190031249 **P.MOHITH**

EXPERIMENT 10

PRE-LAB

1. **Analyze the code and tell your observation?**

```
DECLARE
a number(3) := 100;
BEGIN
IF (a = 50 ) THEN
dbms_output.put_line('Value of a is 10' );
ELSEIF ( a = 75 ) THEN
dbms_output.put_line('Value of a is 20' );
ELSE
dbms_output.put_line('None of the values is matching');
END IF;
dbms_output.put_line('Exact value of a is: '|| a );
END;
```

Ans) The Output is
None of the values is matching
Exact value of a is 100

2. What will be the output of the following code?

```
DECLARE
 lines dbms_output.chararr;
   num_lines number;
BEGIN
    Dbms_output.enable;
   dbms_output.put_line('Hello!');
   dbms_output.put_line('Hope you are doing well!');
   num_lines := 2;
   dbms_output.get_lines(lines, num_lines);
   FOR i IN 1..num_lines LOOP
      dbms_output.put_line(lines(i));
   END LOOP;
END;
```

Ans) Hello Reader
Hope you have enjoyed doing well
2

3. Consider the following code :–

```
DECLARE
   -- Global variables
 num number := 95;
BEGIN
   dbms_output.put_line('num: ' || num1);
   DECLARE
```

```
     -- Local variables
     num number := 195;
    BEGIN
     dbms_output.put_line('num: ' || num1);
    END;
END;
```

What will happen when the code is executed?

Ans) Not executed , because syntax error.

4. What would be printed when the following code is executed?

```
DECLARE
    x   NUMBER;
  BEGIN
    x := 5;
    x := 10;
    dbms_output.put_line(-x);
    dbms_output.put_line(+x);
    x := -10;
    dbms_output.put_line(-x);
    dbms_output.put_line(+x);
  END;
```

Ans)
```
 -10
 10
 10
-10
```

5. What will be printed by the following PL/SQL block?

```
DECLARE
   a number;
   b number;
   c number;
PROCEDURE findMin(x IN number, y IN number, z OUT number) IS
BEGIN
IF x < y THEN
    z:= x;
   ELSE
    z:= y;
END IF;
END;
BEGIN
   a:= 2;
   b:= 5;
   findMin(a, b, c);
   dbms_output.put_line(c);
END;
```

Ans)
```
-5
-10
-25
```

6. What will be printed by the following PL/SQL block?

```
DECLARE
 a number;
```

```
PROCEDURE squareNum(x IN OUT number) IS
BEGIN
  x := x * x;
END;
BEGIN
   a:= 5;
   squareNum(a);
   dbms_output.put_line(a);
END;
```

Ans) **-5**
-10
-25

7. When is the pre-defined exception “CASE_NOT_FOUND” raised?

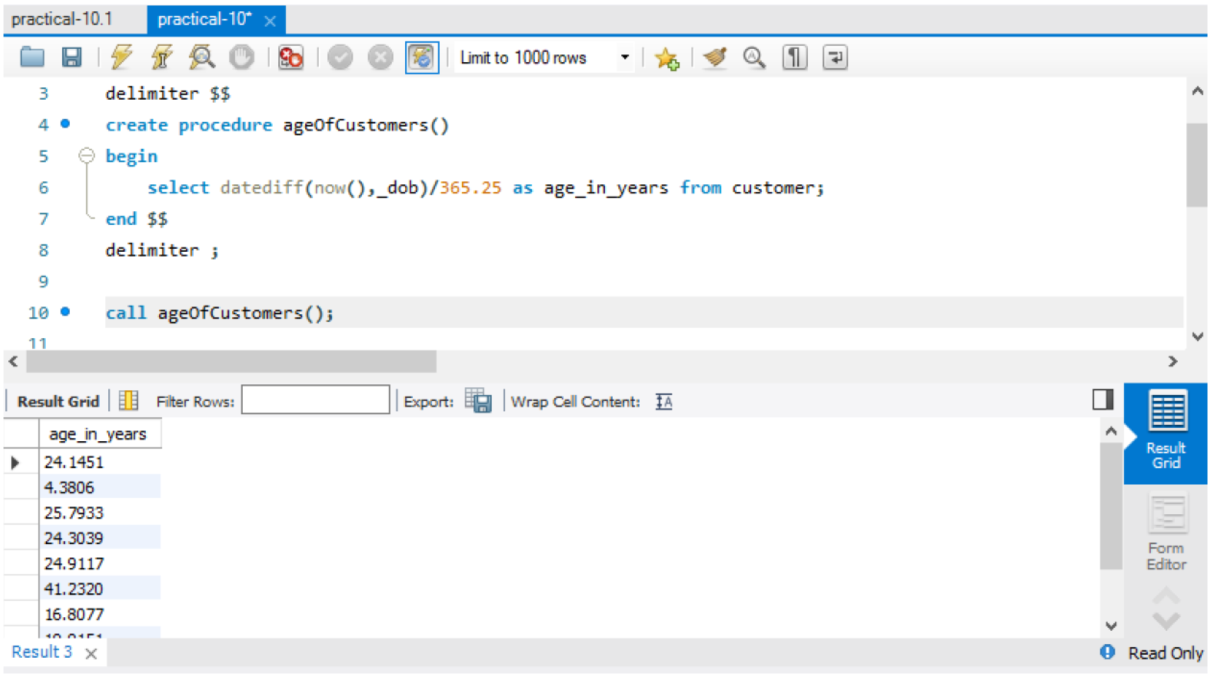
None of the choices in the when clauses of a case statement is selected , and there is no ELSE clause.

IN-LAB

Case Study 1 : TRANSPORT DEPARTMENT

1. Write a PL/SQL stored procedure to know the current age of customers who are associated with AP transport department.

```
delimiter $$
create procedure ageOfCustomers()
begin
        select datediff(now(),_dob)/365.25 as age_in_years from customer;
end $$
delimiter ;

call ageOfCustomers();
```

