Oracle SQL Capstone Project Exam (17/07/2024)

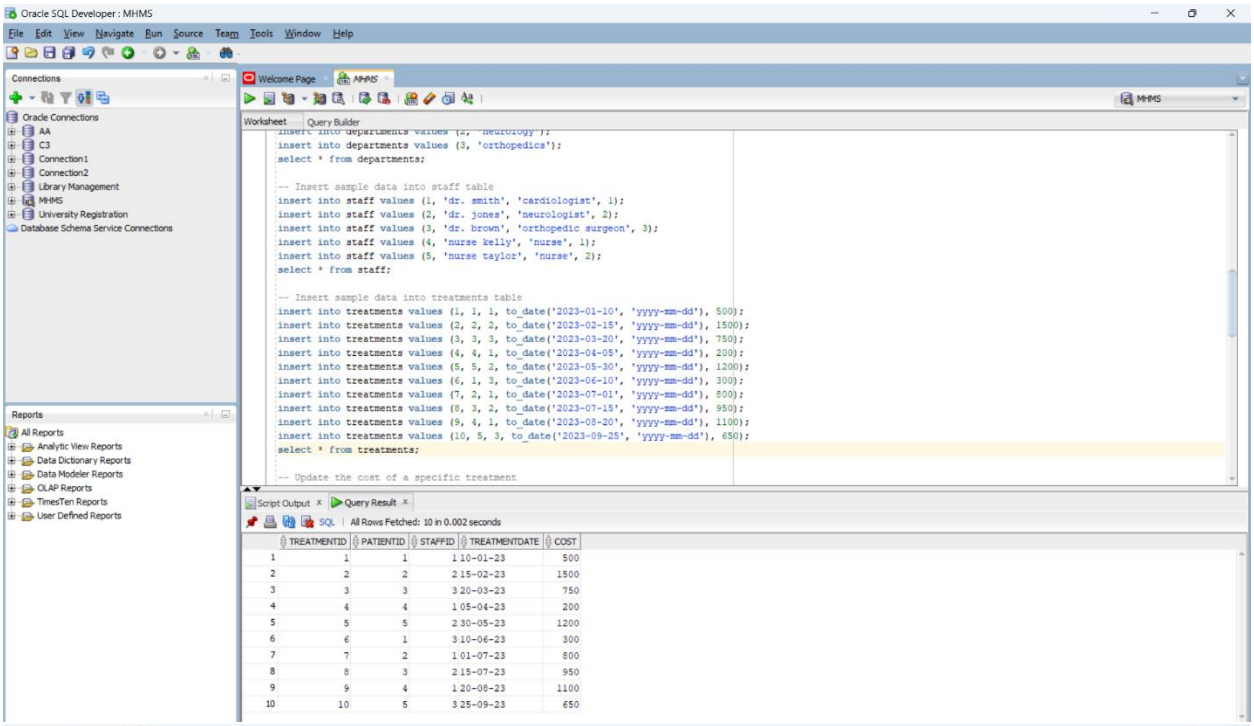
```
-- Create Tables: patients, departments, staff, treatments

-- Patients table
create table patients (
    patientid number primary key,
    name varchar2(100),
    dob date,
    email varchar2(100) unique,
    phone varchar2(20)
);

-- Departments table
create table departments (
    departmentid number primary key,
    departmentname varchar2(100)
);

-- Staff table
create table staff (
    staffid number primary key,
    name varchar2(100),
    role varchar2(50),
    departmentid number,
    constraint fk_staff_department foreign key (departmentid) references
departments(departmentid)
);

-- Treatments table
create table treatments (
    treatmentid number primary key,
    patientid number,
    staffid number,
    treatmentdate date,
    cost number(10, 2),
    constraint fk_treatments_patients foreign key (patientid) references
patients(patientid) on delete cascade,
    constraint fk_treatments_staff foreign key (staffid) references
staff(staffid),
    constraint chk_cost_nonnegative check (cost >= 0)
```

```
);

-- Insert sample data into patients table
insert into patients values (1, 'john doe', to_date('1985-05-15', 'yyyy-mm-
dd'), 'john.doe@example.com', '555-0101');
insert into patients values (2, 'jane smith', to_date('1990-06-20', 'yyyy-mm-
dd'), 'jane.smith@example.com', '555-0102');
insert into patients values (3, 'alice johnson', to_date('1975-09-25', 'yyyy-
mm-dd'), 'alice.j@example.com', '555-0103');
insert into patients values (4, 'bob brown', to_date('1982-01-30', 'yyyy-mm-
dd'), 'bob.brown@example.com', '555-0104');
insert into patients values (5, 'eve white', to_date('1995-12-12', 'yyyy-mm-
dd'), 'eve.white@example.com', '555-0105');

-- Insert sample data into departments table
insert into departments values (1, 'cardiology');
insert into departments values (2, 'neurology');
insert into departments values (3, 'orthopedics');

-- Insert sample data into staff table
insert into staff values (1, 'dr. smith', 'cardiologist', 1);
insert into staff values (2, 'dr. jones', 'neurologist', 2);
insert into staff values (3, 'dr. brown', 'orthopedic surgeon', 3);
insert into staff values (4, 'nurse kelly', 'nurse', 1);
insert into staff values (5, 'nurse taylor', 'nurse', 2);

-- Insert sample data into treatments table
insert into treatments values (1, 1, 1, to_date('2023-01-10', 'yyyy-mm-dd'),
