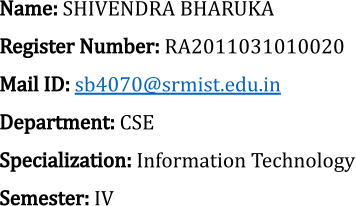
STUDENT PORTFOLIO





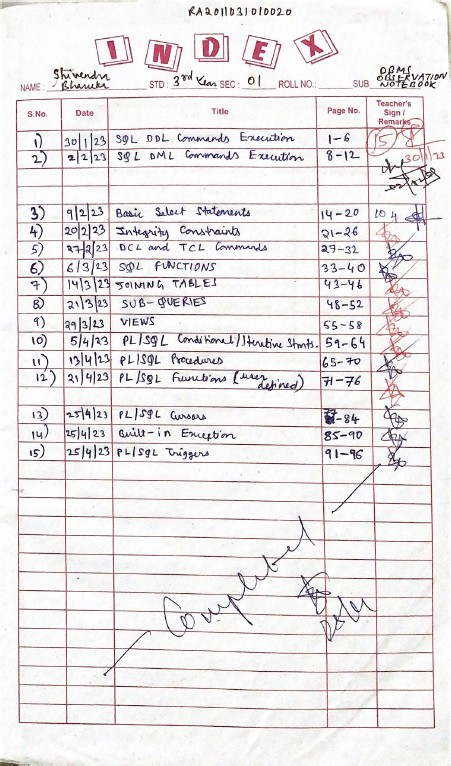
6th

18CSC303J – Database Management Systems Handled By: Dr. S. Thenmalar (102065)



Subject Title:

LAB EXERCISES:



**EXERCISE 1: SQL DDL COMMANDS EXECUTION**

SQL\*Plus: Release 11.2.0.4.0 Production on Mon Jan 30 09:57:53 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon](mailto:RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon) aws.com:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> create table emp(empno number(6),ename varchar2(20)not null,job varchar2(10) not

2 null, deptno number(3),sal number(7,2));

create table emp(empno number(6),ename varchar2(20)not null,job varchar2(10) not

\* ERROR at line 1:

ORA-00955: name is already used by an existing object

SQL> drop table emp 2

SQL> drop table emp; Table dropped.

SQL> create table emp(empno number(6),ename varchar2(20)not null,job varchar2(10) not

2 null, deptno number(3),sal number(7,2)); Table created.

SQL> desc emp

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(10) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

SQL> alter table emp add(experience number(2)); Table altered.

SQL> desc emp

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(10) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

EXPERIENCE NUMBER(2)

SQL> alter table emp modify(job varchar2(12)); Table altered.

SQL> desc emp;

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(12) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

EXPERIENCE NUMBER(2)

SQL> alter table emp modify(job varchar(13)); Table altered.

SQL> desc table; ERROR:

ORA-00931: missing identifier

SQL> desc emp;

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(13) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

EXPERIENCE NUMBER(2)

SQL> create the emp1 table with ename and empno, add constraints to check the empno value

1. while entering (i.e) empno > 100.^Z
2. desc emp;

create the emp1 table with ename and empno, add constraints to check the empno value

\*

ERROR at line 1:

ORA-00901: invalid CREATE command

SQL> create table emp1(ename varchar2(10),empno number(6) constraint

2 desc emp; desc emp

\*

ERROR at line 2:

ORA-02250: missing or invalid constraint name

SQL> create table emp1(ename varchar2(10), empno(6), check(empno>100); create table emp1(ename varchar2(10), empno(6), check(empno>100)

\*

ERROR at line 1:

ORA-00902: invalid datatype

SQL> create table emp1(ename varchar2(10),empno number(6), check (empno>100)); create table emp1(ename varchar2(10),empno number(6), check (empno>100))

\* ERROR at line 1:

ORA-00955: name is already used by an existing object

SQL> drop table emp; Table dropped.

SQL> create table emp1(ename varchar2(10),empno number(6), check (empno>100)); create table emp1(ename varchar2(10),empno number(6), check (empno>100))

\* ERROR at line 1:

ORA-00955: name is already used by an existing object

SQL> create table emp2(ename varchar2(10),empno number(6), check (empno>100));

|  |  |  |
| --- | --- | --- |
| Table created.  SQL> desc emp2 Name | Null? | Type |
| ENAME |  | VARCHAR2(10) |
| EMPNO |  | NUMBER(6) |

SQL> alter table emp drop column experience; alter table emp drop column experience

\*

ERROR at line 1:

ORA-00942: table or view does not exist

SQL> alter table emp drop column experience; alter table emp drop column experience

\*

ERROR at line 1:

ORA-00942: table or view does not exist

SQL> create table emp(empno number(6),ename varchar2(20)not null,job varchar2(10) not

2 null, deptno number(3),sal number(7,2)); Table created.

SQL> desc table; ERROR:

ORA-00931: missing identifier

SQL> desc emp;

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(10) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

SQL> alter table emp drop column experience; alter table emp drop column experience

\*

ERROR at line 1:

ORA-00904: "EXPERIENCE": invalid identifier

SQL> alter table emp add(experience number(2)); Table altered.

SQL> alter table emp drop column experience; Table altered.

SQL> desc emp;

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(10) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

SQL> truncate table emp; Table truncated.

SQL> desc table; ERROR:

ORA-00931: missing identifier

SQL> desc emp;

Name Null? Type

EMPNO NUMBER(6)

ENAME NOT NULL VARCHAR2(20) JOB NOT NULL VARCHAR2(10) DEPTNO NUMBER(3)

SAL NUMBER(7,2)

SQL>

**EXERCISE 2: SQL DML COMMANDS EXECUTION**

SQL> create table employee(empno number(4) primary key, ename char(10));

Table created.

SQL> desc employee;

Name Null? Type

EMPNO NOT NULL NUMBER(4) ENAME CHAR(10)

SQL> insert into dept values (1,'IT','Tholudur');

1 row created.

SQL> insert into dept values (1,'IT','Tholudur'); insert into dept values (1,'IT','Tholudur')

\*

ERROR at line 1:

ORA-00001: unique constraint (RA2011031010020.SYS\_C006024) violated

SQL> truncate table employee;

Table truncated.

SQL> insert into employee values (1,'SHIVENDRA');

1 row created.

SQL> SELECT \* FROM EMPLOYEE;

EMPNO ENAME

1 SHIVENDRA

SQL> INSERT INTO EMPLOYEE VALUES(2,'TAYLOR');

1 row created.

SQL> INSERT INTO EMPLOYEE VALUES (3, 'JOE');

1 row created.

SQL> SELECT \* FROM EMPLOYEE;

EMPNO ENAME

1. SHIVENDRA
2. TAYLOR
3. JOE

SQL>

SQL> DELETE FROM EMPLOYEE WHERE EMPNO=1;

1 row deleted.

SQL> SELECT \* FROM EMPLOYEE;

EMPNO ENAME

1. TAYLOR
2. JOE

SQL> UPDATE EMPLOYEE SET ENAME=SELENA WHERE EMPNO=3; UPDATE EMPLOYEE SET ENAME=SELENA WHERE EMPNO=3

\* ERROR at line 1:

ORA-00904: "SELENA": invalid identifier

SQL> UPDATE EMPLOYEE SET ENAME="SELENA" WHERE EMPNO=3; UPDATE EMPLOYEE SET ENAME="SELENA" WHERE EMPNO=3

\* ERROR at line 1:

ORA-00904: "SELENA": invalid identifier

SQL> UPDATE EMPLOYEE; UPDATE EMPLOYEE

\* ERROR at line 1:

ORA-00971: missing SET keyword

SQL> UPDATE EMPLOYEE

1. SET ENAME='SWIFT'
2. WHERE EMPNO=3;

1 row updated.

SQL> SELECT \* FROM EMPLOYEE;

EMPNO ENAME

1. TAYLOR
2. SWIFT

SQL> SQL> SQL>

**EXERCISE 3: BASIC SELECT STATEMENTS:**

SQL\*Plus: Release 11.2.0.4.0 Production on Thu Feb 9 16:28:56 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon](mailto:RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon) aws.com:1521/orc

ERROR:

ORA-12514: TNS:listener does not currently know of service requested in connect descriptor

Enter user-name:

[RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon](mailto:RA2011031010020/RA2011031010020@sthenmalar-o1.co86hfjmfjkx.us-west-2.rds.amazon) aws.com:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> create table EMP49(EmpNo number(4), "Emp Name" varchar2(25), Dept number(3), Sal number(4), Manager number(4), Job varchar2(15));

|  |  |  |
| --- | --- | --- |
| Table created.  SQL> desc EMP49;  Name | Null? | Type |
| EMPNO |  | NUMBER(4) |
| Emp Name |  | VARCHAR2(25) |
| DEPT |  | NUMBER(3) |

SAL NUMBER(4)

MANAGER NUMBER(4)

JOB VARCHAR2(15)

SQL> INSERT INTO EMP49

2 VALUES

3 (7369, 'Shushrut Kumar', 10, 8000, 7521, 'Founder');

1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7521, 'Viren Parmar', 20, 7000, 7934, 'CoFounder');

1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7934, 'Vidhi Rai', 40, 6000, 7902, 'Chief Advisor');

1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7902, 'Sachin Tilokani', 60, 2000, 7040, 'Secretary');

1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7040, 'Param Shah', 70, 1600, 7566, 'CMO');

1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7566, 'Annahita Patel', 80, 950, 7839, 'Trainee');

1 row created.

SQL> INSERT INTO EMP49

1. VALUES
2. (7839, 'Sakshee Bhavsar', 80, 950, 7789, 'Chief Of Staff'); 1 row created.

SQL> INSERT INTO EMP49

2 VALUES

3 (7789, 'Anna Johnson', 90, 2800, 7369, 'Janitor');

1 row created.

SQL>

SQL> select \* from EMP49;

EMPNO Emp Name DEPT SAL MANAGER

JOB

7369 Shushrut Kumar 10 8000 7521 Founder

7521 Viren Parmar 20 7000 7934

CoFounder

7934 Vidhi Rai 40 6000 7902

Chief Advisor

EMPNO Emp Name DEPT SAL MANAGER

JOB

7902 Sachin Tilokani 60 2000 7040 Secretary

7040 Param Shah 70 1600 7566 CMO

7566 Annahita Patel 80 950 7839 Trainee

EMPNO Emp Name DEPT SAL MANAGER

JOB

7839 Sakshee Bhavsar 80 950 7789 Chief Of Staff

7789 Anna Johnson 90 2800 7369 Janitor

8 rows selected.

SQL> select \* from EMP49 ORDER BY Sal;

EMPNO Emp Name DEPT SAL MANAGER

JOB

7839 Sakshee Bhavsar 80 950 7789 Chief Of Staff

7566 Annahita Patel 80 950 7839 Trainee

7040 Param Shah 70 1600 7566 CMO

EMPNO Emp Name DEPT SAL MANAGER

JOB

7902 Sachin Tilokani 60 2000 7040 Secretary

7789 Anna Johnson 90 2800 7369 Janitor

7934 Vidhi Rai 40 6000 7902

Chief Advisor

EMPNO Emp Name DEPT SAL MANAGER

JOB

7521 Viren Parmar 20 7000 7934 CoFounder

7369 Shushrut Kumar 10 8000 7521 Founder

8 rows selected.

