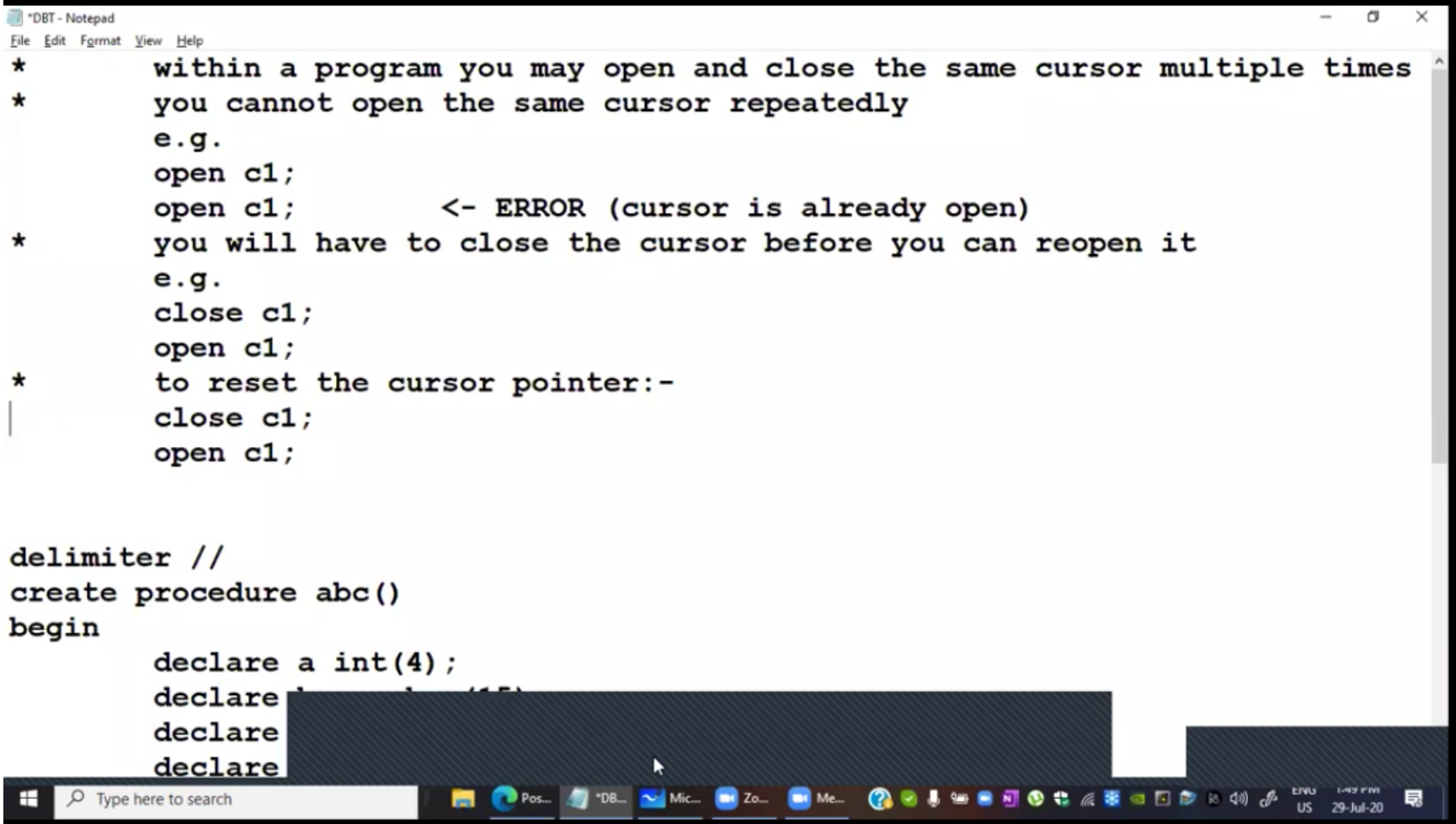
*DBT - Notepad
File Edit Format View Help
* within a program you may open and close the same cursor multiple times
* you cannot open the same cursor repeatedly
e.g.
open c1;
open c1; <- ERROR (cursor is already open)
* you will have to close the cursor before you can reopen it
e.g.
