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CYCLE SHEET 3

Aim:

To solve the given problems by implementing in SQL.

Hospital Database

Doctor (<u>Doc_ID</u>, Doc_Name, Gender, DOB, Specialist, Qualification, Contact, Address, Dept_No)

Department (<u>Dept_No</u>, Dept_Name, Room_No, Floor, HOD, Estd_Date)

Staff (Staff_ID, Staff_Name, Category(nurse, lab technician, cashier, security), Designation, DOB, Contact, Address, Dept_No)

Patient (Pat_ID, Pat_Name, DOB, Gender, Contact, Address)

In_Patient (Pat_ID, Date_Of_Admission, Bed_No, Start_Time, End_Time)

In_Patient_Prescription(Pat_ID, Pres_ID)

Appointment (<u>App_ID</u>, Pat_ID, Doc_ID, Nurse_ID, Consult_Room_No, Date, Time)

Prescription (Pres_ID, App_ID, Date, Time, Diagnosis_Detail)

Prescribed_Medicines (Pres_ID, Medicine_Name, Dosage, Brand)

Hospital_Bill (<u>Inv_No, Inv_Date</u>, Pat_ID, Bill_Amount, Payment_Type (cash/credit card/debit card), discount)

Lab_Tests (<u>Test_ID</u>, Pat_ID, Date, Time)

Test_Results (<u>Test_ID</u>, <u>TT_ID</u>, Result)

Test_Types (<u>TT_ID</u>, Description, Low_Value, High_Value, Test_Method, Technician)

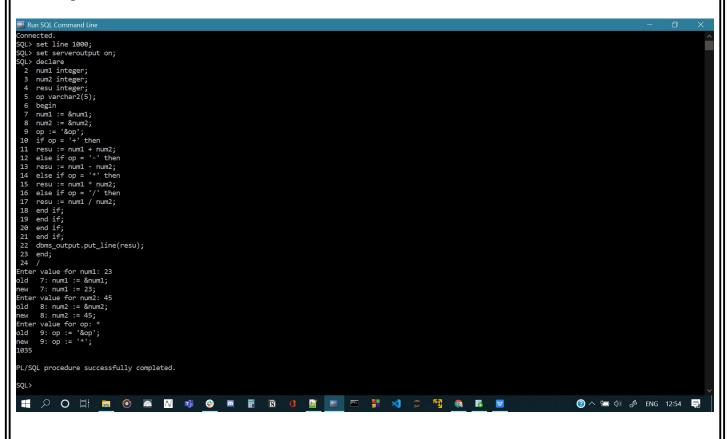
```
Doctor (Doc ID, Doc_Name, Gender, DOB, Specialist, Qualification, Contact, Address, Dept_No)
Department (Nept_No, Dept_Name, Room_No, Floor, HOD, Estd_Date)
Staff (Staff_ID, Staff_Name, Category, Designation, DOB, Contact, Address, Dept_No)
Patient (Pat_ID, Pat_Name, DOB, Gender, Contact, Address)
In_Patient (Pat ID, Date Of Admission, Bed_No, Start_Time, End_Time)
In_Patient_Prescription(Pat In Pres N)
Appointment (App_ID, Pat_ID, Doe_ID, Nurse_ID, Consult_Room_No, Date, Time)
Prescription (Pres_ID, App_ID, Date, Time, Diagnosis_Detail)
Prescribed_Medicines (Pres II), Medicine Name, Dosage, Brand)
Hospital_Bill (Inv_No, Inv_Date, Pat_ID, Bill_Amount, Payment_Type, discount)
Lab_Tests (Test_ID, Pat_ID, Date, Time)
Test_Results (Test_ID, TT_ID, Result)
Test_Types (TT ID, Description, Low_Value, High_Value, Test_Method, Technician)
```

Figure 1: Primary key and foreign keys

1. Write a PL/SQL program to implement a simple calculator

Code:

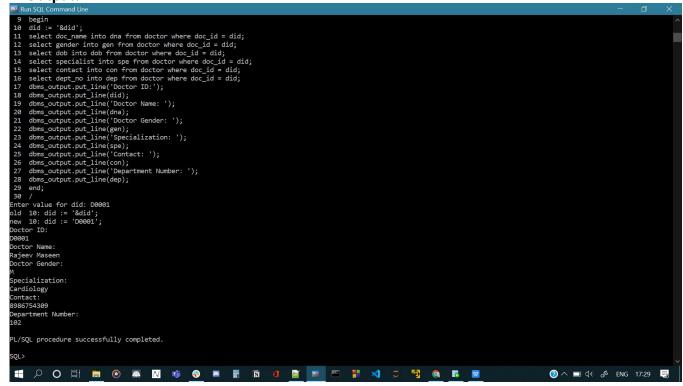
```
declare
num1 integer;
num2 integer;
resu integer;
op varchar2(5);
begin
num1 := &num1;
num2 := &num2;
op := '&op';
if op = '+' then
resu := num1 + num2;
else if op = '-' then
resu := num1 - num2;
else if op = '*' then
resu := num1 * num2;
else if op = '/' then
resu := num1 / num2;
end if;
end if;
end if;
end if;
dbms_output.put_line(resu);
end;
```



2. Write a PL/SQL program to practice reading the record from a table into local variables using different data types and %TYPE and display the same using locally declared variables.

Code:

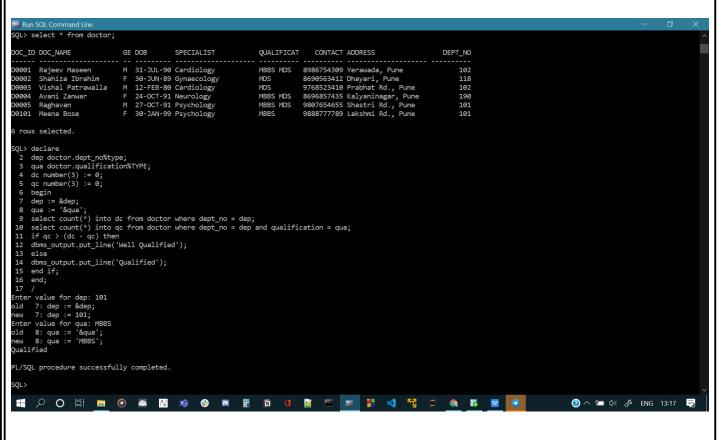
```
declare
did doctor.doc_id%type;
dna doctor.doc_name%type;
gen doctor.gender%type;
dob doctor.dob%type;
spe doctor.specialist%type;
con doctor.contact%type;
dep doctor.dept_no%type;
begin
did := '\&did';
select doc_name into dna from doctor where doc_id = did;
select gender into gen from doctor where doc_id = did;
select dob into dob from doctor where doc_id = did;
select specialist into spe from doctor where doc_id = did;
select contact into con from doctor where doc_id = did;
select dept_no into dep from doctor where doc_id = did;
dbms_output.put_line('Doctor ID:');
dbms_output.put_line(did);
dbms_output.put_line('Doctor Name: ');
dbms_output.put_line(dna);
dbms_output.put_line('Doctor Gender: ');
dbms_output.put_line(gen);
dbms_output.put_line('Specialization: ');
dbms_output.put_line(spe);
dbms_output.put_line('Contact: ');
dbms_output.put_line(con);
dbms_output.put_line('Department Number: ');
dbms_output.put_line(dep);
end;
```



3. Write a PL/SQL program to find the number of doctors in a given department with a given qualification (read values for department and qualification from user during runtime). If number is more than the number of doctors in that department with other qualifications then display 'Well qualified' else 'Qualified'.