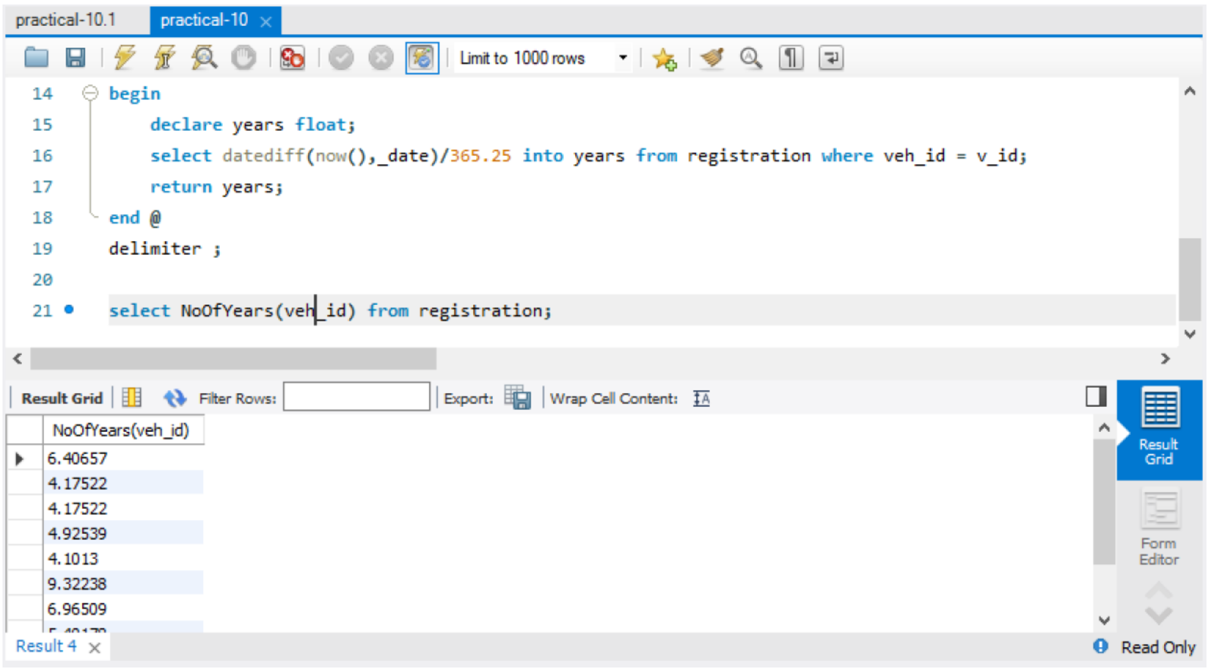


```
delimiter $$
create procedure ageOfCustomers()
begin
    select datediff(now(),_dob)/365.25 as age_in_years from customer;
end $$
delimiter ;

call ageOfCustomers();
```

```
age_in_years
24.1451
4.3806
25.7933
24.3039
24.9117
41.2320
16.8077
```

2. Write a PL/SQL stored function to know that, from how many years vehicles are registered with the AP transport department.

```
delimiter @
create function NoOfyears(v_id int) returns float
begin
        declare years float;
select datediff(now(),_date)/365.25 into years from registration where veh_id = v_id;
   return years;
end @
delimiter ;

select NoOfYears(veh_id) from registration;
```



```
begin
    declare years float;
    select datediff(now(),_date)/365.25 into years from registration where veh_id = v_id;
    return years;
end @
delimiter ;

select NoOfYears(veh_id) from registration;
```

```
NoOfYears(veh_id)
6.40657
4.17522
4.17522
4.92539
4.1013
9.32238
6.96509
```

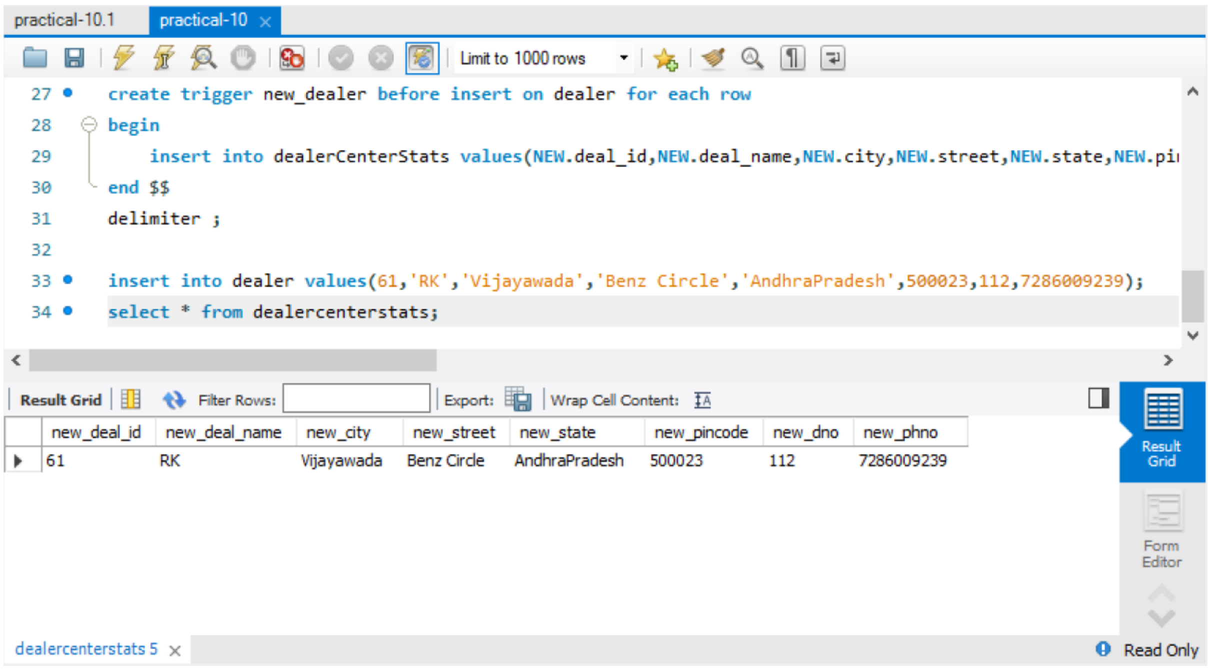
3. Create a trigger before insert to maintain the summary of DealerCenter table into DealerCenterstats. Whenever the capacity of DealerCenters is increased or decreased then the total statistics should be reflected in DealerCenterstats

create table dealerCenterStats(new_deal_id int,new_deal_name varchar(25),new_city varchar(25),new_street varchar(25), new_state varchar(25),new_pincode int,new_dno int,new_phno bigint);

delimiter $$
create trigger new_dealer before insert on dealer for each row
begin
insert into dealerCenterStats values(NEW.deal_id, NEW.deal_name, NEW.city, NEW.street, NEW.state,NEW.pincode,NEW.d_no,NEW.ph_no);
end $$
delimiter ;

insert into dealer values(61,'RK','Vijayawada','BenzCircle' ,'AndhraPradesh' ,500023, 112,7286009239);

select * from dealercenterstats;