500);
insert into treatments values (2, 2, 2, to_date('2023-02-15', 'yyyy-mm-dd'),
1500);
insert into treatments values (3, 3, 3, to_date('2023-03-20', 'yyyy-mm-dd'),
750);
insert into treatments values (4, 4, 1, to_date('2023-04-05', 'yyyy-mm-dd'),
200);
insert into treatments values (5, 5, 2, to_date('2023-05-30', 'yyyy-mm-dd'),
1200);
insert into treatments values (6, 1, 3, to_date('2023-06-10', 'yyyy-mm-dd'),
300);
insert into treatments values (7, 2, 1, to_date('2023-07-01', 'yyyy-mm-dd'),
800);
insert into treatments values (8, 3, 2, to_date('2023-07-15', 'yyyy-mm-dd'),
950);
```

```
insert into treatments values (9, 4, 1, to_date('2023-08-20', 'yyyy-mm-dd'),
1100);
insert into treatments values (10, 5, 3, to_date('2023-09-25', 'yyyy-mm-dd'),
650);

-- Update the cost of a specific treatment
update treatments set cost = 600 where treatmentid = 6;

-- Delete a patient and observe the cascading effect on associated treatments
-- Note: Ensure ON DELETE CASCADE is enabled on the foreign key constraint
(already defined above)

-- Delete patient with patientid = 4
delete from patients where patientid = 4;
select * from treatments;

/*
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the
staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;

-- Create a query to display all treatments, including patient names, staff
names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname,
t.treatmentdate, t.cost
from treatments t
join patients p on t.patientid = p.patientid
join staff s on t.staffid = s.staffid
join departments d on s.departmentid = d.departmentid;

/*
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific
department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
```

```
join staff s on t.staffid = s.staffid
where s.departmentid = 1;

-- Use a correlated subquery to find staff who have treated more than a
specified number of patients (e.g., 3)
select *
from staff s
where (select count(*) from treatments t where t.staffid = s.staffid) > 2;

/*
Aggregate Functions with GROUP BY and HAVING
Calculate the total cost of treatments per patient and filter out patients
with a total treatment cost less than 1000
*/
select p.name as patient_name, sum(t.cost) as total_cost
from patients p
join treatments t on p.patientid = t.patientid
group by p.name
having sum(t.cost) >= 1000;
```