Code:

```
declare
dep doctor.dept_no%type;
qua doctor.qualification%TYPE;
dc number(3) := 0;
qc number(3) := 0;
begin
dep := &dep;
qua := '&qua';
select count(*) into dc from doctor where dept_no = dep;
select count(*) into qc from doctor where dept_no = dep and qualification = qua;
if qc > (dc - qc) then
dbms_output.put_line('Well Qualified');
else
dbms_output.put_line('Qualified');
end if;
end;
```



4. Write a PL/SQL program to insert records into any of the tables in your database.

Code:

```
SQL> declare

2 mn medicines.med_name%type;

3 br medicines.brand%type;

4 md medicines.manu_date%type;

5 ed medicines.exp_date%type;

6 begin

7 mn := '&mn';

8 br := '&br';

9 md := '&md';

10 ed := '&ed';

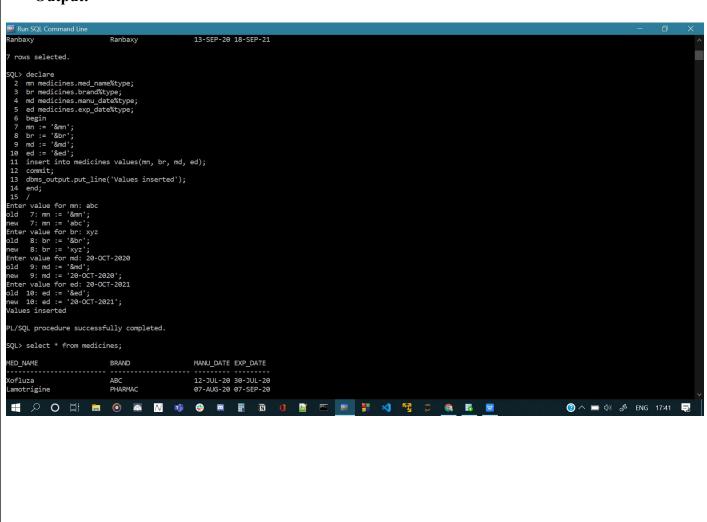
11 insert into medicines values(mn, br, md, ed);

12 commit;

13 dbms_output.put_line('Values inserted');

14 end;

15 /
```



5. Create a function to find the factorial of a given number.

```
Code:
```

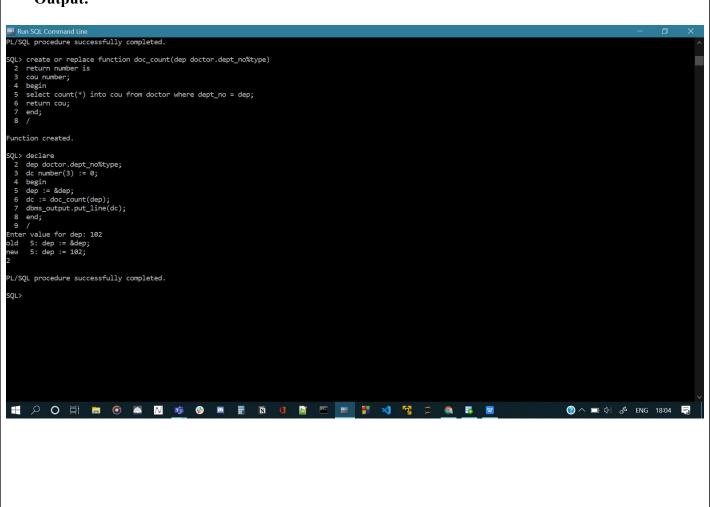
```
SQL> create or replace function factorial_mine(num number)
  2 return number is
  3 inumber;
  4 f number;
 5 begin
  6 if (num = 0 \text{ or } num = 1) then
  7 return(1);
  8 else
  9 f := 1;
 10 for i in 1..num
11 loop
12 f := f^*i;
13 end loop;
14 return f;
15 end if;
16 end;
17 /
SQL> declare
  2 num number;
  3 begin
  4 num := #
  5 dbms_output.put_line(factorial_mine(num));
  6 end;
  7 /
```

```
create or replace function factorial_mine(num number)
return number is
                            if (num = 0 or num = 1) then
                          return(1);
else
f := 1;
for i in 1..num
 QL> declare
2 num number;
3 begin
                          num := #
dbms_output.put_line(factorial_mine(num));
                              value for num: 5
4: num := #
4: num := 5;
PL/SQL procedure successfully completed.
                                오 O 닭 등 © 조 N j + 등 T N j + 등 N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j + N j +
```

6. Create a function DOC_COUNT to find the number of doctors in the given department. Use the department name as the input parameter for the function.