SQL> select \* from EMP49 ORDER BY Sal desc;

EMPNO Emp Name DEPT SAL MANAGER

JOB

7369 Shushrut Kumar 10 8000 7521 Founder

7521 Viren Parmar 20 7000 7934 CoFounder

7934 Vidhi Rai 40 6000 7902

Chief Advisor

EMPNO Emp Name DEPT SAL MANAGER

JOB

7789 Anna Johnson 90 2800 7369 Janitor

7902 Sachin Tilokani 60 2000 7040 Secretary

7040 Param Shah 70 1600 7566 CMO

EMPNO Emp Name DEPT SAL MANAGER

JOB

7566 Annahita Patel 80 950 7839 Trainee

7839 Sakshee Bhavsar 80 950 7789 Chief Of Staff

8 rows selected.

SQL> select \* from EMP49 WHERE Sal BETWEEN 1500 AND 2500; EMPNO Emp Name DEPT SAL MANAGER

JOB

7902 Sachin Tilokani 60 2000 7040 Secretary

7040 Param Shah 70 1600 7566 CMO

SQL> select \* from EMP49 WHERE Manager in (7902,7566,7789); EMPNO Emp Name DEPT SAL MANAGER

JOB

7934 Vidhi Rai 40 6000 7902

Chief Advisor

7040 Param Shah 70 1600 7566 CMO

7839 Sakshee Bhavsar 80 950 7789 Chief Of Staff

SQL> select \* from EMP49 WHERE "Emp Name" LIKE 'J%' OR "Emp Name" LIKE 'T%'; no rows selected

SQL> select \* from EMP49 WHERE Job LIKE '%M%' OR Job LIKE '%P%';

EMPNO Emp Name DEPT SAL MANAGER

JOB

7040 Param Shah 70 1600 7566 CMO

SQL> select DISTINCT(Job) from EMP49; JOB

CoFounder Chief Of Staff Janitor

Chief Advisor CMO

Trainee Founder Secretary

8 rows selected.

SQL> select \* from EMP49 WHERE Dept in (10,20);

EMPNO Emp Name DEPT SAL MANAGER

JOB

7369 Shushrut Kumar 10 8000 7521 Founder

7521 Viren Parmar 20 7000 7934 CoFounder

SQL> select COUNT(DISTINCT(Job)) from EMP49;

COUNT(DISTINCT(JOB))

8

SQL> select DISTINCT(Dept) from EMP49; DEPT

40

70

90

10

20

60

80

7 rows selected.

SQL> select "Emp Name" from EMP49 WHERE "Emp Name" LIKE '%AN%'; no rows selected

SQL>

**EXERCISE 4: INTEGRITY CONSTRAINTS**

SQL\*Plus: Release 11.2.0.4.0 Production on Mon Feb 20 15:34:12 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws.](mailto:RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws) com:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> create table Customer\_Account\_Details\_049(

1. Cust\_ID number(5) constraint CAD\_Pk primary key,
2. Cust\_Last\_Name varchar2(20) constraint CAD\_CLastName not null,
3. Cust\_Mid\_Name char(3),
4. Cust\_First\_Name varchar2(20),
5. Account\_No number(4) constraint CAD\_AcNo unique,
6. Account\_Type varchar2(15),
7. Bank\_Branch varchar2(20),
8. Cust\_Email varchar2(30) constraint CAD\_CEmail unique 10 );

Table created.

SQL> DESC CUSTOMER\_ACCOUNT\_DETAILS ERROR:

ORA-04043: object CUSTOMER\_ACCOUNT\_DETAILS does not exist

SQL> DESC CUSTOMER\_ACCOUNT\_DETAILS\_049

Name Null? Type

CUST\_ID NOT NULL NUMBER(5) CUST\_LAST\_NAME NOT NULL VARCHAR2(20) CUST\_MID\_NAME CHAR(3)

CUST\_FIRST\_NAME VARCHAR2(20) ACCOUNT\_NO NUMBER(4)

ACCOUNT\_TYPE VARCHAR2(15)

BANK\_BRANCH VARCHAR2(20) CUST\_EMAIL VARCHAR2(30)

SQL> insert into Customer\_Account\_Details\_049

2 values (1, 'Jenson', null, 'Laura', 2739, 'Savings', 'Indus Bank', 'laura.jensen@example.com');

1 row created.

SQL> insert into Customer\_Account\_Details\_049

2 values (2, 'Viren', null, 'Parmar', 3057, 'Current', 'HDFC Bank', 'viren@gmail.com'); 1 row created.

SQL> insert into Customer\_Account\_Details\_049

2 values (3, 'Sachin', 'Kalam', 'Tilokani', 7747, 'Salary', 'SBI Bank', 'sachin@gmail.com'); values (3, 'Sachin', 'Kalam', 'Tilokani', 7747, 'Salary', 'SBI Bank', 'sachin@gmail.com')

\* ERROR at line 2:

ORA-12899: value too large for column "RA2011031010020"."CUSTOMER\_ACCOUNT\_DETAILS\_049"."CUST\_MID\_NAME"

(actual: 5,

maximum: 3)

SQL> insert into Customer\_Account\_Details\_049

2 values (4, 'Jakin', 'Deepak', 'Patel', 4089, 'Current', 'Bank of Baroda', 'jakin@gmail.com'); values (4, 'Jakin', 'Deepak', 'Patel', 4089, 'Current', 'Bank of Baroda', 'jakin@gmail.com')

\* ERROR at line 2:

ORA-12899: value too large for column

"RA2011031010020"."CUSTOMER\_ACCOUNT\_DETAILS\_049"."CUST\_MID\_NAME"

(actual: 6,

maximum: 3)

SQL> insert into Customer\_Account\_Details\_049

2 values (5, 'Param', null, 'Shah', 3529, 'NRI', 'Capitol Bank', 'param@gmail.com'); 1 row created.

SQL> insert into Customer\_Account\_Details\_049

2 values (12, 'Neel', null, 'Thaker', 4989, 'Savings', 'LIC Bank', 'neel@gmail.com'); 1 row created.

SQL> select \* from Customer\_Account\_Details\_049;

CUST\_ID CUST\_LAST\_NAME CUS CUST\_FIRST\_NAME ACCOUNT\_NO

ACCOUNT\_TYPE BANK\_BRANCH CUST\_EMAIL

1. Jenson Laura 2739

Savings Indus Bank [laura.jensen@example.com](mailto:laura.jensen@example.com)

1. Viren Parmar 3057

Current HDFC Bank [viren@gmail.com](mailto:viren@gmail.com)

5 Param Shah 3529

NRI Capitol Bank [param@gmail.com](mailto:param@gmail.com)

CUST\_ID CUST\_LAST\_NAME CUS CUST\_FIRST\_NAME ACCOUNT\_NO

ACCOUNT\_TYPE BANK\_BRANCH CUST\_EMAIL

12 Neel Thaker 4989

Savings LIC Bank [neel@gmail.com](mailto:neel@gmail.com)

SQL> create table CustomerLoan\_049(

1. LoanNo number(4) constraint CL\_LNo primary key,
2. Cust\_ID number(5) constraint CL\_CID references Customer\_Account\_Details\_049(Cust\_ID),
3. Ammount\_In\_Dollar number(6,2) 5 );

Table created.

SQL> desc CustomerLoan\_049;

Name Null? Type

LOANNO NOT NULL NUMBER(4) CUST\_ID NUMBER(5)

AMMOUNT\_IN\_DOLLAR NUMBER(6,2)

SQL>

SQL> insert into CustomerLoan\_049

2 values

3 (5577, 2, 9873.36);

1 row created.

SQL> insert into CustomerLoan\_049

2 values

3 (8266, 4, 5660.47);

insert into CustomerLoan\_049

\*

ERROR at line 1:

ORA-02291: integrity constraint (RA2011031010020.CL\_CID) violated - parent key not found

SQL> insert into CustomerLoan\_049

2 values

3 (2430, 1, 6881.00);

1 row created.

SQL> insert into CustomerLoan\_049

2 values

3 (9323, 3, 2811.73);

insert into CustomerLoan\_049

\*

ERROR at line 1:

ORA-02291: integrity constraint (RA2011031010020.CL\_CID) violated - parent key not found

SQL> insert into CustomerLoan\_049

2 values

3 (4743, 5, 5014.56);

1 row created. SQL>

SQL> select \* from CustomerLoan\_049;

LOANNO CUST\_ID AMMOUNT\_IN\_DOLLAR

|  |  |  |
| --- | --- | --- |
| 5577 | 2 | 9873.36 |
| 2430 | 1 | 6881 |
| 4743 | 5 | 5014.56 |

SQL> create table Employee\_Details\_049(

1. Employee\_ID number(6) constraint ED\_Pkey primary key,
2. Employee\_Last\_Name varchar2(20),
3. Employee\_Mid\_Name varchar2(3),
4. Employee\_First\_Name varchar2(20),
5. Employee\_Email varchar2(30),
6. Employee\_Dept varchar2(15) default 'HR',
7. Manager\_ID number(6) constraint ED\_MID references Employee\_Details\_049(Employee\_ID)

9 );

Table created.

SQL> desc Employee\_Details\_049;

Name Null? Type

EMPLOYEE\_ID NOT NULL NUMBER(6) EMPLOYEE\_LAST\_NAME VARCHAR2(20)

EMPLOYEE\_MID\_NAME VARCHAR2(3)

EMPLOYEE\_FIRST\_NAME VARCHAR2(20) EMPLOYEE\_EMAIL VARCHAR2(30)

EMPLOYEE\_DEPT VARCHAR2(15) MANAGER\_ID NUMBER(6)

SQL>

SQL> insert into Employee\_Details\_049(Employee\_ID,Employee\_Last\_Name,Employee\_Mid\_Name,Employ ee\_First\_Name,Employee\_Email)

1. values
2. (6, 'James', null, 'Milner', 'james@gmail.com'); 1 row created.

SQL> insert into Employee\_Details\_049(Employee\_ID,Employee\_Last\_Name,Employee\_Mid\_Name,Employ ee\_First\_Name,Employee\_Email,Manager\_ID)

1. values
2. (7, 'Sergio', 'Ruk' , 'Ramos', 'sergio@gmail.com',6); 1 row created.

SQL>

SQL> insert into Employee\_Details\_049

1. values
2. (8, 'Toni', null , 'Kroos', 'toni@gmail.com', 'Production' , 7); 1 row created.

SQL> insert into Employee\_Details\_049

1. values
2. (9, 'Luka', null , 'Modric', 'luka@gmail.com', 'R&D' , null);

Enter value for d: insert into Employee\_Details\_049

old 3: (9, 'Luka', null , 'Modric', 'luka@gmail.com', 'R&D' , null)

new 3: (9, 'Luka', null , 'Modric', 'luka@gmail.com', 'Rinsert into Employee\_Details\_049' , null)

(9, 'Luka', null , 'Modric', 'luka@gmail.com', 'Rinsert into Employee\_Details\_049' , null)

\*

ERROR at line 3:

ORA-12899: value too large for column "RA2011031010020"."EMPLOYEE\_DETAILS\_049"."EMPLOYEE\_DEPT" (actual: 33,

maximum:

15)

SQL> values

SP2-0042: unknown command "values" - rest of line ignored.

