CYCLE -2

PL/SQL Programs (Trigger, Cursor, Stored Procedures and Functions)

CO 2	Apply PL/SQL for processing databases

1.) Write a PL/SQL code to accept the text and reverse the given text. Check the text is palindrome or not

PROGRAM CODE:

CASE 1:

```
DECLARE
 a VARCHAR(15):='ROAR';
 b VARCHAR(15);
 n NUMBER;
BEGIN
 n:=LENGTH(a);
 FOR I IN REVERSE 1..n
 LOOP
  b:=b || SUBSTR(a,I,1);
 END LOOP;
 DBMS_OUTPUT.PUT_LINE('Reversed String: '||b);
 n:=INSTR(a,b);
 IF n!=1 THEN
 DBMS_OUTPUT.PUT_LINE(b ||' is not a paliandrome');
 ELSE
 DBMS_OUTPUT.PUT_LINE(b ||' is a paliandrome');
 END IF;
END;
```

OUTPUT:

```
Statement processed.
Reversed String: RAOR
RAOR is not a paliandrome
```

CASE 2:

```
DECLARE
 a VARCHAR(15):='MALAYALAM';
 b VARCHAR(15);
 n NUMBER;
BEGIN
 n:=LENGTH(a);
 FOR I IN REVERSE 1..n
 LOOP
  b:=b || SUBSTR(a,I,1);
 END LOOP;
 DBMS_OUTPUT.PUT_LINE('Reversed String: '||b);
 n:=INSTR(a,b);
 IF n!=1 THEN
 DBMS_OUTPUT.PUT_LINE(b ||' is not a paliandrome');
 ELSE
 DBMS_OUTPUT.PUT_LINE(b ||' is a paliandrome');
 END IF;
END;
```

OUTPUT:

```
Statement processed.
Reversed String: MALAYALAM
MALAYALAM is a paliandrome
```

2) Write a program to read two numbers; If the first no > 2nd no, then swap the numbers; if the first number is an odd number, then find its cube; if first no < 2nd no then raise it to its power; if both the numbers are equal, then find its sqrt.

PROGRAM CODE:

CASE 1:

```
DECLARE
 Fst NUMBER:=5;
 Scnd NUMBER:=4;
 N NUMBER;
BEGIN
 IF Fst>Scnd THEN
   N:=Fst;
   Fst:=Scnd;
   Scnd:=N;
   DBMS_OUTPUT.PUT_LINE('AFTER SWAPPING');
   DBMS_OUTPUT.PUT_LINE('The 1st number is '||Fst);
   DBMS_OUTPUT.PUT_LINE('The 2nd number is '||Scnd);
 ELSIF mod(Fst,2)>0
 THEN
   N:=Fst*Fst*Fst;
   DBMS_OUTPUT.PUT_LINE('The cube of first number is: '||N);
 ELSIF Fst<Scnd THEN
    N:=Fst ** Scnd;
    DBMS_OUTPUT.PUT_LINE('The First number raise to its power is '||N);
 ELSE
    N:=Fst ** 1/2;
    DBMS_OUTPUT.PUT_LINE('The two numbers are equal');
    DBMS_OUTPUT.PUT_LINE('The squareroot of '||Fst||' is '||N);
 END IF;
END;
```

<u>OUTPUT:</u>

```
Statement processed.
AFTER SWAPPING
The 1st number is 4
The 2nd number is 5
```

CASE 2:

```
DECLARE
 Fst NUMBER:=5;
 Scnd NUMBER:=6;
 N NUMBER;
BEGIN
 IF Fst>Scnd THEN
   N:=Fst;
   Fst:=Scnd;
   Scnd:=N;
   DBMS_OUTPUT.PUT_LINE('AFTER SWAPPING');
   DBMS_OUTPUT.PUT_LINE('The 1st number is '||Fst);
   DBMS_OUTPUT.PUT_LINE('The 2nd number is '||Scnd);
 ELSIF mod(Fst,2)>0
 THEN
   N:=Fst*Fst*Fst;
   DBMS_OUTPUT.PUT_LINE('The cube of first number is: '||N);
 ELSIF Fst<Scnd THEN
    N:=Fst ** Scnd;
    DBMS_OUTPUT.PUT_LINE('The First number raise to its power is '||N);
 ELSE
    N:=Fst ** 1/2;
    DBMS_OUTPUT.PUT_LINE('The two numbers are equal');
    DBMS_OUTPUT.PUT_LINE('The squareroot of '||Fst||' is '||N);
 END IF;
END;
```