Code:

```
create or replace function doc_count(dep doctor.dept_no%type)
return number is
cou number;
begin
select count(*) into cou from doctor where dept_no = dep;
return cou;
end;
declare
dep doctor.dept_no%type;
dc number(3) := 0;
begin
dep := &dep;
dc := doc_count(dep);
dbms_output.put_line(dc);
end;
```

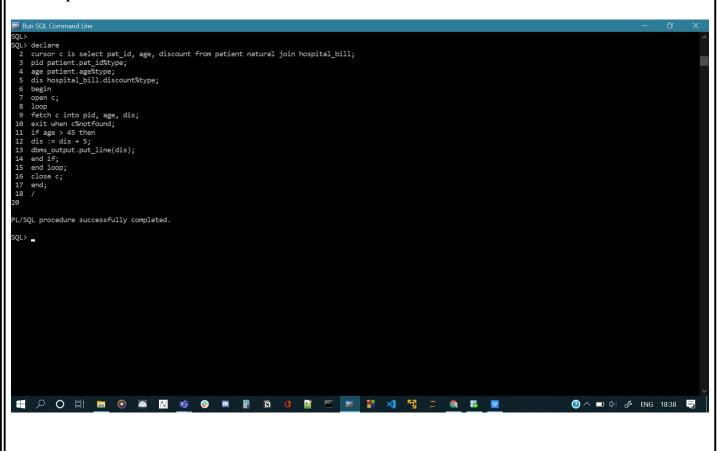


Cursors:

1. Write a CURSOR to give 5% additional discount to all senior citizen patients.

Code:

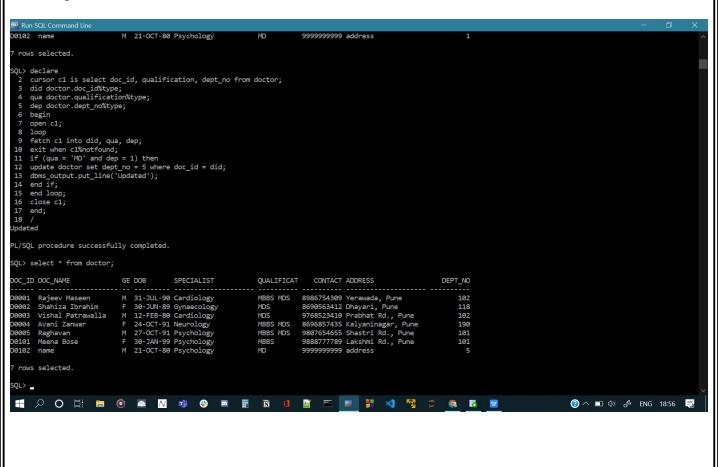
```
SQL> declare
 2 cursor c is select pat_id, age, discount from patient natural join hospital_bill;
 3 pid patient.pat_id%type;
  4 age patient.age%type;
  5 dis hospital_bill.discount%type;
  6 begin
  7 open c;
 8 loop
 9 fetch c into pid, age, dis;
10 exit when c%notfound;
11 if age > 45 then
12 dis := dis + 5;
13 dbms_output.put_line(dis);
14 end if;
15 end loop;
16 close c;
17 end;
18 /
```