SQL> (10, 'Karim', null , 'Benzema', 'karim@gmail.com', 'Production' , 9); (10, 'Karim', null , 'Benzema', 'karim@gmail.com', 'Production' , 9)

\*

ERROR at line 1:

ORA-00928: missing SELECT keyword

SQL>

SQL> select \* from Employee\_Details\_049;

EMPLOYEE\_ID EMPLOYEE\_LAST\_NAME EMP EMPLOYEE\_FIRST\_NAME

EMPLOYEE\_EMAIL EMPLOYEE\_DEPT MANAGER\_ID

* 1. James Milner [james@gmail.com](mailto:james@gmail.com) HR
  2. Sergio Ruk Ramos [sergio@gmail.com](mailto:sergio@gmail.com) HR 6
  3. Toni Kroos

[toni@gmail.com](mailto:toni@gmail.com) Production 7

SQL> create table Customer\_Fixed\_Deposit\_049(

1. FixedDeposit\_No number(4) constraint CFD\_Pkey primary key,
2. Cust\_ID number(5) constraint CFD\_CID references Customer\_Account\_Details\_049(Cust\_ID),
3. Account\_No number(4),
4. Amount\_In\_Dollars number(7,2),
5. Rate\_Of\_Interest number(3,1) constraint CFD\_ROI check (Rate\_Of\_Interest between 2.5 and 12.0)

7 );

Table created.

SQL> desc Customer\_Fixed\_Deposit\_049;

|  |  |  |
| --- | --- | --- |
| Name | Null? | Type |
| FIXEDDEPOSIT\_NO |  | NOT NULL NUMBER(4) |
| CUST\_ID |  | NUMBER(5) |
| ACCOUNT\_NO |  | NUMBER(4) |
| AMOUNT\_IN\_DOLLARS |  | NUMBER(7,2) |
| RATE\_OF\_INTEREST |  | NUMBER(3,1) |

SQL>

SQL> insert into Customer\_Fixed\_Deposit\_049

2 values

3 (9320, 1, 4457, 85907.00, 3.4);

1 row created.

SQL> insert into Customer\_Fixed\_Deposit\_049

2 values

3 (7837, 2, 8615, 40254.28, 4.5);

1 row created.

SQL> insert into Customer\_Fixed\_Deposit\_049

2 values

3 (8072, 3, 3376, 66406.30, 8.7);

insert into Customer\_Fixed\_Deposit\_049

\*

ERROR at line 1:

ORA-02291: integrity constraint (RA2011031010020.CFD\_CID) violated - parent key not found

SQL> insert into Customer\_Fixed\_Deposit\_049

2 values

3 (6422, 4, 8997, 15000.30, 5.9);

insert into Customer\_Fixed\_Deposit\_049

\*

ERROR at line 1:

ORA-02291: integrity constraint (RA2011031010020.CFD\_CID) violated - parent key not found

SQL> insert into Customer\_Fixed\_Deposit\_049

2 values

3 (7720, 5, 8868, 12374.31, 11.5);

1 row created. SQL>

SQL> select \* from Customer\_Fixed\_Deposit\_049;

FIXEDDEPOSIT\_NO CUST\_ID ACCOUNT\_NO AMOUNT\_IN\_DOLLARS RATE\_OF\_INTEREST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9320 | 1 | 4457 | 85907 | 3.4 |
| 7837 | 2 | 8615 | 40254.28 | 4.5 |
| 7720 | 5 | 8868 | 12374.31 | 11.5 |

SQL> alter table Customer\_Fixed\_Deposit\_049 drop constraint CFD\_Pkey; Table altered.

SQL> alter table Customer\_Fixed\_Deposit\_049 add constraint CFD\_Pkey primary key(Account\_No);

Table altered.

SQL> select Cust\_Last\_Name from Customer\_Account\_Details\_049; CUST\_LAST\_NAME

Jenson Viren Param Neel

SQL> select DISTINCT(Cust\_Last\_Name) from Customer\_Account\_Details\_049; CUST\_LAST\_NAME

Param Jenson Viren

Neel

SQL>

SQL> select \* from Customer\_Fixed\_Deposit\_049 where Amount\_In\_Dollars > 10000;

FIXEDDEPOSIT\_NO CUST\_ID ACCOUNT\_NO AMOUNT\_IN\_DOLLARS RATE\_OF\_INTEREST

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9320 | 1 | 4457 | 85907 | 3.4 |
| 7837 | 2 | 8615 | 40254.28 | 4.5 |
| 7720 | 5 | 8868 | 12374.31 | 11.5 |

SQL> select Cust\_ID,Account\_No from Customer\_Account\_Details\_049 where Cust\_First\_Name = 'Graham';

no rows selected

SQL> select Cust\_ID,Cust\_Last\_Name from Customer\_Account\_Details\_049 where Account\_Type = 'Savings' AND Bank\_Branch = 'Capital Bank';

no rows selected

SQL> select Cust\_ID,Cust\_Last\_Name from Customer\_Account\_Details\_049 where Account\_Type != 'Savings' AND Bank\_Branch != 'Capital Bank';

CUST\_ID CUST\_LAST\_NAME

2 Viren

5 Param

SQL> select Cust\_ID,Cust\_Last\_Name from Customer\_Account\_Details\_049 where Account\_Type = 'Savings' OR Bank\_Branch = 'Capital Bank';

CUST\_ID CUST\_LAST\_NAME

1 Jenson

12 Neel

SQL> select Cust\_ID from Customer\_Fixed\_Deposit\_049 where Amount\_In\_Dollars between 10000.00 and 20000.00;

CUST\_ID

5

SQL> select \* from Customer\_Account\_Details\_049 where Bank\_Branch in ('Capital Bank','Indus Bank');

CUST\_ID CUST\_LAST\_NAME CUS CUST\_FIRST\_NAME ACCOUNT\_NO

ACCOUNT\_TYPE BANK\_BRANCH CUST\_EMAIL

1 Jenson Laura 2739

Savings Indus Bank [laura.jensen@example.com](mailto:laura.jensen@example.com)

SQL> select Account\_No,Bank\_Branch from Customer\_Account\_Details\_049 where Bank\_Branch like 'Ca%';

ACCOUNT\_NO BANK\_BRANCH

3529 Capitol Bank

SQL> select Account\_No,Bank\_Branch from Customer\_Account\_Details\_049 where Bank\_Branch like '\_a%';

ACCOUNT\_NO BANK\_BRANCH

3529 Capitol Bank

SQL> select \* from Employee\_Details\_049 where Manager\_ID is null; EMPLOYEE\_ID EMPLOYEE\_LAST\_NAME EMP EMPLOYEE\_FIRST\_NAME

EMPLOYEE\_EMAIL EMPLOYEE\_DEPT MANAGER\_ID

1. James Milner [james@gmail.com](mailto:james@gmail.com) HR

SQL> select \* from Employee\_Details\_049 where Manager\_ID is not null; EMPLOYEE\_ID EMPLOYEE\_LAST\_NAME EMP EMPLOYEE\_FIRST\_NAME

EMPLOYEE\_EMAIL EMPLOYEE\_DEPT MANAGER\_ID

1. Sergio Ruk Ramos [sergio@gmail.com](mailto:sergio@gmail.com) HR 6
2. Toni Kroos

[toni@gmail.com](mailto:toni@gmail.com) Production 7

SQL> select Cust\_ID,Amount\_In\_Dollars from Customer\_Fixed\_Deposit\_049 order by Amount\_In\_Dollars;

CUST\_ID AMOUNT\_IN\_DOLLARS

|  |  |
| --- | --- |
| 5 | 12374.31 |
| 2 | 40254.28 |
| 1 | 85907 |

**EXERCISE 5: DCL AND TCL COMMANDS**

SQL\*Plus: Release 11.2.0.4.0 Production on Mon Feb 27 15:33:09 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws.](mailto:RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws) com:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> CREATE TABLE DEPT(DEPTNO INT,DNAME VARCHAR(10),LOC VARCHAR(10));

Table created.

SQL> INSERT INTO DEPT VALUES(10,'ACCOUNTING','NEW YORK');

1 row created.

SQL> INSERT INTO DEPT VALUES(20,'RESEARCH','DALLAS');

1 row created.

SQL> INSERT INTO DEPT VALUES(30,'SALES','CHICAGO');

1 row created.

SQL> INSERT INTO DEPT VALUES(40,'OPERATIONS','BOSTON');

1 row created.

SQL> INSERT INTO DEPT VALUES(50,'CUSTOMER','BOSTON');

1 row created.

SQL> SELECT \* FROM DEPT;

DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

30 SALES CHICAGO

40 OPERATIONS BOSTON

50 CUSTOMER BOSTON

SQL> GRANT ALL ON DEPT TO RA2011031010001;

Grant succeeded.

SQL> REVOKE ALL ON DEPT FROM RA2011031010001;

Revoke succeeded.

SQL> UPDATE DEPT SET LOC='SAN JOSE' WHERE DEPTNO=40;

1 row updated.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

30 SALES CHICAGO

40 OPERATIONS SAN JOSE

50 CUSTOMER BOSTON

SQL> DELETE FROM DEPT WHERE LOC='CHICAGO';

1 row deleted.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

40 OPERATIONS SAN JOSE

50 CUSTOMER BOSTON

SQL> UPDATE DEPT SET LOC='BOSTON' WHERE DEPTNO=40;

1 row updated.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

40 OPERATIONS BOSTON

50 CUSTOMER BOSTON SQL> ROLLBACK;

Rollback complete.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

30 SALES CHICAGO

40 OPERATIONS BOSTON

50 CUSTOMER BOSTON SQL> SAVEPOINT UPDATE\_OVER;

Savepoint created.

SQL> INSERT INTO DEPT VALUES(&60,'&MARKETING','&TEXAS');

Enter value for 60: 60

Enter value for marketing: MARKETING Enter value for texas: TEXAS

old 1: INSERT INTO DEPT VALUES(&60,'&MARKETING','&TEXAS') new 1: INSERT INTO DEPT VALUES(60,'MARKETING','TEXAS')

1 row created.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

30 SALES CHICAGO

40 OPERATIONS BOSTON

50 CUSTOMER BOSTON

60 MARKETING TEXAS

6 rows selected.

SQL> SAVEPOINT UPDATE\_ANOTHER;

Savepoint created.

SQL> ROLLBACK TO UPDATE\_OVER;

Rollback complete.

SQL> SELECT \* FROM DEPT; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

30 SALES CHICAGO

40 OPERATIONS BOSTON

50 CUSTOMER BOSTON SQL>

**EXERCISE 6: SQL FUNCTIONS**

SQL\*Plus: Release 11.2.0.4.0 Production on Mon Mar 6 15:26:56 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws.](mailto:RA2011031010020/RA2011031010020@n1-n2-o1.c0vm8jxyhl5s.us-east-2.rds.amazonaws) com:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

SQL> create table orders\_049(salesman\_id number(4) NOT NULL,

1. city varchar(15),
2. customer\_id number(4) NOT NULL,
3. order\_date date NOT NULL,
4. order\_amount number(8) NOT NULL,
5. grade char);

Table created.

SQL> desc orders\_049;

Name Null? Type

SALESMAN\_ID NOT NULL NUMBER(4)

CITY VARCHAR2(15)

CUSTOMER\_ID NOT NULL NUMBER(4)

ORDER\_DATE NOT NULL DATE ORDER\_AMOUNT NOT NULL NUMBER(8)

GRADE CHAR(1)

SQL> INSERT INTO orders\_049

2 VALUES(5002,NULL,3000,TO\_DATE('2012-08-15','yyyy-mm-dd'),1500,NULL);

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5003,'Vadodara',3001,TO\_DATE('2012-08-16','yyyy-mm-dd'),1900,'B');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5002,'Mumbai',3002,TO\_DATE('2012-08-16','yyyy-mm-dd'),2100,'A');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5005,'Mumbai',3003,TO\_DATE('2012-08-16','yyyy-mm-dd'),3600,'D');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5003,'Chennai',3004,TO\_DATE('2012-08-17','yyyy-mm-dd'),5400,'A');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5002,'Vadodara',3005,TO\_DATE('2012-08-17','yyyy-mm-dd'),6400,'C');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5003,'Vadodara',3003,TO\_DATE('2012-08-17','yyyy-mm-dd'),5400,'D');

1 row created.

SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5003,NULL,3008,TO\_DATE('2012-08-17','yyyy-mm-dd'),8900,'C');

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5002,'Mumbai',3003,TO\_DATE('2012-08-17','yyyy-mm-dd'),3300,NULL);

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5010,'Chennai',3003,TO\_DATE('2012-08-19','yyyy-mm-dd'),1100,NULL);

1 row created. SQL>

SQL> INSERT INTO orders\_049

2 VALUES(5005,NULL,3003,TO\_DATE('2012-08-20','yyyy-mm-dd'),10000,'A');

1 row created.

SQL> SELECT SUM(ORDER\_AMOUNT) AS TOTAL\_PURCHASE

2 FROM ORDERS\_049;

TOTAL\_PURCHASE

49600

SQL> SELECT CAST(AVG(ORDER\_AMOUNT) AS DECIMAL(10,2)) AS TOTAL\_PURCHASE

2 FROM ORDERS\_049;

TOTAL\_PURCHASE

4509.09

SQL> SELECT COUNT(DISTINCT CUSTOMER\_ID) AS GRADED\_CUSTOMER

1. FROM ORDERS\_049
2. WHERE GRADE IS NOT NULL;

GRADED\_CUSTOMER

6

SQL> SELECT MAX(ORDER\_AMOUNT) AS MAX\_PURCHASE\_AMOUNT

2 FROM ORDERS\_049;

MAX\_PURCHASE\_AMOUNT

10000

SQL> SELECT MIN(ORDER\_AMOUNT) AS MAX\_PURCHASE\_AMOUNT

2 FROM ORDERS\_049;

MAX\_PURCHASE\_AMOUNT

1100

SQL> SELECT CITY, MIN(GRADE) AS HIGHEST\_GRADE

1. FROM ORDERS\_049
2. WHERE CITY IS NOT NULL
3. GROUP BY CITY;

CITY H

- Chennai A

Vadodara B

Mumbai A

SQL>

SQL> SELECT CUSTOMER\_ID, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY CUSTOMER\_ID
3. ORDER BY CUSTOMER\_ID;

CUSTOMER\_ID MAX(ORDER\_AMOUNT)

|  |  |
| --- | --- |
| 3000 | 1500 |
| 3001 | 1900 |
| 3002 | 2100 |
| 3003 | 10000 |
| 3004 | 5400 |
| 3005 | 6400 |
| 3008 | 8900 |

7 rows selected.

SQL> SELECT CUSTOMER\_ID, ORDER\_DATE, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY CUSTOMER\_ID,ORDER\_DATE
3. ORDER BY ORDER\_DATE;

CUSTOMER\_ID ORDER\_DAT MAX(ORDER\_AMOUNT)

|  |  |
| --- | --- |
| 3000 15-AUG-12 | 1500 |
| 3001 16-AUG-12 | 1900 |
| 3002 16-AUG-12 | 2100 |
| 3003 16-AUG-12 | 3600 |
| 3003 17-AUG-12 | 5400 |
| 3004 17-AUG-12 | 5400 |
| 3005 17-AUG-12 | 6400 |
| 3008 17-AUG-12 | 8900 |
| 3003 19-AUG-12 | 1100 |
| 3003 20-AUG-12 | 10000 |

10 rows selected.

SQL> SELECT CUSTOMER\_ID, ORDER\_DATE, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY CUSTOMER\_ID,ORDER\_DATE
3. ORDER BY ORDER\_DATE;

CUSTOMER\_ID ORDER\_DAT MAX(ORDER\_AMOUNT)

|  |  |
| --- | --- |
| 3000 15-AUG-12 | 1500 |
| 3001 16-AUG-12 | 1900 |
| 3002 16-AUG-12 | 2100 |
| 3003 16-AUG-12 | 3600 |
| 3003 17-AUG-12 | 5400 |
| 3004 17-AUG-12 | 5400 |
| 3005 17-AUG-12 | 6400 |
| 3008 17-AUG-12 | 8900 |
| 3003 19-AUG-12 | 1100 |
| 3003 20-AUG-12 | 10000 |

10 rows selected.

SQL> SELECT CUSTOMER\_ID, ORDER\_DATE, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY CUSTOMER\_ID,ORDER\_DATE
3. HAVING MAX(ORDER\_AMOUNT)>2000
4. ORDER BY ORDER\_DATE;

CUSTOMER\_ID ORDER\_DAT MAX(ORDER\_AMOUNT)

|  |  |
| --- | --- |
| 3002 16-AUG-12 | 2100 |
| 3003 16-AUG-12 | 3600 |
| 3003 17-AUG-12 | 5400 |
| 3004 17-AUG-12 | 5400 |

|  |  |
| --- | --- |
| 3005 17-AUG-12 | 6400 |
| 3008 17-AUG-12 | 8900 |
| 3003 20-AUG-12 | 10000 |

1. rows selected.

SQL> SELECT CUSTOMER\_ID, ORDER\_DATE, MAX(ORDER\_AMOUNT)

* 1. FROM ORDERS\_049
  2. GROUP BY CUSTOMER\_ID,ORDER\_DATE
  3. HAVING MAX(ORDER\_AMOUNT)>2000 AND MAX(ORDER\_AMOUNT)<6000
  4. ORDER BY ORDER\_DATE;

CUSTOMER\_ID ORDER\_DAT MAX(ORDER\_AMOUNT)

|  |  |
| --- | --- |
| 3002 16-AUG-12 | 2100 |
| 3003 16-AUG-12 | 3600 |
| 3003 17-AUG-12 | 5400 |
| 3004 17-AUG-12 | 5400 |

SQL> SELECT CUSTOMER\_ID, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY CUSTOMER\_ID
3. HAVING ORDER\_ID>=3002 AND ORDER\_ID<=3007; HAVING ORDER\_ID>=3002 AND ORDER\_ID<=3007

\* ERROR at line 4:

ORA-00904: "ORDER\_ID": invalid identifier

SQL> SELECT SALESMAN\_ID, MAX(ORDER\_AMOUNT)

1. FROM ORDERS\_049
2. GROUP BY SALESMAN\_ID
3. HAVING SALESMAN\_ID>=5003 AND SALESMAN\_ID<=5008;

SALESMAN\_ID MAX(ORDER\_AMOUNT)

5003 8900

5005 10000

SQL>

SQL> SELECT COUNT(ORDER\_AMOUNT) AS ORDER\_COUNT

1. FROM ORDERS\_049
2. WHERE ORDER\_DATE = TO\_DATE('2012-08-17','yyyy-mm-dd');

ORDER\_COUNT

5

SQL>

SQL> SELECT COUNT(DISTINCT CITY) AS CITY\_COUNT

1. FROM ORDERS\_049
2. WHERE CITY IS NOT NULL;

CITY\_COUNT

3

SQL>

**EXERCISE 7: JOINING TABLES**

SQL\*Plus: Release 11.2.0.4.0 Production on Tue Mar 14 08:58:03 2023 Copyright (c) 1982, 2013, Oracle. All rights reserved.

Enter user-name:

[RA2011026010090/RA2011026010090@q1-q2-r1.c0vm8jxyhl5s.us-east-2.rds.amazonaws.c](mailto:RA2011026010090/RA2011026010090@q1-q2-r1.c0vm8jxyhl5s.us-east-2.rds.amazonaws.c) om:1521/orcl

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

|  |  |  |
| --- | --- | --- |
| SQL> select \* from Customer; |  | |
| CUSTOMER\_ID CUST\_AME CITY |  | GRADE SALESMAN\_ID |
| 3002 Nick Rimando New York | 100 | 5001 |
| 3007 Brad Davis New York | 200 | 5001 |
| 3005 Graham Zusi California | 200 | 5002 |
| 3008 Julian Green London | 300 | 5002 |
| 3004 Fabian johnson Paris | 300 | 5006 |
| 3009 Geoff Cameron Berlin | 100 | 5003 |
| 3003 Jozy Altodor Moscow | 200 | 5007 |
| 3001 Brad Guzan London | 0 | 5005 |

1. rows selected.

SQL> Sekect \* from Salesman;

SP2-0734: unknown command beginning "Sekect \* f..." - rest of line ignored. SQL> Select \* from Salesman;

SALES\_ID NAME CITY COMM

5001 James New York .15

5002 Nail Paris .13

5005 Pit London .11

5006 MC Lyon Paris .14

5007 Paul Rome .13

5003 Lauson San Jose .13

6 rows selected.

SQL> Select \* from order1;

ORD\_NO PURCH\_AMT ORD\_DATE CUST\_ID SALES\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 70001 | 150 05-OCT-12 | 3005 | 5002 |
| 70009 | 270.65 10-SEP-12 | 3001 | 5005 |
| 70002 | 65.26 05-OCT-12 | 3002 | 5001 |
| 70004 | 110.5 17-AUG-12 | 3009 | 5003 |
| 70007 | 948.5 10-SEP-12 | 305 | 5002 |
| 70005 | 2400.6 27-JUL-12 | 3007 | 5001 |
| 70008 | 5760 10-SEP-12 | 3002 | 5001 |
| 70010 | 1983.43 10-OCT-12 | 3004 | 5006 |
| 70003 | 2480.4 10-OCT-12 | 3009 | 5003 |
| 70012 | 250.45 27-JUN-12 | 3008 | 5002 |
| 70011 | 75.29 17-AUG-12 | 3003 | 5007 |

ORD\_NO PURCH\_AMT ORD\_DATE CUST\_ID SALES\_ID

70013 3045.6 25-APR-12 3002 5001

12 rows selected.

SQL> select salesman.name,salesman.city,customer.CUST\_ID

1. from salesman
2. left join customer
3. on salesman.CITY=customer.City
4. order by salesman.name;

select salesman.name,salesman.city,customer.CUST\_ID

\*

ERROR at line 1:

ORA-00904: "CUSTOMER"."CUST\_ID": invalid identifier

SQL> select Salesman.name,Salesman.city,Customer.CUST\_ID

1. from Salesman
2. left join Customer
3. order by Salesman.name; order by Salesman.name

\*

ERROR at line 4:

ORA-00905: missing keyword

SQL> select Salesman.name,Salesman.city,Customer.CUST\_ID

2 from salesman 3

SQL>

SQL> select salesman.name,salesman.city,customer.CUST\_ID

1. from Salesman
2. left join Customer
3. on Salesman.CITY=Customer.CITY
4. order by Salesman.name;

select salesman.name,salesman.city,customer.CUST\_ID

\*

ERROR at line 1:

ORA-00904: "CUSTOMER"."CUST\_ID": invalid identifier

SQL> select Salesman.NAME,Salesman.CITY,Customer.CUSTOMER\_ID

1. from Salesman
2. left join Customer
3. on Salesman.CITY=Customer.CITY
4. order by Salesman.name;

|  |  |
| --- | --- |
| NAME CITY | CUSTOMER\_ID |
| James New York | 3002 |
| James New York | 3007 |
| Lauson San Jose |  |
| MC Lyon Paris | 3004 |
| Nail Paris | 3004 |
| Paul Rome |  |
| Pit London | 3001 |
| Pit London | 3008 |

8 rows selected. SQL>

SP2-0734: unknown command beginning " " - rest of line ignored.