<u>OUTPUT:</u>

```
Statement processed.
The cube of first number is: 125
```

CASE 3:

```
DECLARE
 Fst NUMBER:=4;
 Scnd NUMBER:=5;
 N NUMBER;
BEGIN
 IF Fst>Scnd THEN
   N:=Fst;
   Fst:=Scnd;
   Scnd:=N;
   DBMS_OUTPUT.PUT_LINE('AFTER SWAPPING');
   DBMS_OUTPUT.PUT_LINE('The 1st number is '||Fst);
   DBMS_OUTPUT.PUT_LINE('The 2nd number is '||Scnd);
 ELSIF mod(Fst,2)>0
 THEN
   N:=Fst*Fst*Fst;
   DBMS_OUTPUT.PUT_LINE('The cube of first number is: '||N);
 ELSIF Fst<Scnd THEN
    N:=Fst ** Scnd;
    DBMS_OUTPUT.PUT_LINE('The First number raise to its power is '||N);
 ELSE
    N:=Fst ** 1/2;
    DBMS_OUTPUT.PUT_LINE('The two numbers are equal');
    DBMS_OUTPUT.PUT_LINE('The squareroot of '||Fst||' is '||N);
 END IF;
END;
```

<u>OUTPUT:</u>

```
Statement processed.
The First number raise to its power is 1024
```

CASE 4:

```
DECLARE
 Fst NUMBER:=4;
 Scnd NUMBER:=4;
 N NUMBER;
BEGIN
 IF Fst>Scnd THEN
   N:=Fst;
   Fst:=Scnd;
   Scnd:=N;
   DBMS_OUTPUT.PUT_LINE('AFTER SWAPPING');
   DBMS_OUTPUT.PUT_LINE('The 1st number is '||Fst);
   DBMS_OUTPUT.PUT_LINE('The 2nd number is '||Scnd);
 ELSIF mod(Fst,2)>0
 THEN
   N:=Fst*Fst*Fst;
   DBMS_OUTPUT.PUT_LINE('The cube of first number is: '||N);
 ELSIF Fst<Scnd THEN
    N:=Fst ** Scnd;
    DBMS_OUTPUT.PUT_LINE('The First number raise to its power is '||N);
 ELSE
    N:=Fst ** 1/2;
    DBMS_OUTPUT.PUT_LINE('The two numbers are equal');
    DBMS_OUTPUT.PUT_LINE('The squareroot of '||Fst||' is '||N);
 END IF;
END;
```

<u>OUTPUT:</u>

```
Statement processed.
The two numbers are equal
The squareroot of 4 is 2
```

3) Write a program to generate first 10 terms of the Fibonacci series.

PROGRAM CODE:

```
DECLARE
 a NUMBER:=0;
 b NUMBER:=1;
 fib Number;
BEGIN
 DBMS_OUTPUT.PUT_LINE('The first 10 terms of fibonacci series are:');
 DBMS_OUTPUT.PUT_LINE(a);
 DBMS_OUTPUT.PUT_LINE(b);
 fib:=a+b;
 DBMS_OUTPUT.PUT_LINE(fib);
 FOR i IN 4.. 10
 LOOP
  a:=b;
  b:=fib;
  fib:=a+b;
  DBMS_OUTPUT.PUT_LINE(fib);
 END LOOP;
END;
```

OUTPUT:

```
Statement processed.
The first 10 terms of fibonacci series are:
0
1
1
2
3
5
8
13
21
34
```

4.) Write a PL/SQL program to find the salary of an employee in the EMP table (Get the empno from the user). Find the employee drawing minimum salary. If the minimum salary is less than 7500, then give an increment of 15%. Also create an emp %rowtype record. Accept the empno from the user, and display all the information about the employee.

