



VIT[®]
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

ASSESSMENT -4
DATABASE SYSTEMS & DESIGN
CSE 5011

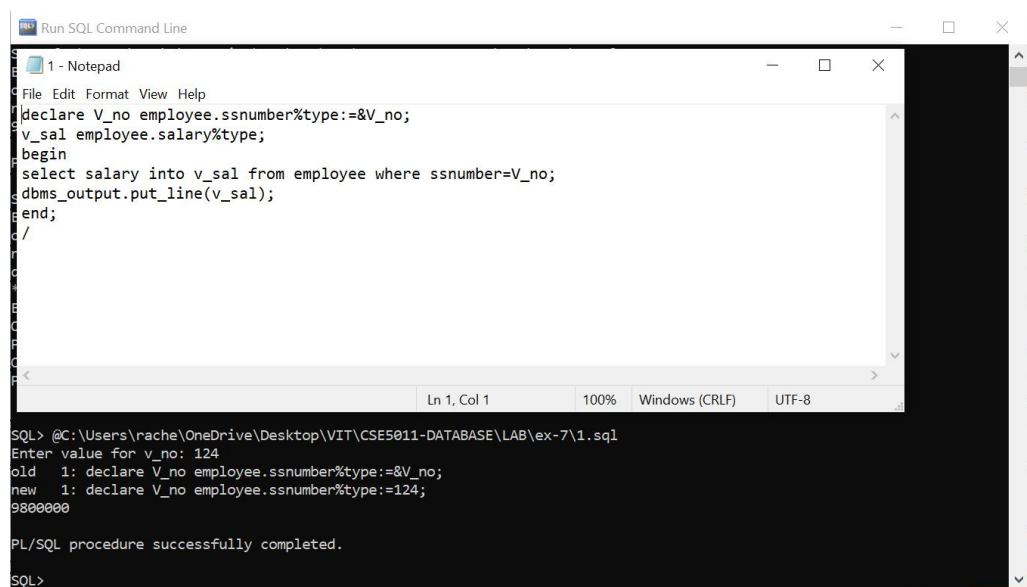
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Exercise - VII:

Aim: To understand the concept of PL/SQL Programming

1. Write a PL/SQL block to accept an empno and display the salary of the person.

```
declare V_no employee.ssnumber%type:=&V_no;
v_sal employee.salary%type;
begin
select salary into v_sal from employee where ssnumber=V_no;
dbms_output.put_line(v_sal);
end;
/
```



```
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-7\1.sql
Enter value for v_no: 124
old 1: declare V_no employee.ssnumber%type:=&V_no;
new 1: declare V_no employee.ssnumber%type:=124;
9800000

PL/SQL procedure successfully completed.
SQL>
```

2. Write a PL/SQL program to delete one record in the employee table.

```
declare V_no employee.ssnumber%type:=&V_no;
begin
delete from employee where ssnumber=V_no;
dbms_output.put_line('record deleted');
end;
/
```

```

2 - Notepad
File Edit Format View Help
declare V_no employee.ssnnumber%type:=&V_no;
begin
delete from employee where ssnnumber=V_no;
dbms_output.put_line('record deleted');
end;

SQL> select * from employee where ssnnumber=234;

FIRSTNAME      MI LASTNAME      SSNUMBER  BIRTHDAY
-----
ADDRESS
-----
S      SALARY SUPERVISO DEPARTMENT_NUMBER
-----
Ramesh      K  Narayan      234      15-SEP-85
Bangalore
M      13450 124      3

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-7\2.sql
Enter value for v_no: 234
old 1: declare V_no employee.ssnnumber%type:=&V_no;
new 1: declare V_no employee.ssnnumber%type:=234;
record deleted

PL/SQL procedure successfully completed.

SQL> select * from employee where ssnnumber=234;

no rows selected

SQL>

```

- Write a program to delete employee details who are having age >60.

```

begin
delete from employee where ROUND((SYSDATE -
TO_DATE(BIRTHDAY))/365.25)>60;
dbms_output.put_line('record deleted');
end;
/

```

```

3 - Notepad
File Edit Format View Help
begin
delete from employee where ROUND((SYSDATE - TO_DATE(BIRTHDAY))/365.25)>60;
dbms_output.put_line('record deleted');
end;
/

Run SQL Command Line
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-7\3.sql
record deleted

PL/SQL procedure successfully completed.

```

- Write a PL/SQL block to display employees who make a minimum salary of \$1,000.