OUTPUT: -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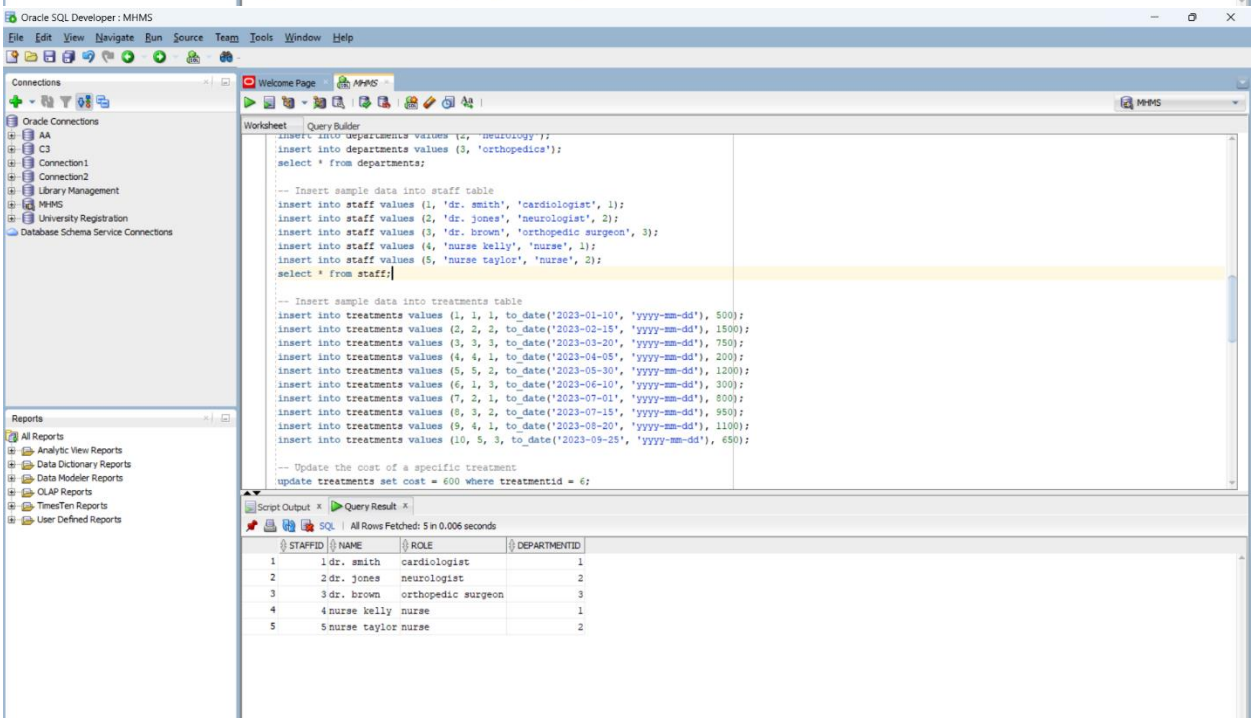
insert into departments values (3, 'orthopedics');
select * from departments;
-- Insert sample data into staff table
insert into staff values (1, 'dr. smith', 'cardiologist', 1);
insert into staff values (2, 'dr. jones', 'neurologist', 2);
insert into staff values (3, 'dr. brown', 'orthopedic surgeon', 3);
insert into staff values (4, 'nurse kelly', 'nurse', 1);
insert into staff values (5, 'nurse taylor', 'nurse', 2);
select * from staff;
-- Insert sample data into treatments table
insert into treatments values (1, 1, 1, to_date('2023-01-10', 'yyyy-mm-dd'), 500);
insert into treatments values (2, 2, 2, to_date('2023-02-15', 'yyyy-mm-dd'), 1500);
insert into treatments values (3, 3, 3, to_date('2023-03-20', 'yyyy-mm-dd'), 750);
insert into treatments values (4, 4, 1, to_date('2023-04-05', 'yyyy-mm-dd'), 200);
insert into treatments values (5, 5, 2, to_date('2023-05-30', 'yyyy-mm-dd'), 1200);
insert into treatments values (6, 1, 3, to_date('2023-06-10', 'yyyy-mm-dd'), 300);
insert into treatments values (7, 2, 1, to_date('2023-07-01', 'yyyy-mm-dd'), 800);
insert into treatments values (8, 3, 2, to_date('2023-07-15', 'yyyy-mm-dd'), 950);
insert into treatments values (9, 4, 1, to_date('2023-08-20', 'yyyy-mm-dd'), 1100);
insert into treatments values (10, 5, 3, to_date('2023-09-25', 'yyyy-mm-dd'), 650);
select * from treatments;
-- Update the cost of a specific treatment
Script Output
Query Result
SQL | All Rows Fetched: 10 in 0.002 seconds
TREATMENTID PATIENTID STAFFID TREATMENTDATE COST
1 1 1 1 10-01-23 500
2 2 2 2 15-02-23 1500
3 3 3 3 20-03-23 750
4 4 4 1 05-04-23 200
5 5 5 2 30-05-23 1200
6 6 1 3 10-06-23 300
7 7 2 1 01-07-23 800
8 8 3 2 15-07-23 950
9 9 4 1 20-08-23 1100
10 10 5 3 25-09-23 650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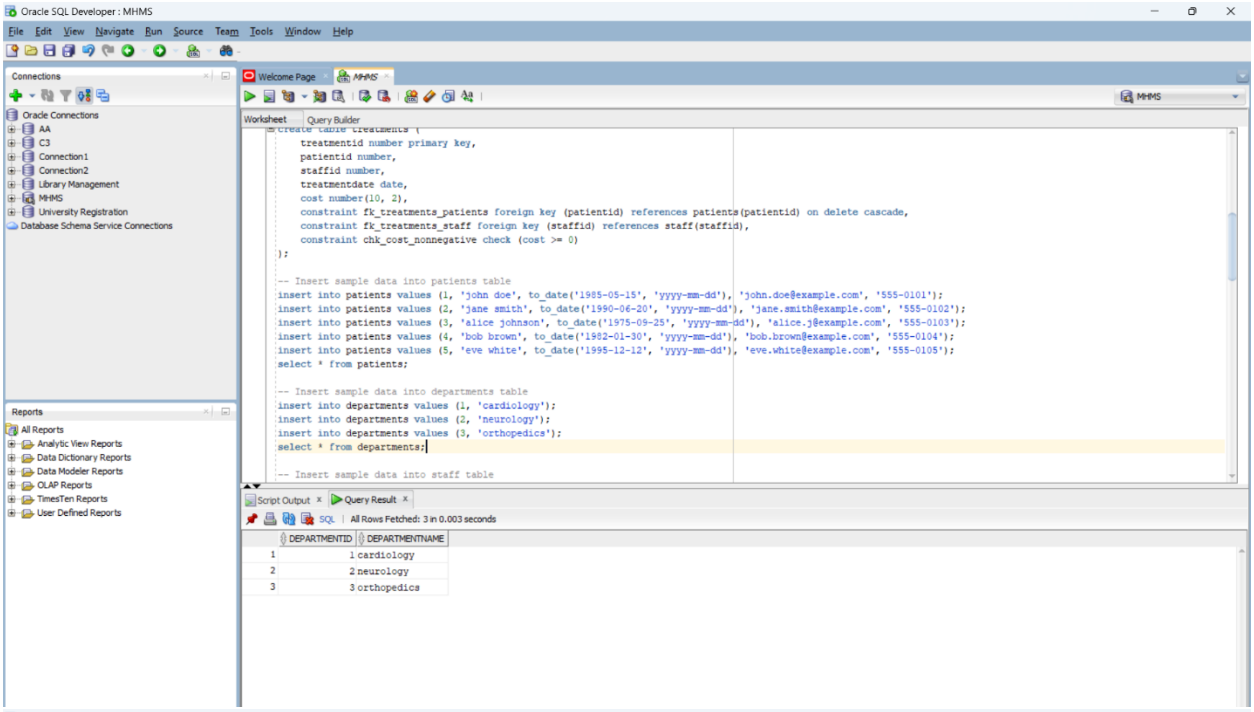
insert into departments values (3, 'orthopedics');
select * from departments;
-- Insert sample data into staff table
insert into staff values (1, 'dr. smith', 'cardiologist', 1);
insert into staff values (2, 'dr. jones', 'neurologist', 2);
insert into staff values (3, 'dr. brown', 'orthopedic surgeon', 3);
insert into staff values (4, 'nurse kelly', 'nurse', 1);
insert into staff values (5, 'nurse taylor', 'nurse', 2);
select * from staff;
-- Insert sample data into treatments table
insert into treatments values (1, 1, 1, to_date('2023-01-10', 'yyyy-mm-dd'), 500);