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Limit to 1000 rows

```
create trigger new_dealer before insert on dealer for each row
begin
    insert into dealerCenterStats values(NEW.deal_id,NEW.deal_name,NEW.city,NEW.street,NEW.state,NEW.pi
end $$
delimiter ;

insert into dealer values(61,'RK','Vijayawada','Benz Circle','AndhraPradesh',500023,112,7286009239);
select * from dealercenterstats;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

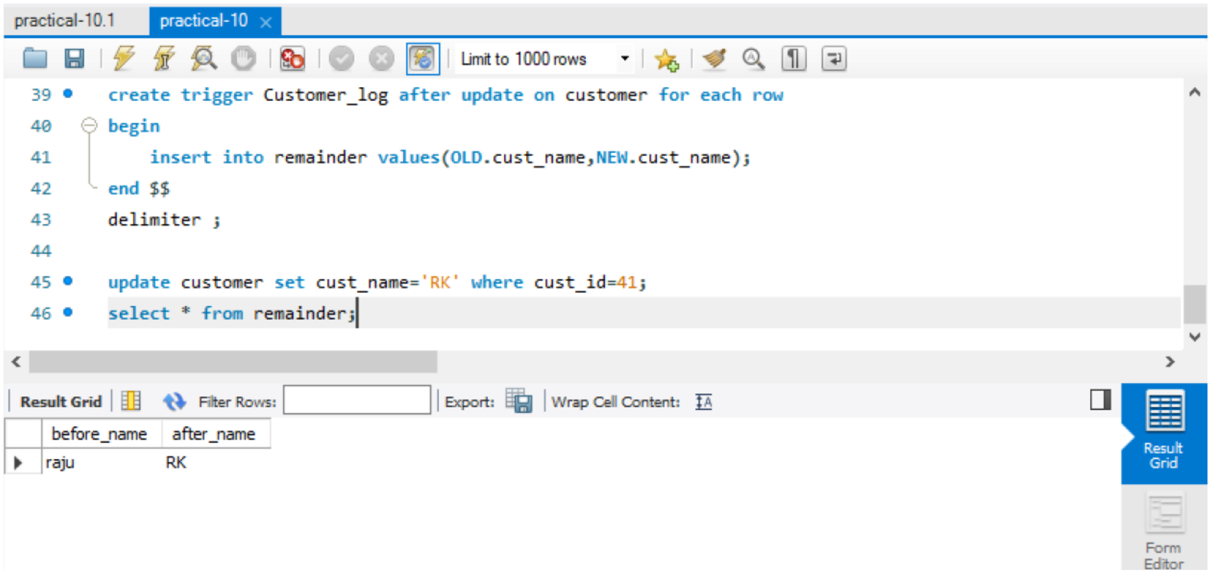
new_deal_id	new_deal_name	new_city	new_street	new_state	new_pincode	new_dno	new_phno
61	RK	Vijayawada	Benz Circle	AndhraPradesh	500023	112	7286009239

dealercenterstats 5 — Read Only

4. Create trigger after insert in members table , a trigger should check the value of attribute name and if it is updated then show the message for updating on name in reminder table.

create table remainder(before_name varchar(50),after_name varchar(50));
delimiter $$
create trigger Customer_log after update on customer for each row
begin
insert into remainder values(OLD.cust_name,NEW.cust_name);
end $$
delimiter ;

update customer set cust_name='RK' where cust_id=41;
select * from remainder;



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Limit to 1000 rows

```
create trigger Customer_log after update on customer for each row
begin
    insert into remainder values(OLD.cust_name,NEW.cust_name);
end $$
delimiter ;

update customer set cust_name='RK' where cust_id=41;
select * from remainder;
```

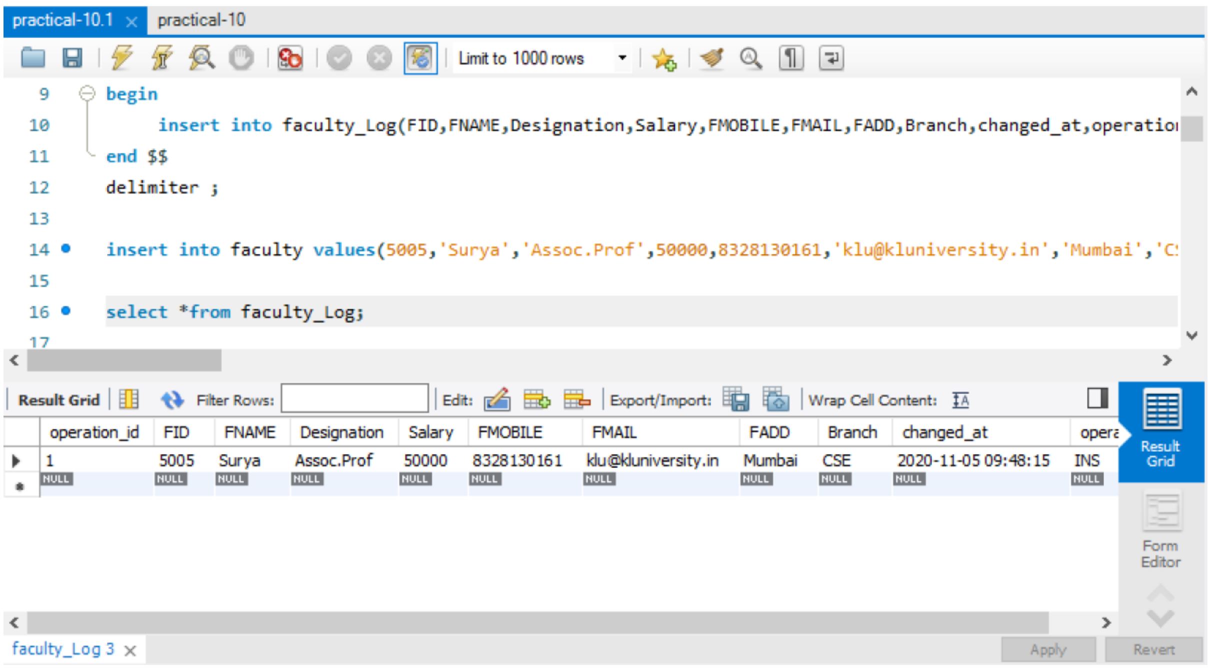
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

before_name	after_name
raju	RK

Case Study 4 : KL UNIVERSITY ERP

1. Write a Program to create a row level trigger that would fire for INSERT or UPDATE or DELETE operations performed on the Faculty table. The program has to print the salary difference of faculty along with Old salary and New salary

```
create table faculty_Log(operation_id int primary key auto_increment,FID int,
FNAME varchar(10),Designation varchar(10),Salary int,FMOBILE bigint,
FMAIL varchar(20),FADD varchar(10),Branch varchar(10),changed_at DATETIME NOT
NULL,
operation varchar(3) NOT NULL,CHECK(operation = 'INS' or operation = 'DEL'));

delimiter $$
create trigger trig_faculty_insert after insert on faculty
for each row
begin
        insert into
faculty_Log(FID,FNAME,Designation,Salary,FMOBILE,FMAIL,FADD,Branch,changed_at,ope
ration)
values(NEW.FID,NEW.FNAME,NEW.Designation,NEW.Salary,NEW.FMOBILE,NEW.FMAIL,N
EW.FADD,NEW.BRANCH,current_timestamp,'INS');
end $$
delimiter ;

insert into faculty
values(5005,'Surya','Assoc.Prof',50000,8328130161,'klu@kluniversity.in','Mumbai','CSE');