Assume that salary is in '\$'.

```

declare
v_name employee.firstname%type;
begin
dbms_output.put_line('employees whose salary is greater than
1000:');

```

```

for c in (select firstname into v_name from employee where
salary>1000)
loop
v_name:=c.firstname;
dbms_output.put_line(v_name);
end loop;
end;
/

```

The screenshot shows two windows. The top window is a Notepad editor with the following PL/SQL code:

```

declare
v_name employee.firstname%type;
begin
dbms_output.put_line('employees whose salary is greater than 1000:');
for c in (select firstname into v_name from employee where salary>1000)
loop
v_name:=c.firstname;
dbms_output.put_line(v_name);
end loop;
end;
/

```

The bottom window is titled 'Run SQL Command Line' and shows the execution of a query:

```

SQL> select firstname from employee where salary>1000;

FIRSTNAME
-----
Doug
Joyce
Franklin
Jennifer
Robert

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-7\4.sql
employees whose salary is greater than 1000:
Doug
Joyce
Franklin
Jennifer
Robert

PL/SQL procedure successfully completed.

SQL>

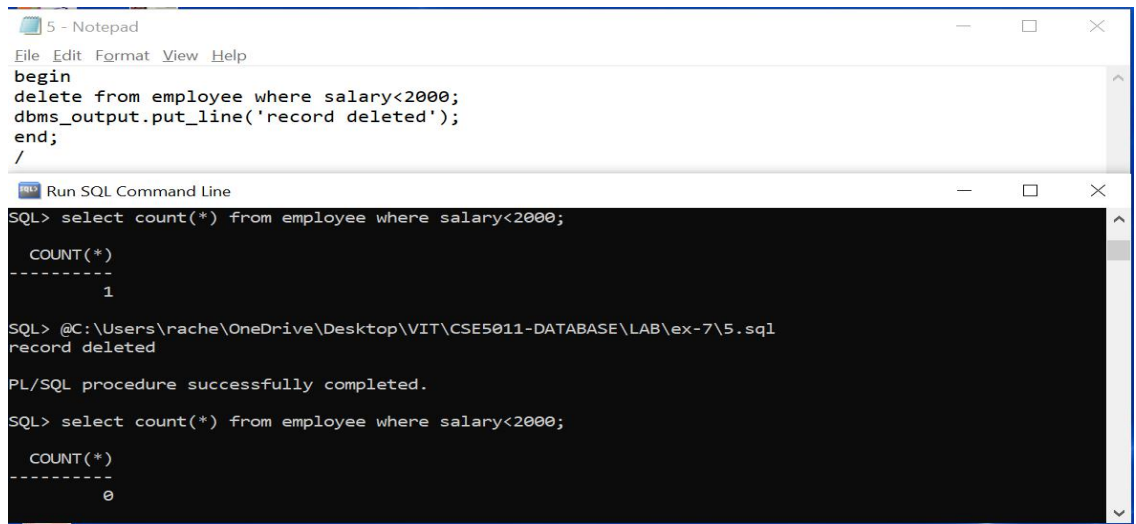
```

5. Write a PL/SQL to delete a records whose basic salary is <2000 from Emp table.

```

begin
delete from employee where salary<2000;
dbms_output.put_line('record deleted');
end;
/

```



```
5 - Notepad
File Edit Format View Help
begin
delete from employee where salary<2000;
dbms_output.put_line('record deleted');
end;
/

Run SQL Command Line
SQL> select count(*) from employee where salary<2000;

COUNT(*)
-----
1

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-7\5.sql
record deleted

PL/SQL procedure successfully completed.

SQL> select count(*) from employee where salary<2000;

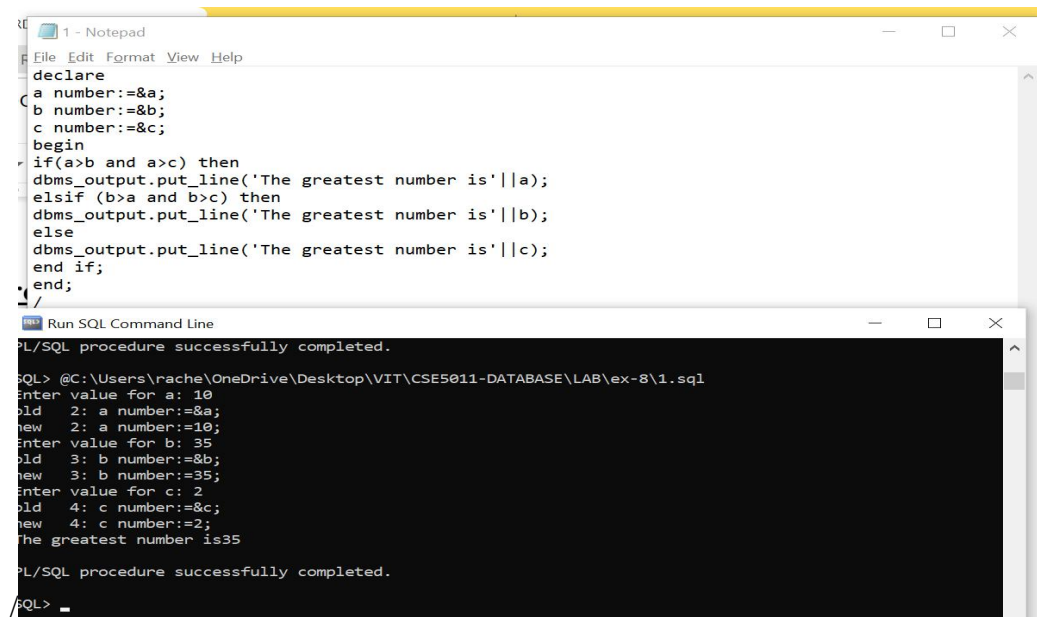
COUNT(*)
-----
0
```