close c1;
open c1;
* to reset the cursor pointer:-
close c1;
open c1;
delimiter //
create procedure abc()
begin
declare a int(4);
declare
declare
declare
Type here to search
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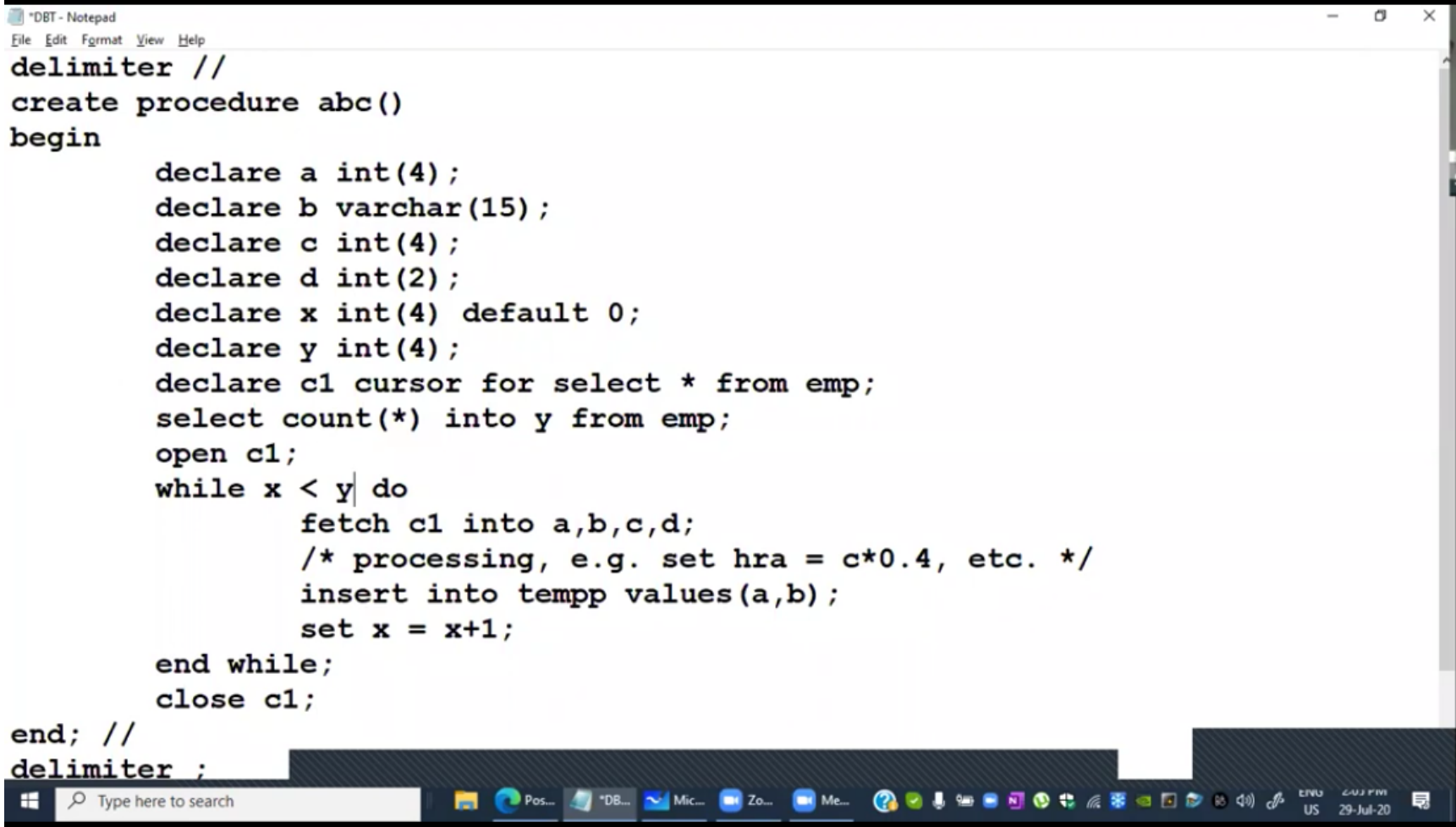
*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare a int(4);
declare b varchar(15);
declare c int(4);
declare d int(2);
declare x int(4) default 0;
declare y int(4);
declare c1 cursor for select * from emp;
select count(*) into y from emp;
open c1;
while x < y do
fetch c1 into a,b,c,d;
/* processing, e.g. set hra = c*0.4, etc. */
insert into tempp values(a,b);
set x = x+1;
end while;
close c1;
end; //
delimiter ;
Type here to search
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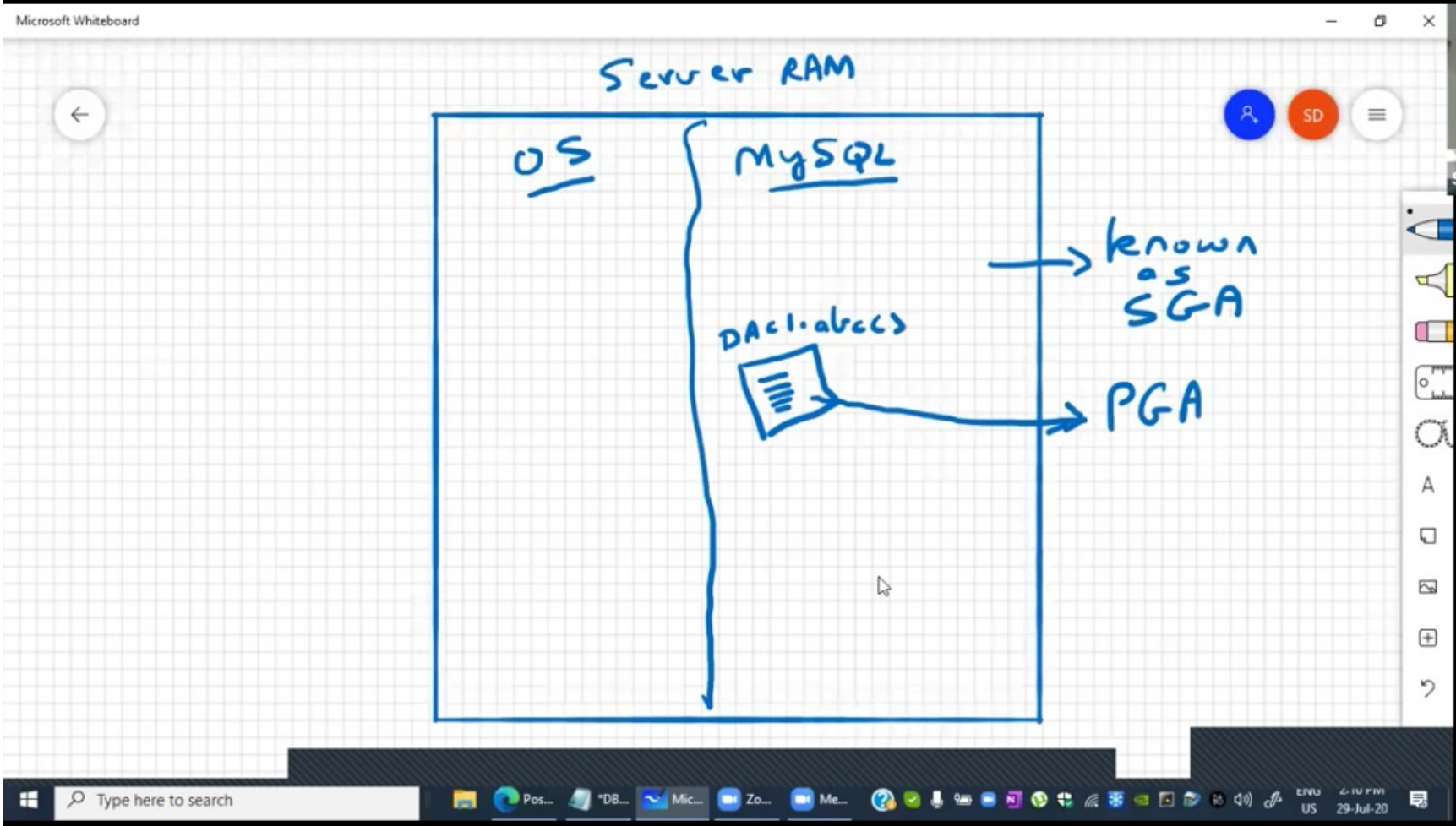