select *from faculty_Log;
```

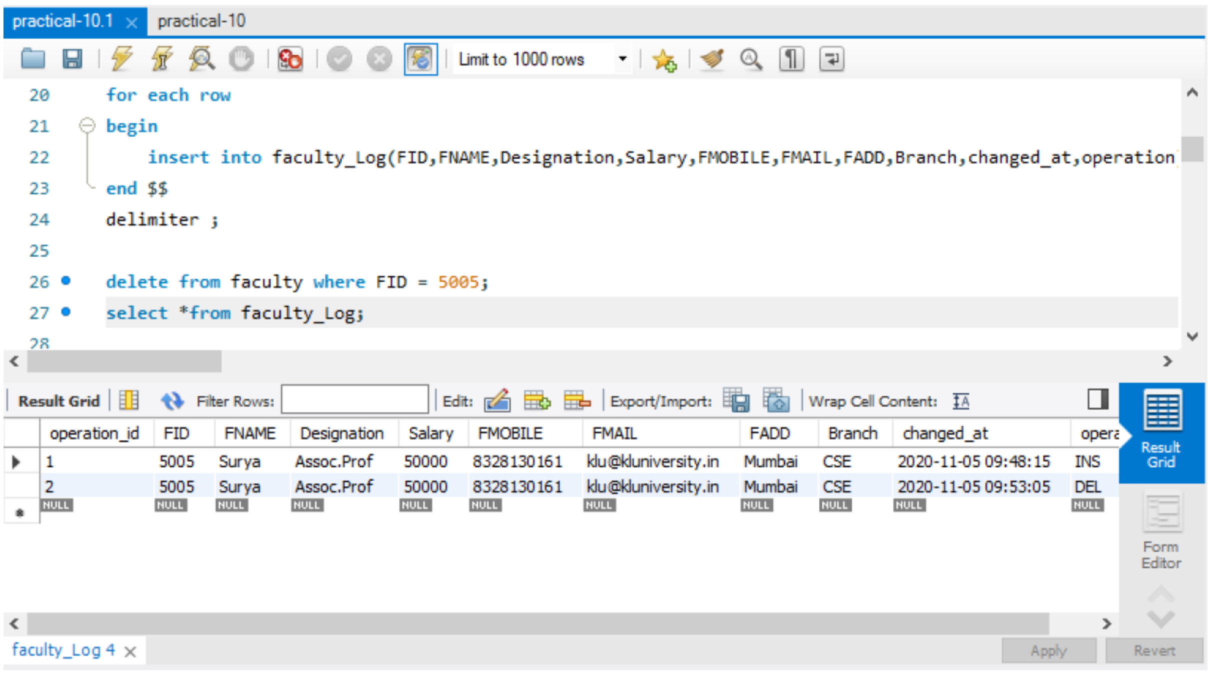


```
begin
    insert into faculty_Log(FID,FNAME,Designation,Salary,FMOBILE,FMAIL,FADD,Branch,changed_at,operatio
end $$
delimiter ;

insert into faculty values(5005,'Surya','Assoc.Prof',50000,8328130161,'klu@kluniversity.in','Mumbai','C

select *from faculty_Log;
```

operation_id	FID	FNAME	Designation	Salary	FMOBILE	FMAIL	FADD	Branch	changed_at	opera
1	5005	Surya	Assoc.Prof	50000	8328130161	klu@kluniversity.in	Mumbai	CSE	2020-11-05 09:48:15	INS
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

delimiter $$
create trigger trig_faulty_delete after delete on faculty
for each row
begin
insert into faculty_Log(FID,FNAME,Designation,Salary,FMOBILE,FMAIL,FADD,Branch,changed_at,operation)
values(OLD.FID,OLD.FNAME,OLD.Designation,OLD.Salary,OLD.FMOBILE,OLD.FMAIL,OLD.FADD,OLD.BRANCH,current_timestamp,'DEL');
end $$
delimiter ;

delete from faculty where FID = 5005;
select *from faculty_Log;



```
for each row
begin
    insert into faculty_Log(FID,FNAME,Designation,Salary,FMOBILE,FMAIL,FADD,Branch,changed_at,operation
end $$
delimiter ;

delete from faculty where FID = 5005;
select *from faculty_Log;
```

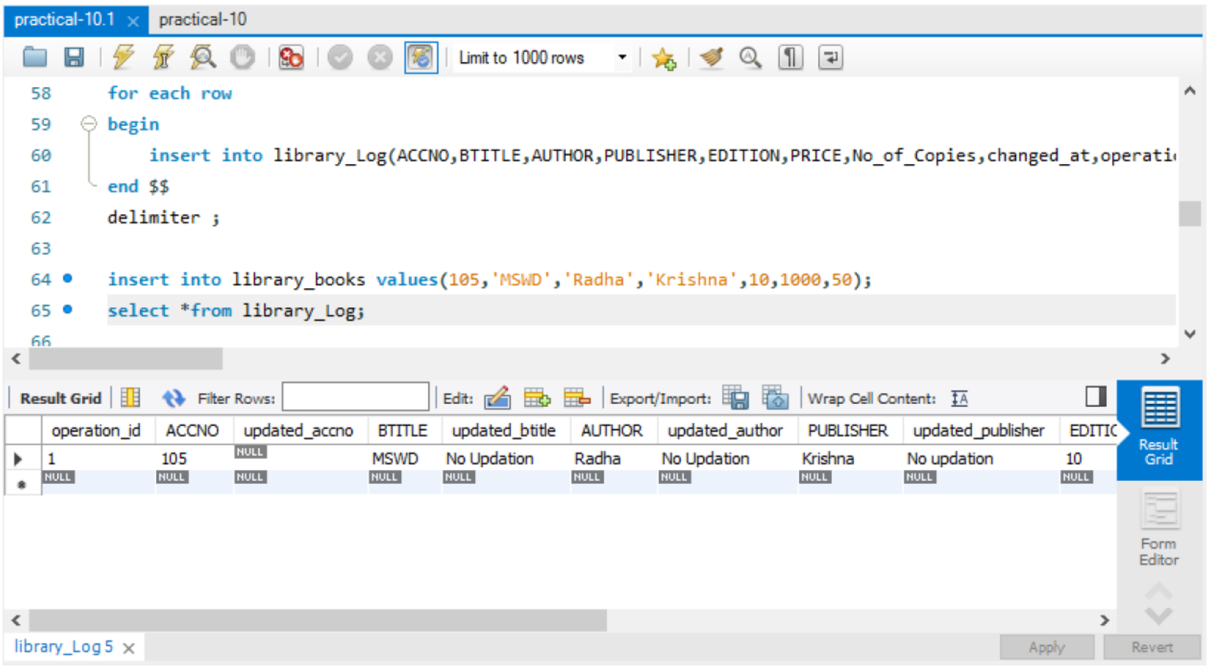
operation_id	FID	FNAME	Designation	Salary	FMOBILE	FMAIL	FADD	Branch	changed_at	opera
1	5005	Surya	Assoc.Prof	50000	8328130161	klu@kluniversity.in	Mumbai	CSE	2020-11-05 09:48:15	INS
2	5005	Surya	Assoc.Prof	50000	8328130161	klu@kluniversity.in	Mumbai	CSE	2020-11-05 09:53:05	DEL
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

2. Write a Program to create a row level trigger that would fire for INSERT or UPDATE or DELETE operations performed on the LIBRARYBooks table. The program has to print the status of the DML operations(Like Insert, Update and delete) performed

create table library_Log(operation_id int primary key auto_increment,ACCNO int, updated_accno int default NULL,BTITLE varchar(30),updated_btitle varchar(30) default 'No Updation',
AUTHOR varchar(30),updated_author varchar(30) default 'No Updation',PUBLISHER varchar(25),
updated_publisher varchar(25) default 'No updation',EDITION int,updated_edition int default null,
PRICE int,updated_price int default null,No_of_Copies int,updated_copies int default null,
changed_at DATETIME NOT NULL,operation varchar(20) NOT NULL,

CHECK(operation = 'Inserted' or operation = 'Deleted' or operation = 'Updated'));