Exercise - VIII:

Aim: To know the usage of different sequential control structures in PL/SQL effective programming

1. Write a PL/SQL block to find the greatest of three numbers.

```
declare
a number:=&a;
b number:=&b;
c number:=&c;
begin
if(a>b and a>c) then
dbms_output.put_line('The greatest number is'||a);
elsif (b>a and b>c) then
dbms_output.put_line('The greatest number is'||b);
else
dbms_output.put_line('The greatest number is'||c);
end if;
end;
/
```



```
1 - Notepad
File Edit Format View Help
declare
a number:=&a;
b number:=&b;
c number:=&c;
begin
if(a>b and a>c) then
dbms_output.put_line('The greatest number is'||a);
elsif (b>a and b>c) then
dbms_output.put_line('The greatest number is'||b);
else
dbms_output.put_line('The greatest number is'||c);
end if;
end;
/

Run SQL Command Line
PL/SQL procedure successfully completed.
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-8\1.sql
Enter value for a: 10
old 2: a number:=&a;
new 2: a number:=10;
Enter value for b: 35
old 3: b number:=&b;
new 3: b number:=35;
Enter value for c: 2
old 4: c number:=&c;
new 4: c number:=2;
The greatest number is35
PL/SQL procedure successfully completed.
SQL> -
```

2. Write a PL/SQL code to print the student's grade accepting their marks in three subjects (hint use: case selector....)

```
declare
mark1 number;
mark2 number;
mark3 number;
total number;
per number;
grade varchar(5);
begin
mark1:=&mark1;
mark2:=&mark2;
mark3:=&mark3;
total:=mark1+mark2+mark3;
dbms_output.put_line('The total marks of student is:'||total);
per:=(total/300)*100;
dbms_output.put_line('The percentage of student is:'||per);
grade:=
case per
WHEN 100 THEN 'A+'
WHEN 90 THEN 'A'
WHEN 80 THEN 'B'
WHEN 70 THEN 'C'
WHEN 60 THEN 'D'
ELSE 'E'
end;
```

```

dbms_output.put_line('The Grade of student is'||grade);
end;
/

```

The screenshot shows two windows. On the left is a Notepad window with a PL/SQL procedure. On the right is a 'Run SQL Command Line' window showing the execution of the procedure. The procedure in Notepad declares variables for marks, total, percentage, and grade. It prompts for three marks, calculates the total and percentage, and then determines the grade based on the percentage. The Run SQL Command Line window shows the execution steps: entering values for mark1, mark2, and mark3, calculating the total (270) and percentage (90), and finally outputting the grade 'A'.

OR

```

declare
mark1 number;
mark2 number;
mark3 number;
total number;
per number;
begin
mark1:=&mark1;
mark2:=&mark2;
mark3:=&mark3;
total:=mark1+mark2+mark3;
dbms_output.put_line('The total marks of student is'||total);
per:=round((total/300)*100);
dbms_output.put_line('The percentage of student is'||per);
dbms_output.put_line('The Grade of student is:');
if( per>=90 and per<=100) then
dbms_output.put_line('A+');
elsif( per>=80 and per<90) then
dbms_output.put_line('A');
elsif( per>=70 and per<80) then
dbms_output.put_line('B');
elsif( per>=60 and per<70) then
dbms_output.put_line('C');
elsif( per>=50 and per<60) then
dbms_output.put_line('D');
else

```

```

dbms_output.put_line('E');
end if;
end;
/

```

The screenshot shows two windows. The left window is a Notepad editor with a PL/SQL script. The right window is a 'Run SQL Command Line' terminal showing the execution of the script.

Notepad Script:

```

declare
mark1 number;
mark2 number;
mark3 number;
total number;
per number;
begin
mark1:=&mark1;
mark2:=&mark2;
mark3:=&mark3;
total:=mark1+mark2+mark3;
dbms_output.put_line('The total marks of student is:'||total);
per:=round((total/300)*100);
dbms_output.put_line('The percentage of student is:'||per);
dbms_output.put_line('The Grade of student is:');
if (per>=90 and per<=100) then
dbms_output.put_line('A+');
elsif (per>=80 and per<90) then
dbms_output.put_line('A');
elsif (per>=70 and per<80) then
dbms_output.put_line('B');
elsif (per>=60 and per<70) then
dbms_output.put_line('C');
elsif (per>=50 and per<60) then
dbms_output.put_line('D');
else
dbms_output.put_line('E');
end if;
end;
/

```

Run SQL Command Line Output:

```

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-8\3.sql
Enter value for mark1: 90
old 8: mark1:=&mark1;
new 8: mark1:=90;
Enter value for mark2: 78
old 9: mark2:=&mark2;
new 9: mark2:=78;
Enter value for mark3: 88
old 10: mark3:=&mark3;
new 10: mark3:=88;
The total marks of student is:256
The percentage of student is:85
The Grade of student is:
A
PL/SQL procedure successfully completed.
SQL>