Microsoft Whiteboard
Server RAM
OS
MySQL
known as SGA
DAC1.abccs
PGA
SD
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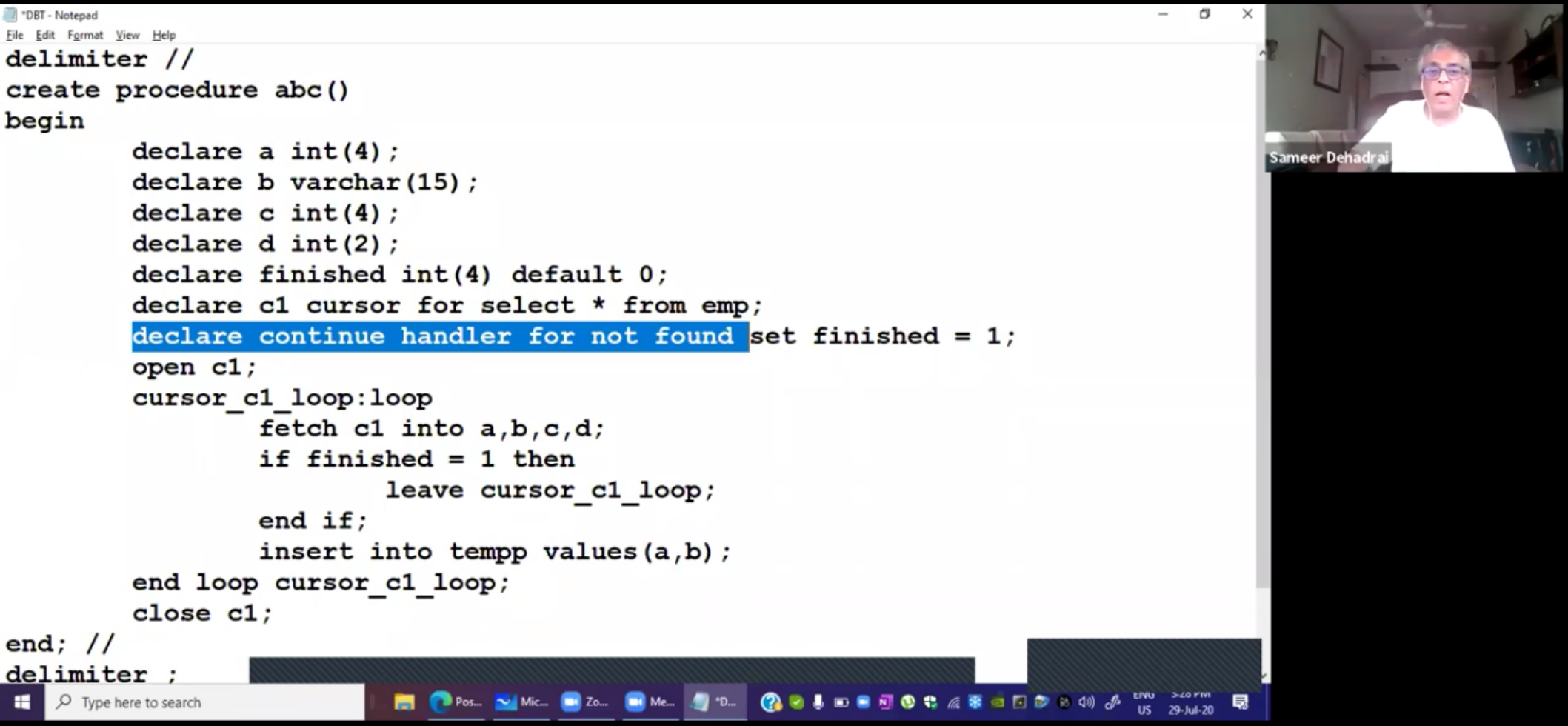
Type here to search
ENG US
29-Jul-20


*DBT - Notepad
File Edit Format View Help
delimiter //
create procedure abc()
begin
declare a int(4);
declare b varchar(15);
declare c int(4);
declare d int(2);
declare finished int(4) default 0;
declare c1 cursor for select * from emp;
declare continue handler for not found set finished = 1;
open c1;
cursor_c1_loop:loop
fetch c1 into a,b,c,d;
if finished = 1 then
leave cursor_c1_loop;
end if;
insert into tempp values(a,b);
end loop cursor_c1_loop;
close c1;
end; //
delimiter ;