```
delimiter $$
create trigger trig_library_insert after insert on library_Books
for each row
begin
        insert into
library_Log(ACCNO,BTITLE,AUTHOR,PUBLISHER,EDITION,PRICE,No_of_Copies,changed_at,
operation)
values(new.ACCNO,NEW.BTITLE,NEW.AUTHOR,NEW.PUBLISHER,NEW.EDITION,NEW.PRIC
E,NEW.No_of_Copies,current_timestamp,'Inserted');
end $$
delimiter ;

insert into library_Books values(105,'MSWD','Radha','Krishna',10,1000,50);
select *from library_Log;
```

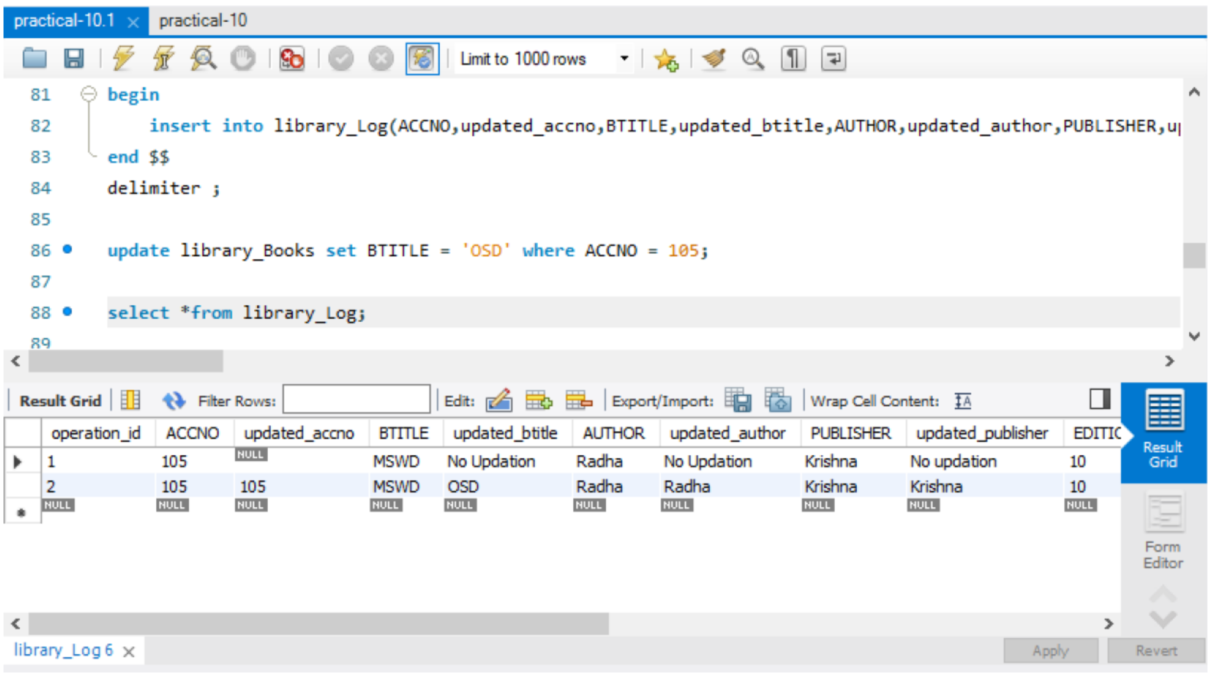


```
for each row
begin
    insert into library_Log(ACCNO,BTITLE,AUTHOR,PUBLISHER,EDITION,PRICE,No_of_Copies,changed_at,operati
end $$
delimiter ;

insert into library_books values(105,'MSWD','Radha','Krishna',10,1000,50);
select *from library_Log;
```

operation_id	ACCNO	updated_accno	BTITLE	updated_btitle	AUTHOR	updated_author	PUBLISHER	updated_publisher	EDITIC
1	105	NULL	MSWD	No Updation	Radha	No Updation	Krishna	No updation	10
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
delimiter $$
create trigger trig_library_update after update on library_Books
for each row
begin
        insert into library_Log(ACCNO,updated_accno,BTITLE, updated_btitle, AUTHOR,
updated_author,PUBLISHER,updated_publisher,EDITION,updated_edition,PRICE,updated_
price,No_of_Copies,updated_copies,changed_at,operation) values (old.ACCNO,
new.ACCNO,old.BTITLE,new.BTITLE,old.AUTHOR,new.AUTHOR,old.PUBLISHER,new.PUBLI
SHER,old.EDITION,new.EDITION,old.PRICE,new.PRICE,old.No_of_Copies,new.No_of_Copie
s,current_timestamp,'Updated');
end $$
delimiter ;
```

update library_Books set BTITLE = 'OSD' where ACCNO = 105;
select *from library_Log;



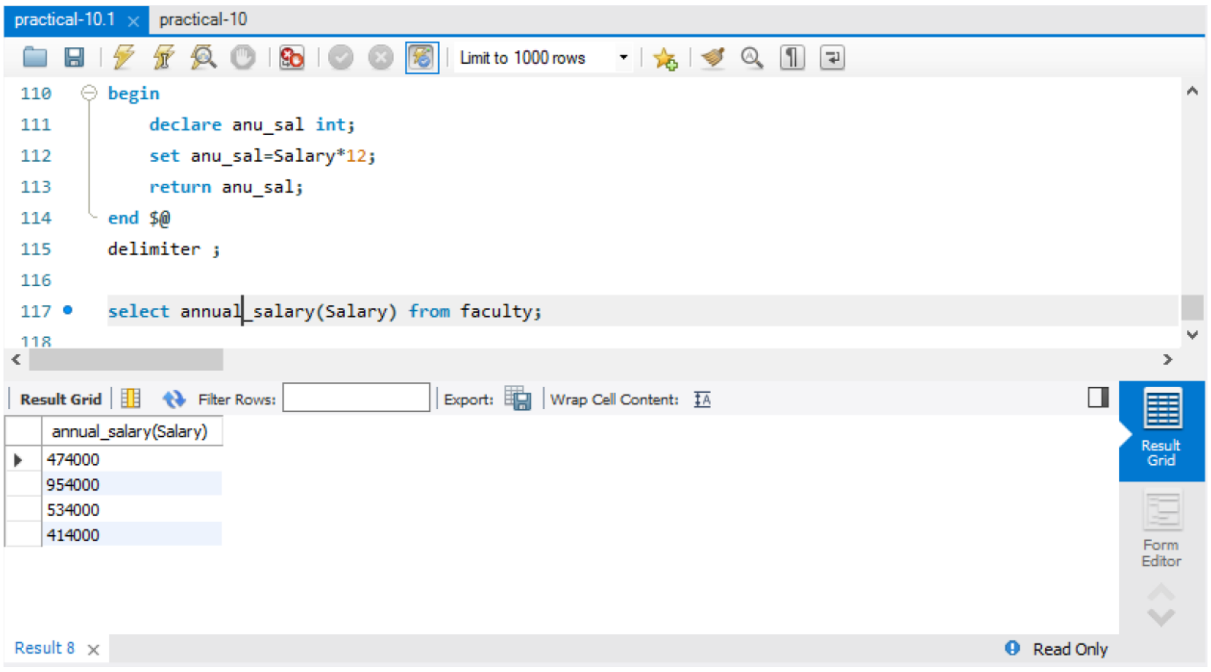
```
begin
    insert into library_Log(ACCNO,updated_accno,BTITLE,updated_btitle,AUTHOR,updated_author,PUBLISHER,u|
end $$
delimiter ;

update library_Books set BTITLE = 'OSD' where ACCNO = 105;

select *from library_Log;
```

operation_id	ACCNO	updated_accno	BTITLE	updated_btitle	AUTHOR	updated_author	PUBLISHER	updated_publisher	EDITIC
1	105	NULL	MSWD	No Updation	Radha	No Updation	Krishna	No updation	10
2	105	105	MSWD	OSD	Radha	Radha	Krishna	Krishna	10
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