insert into treatments values (2, 2, 2, to_date('2023-02-15', 'yyyy-mm-dd'), 1500);
insert into treatments values (3, 3, 3, to_date('2023-03-20', 'yyyy-mm-dd'), 750);
insert into treatments values (4, 4, 1, to_date('2023-04-05', 'yyyy-mm-dd'), 200);
insert into treatments values (5, 5, 2, to_date('2023-05-30', 'yyyy-mm-dd'), 1200);
insert into treatments values (6, 1, 3, to_date('2023-06-10', 'yyyy-mm-dd'), 300);
insert into treatments values (7, 2, 1, to_date('2023-07-01', 'yyyy-mm-dd'), 800);
insert into treatments values (8, 3, 2, to_date('2023-07-15', 'yyyy-mm-dd'), 950);
insert into treatments values (9, 4, 1, to_date('2023-08-20', 'yyyy-mm-dd'), 1100);
insert into treatments values (10, 5, 3, to_date('2023-09-25', 'yyyy-mm-dd'), 650);
-- Update the cost of a specific treatment
update treatments set cost = 600 where treatmentid = 6;
Script Output
Query Result
SQL | All Rows Fetched: 5 in 0.006 seconds
STAFFID NAME ROLE DEPARTMENTID
1 1 dr. smith cardiologist 1
2 2 dr. jones neurologist 2
3 3 dr. brown orthopedic surgeon 3
4 4 nurse kelly nurse 1
5 5 nurse taylor nurse 2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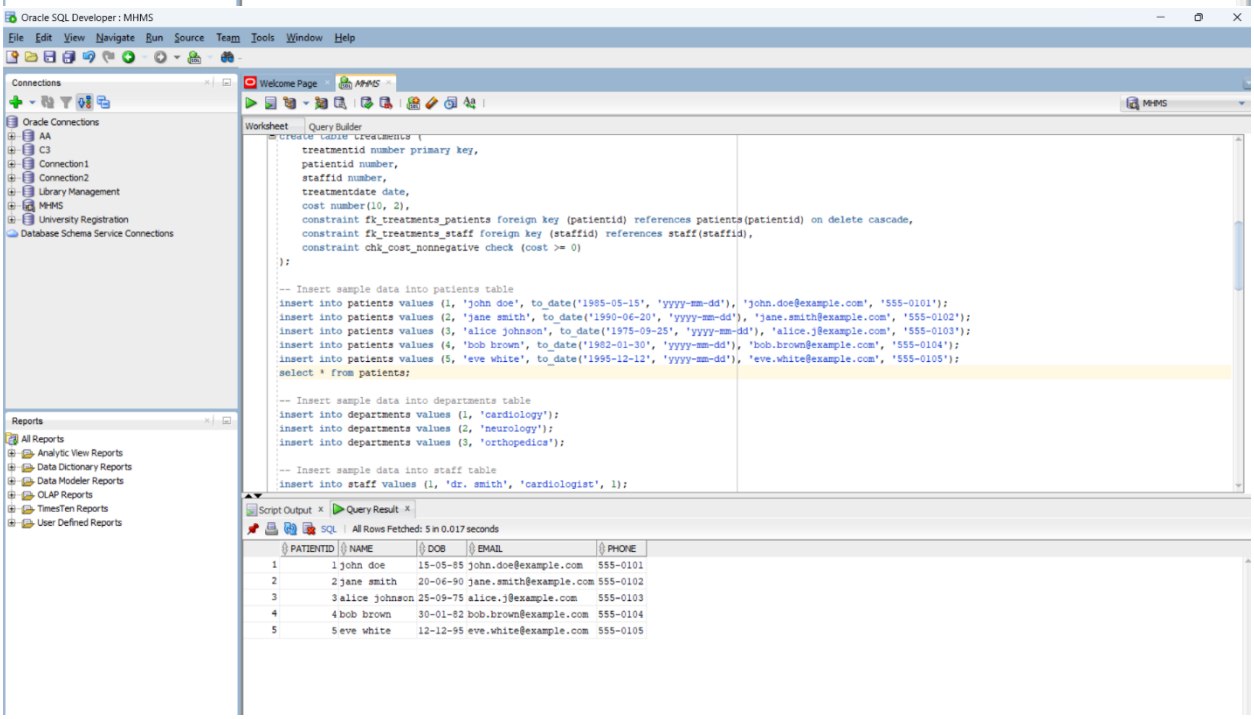
create table treatments (
treatmentid number primary key,
patientid number,
staffid number,
treatmentdate date,
cost number(10, 2),
constraint fk_treatments_patients foreign key (patientid) references patients(patientid) on delete cascade,
constraint fk_treatments_staff foreign key (staffid) references staff(staffid),
constraint chk_cost_nonnegative check (cost >= 0)
);
-- Insert sample data into patients table
insert into patients values (1, 'john doe', to_date('1985-05-15', 'yyyy-mm-dd'), 'john.doe@example.com', '555-0101');
insert into patients values (2, 'jane smith', to_date('1990-06-20', 'yyyy-mm-dd'), 'jane.smith@example.com', '555-0102');
insert into patients values (3, 'alice johnson', to_date('1975-09-25', 'yyyy-mm-dd'), 'alice.j@example.com', '555-0103');
insert into patients values (4, 'bob brown', to_date('1982-01-30', 'yyyy-mm-dd'), 'bob.brown@example.com', '555-0104');
insert into patients values (5, 'eve white', to_date('1995-12-12', 'yyyy-mm-dd'), 'eve.white@example.com', '555-0105');
select * from patients;
-- Insert sample data into departments table
insert into departments values (1, 'cardiology');
insert into departments values (2, 'neurology');