PROGRAM CODE:

```
create table employee(emp_no int,emp_name varchar(20),emp_post
varchar(20),emp_salary decimal(10,2));
Table created.
insert into employee values(103,'Rahul','MD',25000);
```

```
1 row(s) inserted.

insert into employee values(105,'Ravi','HR',20000);

1 row(s) inserted.

insert into employee values(107,'Rani','Accountant',15000);

1 row(s) inserted.

insert into employee values(109,'Rema','Clerk',10000);

1 row(s) inserted.

insert into employee values(201,'Ramu','Peon',5000);1 row(s) inserted.

Declare

emno employee.emp_no%type;

salary employee.emp_salary%type;

emp_rec employee%rowtype;

begin

emno:=109;

select emp_salary into salary from employee where emp_no=emno;

if salary<7500 then

update employee set emp_salary=emp_salary * 15/100 where

emp_no=emno;

else

dbms_output.put_line('No more increment');

end if;

select * into emp_rec from employee where emp_no=emno;

dbms_output.put_line('Employee num: '||emp_rec.emp_no);

dbms_output.put_line('Employee name: '||emp_rec.emp_name);

dbms_output.put_line('Employee post: '||emp_rec.emp_post);

dbms_output.put_line('Employee salary: '||emp_rec.emp_salary);

end;
```

OUTPUT:

```
No more increment
Employee num: 109
Employee name: Rema
Employee post: Clerk
Employee salary: 10000
```

5) Write a PL/SQL **function** to find the total strength of students present in different classes of the MCA department using the table Class(ClassId, ClassName, Strength);

PROGRAM CODE :

```
create table class(cls_id int,cls_name varchar(20),cls_std int);
Table created.
insert into class values(201,'mca',60);
1 row(s) inserted.
insert into class values(202,'mca',60);
1 row(s) inserted.
insert into class values(203,'bca',57);1 row(s) inserted.
insert into class values(204,'bca',59);
1 row(s) inserted.
insert into class values(205,'msc',62);
1 row(s) inserted.
CREATE OR REPLACE FUNCTION total_std
RETURN NUMBER IS
total NUMBER(5):=0;
```

```
BEGIN

SELECT sum(cls_std) INTO total FROM class WHERE cls_name='mca';

RETURN total;

END;

Function created.

DECLARE

c NUMBER(5);

BEGIN

c:=total_std();

DBMS_OUTPUT.PUT_LINE('Total students in MCA department is:'||c);

END;
```

OUTPUT:

```
Statement processed.
Total students in MCA department is:120
```

6) Write a PL/SQL **procedure** to increase the salary for the specified employee. Using empno in the employee table based on the following criteria: increase the salary by 5% for clerks, 7% for salesman, 10% for analyst and 20 % for manager. Activate using PL/SQL block.

procedure code

```
CREATE OR REPLACE PROCEDURE increSalary

IS

emp1 emp%rowtype;

sal emp.salary%type;

dpt emp.emp_dpt%type;

BEGIN
```

```
SELECT salary,emp_dpt INTO sal,dpt FROM emp WHERE emp_no = 104;
  IF dpt ='clerk' THEN
    UPDATE emp SET salary = salary+salary* 5/100 ;
  ELSIF dpt = 'salesman' THEN
    UPDATE emp SET salary = salary+salary* 7/100  ;
  ELSIF dpt = 'analyst' THEN
    UPDATE emp SET salary = salary+salary* 10/100  ;
 ELSIF dpt = 'manager' THEN
    UPDATE emp SET salary = salary+salary* 20/100  ;
 ELSE
    DBMS_OUTPUT.PUT_LINE ('NO INCREMENT');
  END IF;
  SELECT * into emp1 FROM emp WHERE emp_no = 104;
  DBMS_OUTPUT.PUT_LINE ('Name: '||emp1.emp_name);
  DBMS_OUTPUT.PUT_LINE ('employee number: '||emp1.emp_no);
  DBMS_OUTPUT.PUT_LINE ('salary: '|| emp1.salary);
  DBMS_OUTPUT.PUT_LINE ('department: '|| emp1.emp_dpt);
END;
```