SQL> SQL> SQL>

SQL> SELECT Customer.CUST\_AME,Customer.CITY,Salesman.NAME,Salesman.COMM

1. From Salesman
2. RIGHT JOIN Customer
3. ON Salesman.SALES\_ID=CUSTOMER.SALESMAN\_ID
4. ORDER BY Salesman.SALES\_ID;

CUST\_AME CITY NAME COMM

|  |  |  |  |
| --- | --- | --- | --- |
| Nick Rimando | New York | James | .15 |
| Brad Davis | New York | James | .15 |
| Graham Zusi | California | Nail | .13 |
| Julian Green | London | Nail | .13 |
| Geoff Cameron Berlin | | Lauson | .13 |
| Brad Guzan London | | Pit | .11 |
| Fabian johnson Paris | | MC Lyon | .14 |
| Jozy Altodor Moscow | | Paul | .13 |

8 rows selected.

SQL> SELECT \* FROM Salesman A CROSS JOIN CUSTOMER B WHERE A.CITY IS NOT NULL AND B.GRADE IS NOT NULL

2 AND A.CITY<>B.CITY;

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5001 James  California | New York  200 5002 | .15 | 3005 Graham Zusi |
| 5001 James London | New York 300 5002 | .15 | 3008 Julian Green |
| 5001 James Paris | New York  300 5006 | .15 | 3004 Fabian johnson |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5001 James  Berlin | New York  100 5003 | .15 | 3009 Geoff Cameron |
| 5001 James Moscow | New York 200 5007 | .15 | 3003 Jozy Altodor |
| 5001 James London | New York 0 5005 | .15 | 3001 Brad Guzan |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5002 Nail | Paris | .13 | 3002 Nick Rimando |
| New York | 100 | 5001 |  |
| 5002 Nail | Paris | .13 | 3007 Brad Davis |
| New York | 200 | 5001 |  |
| 5002 Nail | Paris | .13 | 3005 Graham Zusi |
| California | 200 | 5002 |  |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5002 Nail | Paris | .13 | 3008 Julian Green |
| London | 300 | 5002 |  |
| 5002 Nail | Paris | .13 | 3009 Geoff Cameron |
| Berlin | 100 | 5003 |  |
| 5002 Nail | Paris | .13 | 3003 Jozy Altodor |
| Moscow | 200 | 5007 |  |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5002 Nail | Paris | .13 | 3001 Brad Guzan |
| London | 0 | 5005 |  |

5005 Pit London .11 3002 Nick Rimando

New York 100 5001

5005 Pit London .11 3007 Brad Davis

New York 200 5001

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5005 Pit  California | London  200 | 5002 | .11 | 3005 Graham Zusi |
| 5005 Pit  Paris | London 300 | 5006 | .11 | 3004 Fabian johnson |

5005 Pit London .11 3009 Geoff Cameron

Berlin 100 5003

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 5005 Pit | London | | .11 | | 3003 Jozy Altodor |
| Moscow | 200 | | 5007 | |  |
| 5006 MC Lyon New York | | Paris 100 | 5001 | .14 | 3002 Nick Rimando |
| 5006 MC Lyon New York | | Paris 200 | 5001 | .14 | 3007 Brad Davis |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

5006 MC Lyon Paris .14 3005 Graham Zusi

California 200 5002

5006 MC Lyon Paris .14 3008 Julian Green

London 300 5002

|  |  |  |  |
| --- | --- | --- | --- |
| 5006 MC Lyon | Paris | .14 | 3009 Geoff Cameron |
| Berlin 100 | 5003 |  |  |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

5006 MC Lyon Paris .14 3003 Jozy Altodor

Moscow 200 5007

5006 MC Lyon Paris .14 3001 Brad Guzan

London 0 5005

|  |  |  |  |
| --- | --- | --- | --- |
| 5007 Paul | Rome | .13 | 3002 Nick Rimando |
| New York | 100 | 5001 |  |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5007 Paul  New York | Rome  200 | 5001 | .13 | 3007 Brad Davis |
| 5007 Paul California | Rome 200 | 5002 | .13 | 3005 Graham Zusi |
| 5007 Paul London | Rome 300 | 5002 | .13 | 3008 Julian Green |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5007 Paul  Paris | Rome  300 | 5006 | .13 | 3004 Fabian johnson |
| 5007 Paul Berlin | Rome 100 | 5003 | .13 | 3009 Geoff Cameron |
| 5007 Paul Moscow | Rome 200 | 5007 | .13 | 3003 Jozy Altodor |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5007 Paul  London | Rome  0 | 5005 | .13 | 3001 Brad Guzan |
| 5003 Lauson New York | San Jose 100 5001 | | .13 | 3002 Nick Rimando |
| 5003 Lauson New York | San Jose 200 5001 | | .13 | 3007 Brad Davis |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5003 Lauson | San Jose | .13 | 3005 Graham Zusi |
| California | 200 5002 |  |  |

5003 Lauson San Jose .13 3008 Julian Green

London 300 5002

|  |  |  |  |
| --- | --- | --- | --- |
| 5003 Lauson San Jose | | .13 | 3004 Fabian johnson |
| Paris | 300 5006 |  |  |

SALES\_ID NAME CITY COMM CUSTOMER\_ID CUST\_AME

CITY GRADE SALESMAN\_ID

|  |  |  |  |
| --- | --- | --- | --- |
| 5003 Lauson  Berlin | San Jose  100 5003 | .13 | 3009 Geoff Cameron |
| 5003 Lauson Moscow | San Jose 200 5007 | .13 | 3003 Jozy Altodor |

5003 Lauson San Jose .13 3001 Brad Guzan

London 0 5005

42 rows selected.

SQL> SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A RIGHT OUTER JOIN SALESMAN B ON B.SALESMAN\_ID = A.SALES\_ID ORDER BY B.SALESMAN\_ID;

SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A RIGHT OUTER JOIN SALESMAN B ON B.SALESMAN\_ID = A.SALES\_ID ORDER BY B.SALESMAN\_ID

\*

ERROR at line 1:

ORA-00904: "A"."SALES\_ID": invalid identifier

SQL> SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A RIGHT OUTER JOIN SALESMAN B ON B.SALESMAN\_ID = A.SALES\_ID ORDER BY B.SALESMAN\_ID;

SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A RIGHT OUTER JOIN SALESMAN B ON B.SALESMAN\_ID = A.SALES\_ID ORDER BY B.SALESMAN\_ID

\*

ERROR at line 1:

ORA-00904: "A"."SALES\_ID": invalid identifier

SQL> SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. RIGHT OUTER JOIN SALESMAN B
2. ON B.SALES\_ID = A.SALES\_ID
3. ORDER BY B.SALES\_ID; ON B.SALES\_ID = A.SALES\_ID

\* ERROR at line 3:

ORA-00904: "A"."SALES\_ID": invalid identifier

SQL> SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. RIGHT OUTER JOIN SALESMAN B
2. ON B.SALESMAN\_ID = A.SALES\_ID
3. ORDER BY B.SALESMAN\_ID; ON B.SALESMAN\_ID = A.SALES\_ID

\* ERROR at line 3:

ORA-00904: "A"."SALES\_ID": invalid identifier

SQL> SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. RIGHT OUTER JOIN SALESMAN B
2. ON B.SALES\_ID = A.SALESMAN\_ID
3. ORDER BY B.SALES\_ID;

SELECT A.CUST\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

\*

ERROR at line 1:

ORA-00904: "A"."CUST\_NAME": invalid identifier

SQL> SELECT A.CUSTOMER\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. ON B.SALES\_ID = A.SALESMAN\_ID
2. ON B.SALES\_ID = A.SALES\_ID 4

SQL> SELECT A.CUSTOMER\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. RIGHT OUTER JOIN SALESMAN B
2. ON B.SALES\_ID = A.SALESMAN\_ID
3. ORDER BY B.SALES\_ID;

SELECT A.CUSTOMER\_NAME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

\*

ERROR at line 1:

ORA-00904: "A"."CUSTOMER\_NAME": invalid identifier

SQL> SELECT A.CUST\_AME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A

1. RIGHT OUTER JOIN SALESMAN B
2. ON B.SALES\_ID = A.SALESMAN\_ID
3. ORDER BY B.SALES\_ID;

CUST\_AME CITY SALESMAN CITY

Nick Rimando New York James New York Brad Davis New York James New York Graham Zusi California Nail Paris

Julian Green London Nail Paris

Geoff Cameron Berlin Lauson San Jose Brad Guzan London Pit London Fabian johnson Paris MC Lyon Paris Jozy Altodor Moscow Paul Rome

8 rows selected.

SQL>

SQL> SQL> ;

1. SELECT A.CUST\_AME,A.CITY,B.NAME AS "SALESMAN", B.CITY FROM CUSTOMER A
2. RIGHT OUTER JOIN SALESMAN B
3. ON B.SALES\_ID = A.SALESMAN\_ID 4\* ORDER BY B.SALES\_ID

SQL>

SQL> select A.CUST\_AME as "CUSTOMER NAME", A.CITY, B.NAME AS "SALEMAN", B.COMM

1. FROM CUSTOMER A INNER JOIN SALESMAN B
2. ON A.SALESMAN\_ID = B.SALES\_ID
3. WHERE B>COMM> .10; WHERE B>COMM> .10

\*

ERROR at line 4:

ORA-00933: SQL command not properly ended

SQL> select A.CUST\_AME as "CUSTOMER NAME", A.CITY, B.NAME AS "SALEMAN", B.COMM

1. FROM CUSTOMER A INNER JOIN SALESMAN B
2. ON A.SALESMAN\_ID = B.SALES\_ID
3. WHERE B.COMM> .10;

CUSTOMER NAME CITY SALEMAN COMM

Nick Rimando New York James .15

|  |  |  |
| --- | --- | --- |
| Brad Davis New York | James | .15 |
| Graham Zusi California | Nail | .13 |

Julian Green London Nail .13

|  |  |  |
| --- | --- | --- |
| Fabian johnson Paris | MC Lyon | .14 |
| Geoff Cameron Berlin | Lauson | .13 |
| Jozy Altodor Moscow | Paul | .13 |
| Brad Guzan London | Pit | .11 |

8 rows selected. SQL> commit; Commit complete.

**EXERCISE 8: SUB-QUERIES**

SQL> SELECT \* FROM EMP1;

EMPNO ENAME JOB MGR HIREDATE SAL COMM

DEPTNO

7369 SMITH CLERK 7902 17-DEC-80 800 0

20

7499 ALLEN SALESMAN 7698 20-FEB-81 1600 300

30

7521 WARD SALESMAN 7698 22-FEB-81 1250 500

30

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EMPNO ENAME | JOB | MGR HIREDATE | SAL | COMM |
| DEPTNO |  |  |  |  |
| 7566 JONES | MANAGER | 7839 02-APR-81 | 2975 | 0 |

20

7654 MARTIN SALESMAN 7698 28-SEP-81 1250 1400

30

7698 BLAKE MANAGER 7839 01-MAY-81 2850 0

30

EMPNO ENAME JOB MGR HIREDATE SAL COMM

DEPTNO

7782 SCOTT ANALYST 7566 19-APR-87 3000 0

20

7902 FORD ANALYST 7566 03-DEC-81 3000 0

20

8 rows selected.