```

Exercise –IX :

Aim: To understand the concepts of Iterations and Subprogram (Procedures and Functions)

Iterations

1. Write a PL/SQL code to print the numbers in reverse order from 100 to 1.

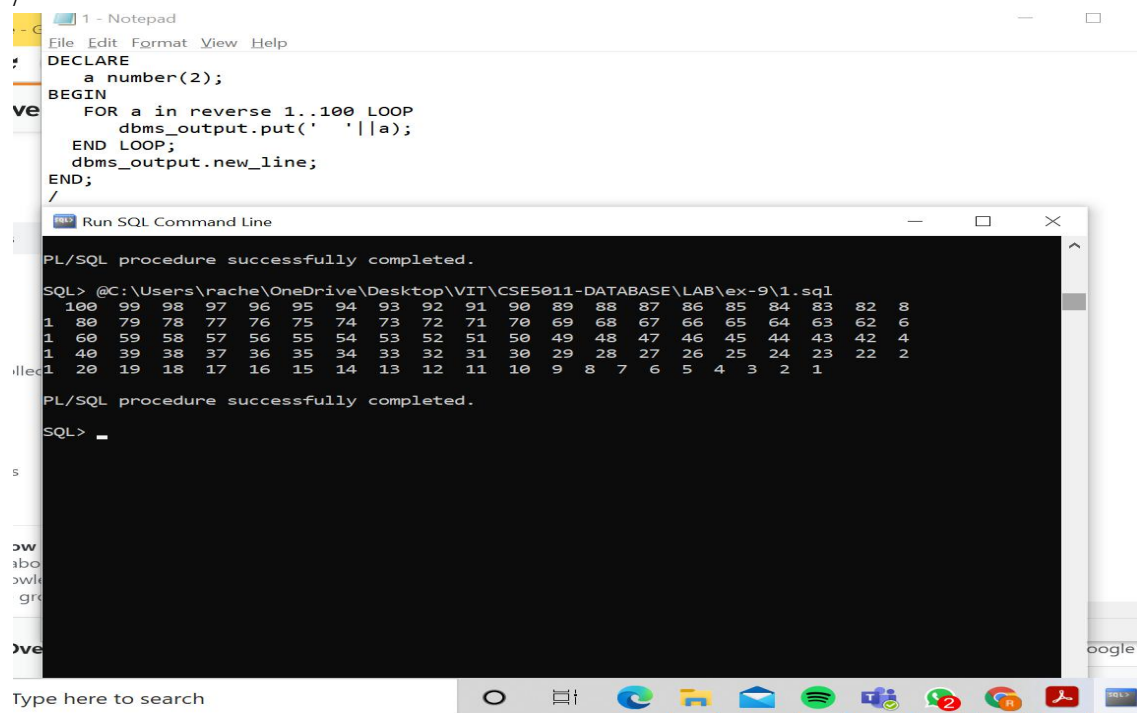
```

declare
a number(2);
begin
for a in reverse 1..100 loop
dbms_output.put(' '||a);
end loop;
dbms_output.new_line;

```


end;

/



```
1 - Notepad
File Edit Format View Help
DECLARE
  a number(2);
BEGIN
  FOR a in reverse 1..100 LOOP
    dbms_output.put(' '||a);
  END LOOP;
  dbms_output.new_line;
END;
/

Run SQL Command Line
PL/SQL procedure successfully completed.

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-9\1.sql
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81
1 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61
1 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41
1 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21
1 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

PL/SQL procedure successfully completed.

SQL> _
```

2. Create a pl/sql block to find the sum of series $1+3+5+\dots+n$.

declare

a number(2);

s number(2);

n number(2);

c number(2);

begin

a:=1;

s:=0;

n:=&n;

c:=1;

while(c<=n)

loop

s:=s+a;

a:=a+2;