3. Write a PL/SQL Program to calculate the tax of a faculty based on the below conditions using Functions.
    a. If the salary of a faculty is between 0 and 30000 then tax should be 10%
    b. If the salary of a faculty is between 30001 and 50000 then tax should be 15%
    c. If the salary of a faculty is above 50001 then tax should be 25%

4. Write a PL/SQL Program to create a package that contains the following functions:
a. Function for computing Annual salary of a faculty

```
delimiter $@
create function annual_salary(Salary int) returns integer
deterministic
begin
        declare anu_sal int;
   set anu_sal=Salary*12;
   return anu_sal;
end $@
delimiter ;

select annual_salary(Salary) from faculty;
```



```
begin
    declare anu_sal int;
    set anu_sal=Salary*12;
    return anu_sal;
end $@
delimiter ;

select annual_salary(Salary) from faculty;
```

```
annual_salary(Salary)
474000
954000
534000
414000
```

b. Function to calculate the tax of a faculty based on the conditions in Q3 above.

```
delimiter $$
create function faculty_tax(Salary int) returns integer
deterministic
begin
            declare tax int;
   if Salary >= 0 and Salary < 30000 then
   set tax = 10/100 * Salary;
   elseif Salary >= 30001 and Salary < 50000 then
   set tax = 15/100 * Salary;
   elseif Salary >= 50001 then
   set tax = 25/100 * Salary;
   end if;
   return (tax);
END $$
delimiter ;

select faculty_tax(Salary) from faculty;
```

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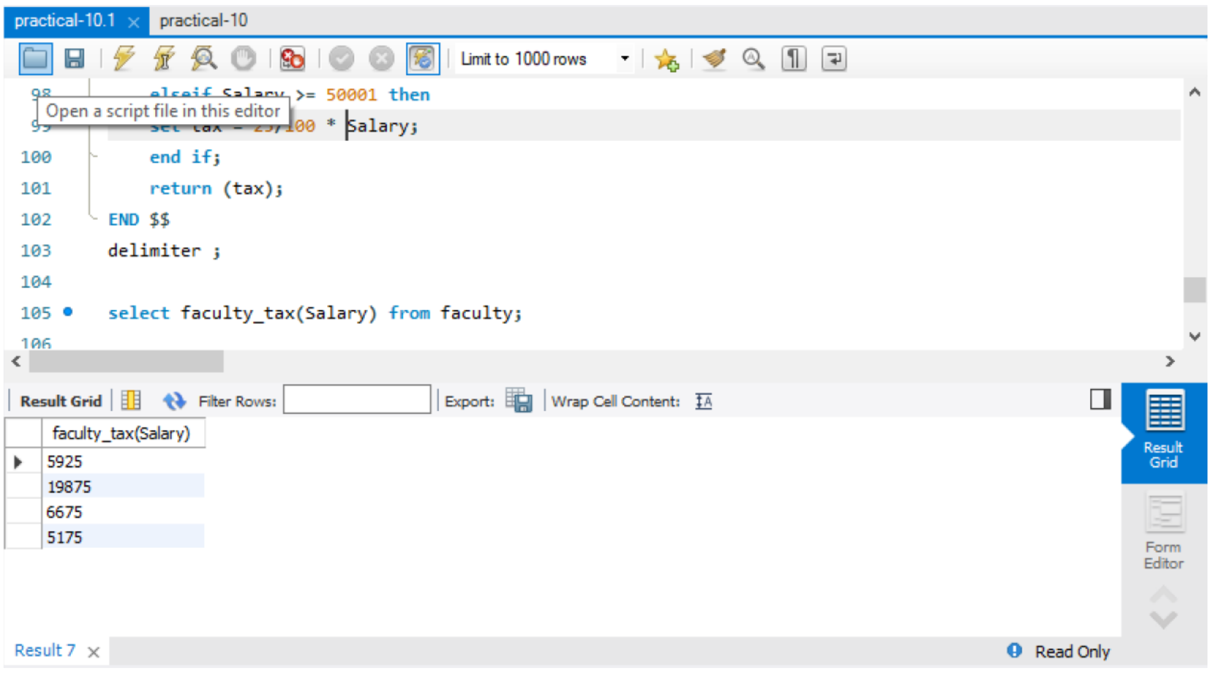

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```
    elseif Salary >= 50001 then
    set tax = 25/100 * Salary;
    end if;
    return (tax);
END $$
delimiter ;

select faculty_tax(Salary) from faculty;
```

```
faculty_tax(Salary)
5925
19875
6675
5175
```

Result 7 Read Only

Java Database Connectivity with MySQL

To connect Java application with the MySQL database, we need to follow 5 following steps.
In this example we are using MySql as the database. So we need to know following informations for the mysql database:

1. **Driver class:** The driver class for the mysql database is **com.mysql.jdbc.Driver**.
2. **Connection URL:** The connection URL for the mysql database is **jdbc:mysql://localhost:3306/sonoo** where jdbc is the API, mysql is the database, localhost is the server name on which mysql is running, we may also use IP address, 3306 is the port number and sonoo is the database name. We may use any database, in such case, we need to replace the sonoo with our database name.
3. **Username:** The default username for the mysql database is **root**.
4. **Password:** It is the password given by the user at the time of installing the mysql database. In this example, we are going to use root as the password.

Let's first create a table in the mysql database, but before creating table, we need to create database first.

```
create database transport;
use transport;
create table emp(id int(10),name varchar(40),age int(3));
```

In this example, transport is the database name, root is the username and password both.

```
import java.sql.*;
class MysqlCon{
    public static void main(String args[]){
try{
Class.forName("com.mysql.jdbc.Driver");
Connection con=DriverManager.getConnection(
"jdbc:mysql://localhost:3306/sonoo","root","root");
//here sonoo is database name, root is username and password
Statement stmt=con.createStatement();
ResultSet rs=stmt.executeQuery("select * from emp");
while(rs.next())
System.out.println(rs.getInt(1)+"  "+rs.getString(2)+"  "+rs.getString(3));
con.close();
}catch(Exception e){ System.out.println(e);}
}
}
```

The above example will fetch all the records of emp table.
connect java application with the mysql database, **mysqlconnector.jar** file is required to be loaded.
download the jar file mysql-connector.jar
Two ways to load the jar file:

1. Paste the mysqlconnector.jar file in jre/lib/ext folder
2. Set classpath

1) Paste the mysqlconnector.jar file in JRE/lib/ext folder:

Download the mysqlconnector.jar file. Go to jre/lib/ext folder and paste the jar file here.

2) Set classpath:

There are two ways to set the classpath:

- temporary
- permanent

How to set the temporary classpath

open command prompt and write:

```
C:>set classpath=c:\folder\mysql-connector-java-5.0.8-bin.jar;.;
```

How to set the permanent classpath

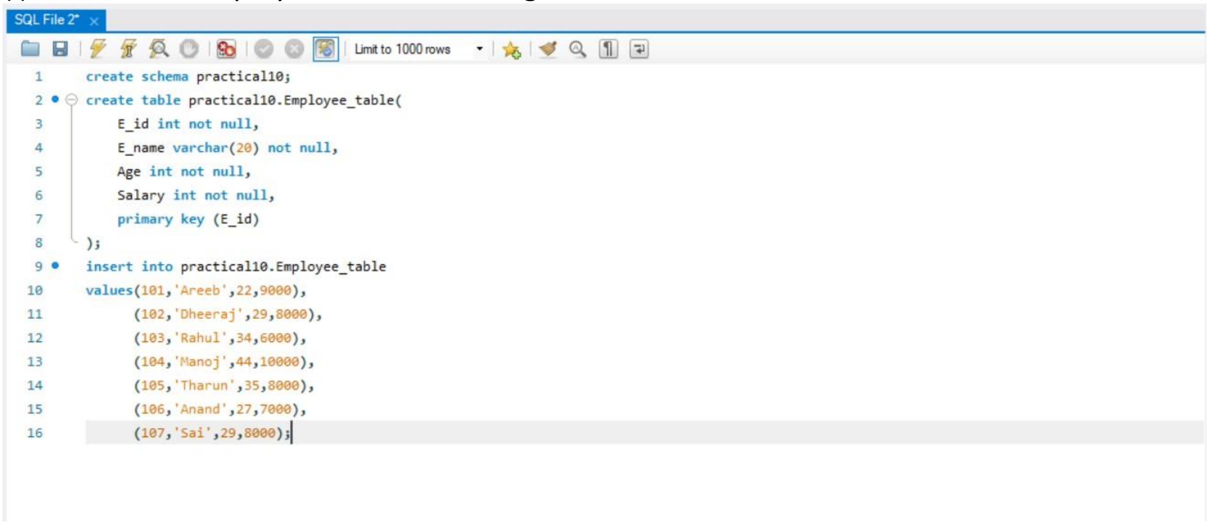
Go to environment variable then click on new tab. In variable name write **classpath** and in variable value paste the path to the mysqlconnector.jar file by appending mysqlconnector.jar;.; as C:\folder\mysql-connector-java-5.0.8-bin.jar;.;

POST-LAB

Queries using aggregate functions(COUNT,AVG,MIN,MAX,SUM),Group by, Order by, Having.

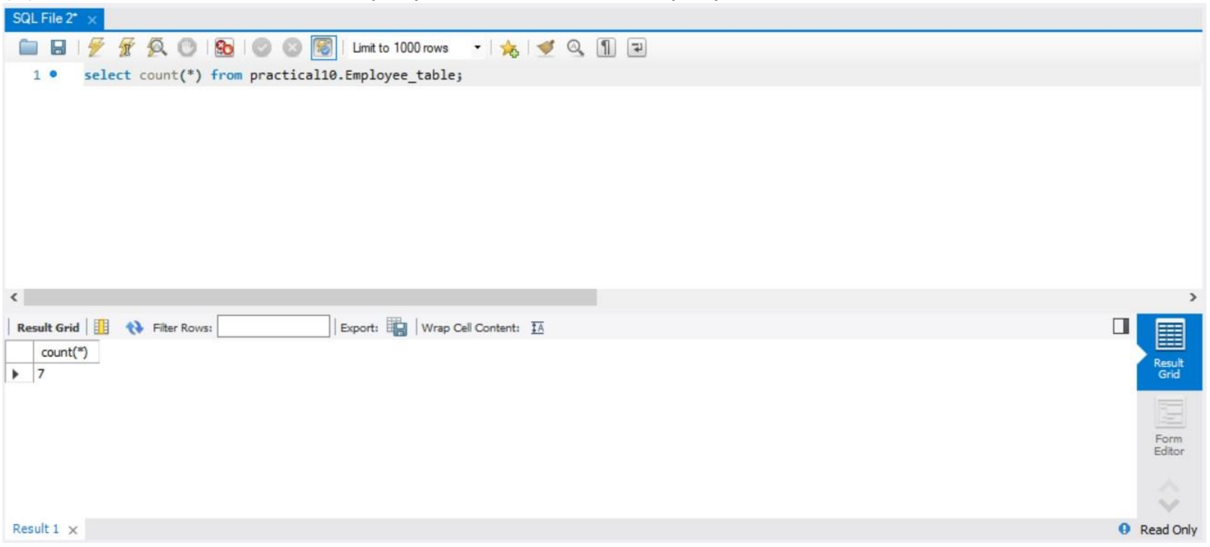
E_id	E_name	Age	Salary
101	AREEB	22	9000
102	DHEERAJ	29	8000
103	RAHUL	34	6000
104	MANOJ	44	10000
105	THARUN	35	8000
106	ANAND	27	7000
107	SAI	29	8000

(i) Create Employee table containing all Records.



```
create schema practical10;
create table practical10.Employee_table(
    E_id int not null,
    E_name varchar(20) not null,
    Age int not null,
    Salary int not null,
    primary key (E_id)
);
insert into practical10.Employee_table
values(101,'Areeb',22,9000),
      (102,'Dheeraj',29,8000),
      (103,'Rahul',34,6000),
      (104,'Manoj',44,10000),
      (105,'Tharun',35,8000),
      (106,'Anand',27,7000),
      (107,'Sai',29,8000);
```

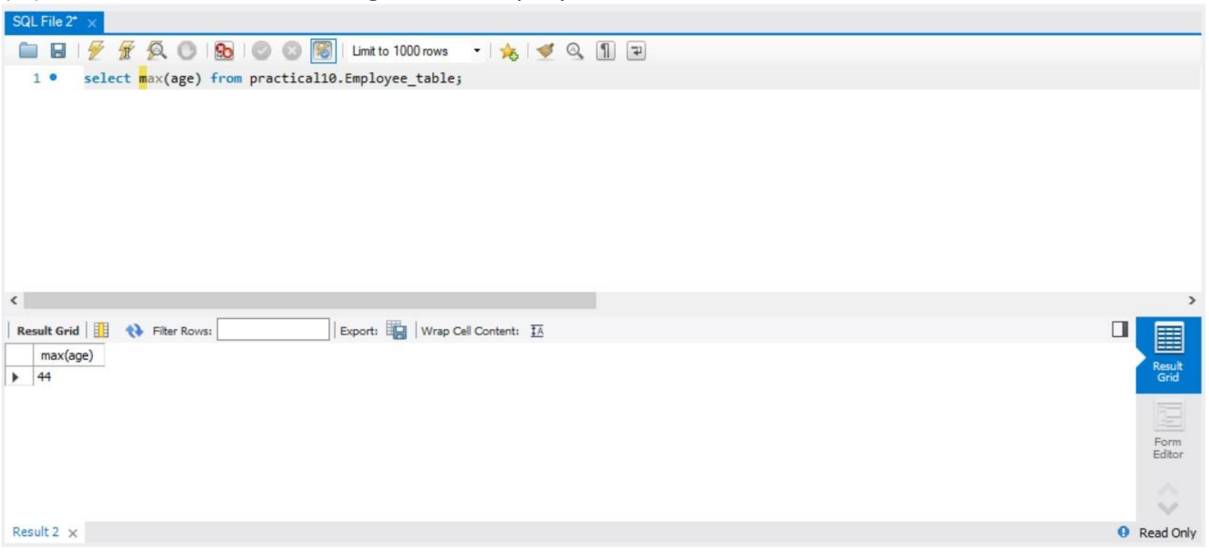
(ii) Count number of employee names from employee table