insert into departments values (3, 'orthopedics');
select * from departments;
-- Insert sample data into staff table
Script Output
Query Result
SQL | All Rows Fetched: 3 in 0.003 seconds
DEPARTMENTID DEPARTMENTNAME
1 1 cardiology
2 2 neurology
3 3 orthopedics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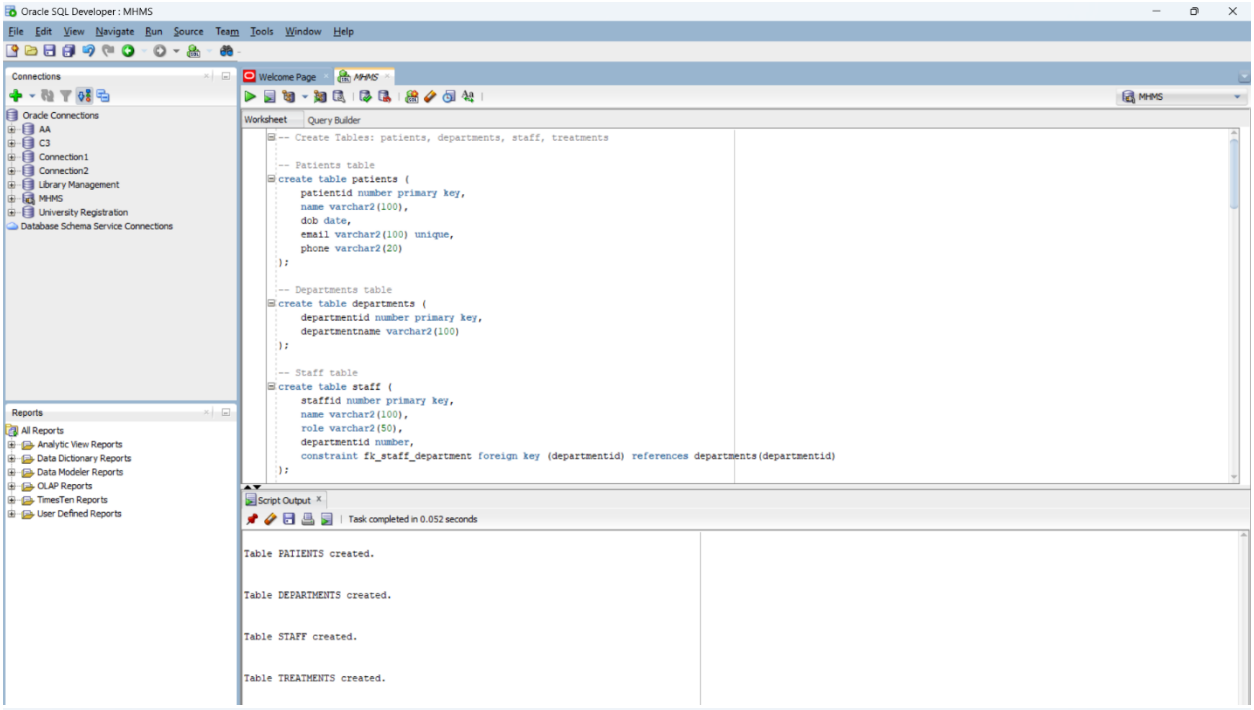
create table treatments (
treatmentid number primary key,
patientid number,
staffid number,
treatmentdate date,
cost number(10, 2),
constraint fk_treatments_patients foreign key (patientid) references patients(patientid) on delete cascade,
constraint fk_treatments_staff foreign key (staffid) references staff(staffid),
constraint chk_cost_nonnegative check (cost >= 0)
);
-- Insert sample data into patients table
insert into patients values (1, 'john doe', to_date('1985-05-15', 'yyyy-mm-dd'), 'john.doe@example.com', '555-0101');
insert into patients values (2, 'jane smith', to_date('1990-06-20', 'yyyy-mm-dd'), 'jane.smith@example.com', '555-0102');
insert into patients values (3, 'alice johnson', to_date('1975-09-25', 'yyyy-mm-dd'), 'alice.j@example.com', '555-0103');
insert into patients values (4, 'bob brown', to_date('1982-01-30', 'yyyy-mm-dd'), 'bob.brown@example.com', '555-0104');
insert into patients values (5, 'eve white', to_date('1995-12-12', 'yyyy-mm-dd'), 'eve.white@example.com', '555-0105');
select * from patients;
-- Insert sample data into departments table
insert into departments values (1, 'cardiology');
insert into departments values (2, 'neurology');
insert into departments values (3, 'orthopedics');
-- Insert sample data into staff table
insert into staff values (1, 'dr. smith', 'cardiologist', 1);
Script Output
Query Result
SQL | All Rows Fetched: 5 in 0.017 seconds
PATIENTID NAME DOB EMAIL PHONE
1 1 john doe 15-05-85 john.doe@example.com 555-0101
2 2 jane smith 20-06-90 jane.smith@example.com 555-0102
3 3 alice johnson 25-09-75 alice.j@example.com 555-0103
4 4 bob brown 30-01-82 bob.brown@example.com 555-0104
5 5 eve white 12-12-95 eve.white@example.com 555-0105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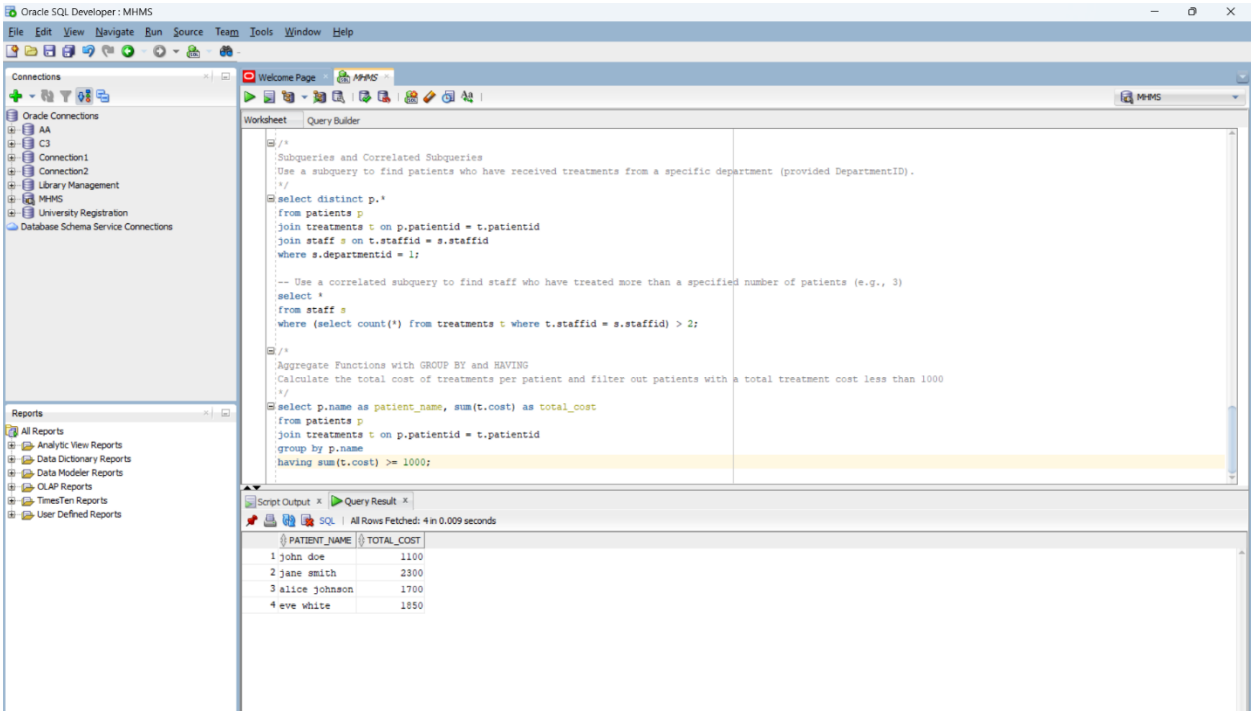
Query Builder
-- Create Tables: patients, departments, staff, treatments
-- Patients table
create table patients (
patientid number primary key,
name varchar2(100),
dob date,
email varchar2(100) unique,
phone varchar2(20)
);
-- Departments table
create table departments (