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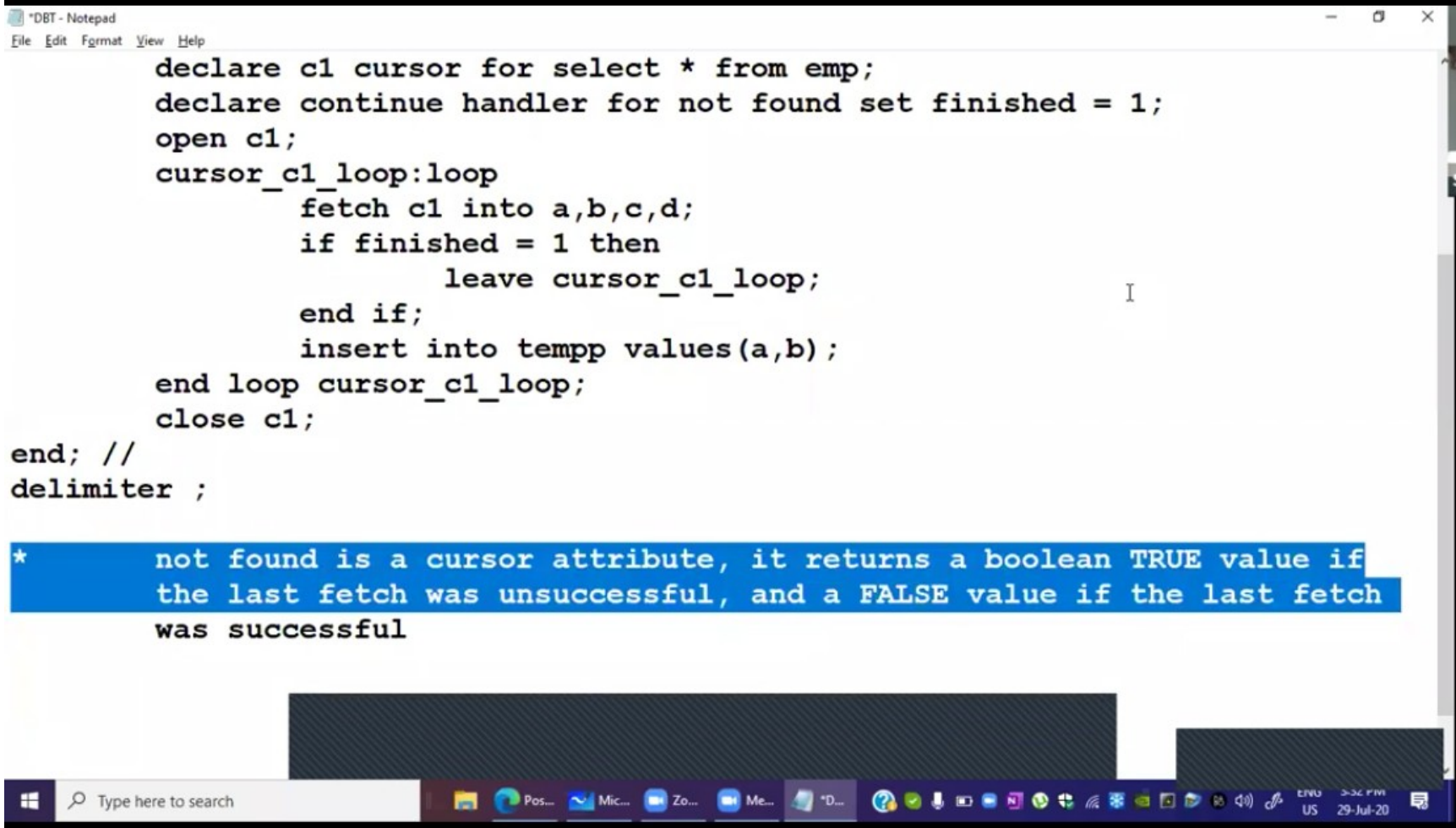
Type here to search
ENG
US
29-Jul-20


*DBT - Notepad
File Edit Format View Help
declare c1 cursor for select * from emp;
declare continue handler for not found set finished = 1;
open c1;
cursor_c1_loop:loop
fetch c1 into a,b,c,d;
if finished = 1 then
leave cursor_c1_loop;
end if;
insert into tempp values(a,b);
end loop cursor_c1_loop;
close c1;
end; //
delimiter ;
* not found is a cursor attribute, it returns a boolean TRUE value if the last fetch was unsuccessful, and a FALSE value if the last fetch was successful
Type here to search
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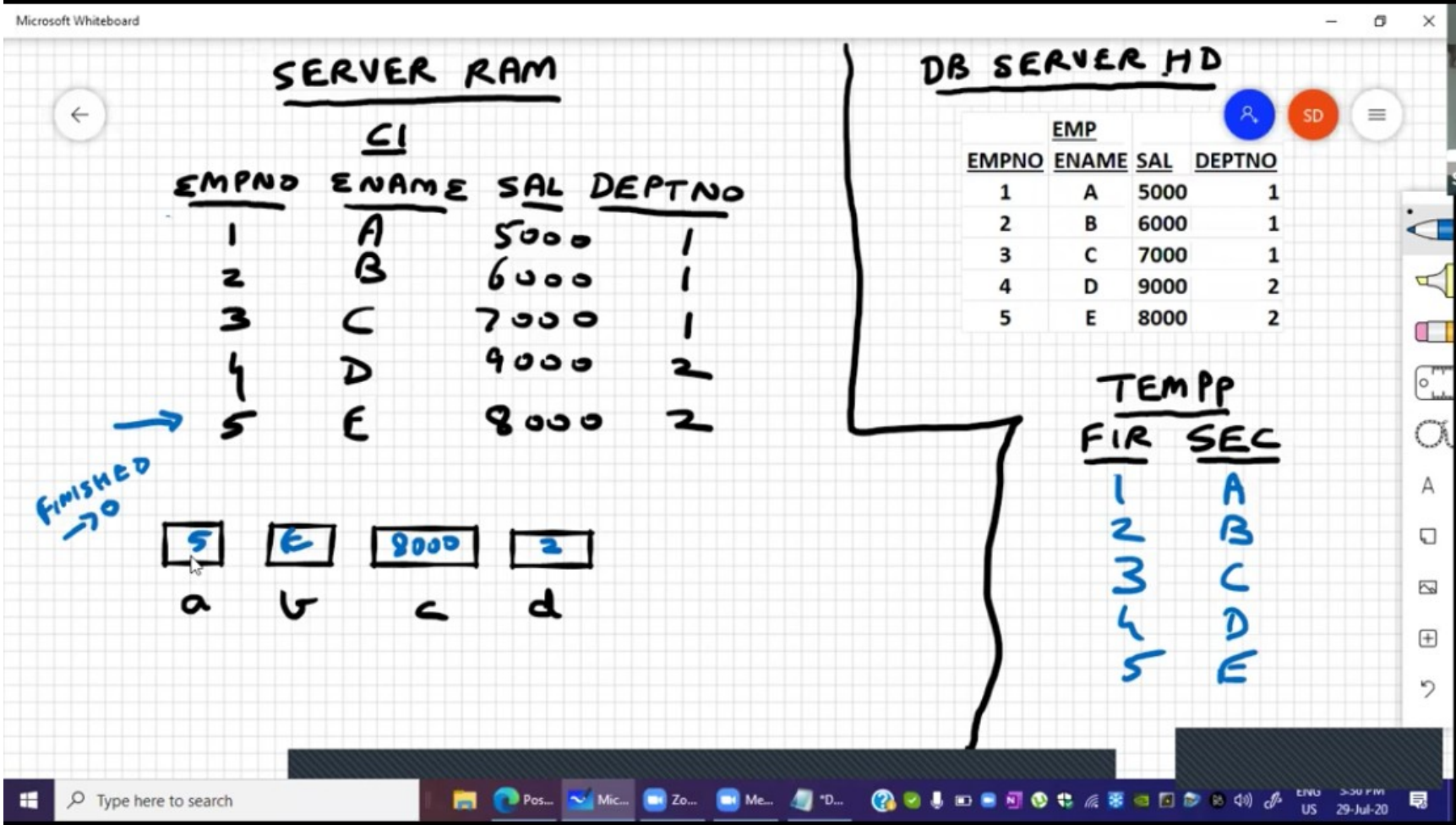
Microsoft Whiteboard



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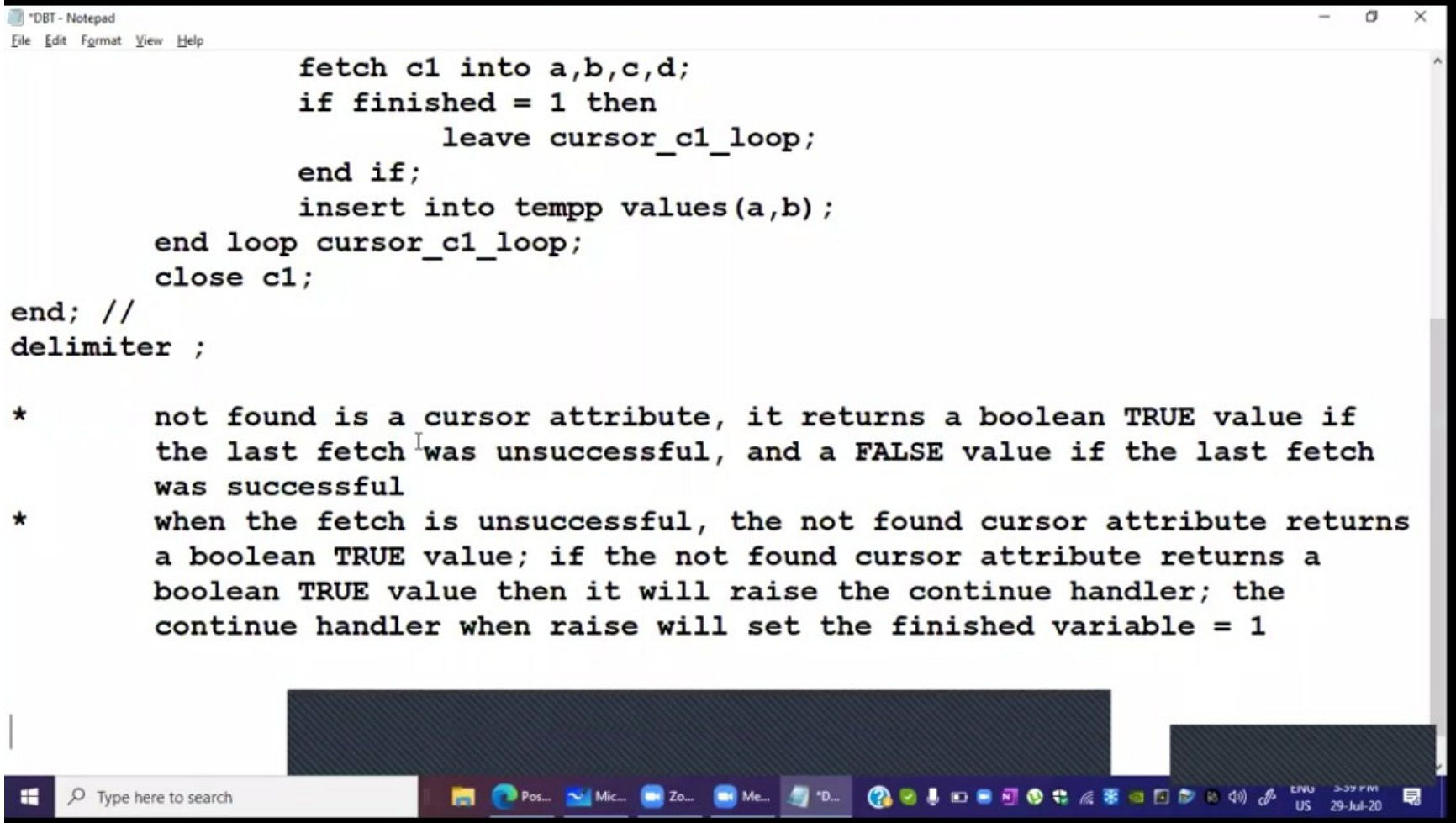