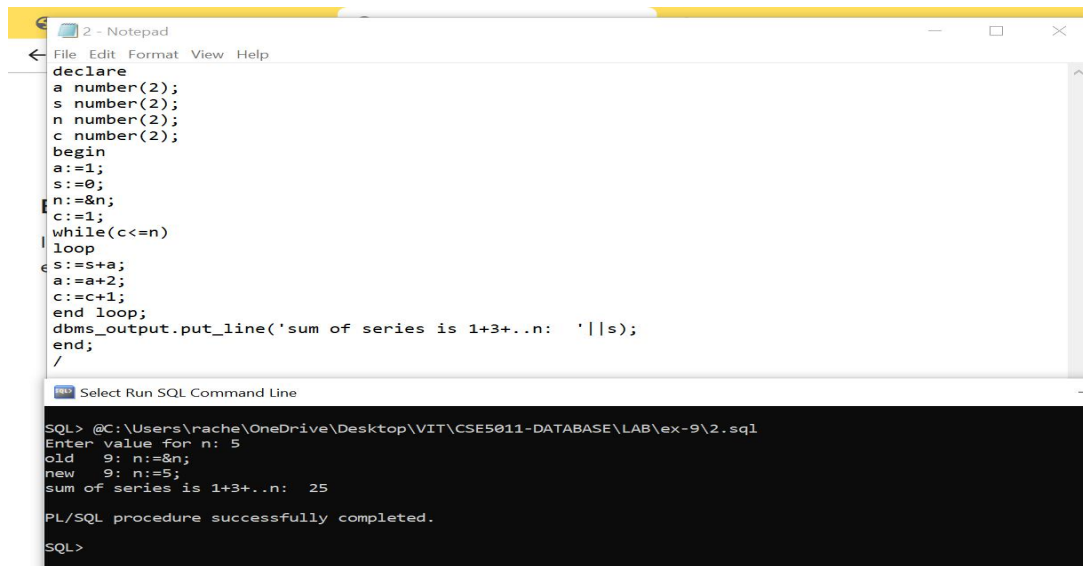
c:=c+1;

end loop;

dbms_output.put_line('sum of series is 1+3+..n: '||s);

end;

/



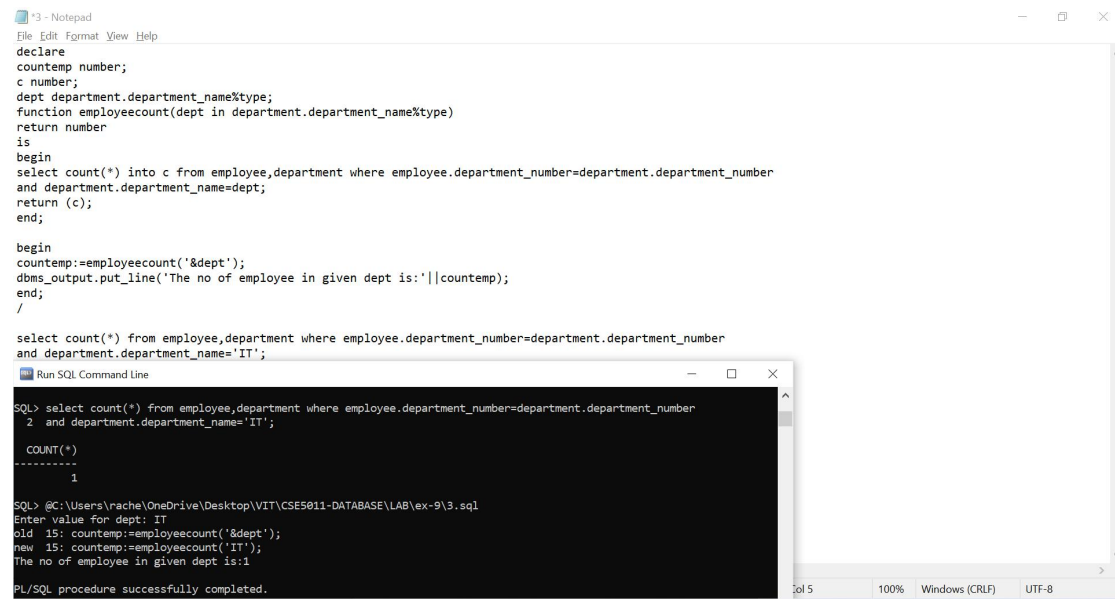
```
2 - Notepad
File Edit Format View Help
declare
a number(2);
s number(2);
n number(2);
c number(2);
begin
a:=1;
s:=0;
n:=&n;
c:=1;
while(c<=n)
loop
s:=s+a;
a:=a+2;
c:=c+1;
end loop;
dbms_output.put_line('sum of series is 1+3+..n: '||s);
end;
/

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-9\2.sql
Enter value for n: 5
old 9: n:=&n;
new 9: n:=5;
sum of series is 1+3+..n: 25
PL/SQL procedure successfully completed.
SQL>
```

Functions

3. Write a function to give the number of employees for a given Department name.

```
declare
countemp number;
c number;
dept department.department_name%type;
function employeecount(dept in department.department_name%type)
return number
is
begin
select count(*) into c from employee,department where
employee.department_number=department.department_number
and department.department_name=dept;
return (c);
end;
begin
countemp:=employeecount('&dept');
dbms_output.put_line('The no of employee in given dept is:'||countemp);
end;
/
```



The image shows a Notepad window with the following PL/SQL code:

```
declare
countemp number;
c number;
dept department.department_name%type;
function employeecount(dept in department.department_name%type)
return number
is
begin
select count(*) into c from employee,department where employee.department_number=department.department_number
and department.department_name=dept;
return (c);
end;

begin
countemp:=employeecount('&dept');
dbms_output.put_line('The no of employee in given dept is: '||countemp);
end;
/

select count(*) from employee,department where employee.department_number=department.department_number
and department.department_name='IT';
```

Below the Notepad window is a "Run SQL Command Line" window showing the execution results:

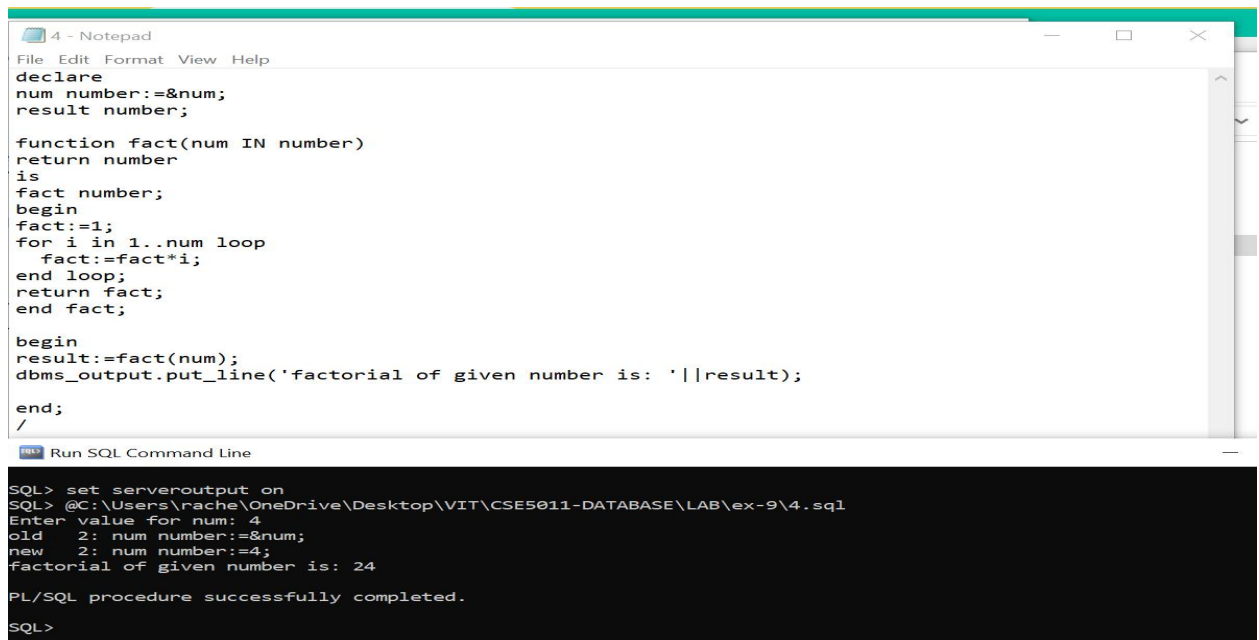
```
SQL> select count(*) from employee,department where employee.department_number=department.department_number
2 and department.department_name='IT';

COUNT(*)
-----
1

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-9\3.sql
Enter value for dept: IT
old 15: countemp:=employeecount('&dept');
new 15: countemp:=employeecount('IT');
The no of employee in given dept is:1
PL/SQL procedure successfully completed.
```

4. Write a PL/SQL to find the factorial of the given number using function.

```
declare
num number:=&num;
result number;
function fact(num IN number)
return number
is
fact number;
begin
fact:=1;
for i in 1..num loop
    fact:=fact*i;
end loop;
return fact;
end fact;
begin
result:=fact(num);
dbms_output.put_line('factorial of given number is: '||result);
end;
/
```



```
4 - Notepad
File Edit Format View Help
declare
num number:=&num;
result number;

function fact(num IN number)
return number
is
fact number;
begin
fact:=1;
for i in 1..num loop
fact:=fact*i;
end loop;
return fact;
end fact;

begin
result:=fact(num);
dbms_output.put_line('factorial of given number is: '||result);
end;
/

Run SQL Command Line

SQL> set serveroutput on
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-9\4.sql
Enter value for num: 4
old 2: num number:=&num;
new 2: num number:=4;
factorial of given number is: 24

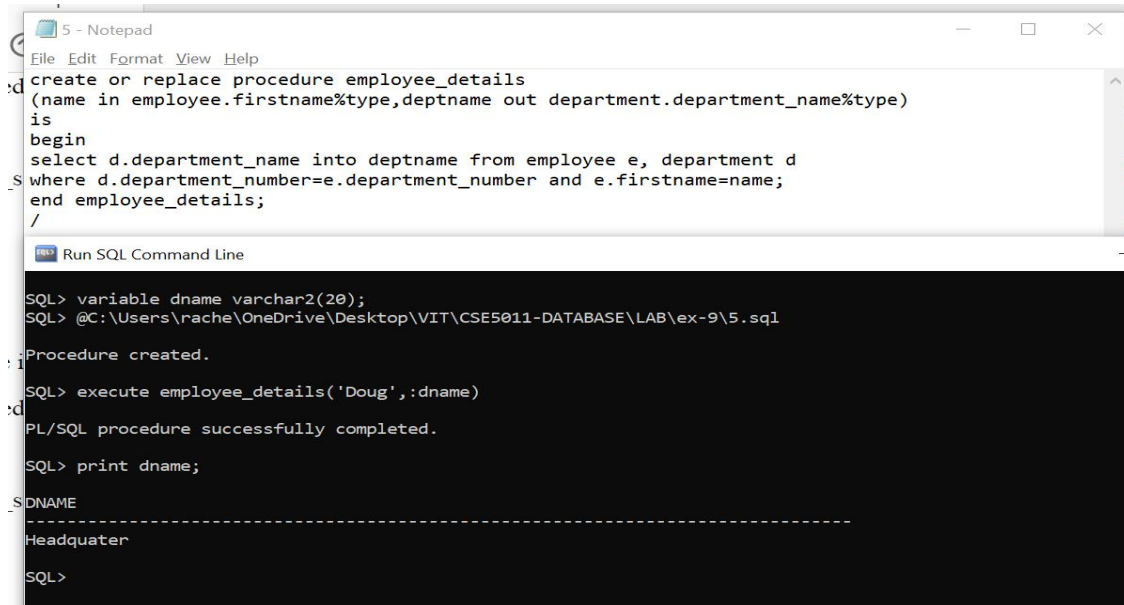
PL/SQL procedure successfully completed.

SQL>
```