departmentid number primary key,
departmentname varchar2(100)
);
-- Staff table
create table staff (
staffid number primary key,
name varchar2(100),
role varchar2(50),
departmentid number,
constraint fk_staff_department foreign key (departmentid) references departments(departmentid)
);
Script Output
Task completed in 0.052 seconds
Table PATIENTS created.
Table DEPARTMENTS created.
Table STAFF created.
Table TREATMENTS created.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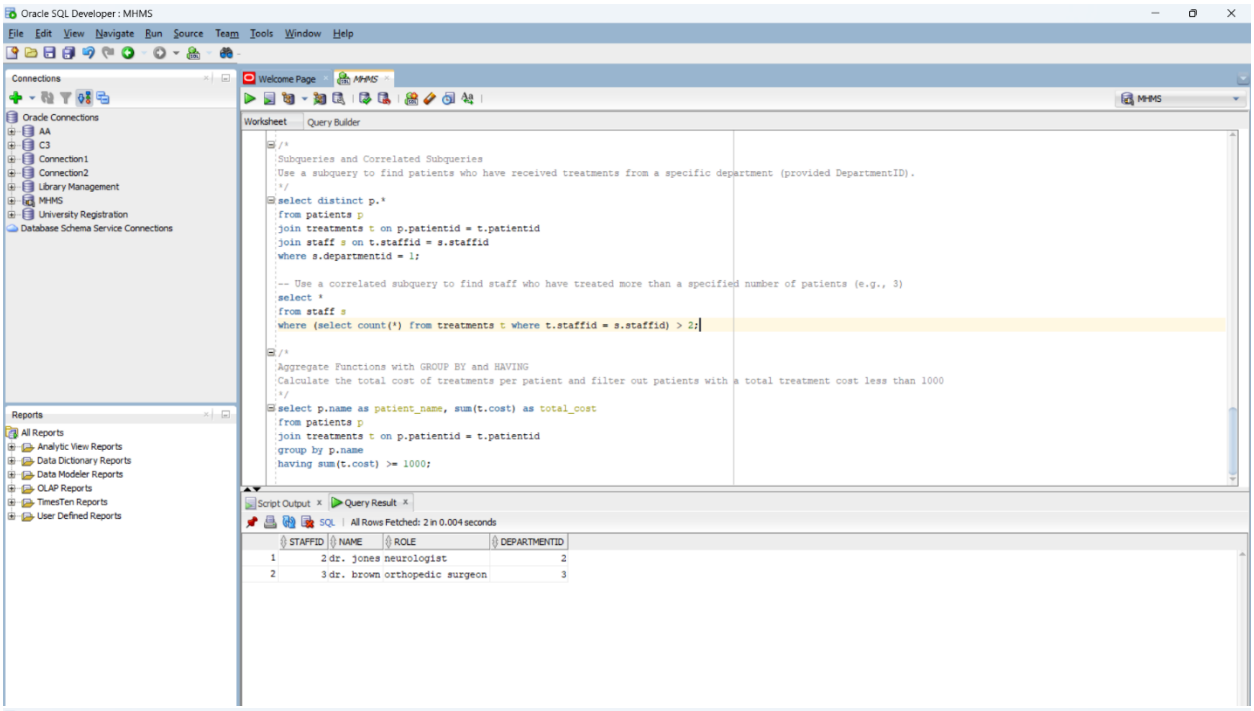
Worksheet
Query Builder
/*
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid
where s.departmentid = 1;
-- Use a correlated subquery to find staff who have treated more than a specified number of patients (e.g., 3)
select *
from staff s
where (select count(*) from treatments t where t.staffid = s.staffid) > 2;
/*
Aggregate Functions with GROUP BY and HAVING
Calculate the total cost of treatments per patient and filter out patients with a total treatment cost less than 1000
*/
select p.name as patient_name, sum(t.cost) as total_cost
from patients p
join treatments t on p.patientid = t.patientid
group by p.name
having sum(t.cost) >= 1000;
Script Output
Query Result
SQL
All Rows Fetched: 4 in 0.009 seconds
PATIENT_NAME
TOTAL_COST
1 john doe 1100
2 jane smith 2300
3 alice johnson 1700
4 eve white 1850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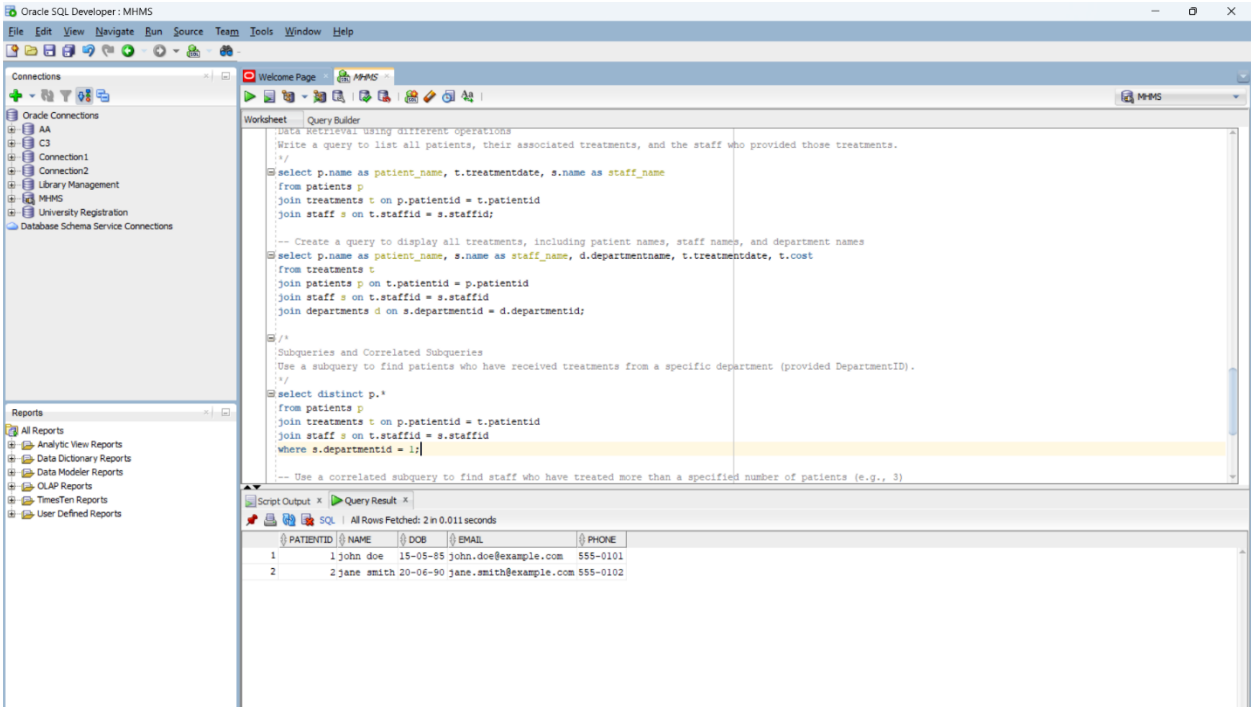
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid
where s.departmentid = 1;
-- Use a correlated subquery to find staff who have treated more than a specified number of patients (e.g., 3)
select *
from staff s
where (select count(*) from treatments t where t.staffid = s.staffid) > 2;
/*
Aggregate Functions with GROUP BY and HAVING
Calculate the total cost of treatments per patient and filter out patients with a total treatment cost less than 1000
*/
select p.name as patient_name, sum(t.cost) as total_cost
from patients p
join treatments t on p.patientid = t.patientid
group by p.name
having sum(t.cost) >= 1000;
Script Output
Query Result
SQL | All Rows Fetched: 2 in 0.004 seconds
STAFFID NAME ROLE DEPARTMENTID
1 2 dr. jones neurologist 2
2 3 dr. brown orthopedic surgeon 3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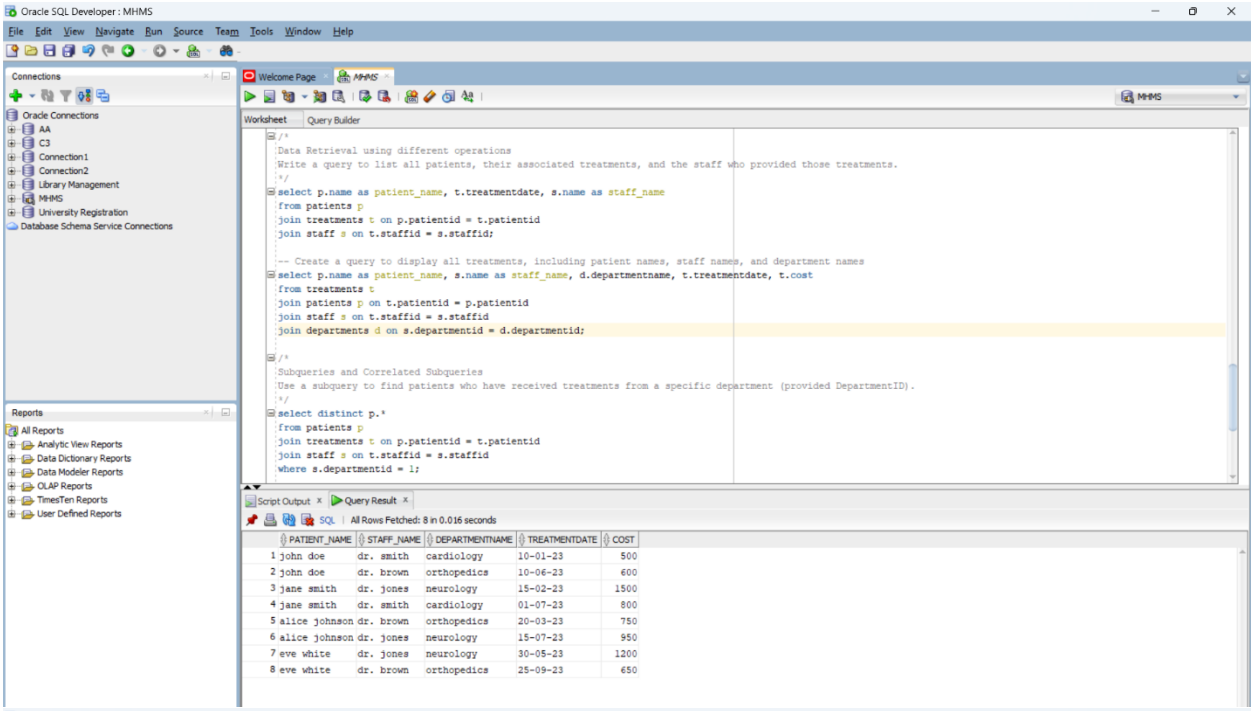
Query Builder
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;