*DBT - Notepad
File Edit Format View Help
fetch c1 into a,b,c,d;
if finished = 1 then
leave cursor_c1_loop;
end if;
insert into tempp values(a,b);
end loop cursor_c1_loop;
close c1;
end; //
delimiter ;
* not found is a cursor attribute, it returns a boolean TRUE value if the last fetch was unsuccessful, and a FALSE value if the last fetch was successful
* when the fetch is unsuccessful, the not found cursor attribute returns a boolean TRUE value; if the not found cursor attribute returns a boolean TRUE value then it will raise the continue handler; the continue handler when raise will set the finished variable = 1
Type here to search
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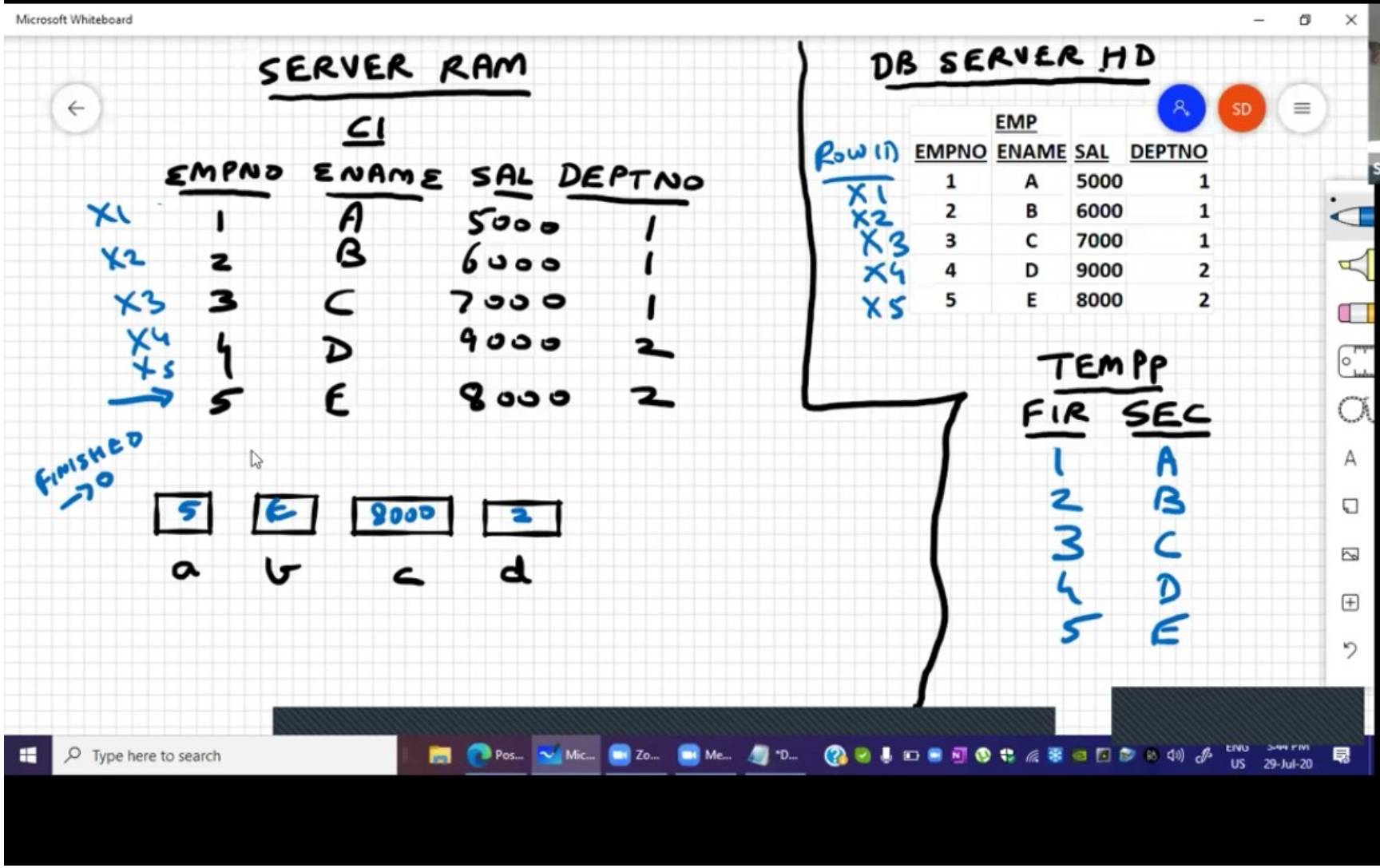