```
select count(*) from practical10.Employee_table;
```

```
count(*)
7
```

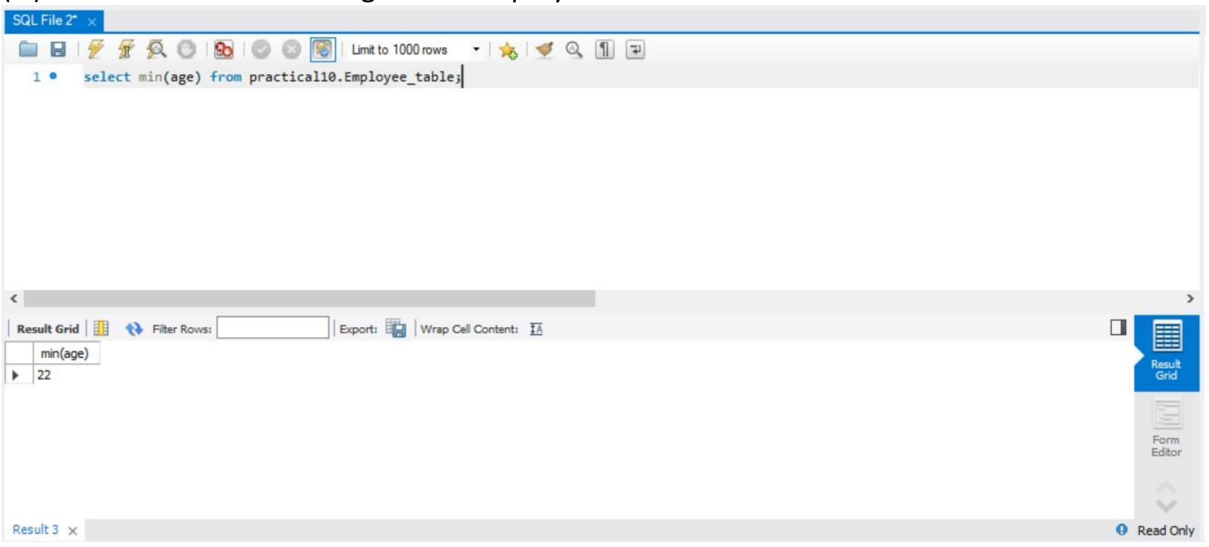
(iii) Find the Maximum age from employee table.



```
select max(age) from practical10.Employee_table;
```

```
max(age)
44
```

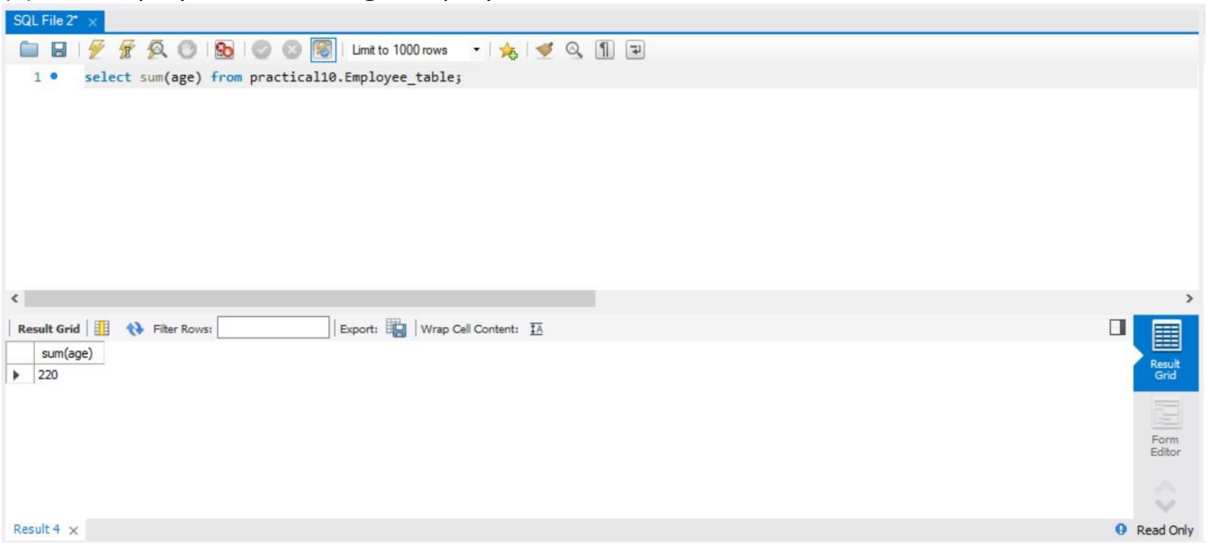
(iv) Find the Minimum age from employee table



```
select min(age) from practical10.Employee_table;
```

```
min(age)
22
```

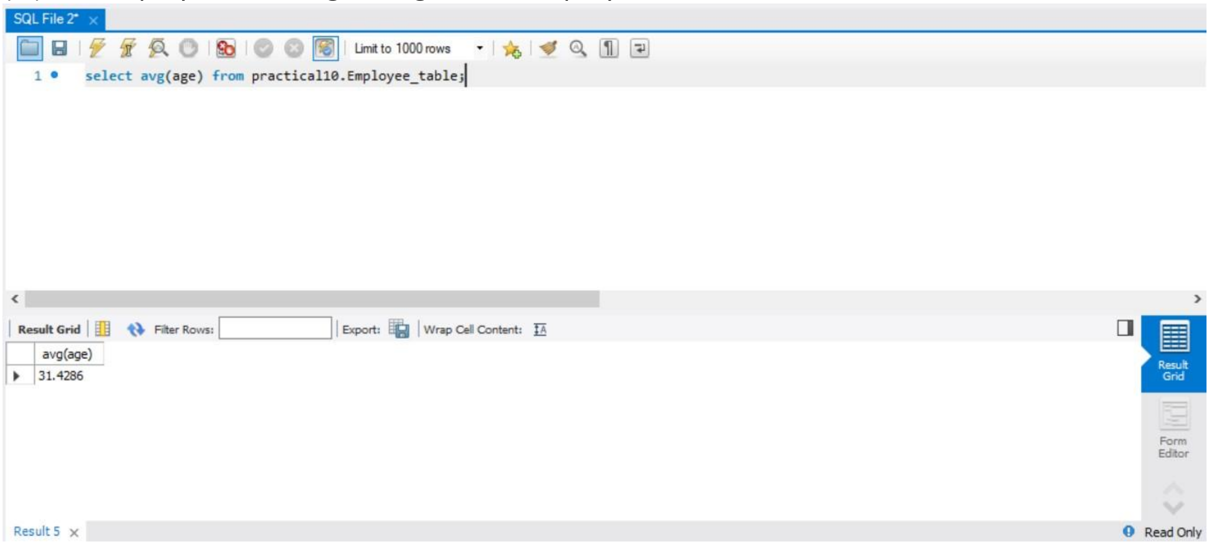
(v) Display the Sum of age employee table



```
select sum(age) from practical10.Employee_table;
```

```
sum(age)
220
```

(vi) Display the Average of age from Employee table.



```
select avg(age) from practical10.Employee_table;
```

```
avg(age)
31.4286
```