table creation

```
create table emp(emp_no int,emp_name varchar(20),salary int,emp_dpt varchar(20));
insert into emp values(101,'arun',50000,'salesman');
insert into emp values(102,'appu',6500,'manager');
insert into emp values(103,'ammu',7500,'clerk');
insert into emp values(104,'anitha',7500,'analyst');
```

calling function

```
DECLARE
```

```
BEGIN
  increSalary();
END;
```

Output:

```
Statement processed.
Name: anitha
employee number: 104
salary: 8250
department: analyst
```

7) Create a **cursor** to modify the salary of 'president' belonging to all departments by 50%

Table creation and insertion command:

```
create table emp(emp_no int,emp_name varchar(20),salary int,emp_dpt varchar(20),dsgt varchar(20));
insert into emp values(101,'arun',50000,'sales','president');
insert into emp values(102,'appu',6500,'Ac','president');
insert into emp values(103,'ammu',7500,'HR','manager');
insert into emp values(104,'anitha',7500,'Ac','snr grade');
insert into emp values(105,'anitha.c',7500,'HR','president');
```

Cursor code:

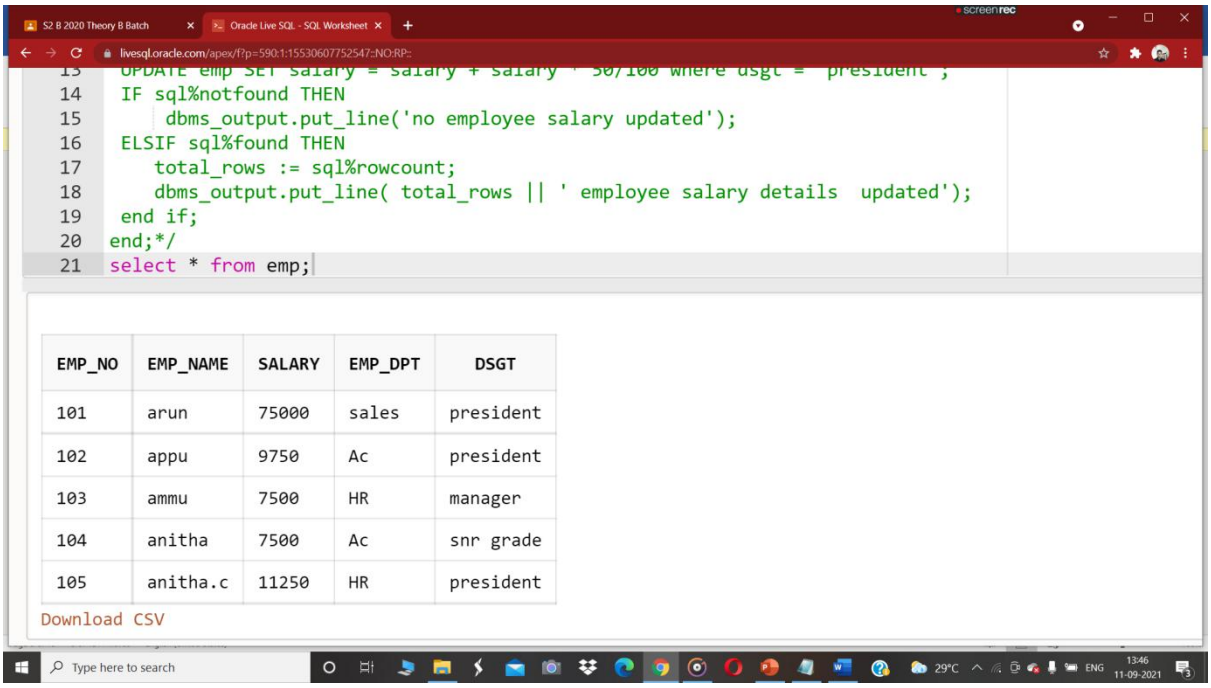
```
DECLARE
   total_rows number(2);
   emp1 EMP%rowtype;
BEGIN

 UPDATE emp SET salary = salary + salary * 50/100 where dsgt = 'president';
 IF sql%notfound THEN
    dbms_output.put_line('no employee salary updated');
 ELSIF sql%found THEN
   total_rows := sql%rowcount;
   dbms_output.put_line( total_rows || ' employee salary details  updated');
 end if;
```