29-Jul-20

Microsoft Whiteboard



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*DBT - Notepad

File Edit Format View Help

```
begin
        declare a int(4);
        declare b varchar(15);
        declare c int(4);
        declare d int(2);
        declare finished int(4) default 1;
        declare c1 cursor for select * from emp;
        declare continue handler for not found set finished = 0;
        open c1;
        cursor_c1_loop:loop
                fetch c1 into a,b,c,d;
                if finished = 1 then
                        leave cursor_c1_loop;
                end if;
                update emp set sal = sal+1;
        end loop cursor_c1_loop;
        close c1;
end; //
delimiter ;
```

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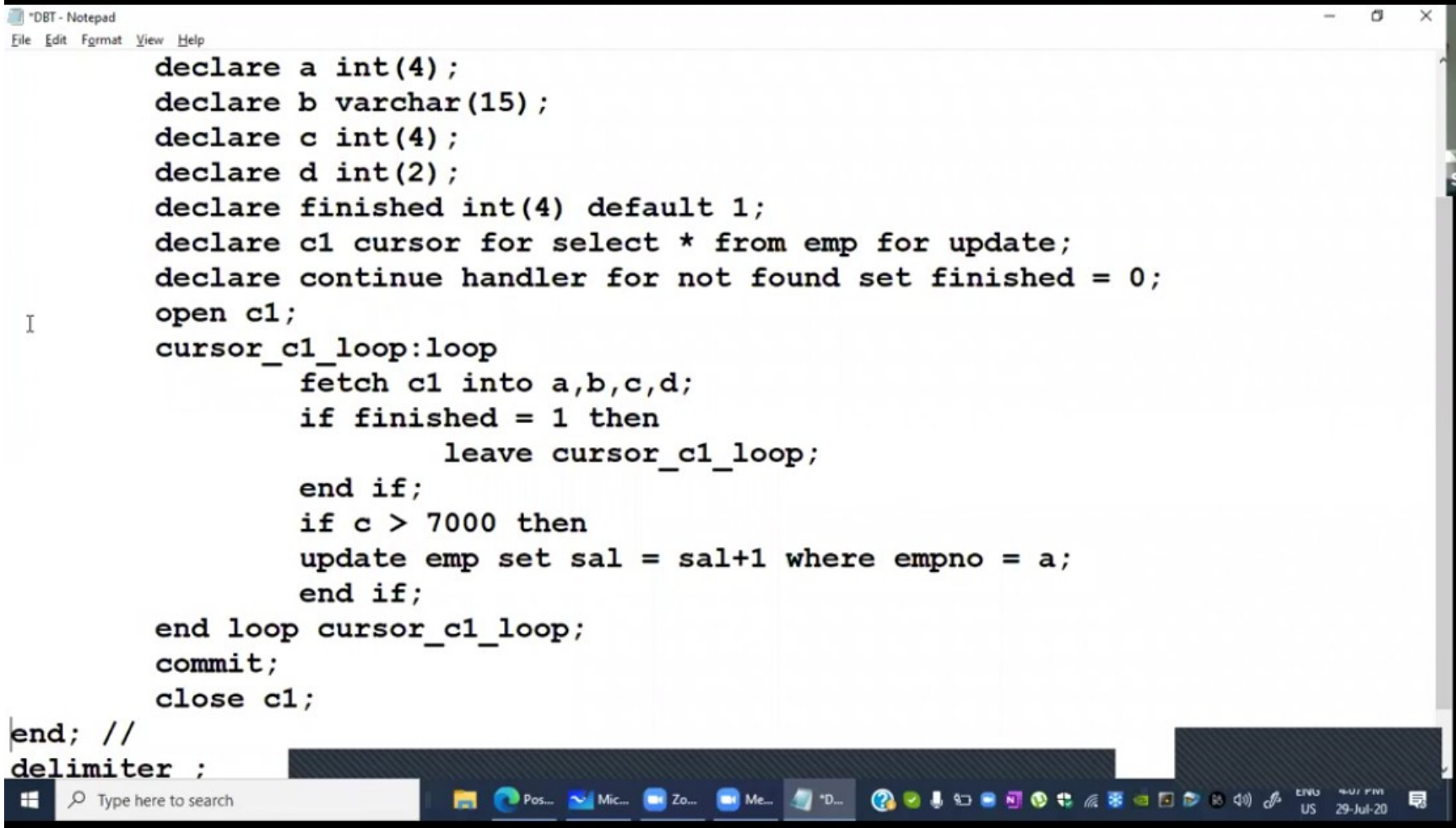
*DBT - Notepad
File Edit Format View Help
declare a int(4);
declare b varchar(15);
declare c int(4);
declare d int(2);
declare finished int(4) default 1;
declare c1 cursor for select * from emp for update;
declare continue handler for not found set finished = 0;
open c1;
cursor_c1_loop:loop
fetch c1 into a,b,c,d;
if finished = 1 then
leave cursor_c1_loop;
end if;
if c > 7000 then
update emp set sal = sal+1 where empno = a;
end if;
end loop cursor_c1_loop;
commit;
close c1;
end; //
delimiter ;
Type here to search


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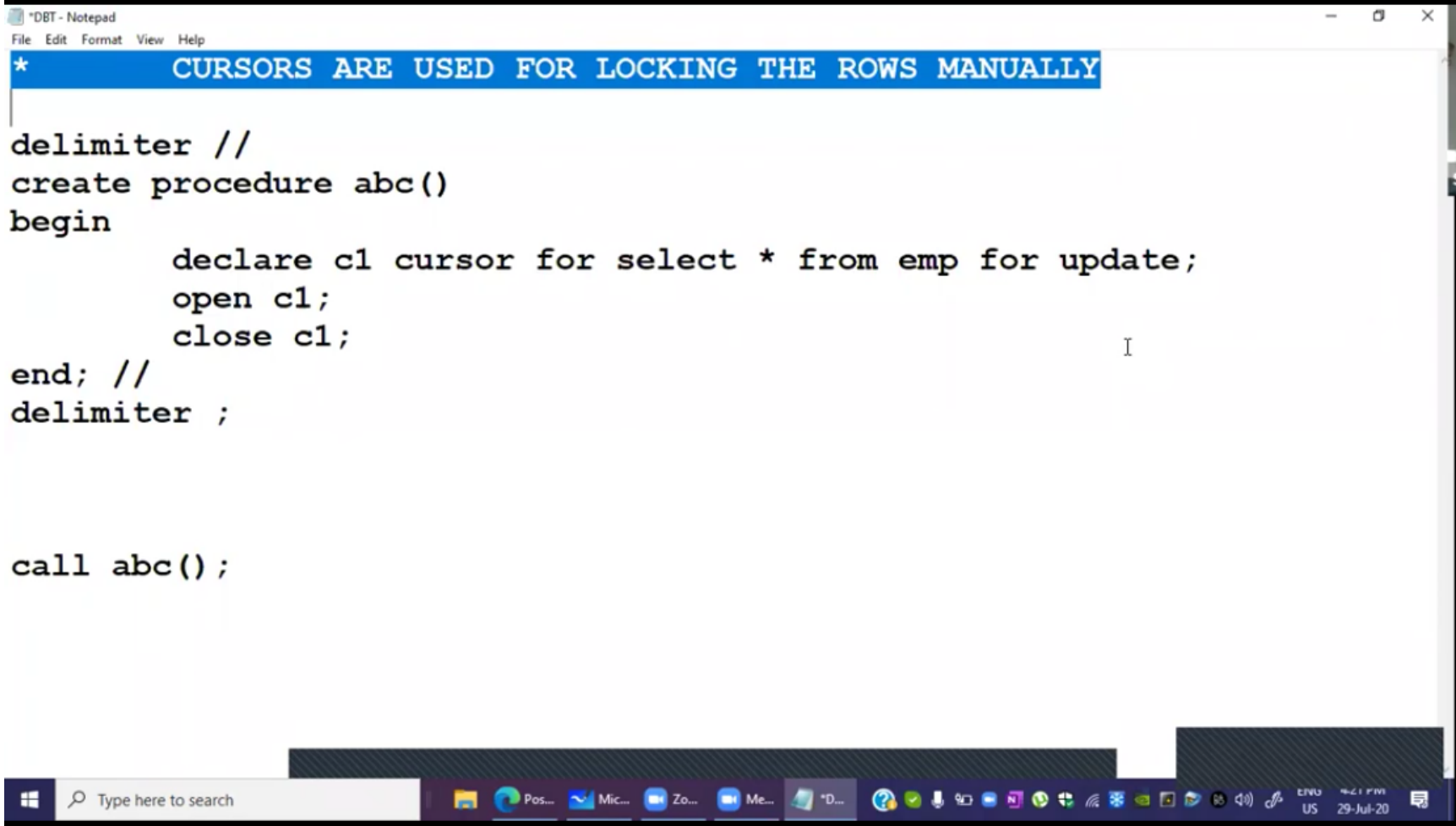
*DBT - Notepad
File Edit Format View Help
* CURSORS ARE USED FOR LOCKING THE ROWS MANUALLY
delimiter //
create procedure abc()
begin
declare c1 cursor for select * from emp for update;
open c1;
close c1;
end; //
delimiter ;
call abc();
Type here to search
Pos...
Mic...
Zo...
Me...
*D...
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US
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*DBT - Notepad

File Edit Format View Help

```
*       CURSORS ARE USED FOR LOCKING THE ROWS MANUALLY

delimiter //
create procedure abc(y int(4))
begin
        declare c1 cursor for select * from emp
        where deptno = y for update;
        open c1;
        close c1;
end; //
delimiter ;

-----------------------------------------
call abc(1);

*       LOCKS ARE AUTOMATICALLY RELEASED WHEN YOU ROLLBACK OR COMMIT
```

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