2. Write a CURSOR to change the department number from 1 as 5 for all doctors with a qualification 'MD'.

Code:

```
declare
cursor c1 is select doc_id, qualification, dept_no from doctor;
did doctor.doc_id%type;
qua doctor.qualification%type;
dep doctor.dept_no%type;
begin
open c1;
loop
fetch c1 into did, qua, dep;
exit when c1%notfound;
if (qua = 'MD' and dep = 1) then
update doctor set dept_no = 5 where doc_id = did;
dbms_output.put_line('Updated');
end if;
end loop;
close c1;
end;
```

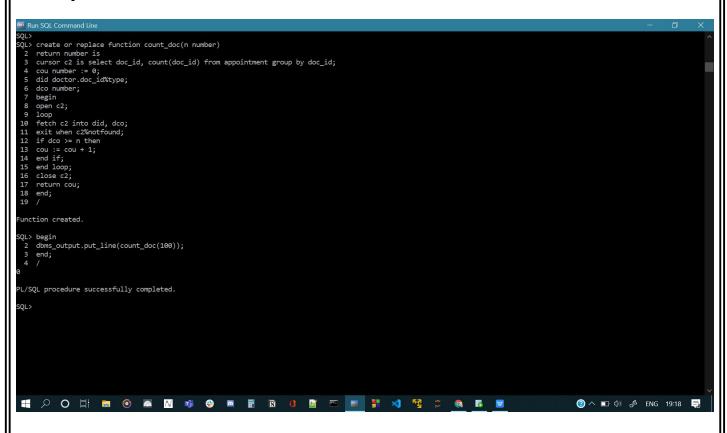


Functions and Procedures:

1. Write a PL/SQL stored function COUNT_DOC to count the number of doctors who have treated at least 100 patients if given a doctor id as input parameter.

Code:

```
create or replace function count doc(n number)
return number is
cursor c2 is select doc_id, count(doc_id) from appointment group by doc_id;
cou number := 0;
did doctor.doc_id%type;
dco number;
begin
open c2;
loop
fetch c2 into did, dco;
exit when c2%notfound;
if dco >= n then
cou := cou + 1;
end if;
end loop;
close c2;
return cou;
end;
```



2. Write a PL/SQL stored procedure to adjust the payment type of hospital bills to CASH if the patient id and amount details given as input.

Code:

```
create or replace procedure cash(pid patient.pat_id%type, amt hospital_bill.bill_amount%type)
is
begin
update hospital_bill set payment_type = 'CASH' where pat_id = pid and bill_amount = amt;
end;

declare
pid patient.pat_id%type;
amt hospital_bill.bill_amount%type;
begin
pid := '&pid';
amt := &amt;
cash(pid, amt);
dbms_output.put_line('Updated');
end;
```

```
### Run SQL Command Like  

OQL create on replace procedure cash(pid patient.pat_id%type, amt hospital_bill.bill_amount%type)

2 is
3 begin
4 update hospital_bill set payment_type = 'CASH' where pat_id = pid and bill_amount = amt;
5 end;
6 /
CQL declare
2 pid patient.pat_id%type;
3 ant hospital_bill.bill_amount%type;
4 begin
5 of sat : Samt;
7 cash(pid, amt);
8 dbms_outpt.put_lain('Updated');
9 end;
3 dbms_outpt.put_lain('Updated');
9 end;
9 en
```

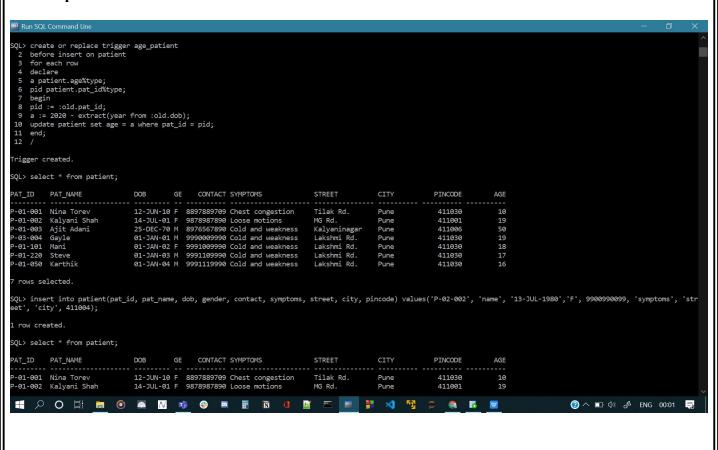
Triggers:

Add an attribute with patients table to store the age of the patients. Then answer the following question;

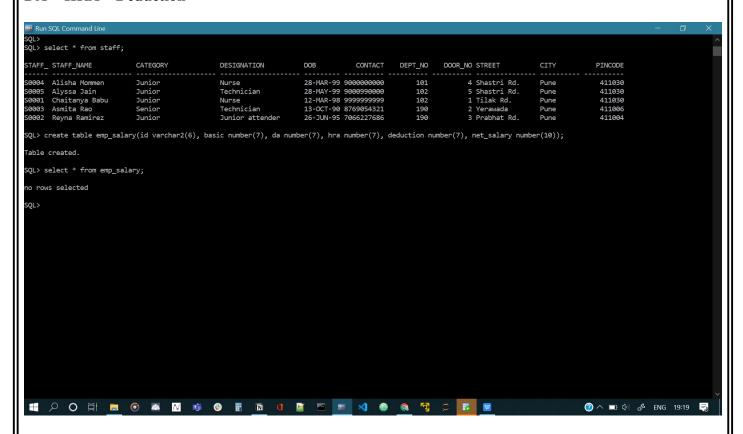
1. Write a Trigger to find and fill the age of a patient whenever a patient record is inserted into patients table.

Code:

```
create or replace trigger age_patient
before insert on patient
for each row
declare
a patient.age%type;
pid patient.pat_id%type;
begin
pid := :old.pat_id;
a := 2020 - extract(year from :old.dob);
update patient set age = a where pat_id = pid;
end;
```



Create a table EMP_SALARY with attributes ID, Basic, DA, HRA, Deduction, Net_Salary. Here, ID refers the Staff_ID of staff table. Treat 'Net_Salary' as a derived attribute and don't insert a value through insert operation. The value for Net Salary can be calculated as follows; Net_Salary = Basic + DA + HRA – Deduction



1. Write a Trigger to perform the following; whenever new staff is recruited and a designation is assigned, insert an appropriate record into EMP_SALARY table. Refer the following table for salary details.

Code:

```
create or replace trigger insert_emp_salary
after insert on staff
for each row
enable
begin
if :new.Designation = 'Staff nurse' then
insert into emp_salary values (:new.Staff_ld, 6000, 6000, 2000, 2, (6000 + 6000 + 2000 - (0.02*6000)));
ELSIF: new. Designation = 'Head nurse' then
insert into emp salary values (:new.Staff Id, 8000, 2500, 3000, 2, (8000 + 2500 + 3000 - (0.2*8000)));
ELSIF: new. Designation = 'Technician' THEN
INSERT INTO emp_salary VALUES (:new.Staff_Id, 6000, 2000, 2000, 2, (6000 + 2000 + 2000 - (0.2*6000)));
ELSIF: new. Designation = 'Senior technician' THEN
INSERT INTO emp_salary VALUES (:new.Staff_ld, 9000, 2500, 3500, 2, (9000 + 2500 + 3500 - (0.2*9000)));
ELSIF :new.Designation = 'Junior attender' THEN
INSERT INTO emp salary VALUES (:new.Staff Id, 5000, 1500, 2000, 2, (5000 + 1500 + 2000 - (0.2*5000)));
ELSIF: new. Designation = 'Senior attender' THEN
INSERT INTO emp_salary VALUES (:new.Staff_ld, 6500, 2000, 2000, 2, (6500 + 2000 + 2000 - (0.2*6500)));
```

```
END IF;
END;

Output:

Table created.

SQL> select * from emp_salary;
no rows selected
```