-- Create a query to display all treatments, including patient names, staff names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname, t.treatmentdate, t.cost
from treatments t
join patients p on t.patientid = p.patientid
join staff s on t.staffid = s.staffid
join departments d on s.departmentid = d.departmentid;
/*
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid
where s.departmentid = 1;
-- Use a correlated subquery to find staff who have treated more than a specified number of patients (e.g., 3)
Script Output
Query Result
SQL | All Rows Fetched: 2 in 0.011 seconds
PATIENTID NAME DOB EMAIL PHONE
1 1 john doe 15-05-85 john.doe@example.com 555-0101
2 2 jane smith 20-06-90 jane.smith@example.com 555-0102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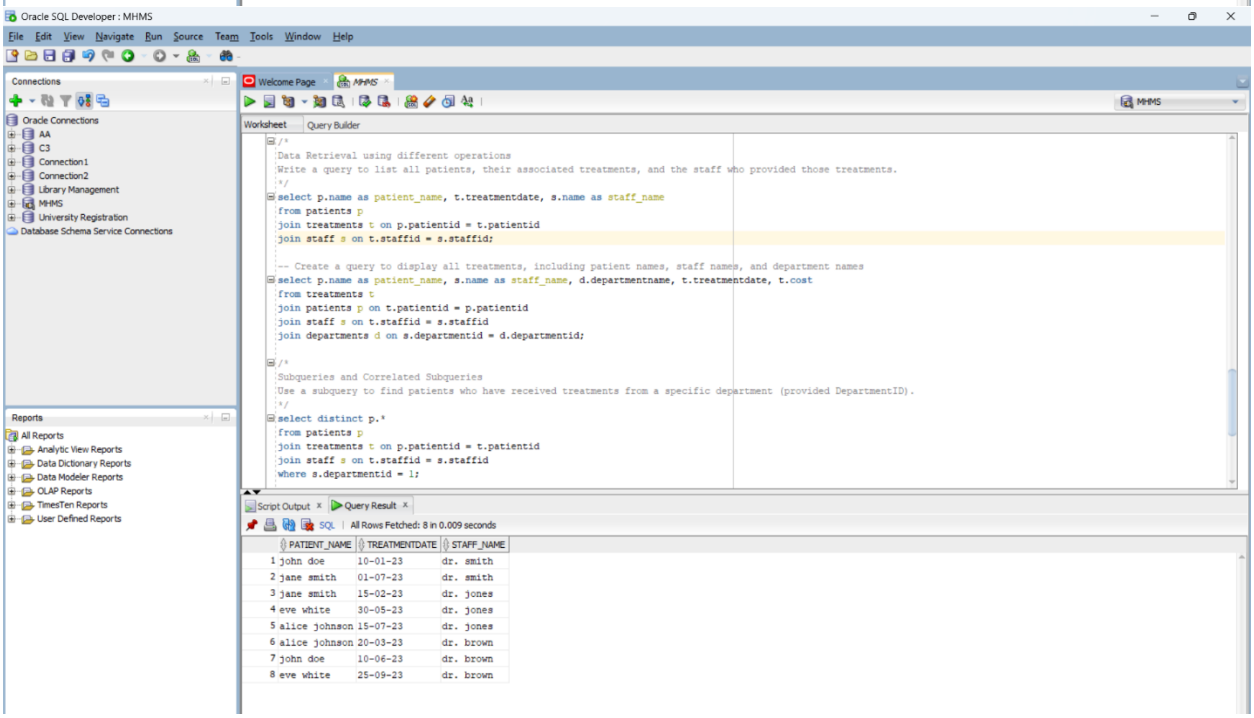
/*
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;
-- Create a query to display all treatments, including patient names, staff names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname, t.treatmentdate, t.cost
from treatments t
join patients p on t.patientid = p.patientid
join staff s on t.staffid = s.staffid
join departments d on s.departmentid = d.departmentid;
/*
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid
where s.departmentid = 1;
Script Output
Query Result
SQL | All Rows Fetched: 8 in 0.016 seconds
PATIENT_NAME STAFF_NAME DEPARTMENTNAME TREATMENTDATE COST
1 john doe dr. smith cardiology 10-01-23 500
2 john doe dr. brown orthopedics 10-06-23 600
3 jane smith dr. jones neurology 15-02-23 1500
4 jane smith dr. smith cardiology 01-07-23 800
5 alice johnson dr. brown orthopedics 20-03-23 750
6 alice johnson dr. jones neurology 15-07-23 950
7 eve white dr. jones neurology 30-05-23 1200
8 eve white dr. brown orthopedics 25-09-23 650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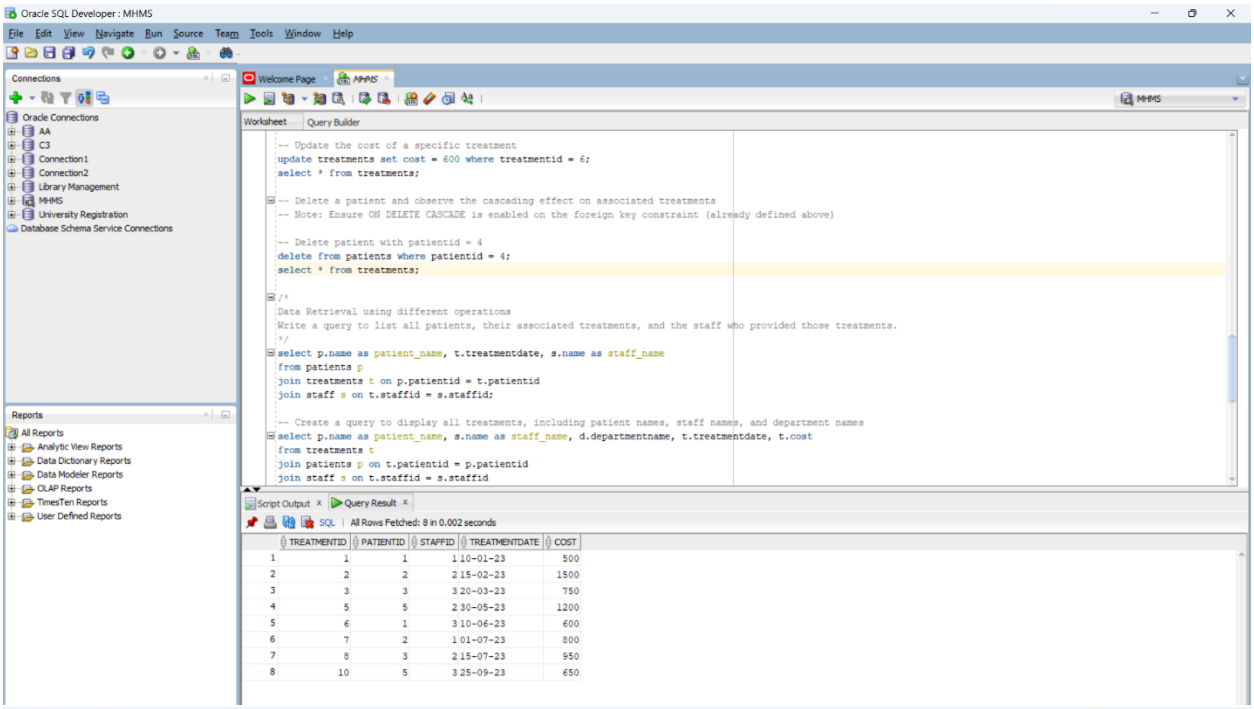
Worksheet
Query Builder
/*
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;
-- Create a query to display all treatments, including patient names, staff names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname, t.treatmentdate, t.cost
from treatments t
join patients p on t.patientid = p.patientid
join staff s on t.staffid = s.staffid
join departments d on s.departmentid = d.departmentid;
/*
Subqueries and Correlated Subqueries
Use a subquery to find patients who have received treatments from a specific department (provided DepartmentID).