SQL> SELECT \* FROM DEPT1; DEPTNO DNAME LOC

10 ACCOUNTING NEW YORK

20 RESEARCH DALLAS

40 OPERATIONS BOSTON

50 MANUFAC BOSTON

q1)

SQL> SELECT ENAME FROM EMP1 WHERE SAL > (SELECT SAL FROM EMP1 WHERE EMPNO = 7566);

ENAME

SCOTT FORD

q2)

SQL> SELECT ENAME FROM EMP1 WHERE JOB = (SELECT JOB FROM EMP1 WHERE EMPNO = 7369) AND SAL > (SELECT SAL FROM EMP1 WHERE EMPNO = 7876);

ENAME

MILLER

q3)

SQL> SELECT ENAME, JOB, SAL FROM EMP1 WHERE SAL = (SELECT MIN(SAL) FROM EMP1);

|  |  |  |
| --- | --- | --- |
| ENAME | JOB | SAL |
| SMITH | CLERK | 800 |

Q4)

SQL> SELECT DEPTNO,MIN(SAL) FROM EMP1 WHERE SAL >(SELECT MIN(SAL) FROM EMP1 WHERE DEPTNO = 20) GROUP BY DEPTNO;

DEPTNO MIN(SAL)

30 1250

20 2975

Q5)

SQL> SELECT EMPNO,ENAME,JOB FROM EMP1 WHERE JOB != 'CLERK' AND SAL<(SELECT MAX(SAL) FROM EMP1 WHERE JOB = 'CLERK');

EMPNO ENAME JOB

7499 ALLEN SALESMAN

7521 WARD SALESMAN

7566 JONES MANAGER

7654 MARTIN SALESMAN

7698 BLAKE MANAGER

7782 SCOTT ANALYST

7902 FORD ANALYST

7 rows selected.

Q6)

SQL> SELECT EMPNO,ENAME,JOB FROM EMP1 WHERE SAL > (SELECT AVG(SAL) FROM EMP1);

EMPNO ENAME JOB

7876 ADAMS CLERK

7934 MILLER CLERK

7566 JONES MANAGER

7698 BLAKE MANAGER

7782 SCOTT ANALYST

7902 FORD ANALYST

6 rows selected.

Q7)

SQL> SELECT ENAME,JOB FROM EMP1 WHERE

(SAL = (SELECT SAL FROM EMP1 WHERE ENAME = 'SCOTT') OR SAL = (SELECT SAL FROM EMP1 WHERE ENAME='FORD')) AND (ENAME !='SCOTT' OR ENAME !='FORD');

ENAME JOB

TURNER ANALYST ERIC SALESMAN SCOTT ANALYST FORD ANALYST

Q8)

SQL> SELECT ENAME,JOB,SAL FROM EMP1 WHERE JOB = (SELECT JOB FROM EMP1 WHERE ENAME = 'FORD') AND SAL = (SELECT SAL FROM EMP1 WHERE ENAME = 'FORD');

ENAME JOB SAL

|  |  |  |
| --- | --- | --- |
| TURNER | ANALYST | 3000 |
| SCOTT | ANALYST | 3000 |
| FORD | ANALYST | 3000 |

Q9)

SQL> SELECT ENAME,JOB,SAL FROM EMP1 WHERE

JOB = (SELECT JOB FROM EMP1 WHERE ENAME ='JONES') AND SAL >(SELECT SAL FROM EMP1 WHERE ENAME = 'FORD');

no rows selected

Q10)

SQL> SELECT ENAME,JOB FROM EMP1 WHERE DEPTNO=10 AND JOB = 'SALESMAN';

no rows selected

**EXERCISE 9: VIEWS**

Q1) Create a view empv10 that contains empno, ename, job of the employees who work in dept 10. Also describe the structure of the view.

CREATE VIEW empv10 AS SELECT empno, ename, job FROM EMP WHERE deptno = 10; Q2) Create a view with column aliases empv30 that contains empno, ename, sal of the employees who work in dept 30. Also display the contents of the view.

CREATE VIEW empv30 AS SELECT empno AS "Employee Number", ename AS "Employee Name", sal AS "Salary" FROM EMP WHERE deptno = 30;

Q3) Update the view empv10 by increasing 10% salary of the employees who work as ‘CLERK’. Also confirm the modifications in emp table

UPDATE empv10 SET sal = sal \* 1.1 WHERE job = 'CLERK';

Q4) Modify the view empv10 which contains the data empno, ename, job, sal. Add an alias for each column name.

CREATE OR REPLACE VIEW empv10 AS SELECT empno AS "Employee Number", ename AS "Employee Name", job AS "Job Title", sal AS "Salary" FROM EMP WHERE deptno = 10; Q5) Using emp table, create a view pay which contains ename, monthly\_sal, annual\_sal, deptno.

CREATE VIEW pay AS SELECT ename, sal/12 AS monthly\_sal, sal\*12 AS annual\_sal, deptno FROM EMP;

Q6) Create a view dept\_stat which contains department no., department name, minimum salary, maximum salary, total salary.

CREATE VIEW dept\_stat AS SELECT d.deptno, d.dname, MIN(e.sal) AS min\_sal, MAX(e.sal) AS max\_sal, SUM(e.sal) AS total\_sal FROM EMP e JOIN DEPT d ON e.deptno

= d.deptno GROUP BY d.deptno, d.dname;

Q7) Execute the following query and then try to delete the row with dept no 20. Now write in words that you understand

/\* Note this query is the Question \*/ create or replace view empv20

as select \* from emp where deptno = 20 with check option constraint empv20\_ck;

/\* Answer \*/

The given query creates or replaces a view named empv20 that selects all the columns from the EMP table where the deptno column equals 20. The view also has a check option constraint named empv20\_ck.

The check option constraint ensures that any data modification to the view only affects rows that meet the view's filter criteria. In this case, the constraint makes sure that any new or modified rows inserted into the empv20 view also have a deptno value of 20. This constraint helps maintain data consistency and integrity by preventing invalid data from being added to the view.

Regarding the task of deleting the row with dept no 20, it is not possible to do so directly since the view empv20 only selects rows with deptno of 20. If you want to delete the row with deptno 20, you will need to delete it from the EMP table directly. However, if you try to delete a row from the EMP table that has a deptno of 20, the check option constraint named empv20\_ck will prevent the deletion since it violates the constraint's rule that the deptno must be 20.

Q8) Create a view empv10 with all the details of employees who work in dept no. 10. CREATE VIEW empv10 AS SELECT \* FROM emp WHERE deptno = 10 WITH READ ONLY;

Q9) Statement1 : Update the view will update data in original table. Statement 2: update in main table will affect the created view or not? State whether the above statements is True or False with explanation.

Statement 1 is True. Updating a view can update the underlying data in the original table. This happens when the view is based on a single table and the update statement only

modifies columns in that table. In such cases, the update operation is passed through the view to the underlying table, and the data in the table is updated accordingly.

Statement 2 is also True. If an update is made in the main table, it will affect the data in any views based on that table. Views are simply virtual tables that provide a different way of looking at the data in the original table. Therefore, any updates made to the original table will also be reflected in the views that are based on that table.

It is important to note, however, that some views are based on more than one table, or use complex queries or aggregation functions, and in these cases, updates to the view may not be possible, or may not be passed through to the underlying tables. Additionally, views can have various constraints such as read-only or with-check options, which can further limit the ability to update the data in the underlying tables.

Q10) Delete the view empv20. DROP VIEW empv20;

**EXERCISE 10: PL/SQL CONDITIONAL ITERATIVE STATEMENT**

set serveroutput on;

1. Get FARENHEIT and convert into CELSIUS DECLARE

celcius NUMBER; fahrenheit NUMBER;

BEGIN

celcius := &input\_celcius; fahrenheit := 9/5 \* celcius + 32;

DBMS\_OUTPUT.PUT\_LINE (celcius ||' Celcius = '||fahrenheit|| ' Fahrenheit'); END;

1. Write a pl/sql program to find SUM OF EVEN INTEGERS DECLARE

num NUMBER(3) := 2; sum1 NUMBER(4) := 0;

BEGIN

WHILE num <= 5 LOOP

dbms\_output.Put\_line(num); sum1 := sum1 + num;

num := num + 2; END LOOP;

dbms\_output.Put\_line('Sum of even numbers is ' || sum1); END;

1. Write a pl/sql program to find GREATEST OF THREE NUMBERS USING IF ELSEIF DECLARE

a NUMBER := 46; b NUMBER := 67; c NUMBER := 21;

BEGIN

IF a > b

AND a > c THEN

dbms\_output.Put\_line('Greatest number is '

||a);

ELSIF b > a

AND b > c THEN

dbms\_output.Put\_line('Greatest number is '

||b);

ELSE

dbms\_output.Put\_line('Greatest number is '

||c);

END IF; END;

1. Write a pl/sql program to find a number is ODD OR EVEN DECLARE

n1 NUMBER := &num1; BEGIN

-- test if the number provided by the user is even IF MOD(n1,2) = 0 THEN

DBMS\_OUTPUT.PUT\_LINE ('The number. '||n1|| ' is even number');

ELSE

DBMS\_OUTPUT.PUT\_LINE ('The number '||n1||' is odd number.'); END IF;

DBMS\_OUTPUT.PUT\_LINE ('Done Successfully'); END;

1. Write a pl/sql program to find a FACTORIAL OF A NUMBER DECLARE

num NUMBER := &num; factorial NUMBER := 1; BEGIN

FOR i IN 1..num LOOP

factorial := factorial \* i; END LOOP;

DBMS\_OUTPUT.PUT\_LINE('Factorial of ' || num || ' is ' || factorial); END;

**EXERCISE 11: PL/SQL PROCEDURES**

set serveroutput on;

1. creates a simple procedure that displays the string Hello World!; on the screen when executed

CREATE OR REPLACE PROCEDURE display\_hello\_world IS BEGIN

DBMS\_OUTPUT.PUT\_LINE('Hello World!'); END;

/

EXECUTE display\_hello\_world;

1. Create a procedure to find the minimum of two values. HINT - Procedure takes two numbers using the IN mode and returns their minimum using the OUT parameters CREATE OR REPLACE PROCEDURE find\_minimum (

num1 IN NUMBER, num2 IN NUMBER,

min\_num OUT NUMBER

) IS BEGIN

IF num1 < num2 THEN min\_num := num1;

ELSE

min\_num := num2; END IF;

END;

/ DECLARE

num1 NUMBER := 10; num2 NUMBER := 5;

min\_num NUMBER; BEGIN

find\_minimum(num1, num2, min\_num);

DBMS\_OUTPUT.PUT\_LINE('The minimum of ' || num1 || ' and ' || num2 || ' is ' || min\_num);

END;

/

1. Create a procedure, to get cube of passed number. CREATE OR REPLACE PROCEDURE get\_cube (

num IN NUMBER,

cube\_num OUT NUMBER

) IS BEGIN

cube\_num := num \* num \* num; END;

/ DECLARE

num NUMBER := 5;

cube NUMBER; BEGIN

get\_cube(num, cube);

DBMS\_OUTPUT.PUT\_LINE('The cube of ' || num || ' is ' || cube); END;

/

1. Write a procedure to reverse a input string and check it is palindrome or not. CREATE OR REPLACE PROCEDURE check\_palindrome (

str IN VARCHAR2,

is\_palindrome OUT BOOLEAN

) IS

rev\_str VARCHAR2(32767); BEGIN

-- Reverse the input string

FOR i IN REVERSE 1..LENGTH(str) LOOP

rev\_str := rev\_str || SUBSTR(str, i, 1); END LOOP;

-- Check if the reversed string is equal to the original string IF str = rev\_str THEN

is\_palindrome := TRUE; ELSE

is\_palindrome := FALSE; END IF;

END;

/ DECLARE

str VARCHAR2(32767) := 'racecar'; palindrome BOOLEAN;

BEGIN

check\_palindrome(str, palindrome); IF palindrome THEN

DBMS\_OUTPUT.PUT\_LINE(str || ' is a palindrome'); ELSE

DBMS\_OUTPUT.PUT\_LINE(str || ' is not a palindrome'); END IF;