Procedure

5. Write a procedure to accept an employee name and display his Department names.

```
create or replace procedure employee_details
(name in employee.firstname%type,deptname out
department.department_name%type)
is
begin
select d.department_name into deptname from employee e, department d
where d.department_number=e.department_number and
e.firstname=name;
end employee_details;
/
```



```
5 - Notepad
File Edit Format View Help
create or replace procedure employee_details
(name in employee.firstname%type,deptname out department.department_name%type)
is
begin
select d.department_name into deptname from employee e, department d
where d.department_number=e.department_number and e.firstname=name;
end employee_details;
/

Run SQL Command Line
SQL> variable dname varchar2(20);
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-9\5.sql
PL/SQL procedure successfully completed.
SQL> print dname;
DNAME
-----
Headquater
SQL>
```

Exercise - X:

Cursor

Aim: To understand implicit and explicit cursor in PL/SQL

1. Retrieve the employee details using cursors.

declare

v_fname employee.FIRSTNAME%type;

v_mname employee.MIDNAME%type;

v_lname employee.LASTNAME%type;

v_sno employee.SSNUMBER %type;

v_bday employee.BIRTHDAY%type;

v_add employee.ADDRESS %type;

v_sex employee.SEX%type;

v_salary employee.SALARY%type;

v_supno employee. SUPERVISOR_SSN%type;

v_dno employee.DEPARTMENT_NUMBER%type;

n number;

cursor emp_c is select * from employee;

begin

select count(*) into n from employee where SSNUMBER is not null;

open emp_c;

for i in 1..n loop

fetch emp_c into

v_fname,v_mname,v_lname,v_sno,v_bday,v_add,v_sex,v_salary,v_supno,v_dno;

dbms_output.put_line(v_fname||' '||v_mname||' '||v_lname||' '||v_sno||' '||v_bday||'

```

'||v_add||' '||v_sex||' '||v_salary||' '||v_supno||' '||v_dno);
end loop;
close emp_c;
end;
/

```

The screenshot shows two windows. The Notepad window contains the following PL/SQL code:

```

declare
v_fname employee.FIRSTNAME%type;
v_mname employee.MIDNAME%type;
v_lname employee.LASTNAME%type;
v_sno employee.SSNUMBER%type;
v_bday employee.BIRTHDAY%type;
v_add employee.ADDRESS %type;
v_sex employee.SEX%type;
v_salary employee.SALARY%type;
v_supno employee.SUPERVISOR_SSN%type;
v_dno employee.DEPARTMENT_NUMBER%type;
n number;
cursor emp_c is select * from employee;
begin
select count(*) into n from employee where
open emp_c;
for i in 1..n loop
fetch emp_c into v_fname,v_mname,v_lname,v
dbms_output.put_line(v_fname||' '||v_mname
end loop;
close emp_c;
end;
/

```

The Run SQL Command Line window shows the execution output:

```

SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-10\1.sql
PL/SQL procedure successfully completed.

SQL> set serveroutput on
SQL> @C:\Users\rache\OneDrive\Desktop\VIT\CSE5011-DATABASE\LAB\ex-10\1.sql
Doug E Gilbert 123      09-JUN-68 Chennai M 300000 1
Joyce PAN 124          07-FEB-73 Vellore F 9800000 5
Franklin T Wong 125    08-DEC-72 Delhi M 7000 123 2
Jennifer S Wallace 564 20-JUN-83 Chennai F 67000 123 2
John B Smith 678       09-JAN-87 Madurai M 1213 124 1
Ramesh K Narayan 234    15-SEP-85 Bangalore M 13450 124 3
UNKNOWN UNKNOWN 123456789 F 1
UNKNOWN UNKNOWN 666884444 F 1
UNKNOWN UNKNOWN 453453453 F 1
UNKNOWN UNKNOWN 333445555 F 2
UNKNOWN UNKNOWN 999887777 F
UNKNOWN UNKNOWN 543216789 F
UNKNOWN UNKNOWN 554433221 F 1
UNKNOWN UNKNOWN 987654321 F
UNKNOWN UNKNOWN 888665555 F
Robert F Scott 943775543 21-JUN-42 2365 Newcastle Rd, Bellaire TX M 80000
888665555 1
RAMESH E GILBERT 22      09-JUN-68 CHENNAI M 80000 123 4

PL/SQL procedure successfully completed.

SQL>