end;

output:

```
Statementprocessed.
3 employee salary details updated
```



8) Write a **cursor** to display list of Male and Female employees whose name starts with S.

Table creation and insert command:

```
create table emp(emp_no varchar(20),emp_name varchar(20),salary int,emp_dpt
varchar(20),gender varchar(10));

insert into emp values('101','arun',50000,'sales','male');

insert into emp values('102','sandeep',6500,'Ac','male');

insert into emp values('103','ammu',7500,'HR','female');

insert into emp values('104','snitha',7500,'Ac','female');
```

```
insert into emp values('105','anitha.c',7500,'HR','female');
```

Cursor code:

```
DECLARE
 CURSOR emp1 is SELECT * FROM emp WHERE emp_name like ('s%');
 emp2 emp1%rowtype;
BEGIN
 open emp1;
 loop
  fetch emp1 into emp2;
  exit when emp1%notfound;
  dbms_output.put_line('employee information: '||' '||emp2.emp_no || ' ' ||
emp2.emp_name || ' ' || emp2.salary|| ' '||emp2.emp_dpt||' '||emp2.gender);
 end loop;
 dbms_output.put_line('Totel number of rows :'||emp1%rowcount);
close emp1;
end;
```

output:

```
Statement processed.
employee information: 102 sandeep 6500 Ac male
employee information: 104 snitha 7500 Ac female
Totel number of rows :2
```

9)Create the following tables for Library Information System: Book : (accession-no, title, publisher, publishedDate, author, status). Status could be issued, present in the library, sent for binding, and cannot be issued. Write a **trigger** which sets the status of a book to "cannot be issued", if it is published 15 years back.

Table creation:

```
create table book(accession_no int , title varchar(20), publisher varchar(20),
publishedDate date, author varchar(20), status varchar(30));
```

Trigger code:

```
CREATE OR REPLACE TRIGGER search1
 before insert  ON book
 FOR EACH ROW
 declare
  temp date;
BEGIN
 select sysdate into temp from dual;
 if inserting  then
  if :new.publishedDate < add_months(temp, -180) then
      :new.status:='cannot be issued' ;
  end if;
 end if;
end;
```

inserting command:

```
insert into book values( 2511,'abcd','cp','21-jan-2009','john','issued');
insert into book values( 2512,'efhj','cp','30-mar-2010','malik','present in the library');
insert into book values( 2513,'hijk','cp','21-june-2011','sonu','sent for binding');
insert into book values( 2514,'lmno','cp','01-sep-2016','johns','issued');
insert into book values( 2515,'pqrst','cp','21-jan-2004','joppy','can not be issued');
insert into book values( 2516,'uvwx','cp','21-jan-2006','juosoop',' issued');

SELECT * FROM book;
```

Output:

```
/*insert into book values( 2511,'abcd','cp','21-jan-2009','john','issued');
insert into book values( 2512,'efhj','cp','30-mar-2010','malik','present in the library');
insert into book values( 2513,'hijk','cp','21-june-2011','sonu','sent for binding');
insert into book values( 2514,'lmno','cp','01-sep-2016','johns','issued');
insert into book values( 2515,'pqrst','cp','21-jan-2004','joppy','can not be issued');
insert into book values( 2516,'uvwx','cp','21-jan-2006','juosoop',' issued');*/
```

ACCESSION_NO	TITLE	PUBLISHER	PUBLISHEDDATE	AUTHOR	STATUS
2511	abcd	cp	21-JAN-09	john	issued
2512	efhj	cp	30-MAR-10	malik	present in the library
2513	hijk	cp	21-JUN-11	sonu	sent for binding
2514	lmno	cp	01-SEP-16	johns	issued
2515	pqrst	cp	21-JAN-04	joppy	cannot be issued
2516	uvwx	cp	21-JAN-06	juosoop	cannot be issued

Download CSV

6 rows selected.