END;

/

1. Write a procedure to delete a specific row from the table already created. CREATE TABLE student4 (

id NUMBER(10) PRIMARY KEY, name VARCHAR2(100) NOT NULL, email VARCHAR2(100) UNIQUE, phone VARCHAR2(20),

age NUMBER(3),

gender VARCHAR2(10), address VARCHAR2(200)

);

INSERT INTO student4 (id, name, email, phone, age, gender, address)

VALUES (101, 'John Smith', 'john.smith@example.com', '555-1234', 25, 'Male', '123 Main St');

INSERT INTO student4 (id, name, email, phone, age, gender, address)

VALUES (202, 'Jane Doe', 'jane.doe@example.com', '555-5678', 22, 'Female', '456 Maple Ave');

INSERT INTO student4 (id, name, email, phone, age, gender, address)

VALUES (303, 'Bob Johnson', 'bob.johnson@example.com', '555-2468', 28, 'Male', '789 Elm St');

CREATE OR REPLACE PROCEDURE delete\_row(

row\_id IN NUMBER

) IS

BEGIN

DELETE FROM student4 WHERE id = row\_id; COMMIT;

END;

/ DECLARE

row\_id NUMBER := 101; BEGIN

delete\_row(row\_id);

DBMS\_OUTPUT.PUT\_LINE('Row with ID ' || row\_id || ' deleted.'); END;

/

**EXERCISE 12: PL/SQL USER DEFINED FUNCTIONS**

set serveroutput on;

1. Write a pl/sql function recursive code for finding factorial of a number.

CREATE OR REPLACE FUNCTION factorial(n IN NUMBER) RETURN NUMBER IS

BEGIN

-- base case

IF n = 0 OR n = 1 THEN RETURN 1;

ELSE

-- recursive case

RETURN n \* factorial(n - 1); END IF;

END;

/ DECLARE

n NUMBER := 5;

fact NUMBER; BEGIN

fact := factorial(n);

DBMS\_OUTPUT.PUT\_LINE('Factorial of ' || n || ' is ' || fact); END;

/

1. Write a pl/sql function for finding a number is a prime number.

CREATE OR REPLACE FUNCTION is\_prime(n IN NUMBER) RETURN BOOLEAN IS

divisor NUMBER := 2; BEGIN

IF n <= 1 THEN RETURN FALSE; END IF;

WHILE divisor <= SQRT(n) LOOP IF MOD(n, divisor) = 0 THEN RETURN FALSE;

END IF;

divisor := divisor + 1; END LOOP;

RETURN TRUE; END;

/ DECLARE

n NUMBER := 17; BEGIN

IF is\_prime(n) THEN

DBMS\_OUTPUT.PUT\_LINE(n || ' is a prime number.'); ELSE

DBMS\_OUTPUT.PUT\_LINE(n || ' is not a prime number.'); END IF;

END;

/

Student Table Creation for 3rd Question CREATE TABLE Student (

Sno NUMBER,

sname VARCHAR2(50), dept VARCHAR2(50),

cgpa NUMBER

);

Values

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (1, 'John', 'CSE', 8.5);

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (2, 'Jane', 'CSE', 9.0);

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (3, 'Mike', 'CSE', 7.5);

1. Write a pl/sql function to retrieve the count of students from ‘CSE’ department from the table Student (Sno, sname, dept, cgpa).

CREATE OR REPLACE FUNCTION get\_cse\_student\_count RETURN NUMBER IS

cse\_count NUMBER; BEGIN

SELECT COUNT(\*) INTO cse\_count FROM Student WHERE dept = 'CSE'; RETURN cse\_count;

END;

/ DECLARE

cse\_count NUMBER; BEGIN

cse\_count := get\_cse\_student\_count;

DBMS\_OUTPUT.PUT\_LINE('Number of students in CSE department: ' || cse\_count);

END;

/

1. Write a pl/sql function to retrieve the maximum CGPA of the student from the table Student (Sno, sname, dept, cgpa).

CREATE OR REPLACE FUNCTION get\_max\_cgpa RETURN NUMBER IS

max\_cgpa NUMBER; BEGIN

SELECT MAX(cgpa) INTO max\_cgpa FROM Student; RETURN max\_cgpa;

END;

/ DECLARE

max\_cgpa NUMBER; BEGIN

max\_cgpa := get\_max\_cgpa; DBMS\_OUTPUT.PUT\_LINE('Maximum CGPA: ' || max\_cgpa); END;

/

1. Write a simple PL/SQL Function that computes and returns the average of two numbers. CREATE OR REPLACE FUNCTION average\_of\_two\_numbers (

num1 NUMBER, num2 NUMBER

) RETURN NUMBER IS

avg\_num NUMBER; BEGIN

avg\_num := (num1 + num2) / 2; RETURN avg\_num;

END;

/

SELECT average\_of\_two\_numbers(10, 20) FROM dual;

**EXERCISE 13: PL/SQL CURSORS**

set serveroutput on;

1. Write a pl/sql function recursive code for finding factorial of a number.

CREATE OR REPLACE FUNCTION factorial(n IN NUMBER) RETURN NUMBER IS

BEGIN

-- base case

IF n = 0 OR n = 1 THEN RETURN 1;

ELSE

-- recursive case

RETURN n \* factorial(n - 1); END IF;

END;

/

DECLARE

n NUMBER := 5;

fact NUMBER; BEGIN

fact := factorial(n);

DBMS\_OUTPUT.PUT\_LINE('Factorial of ' || n || ' is ' || fact); END;

/

1. Write a pl/sql function for finding a number is a prime number.

CREATE OR REPLACE FUNCTION is\_prime(n IN NUMBER) RETURN BOOLEAN IS

divisor NUMBER := 2; BEGIN

IF n <= 1 THEN RETURN FALSE; END IF;

WHILE divisor <= SQRT(n) LOOP IF MOD(n, divisor) = 0 THEN RETURN FALSE;

END IF;

divisor := divisor + 1; END LOOP;

RETURN TRUE; END;

/ DECLARE

n NUMBER := 17; BEGIN

IF is\_prime(n) THEN

DBMS\_OUTPUT.PUT\_LINE(n || ' is a prime number.'); ELSE

DBMS\_OUTPUT.PUT\_LINE(n || ' is not a prime number.'); END IF;

END;

/

Student Table Creation for 3rd Question CREATE TABLE Student (

Sno NUMBER,

sname VARCHAR2(50), dept VARCHAR2(50),

cgpa NUMBER

);

Values

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (1, 'John', 'CSE', 8.5);

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (2, 'Jane', 'CSE', 9.0);

INSERT INTO Student (Sno, sname, dept, cgpa) VALUES (3, 'Mike', 'CSE', 7.5);

1. Write a pl/sql function to retrieve the count of students from ‘CSE’ department from the table Student (Sno, sname, dept, cgpa).

CREATE OR REPLACE FUNCTION get\_cse\_student\_count RETURN NUMBER IS

cse\_count NUMBER; BEGIN

SELECT COUNT(\*) INTO cse\_count FROM Student WHERE dept = 'CSE'; RETURN cse\_count;

END;

/ DECLARE

cse\_count NUMBER; BEGIN

cse\_count := get\_cse\_student\_count;

DBMS\_OUTPUT.PUT\_LINE('Number of students in CSE department: ' || cse\_count); END;

/

1. Write a pl/sql function to retrieve the maximum CGPA of the student from the table Student (Sno, sname, dept, cgpa).

CREATE OR REPLACE FUNCTION get\_max\_cgpa RETURN NUMBER IS

max\_cgpa NUMBER; BEGIN

SELECT MAX(cgpa) INTO max\_cgpa FROM Student; RETURN max\_cgpa;

END;

/ DECLARE

max\_cgpa NUMBER; BEGIN

max\_cgpa := get\_max\_cgpa; DBMS\_OUTPUT.PUT\_LINE('Maximum CGPA: ' || max\_cgpa); END;

/

1. Write a simple PL/SQL Function that computes and returns the average of two numbers. CREATE OR REPLACE FUNCTION average\_of\_two\_numbers (

num1 NUMBER, num2 NUMBER

) RETURN NUMBER IS

avg\_num NUMBER; BEGIN

avg\_num := (num1 + num2) / 2; RETURN avg\_num;

END;

/

SELECT average\_of\_two\_numbers(10, 20) FROM dual;

**EXERCISE 14: PL/SQL BUILT-IN EXCEPTION**

set serveroutput on;

create or replace procedure findGrade(n IN number, grade OUT varchar) as begin

declare

no\_score exception; begin

if n > 90 then grade:='A';

elsif n > 80 then grade:='B';

elsif n > 70 then grade:='C';

elsif n > 60 then grade:='D';

elsif n > 50 then grade:='E';

elsif n <= 50 and n >=0 then grade:='F';

else

raise no\_score; end if; exception

when no\_score then dbms\_output.put\_line('Invalid score!'); end;

end;

/ declare

n number;

grade varchar(1); begin

n:=-1;

findGrade(n, grade);

if grade is not null then dbms\_output.put\_line('Grade: '||grade); end if;

end;

**EXERCISE 15: PL/SQL TRIGGERS**

create table STD049 ("Std\_ID" number(6), "Std\_name" varchar2(20),"Subject" varchar2(10), "Sub\_Code" number(2), "Marks" Number(2), "Grade" varchar2(20)) ;

INSERT INTO STD049 ("Std\_ID", "Std\_Name" , "Subject" , "Sub\_Code", "Marks" , "Grade") WITH input AS (

SELECT 0001, 'Shushrut' , 'Maths', 10 , 90 , 'A' FROM dual UNION ALL SELECT 0002, 'Viren' , 'History', 30 , 87 , 'B' FROM dual UNION ALL SELECT 0003, 'Vidhi', 'Physics' , 20 , 91 , 'A' FROM dual UNION ALL SELECT 0004, 'Sachin' , 'EVS' , 40 , 83 , 'B' FROM dual UNION ALL

SELECT 0005, 'Param', 'History' , 50 , 57 , 'D' FROM dual

) SELECT \* FROM input ;

-- EXP9 --

create table stdn049 (rollno number(3), name varchar(2), m1 number(3), m2 number(3), m3 number(3), tot number(3), avrg number(3), result varchar(10));

create or replace trigger t1 before insert on stdn for each row

begin

:new.tot:=:new.m1+:new.m2+:new.m3;

:new.avrg:=:new.tot/3;

if(:new.m1>=50 and :new.m2>=50 and :new.m3>=50) THEN

:new.result:='pass'; else

:new.result:='Fail'; end if;

end;

/

create table STUDENT049 (Id number(2), Name varchar(20), Age number(3), History number(3), Physics number(3), Maths number(3), Result varchar2(4));

CREATE OR REPLACE TRIGGER grade\_display BEFORE INSERT ON STUDENT049

FOR EACH ROW BEGIN

IF (:NEW.History >=50 and :NEW.Physics >= 50 and :NEW.Maths >= 50) THEN

:NEW.Result := 'PASS'; ELSE

:NEW.Result := 'FAIL'; END IF;

END;

/

INSERT INTO STUDENT049 (Id, Name, Age, History, Physics, Maths) VALUES (01, 'Shushrut Kumar', 27, 99, 95, 100);

INSERT INTO STUDENT049 (Id, Name, Age, History, Physics, Maths) VALUES (02, 'Viren Parmar', 21, 92, 90, 95);

INSERT INTO STUDENT049 (Id, Name, Age, History, Physics, Maths) VALUES (03, 'Vidhi Rai', 49, 20, 55, 33);