```

2. Write a cursor program to display all the employee and department details

```

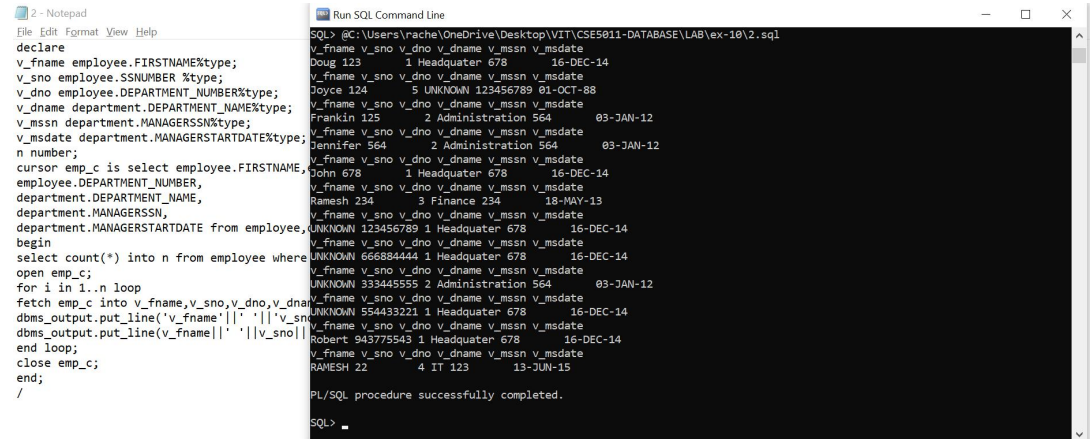
v_fname employee.FIRSTNAME%type;
v_sno employee.SSNUMBER %type;
v_dno employee.DEPARTMENT_NUMBER%type;
v_dname department.DEPARTMENT_NAME%type;
v_mssn department.MANAGERSSN%type;
14v_msdate department.MANAGERSTARTDATE%type;
n number;
cursor emp_c is select employee.FIRSTNAME,employee.SSNUMBER,
employee.DEPARTMENT_NUMBER,
department.DEPARTMENT_NAME,
department.MANAGERSSN,
department.MANAGERSTARTDATE from employee,department where
employee.DEPARTMENT_NUMBER=department.DEPARTMENT_NU
MBER;
begin
select count(*) into n from employee where SSNUMBER is not null and
DEPARTMENT_NUMBER is not null;
open emp_c;
for i in 1..n loop
fetch emp_c into v_fname,v_sno,v_dno,v_dname,v_mssn,v_msdate;
dbms_output.put_line('v_fname'|| '||v_sno'|| '||v_dno'|| '||v_dname'||
'v_mssn'||
'v_msdate');

```

```

dbms_output.put_line(v_fname||' '||v_sno||' '||v_dno||' '||v_dname||'
'||v_mssn||'
'||v_msdate);
end loop;
close emp_c;
end;
/

```



The screenshot shows two windows side-by-side. The left window is a Notepad editor with a PL/SQL procedure named 'emp_c' that iterates through employee records and prints their details. The right window is a 'Run SQL Command Line' terminal showing the output of the procedure, displaying employee names, IDs, department numbers, department names, manager IDs, and hire dates.

```

SQL> @C:\Users\rache\OneDrive\Desktop\KIT\CS5011-DATABASE\LAB\ex-10\2.sql
v_fname v_sno v_dno v_dname v_mssn v_msdate
Doug 123      1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
Doyce 124      5 UNKNOWN 123456789 01-OCT-88
v_fname v_sno v_dno v_dname v_mssn v_msdate
Franklin 125     2 Administration 564      03-JAN-12
v_fname v_sno v_dno v_dname v_mssn v_msdate
Jennifer 564     2 Administration 564      03-JAN-12
v_fname v_sno v_dno v_dname v_mssn v_msdate
John 678      1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
Ramesh 234     3 Finance 234      18-MAY-13
v_fname v_sno v_dno v_dname v_mssn v_msdate
UNKNOWN 123456789 1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
UNKNOWN 666884444 1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
UNKNOWN 333445555 2 Administration 564      03-JAN-12
v_fname v_sno v_dno v_dname v_mssn v_msdate
UNKNOWN 554433221 1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
Robert 943775543 1 Headquater 678      16-DEC-14
v_fname v_sno v_dno v_dname v_mssn v_msdate
RAMESH 22      4 IT 123      13-JUN-15
PL/SQL procedure successfully completed.

SQL>

```