*/
select distinct p.*
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid
where s.departmentid = 1;
Script Output
Query Result
SQL | All Rows Fetched: 8 in 0.009 seconds
PATIENT_NAME TREATMENTDATE STAFF_NAME
1 john doe 10-01-23 dr. smith
2 jane smith 01-07-23 dr. smith
3 jane smith 15-02-23 dr. jones
4 eve white 30-05-23 dr. jones
5 alice johnson 15-07-23 dr. jones
6 alice johnson 20-03-23 dr. brown
7 john doe 10-06-23 dr. brown
8 eve white 25-09-23 dr. brown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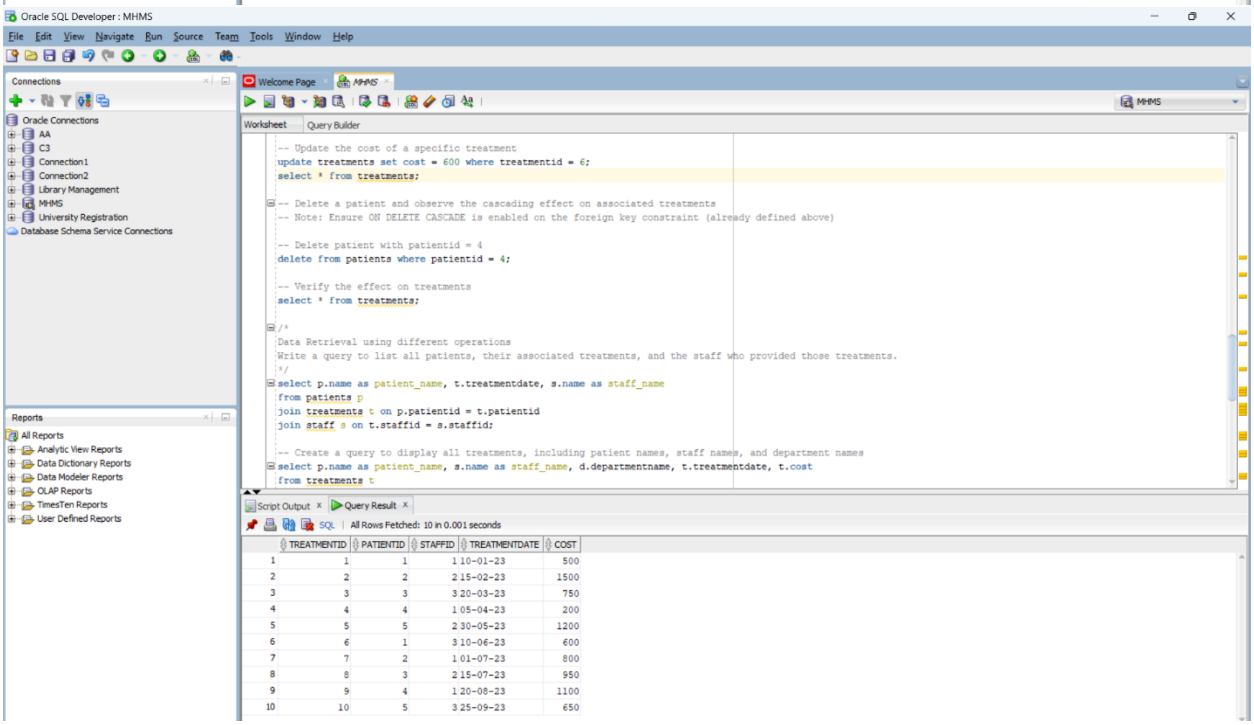
Worksheet
Query Builder
-- Update the cost of a specific treatment
update treatments set cost = 600 where treatmentid = 6;
select * from treatments;
-- Delete a patient and observe the cascading effect on associated treatments
-- Note: Ensure ON DELETE CASCADE is enabled on the foreign key constraint (already defined above)
-- Delete patient with patientid = 4
delete from patients where patientid = 4;
select * from treatments;
/*
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;
-- Create a query to display all treatments, including patient names, staff names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname, t.treatmentdate, t.cost
from treatments t
join patients p on t.patientid = p.patientid
join staff s on t.staffid = s.staffid
Script Output
Query Result
SQL | All Rows Fetched: 8 in 0.002 seconds
TREATMENTID PATIENTID STAFFID TREATMENTDATE COST
1 1 1 1 10-01-23 500
2 2 2 2 15-02-23 1500
3 3 3 3 20-03-23 750
4 5 5 2 30-05-23 1200
5 6 1 3 10-06-23 600
6 7 2 1 01-07-23 800
7 8 3 2 15-07-23 950
8 10 5 3 25-09-23 650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Worksheet
Query Builder
-- Update the cost of a specific treatment
update treatments set cost = 600 where treatmentid = 6;
select * from treatments;
-- Delete a patient and observe the cascading effect on associated treatments
-- Note: Ensure ON DELETE CASCADE is enabled on the foreign key constraint (already defined above)
-- Delete patient with patientid = 4
delete from patients where patientid = 4;
-- Verify the effect on treatments
select * from treatments;
/*
Data Retrieval using different operations
Write a query to list all patients, their associated treatments, and the staff who provided those treatments.
*/
select p.name as patient_name, t.treatmentdate, s.name as staff_name
from patients p
join treatments t on p.patientid = t.patientid
join staff s on t.staffid = s.staffid;
-- Create a query to display all treatments, including patient names, staff names, and department names
select p.name as patient_name, s.name as staff_name, d.departmentname, t.treatmentdate, t.cost
from treatments t
Script Output
Query Result
SQL | All Rows Fetched: 10 in 0.001 seconds
TREATMENTID PATIENTID STAFFID TREATMENTDATE COST
1 1 1 1 10-01-23 500
2 2 2 2 15-02-23 1500
3 3 3 3 20-03-23 750
4 4 4 1 05-04-23 200
5 5 5 2 30-05-23 1200
6 6 1 3 10-06-23 600
7 7 2 1 01-07-23 800
8 8 3 2 15-07-23 950
9 9 4 1 20-08-23 1100
10 10 5 3 25-09-23 650