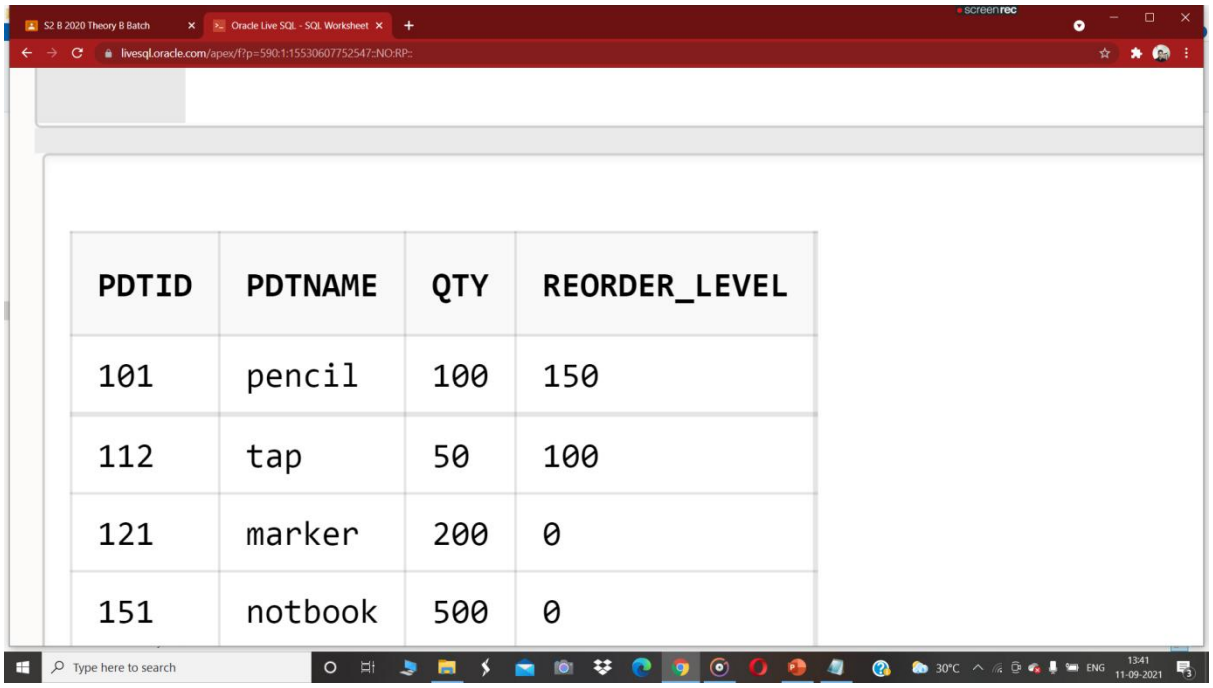
10) Create a table Inventory with fields pdtid, pdtname, qty and reorder_level. Create a **trigger** control on the table for checking whether qty<reorder_level while inserting values.

Code:

```
 create table inventory(pdtid number primary key, pdtname varchar(10), qty int,reorder_level number);
CREATE OR REPLACE TRIGGER checking
 before insert  ON inventory
 FOR EACH ROW
declare
BEGIN
 if inserting  then
  if :new.qty > :new.reorder_level then
     :new.reorder_level:=0;
  end if;
 end if;
```

```
end;
insert into inventory values(101,'pencil',100,150);
insert into inventory values(112,'tap',50,100);
insert into inventory values(121,'marker',200,150);
insert into inventory values(151,'notbook',500,250);
select * from inventory;
```

Output:



PDTID	PDTNAME	QTY	REORDER_LEVEL
101	pencil	100	150
112	tap	50	100
121	marker	200	0
151	notbook	500	0