CREATE OR REPLACE TRIGGER invalid\_age BEFORE INSERT ON STUDENT049

FOR EACH ROW BEGIN

IF (:NEW.Age > 100) THEN

raise\_application\_error(-20000, 'INSERTING INVALID AGE!'); END IF;

END;

/

INSERT INTO STUDENT049 (Id, Name, Age, History, Physics, Maths) VALUES (04, 'Sachin Tilokani', 120, 100, 49, 88);

**DBMS COURSE MINI PROJECT:**

## ABSTRACT

A Hospital Management System (HMS) is a computer-based system that manages all aspects of hospital operations, such as patient management, appointment scheduling, medical records, billing, and inventory management. The primary objective of the HMS is to enhance the quality of patient care and optimize the hospital's performance by automating its processes. The proposed HMS project aims to develop a comprehensive software system that integrates all the hospital's operations into a single platform, enabling healthcare providers to manage patient data efficiently and securely. The system will consist of several modules that perform various functions, including patient registration, appointment scheduling, laboratory and radiology management, pharmacy management, and billing. The patient registration module will allow patients to register at the hospital by providing their personal details, medical history, and insurance information. The appointment scheduling module will enable patients to book appointments with doctors, and doctors to manage their schedules and view patient appointments. The laboratory and radiology modules will provide a platform for healthcare providers to manage diagnostic tests and imaging procedures. The pharmacy management module will manage the hospital's medication inventory and provide real-time updates on stock levels. The billing module will generate bills for patient services, process insurance claims, and manage financial transactions. The HMS project will utilize the latest technologies to ensure that the system is secure, scalable, and easy to use. The system will be developed using a client-server architecture, with a web-based user interface that healthcare providers can access from any device with internet connectivity. The system will also incorporate advanced security features, such as user authentication, data encryption, and access controls, to protect patient data from unauthorized access. In conclusion, the proposed HMS project will revolutionize the way hospitals manage patient data and operations. The system will improve patient care, increase efficiency, and reduce operational costs, making it a valuable tool for healthcare providers.

## CHAPTER 1: INTRODUCTION

### About

A Hospital Management System (HMS) is a computer-based system that manages the day-to-day operations of a hospital. It includes several modules that manage different aspects of the hospital, such as patient management, appointment scheduling, medical records, billing, and inventory management. The HMS project aims to develop a comprehensive software system that integrates all the hospital's operations into a single platform, enabling healthcare providers to manage patient data efficiently and securely.

The proposed HMS project seeks to address some of the challenges faced by healthcare providers, such as managing patient records, scheduling appointments, and managing finances. The system will provide a centralized platform that allows healthcare providers to access patient records, view appointment schedules, and manage billing and inventory. The system will be developed using a client-server architecture, with a web-based user interface that healthcare providers can access from any device with internet connectivity.

The HMS project will consist of several modules that perform various functions. The patient registration module will allow patients to register at the hospital by providing their personal details, medical history, and insurance information. The appointment scheduling module will enable patients to book appointments with doctors, and doctors to manage their schedules and view patient appointments. The laboratory and radiology module will provide a platform for healthcare providers to manage diagnostic tests and imaging procedures. The pharmacy management module will manage the hospital's medication inventory and provide real-time updates on stock levels. The billing module will generate bills for patient services, process insurance claims, and manage financial transactions.

The HMS project will utilize the latest technologies to ensure that the system is secure, scalable, and easy to use. The system will incorporate advanced security features, such as user authentication, data encryption, and access controls, to protect patient data from unauthorized access. The system will also be designed to be scalable, allowing healthcare providers to add more modules as needed to meet the hospital's evolving needs.

### PROBLEM STATEMENT

The healthcare industry is facing numerous challenges that affect the quality of patient care, efficiency, and cost-effectiveness. One of the primary challenges faced by healthcare providers is managing patient data and the day-to-day operations of the hospital. Traditional paper-based systems are often prone to errors, time-consuming, and challenging to manage, leading to delays in patient care, mismanagement of resources, and increased costs.

The problem statement of the Hospital Management System (HMS) project is to address these challenges by developing a comprehensive software system that integrates all the hospital's operations into a single platform, enabling healthcare providers to manage patient data efficiently and securely. The proposed HMS project seeks to provide a centralized platform that allows healthcare providers to access patient records, view appointment schedules, and manage billing and inventory. The system will be developed using a client-server architecture, with a web-based user interface that healthcare providers can access from any device with internet connectivity.

The traditional system of managing hospital operations is cumbersome and requires a lot of manual labor, which results in errors, delay in patient care, and increased costs. This outdated system also makes it challenging to share patient data across different departments, which can result in miscommunication and inefficiencies. Additionally, it can be difficult to manage the hospital's resources, including equipment, inventory, and medication.

To address these challenges, the proposed HMS project will provide healthcare providers with an efficient and secure system that is easy to use, scalable, and cost-effective. The system will be designed to streamline patient care processes, improve resource management, and reduce operational costs, making it a valuable tool for healthcare providers. The HMS project aims to provide a comprehensive solution that can address the challenges faced by healthcare providers in managing patient data and hospital operations.

### OBJECTIVES

The Hospital Management System (HMS) project aims to develop a comprehensive software system that integrates all the hospital's operations into a single platform, enabling healthcare providers to manage patient data efficiently and securely. The objectives of the HMS project are:

1. Efficient Patient Management: The HMS project aims to streamline the patient management process by providing healthcare providers with an efficient and secure platform to manage patient records, appointments, and medical history.
2. Resource Management: The project aims to improve the management of hospital resources, including equipment, inventory, and medication, by providing real-time updates on stock levels, usage patterns, and maintenance schedules.
3. Cost-effectiveness: The project aims to reduce operational costs by automating routine tasks, optimizing resource utilization, and reducing errors and inefficiencies in the healthcare delivery process.
4. Data Security: The project aims to ensure the security of patient data by incorporating advanced security features, such as user authentication, data encryption, and access controls, to protect patient data from unauthorized access.
5. Scalability: The project aims to be scalable, allowing healthcare providers to add more modules as needed to meet the hospital's evolving needs.
6. Improved Patient Care: The project aims to improve patient care by providing healthcare providers with real-time access to patient records, appointment schedules, and medical history, enabling them to provide timely and accurate care to patients.
7. Streamlined Billing and Insurance Processes: The project aims to streamline the billing and insurance processes, reducing errors and inefficiencies, and enabling healthcare providers to generate bills for patient services, process insurance claims, and manage financial transactions.
8. Regulatory Compliance: The project aims to ensure regulatory compliance by adhering to industry standards, such as HIPAA, ensuring the privacy and security of patient data.

### SCOPE AND APPLICATIONS

The scope and applications of the Hospital Management System (HMS) project are vast, and it can benefit healthcare providers, patients, and other stakeholders in the healthcare industry. Some of the significant scopes and applications of the HMS project are:

1. Patient Management: The HMS project provides healthcare providers with a comprehensive platform for managing patient data, including medical history, appointments, and test results, enabling them to provide timely and accurate care to patients.
2. Resource Management: The project aims to improve the management of hospital resources, including equipment, inventory, and medication, by providing real-time updates on stock levels, usage patterns, and maintenance schedules.
3. Billing and Insurance Management: The project provides a streamlined process for managing billing and insurance claims, enabling healthcare providers to generate bills for patient services, process insurance claims, and manage financial transactions.
4. Employee Management: The project provides a platform for managing employee data, including their schedules, salaries, and benefits, making it easier to manage staff and ensure compliance with labor laws.
5. Reporting and Analytics: The project provides a platform for generating reports and analytics, enabling healthcare providers to track key performance indicators, identify areas for improvement, and make informed decisions based on data-driven insights.
6. Telemedicine: The project's platform can be integrated with telemedicine solutions, enabling healthcare providers to offer remote consultations, diagnosis, and treatment to patients, improving access to healthcare services.
7. Mobile Applications: The project's platform can be accessed through mobile applications, enabling healthcare providers to manage patient data and other hospital operations from their mobile devices.
8. Regulatory Compliance: The project ensures regulatory compliance by adhering to industry standards, such as HIPAA, ensuring the privacy and security of patient data.

### GENERAL AND UNIQUE SERVICES IN THE DATABASE APPLICATION

The Hospital Management System has always been one of the most critical solutions to be implemented in a hospital. An advanced cloud based HMS can significantly boost the productivity of a hospital and save up to 50% of operational costs. A reliable hospital management system can give you more detailed insights and empower you to make better decisions in the future. But it won’t be easy to get one until you become aware of a few features of HIMS that are necessary for any size hospital. During the investment decision on HMS, pick several issues that you think features of the hospital management system can fix. The decision you take here will help you not only achieve cost-saving but also save you from the false promises of several HMS providers.

GENERAL FEATURES :

*Patient side features:*

* There is a separate interface for patients. Patients have a separate login.
* Patients can book appointments. Patients can view/update/cancel already booked appointments if necessary.
* Patients are able to see complete diagnoses, prescriptions, and medical histories.

*Doctor side features:*

* There is a separate interface for doctors. Doctors have a separate login.
* Doctors are able to access patient history and profile, and add to patient history.
* Doctors are able to give diagnosis and prescriptions.

UNIQUE FEATURES:

*Patient side features:*

* Patients can enter their previous medical history.
* Canceled appointments create free slots for other patients.
* The system avoids clashes of appointments with other patients. Each patient is therefore ensured his/her slot.
* Patient medical history is only available to the doctor with whom the appointment is booked to ensure privacy.

*Doctor side features:*

* The system takes into consideration doctor schedules and does not allow appointments when a doctor is already busy or has a break.
* Doctors are able to modify diagnosis and prescriptions.

### SOFTWARE REQUIREMENTS SPECIFICATION

The Hospital Management System (HMS) project is designed to automate and streamline hospital operations, including patient management, resource management, billing and insurance management, employee management, reporting and analytics, telemedicine, and regulatory compliance. This Software Requirements Specification (SRS) document outlines the functional and non-functional requirements of the HMS project.

Functional Requirements:

### Patient Management:

* The system must allow healthcare providers to create and maintain patient records, including demographic information, medical history, allergies, and medications.
* The system must allow healthcare providers to schedule appointments, including booking, rescheduling, and canceling appointments.
* The system must allow healthcare providers to manage patient tests, including ordering, tracking, and retrieving test results.
* The system must allow healthcare providers to manage patient admissions and discharges, including room assignments, bed allocation, and discharge summaries.

### Resource Management:

* The system must allow healthcare providers to manage hospital resources, including equipment, inventory, and medication.
* The system must allow healthcare providers to track resource usage, including stock levels, usage patterns, and maintenance schedules.
* The system must allow healthcare providers to generate purchase orders, receive goods, and manage invoices related to hospital resources.

### Billing and Insurance Management:

* The system must allow healthcare providers to generate bills for patient services, including consultation fees, medication costs, and laboratory tests.
* The system must allow healthcare providers to process insurance claims, including verifying patient eligibility, submitting claims, and tracking claim status.
* The system must allow healthcare providers to manage financial transactions, including recording payments, issuing refunds, and generating financial reports.

### Employee Management:

* The system must allow healthcare providers to manage employee data, including their schedules, salaries, and benefits.
* The system must allow healthcare providers to track employee attendance, including leave requests, sick days, and overtime hours.
* The system must allow healthcare providers to manage employee performance, including performance evaluations, promotions, and disciplinary actions.

### Reporting and Analytics:

* The system must allow healthcare providers to generate reports and analytics, including patient statistics, resource usage, financial reports, and regulatory compliance reports.
* The system must allow healthcare providers to customize reports and analytics based on user preferences, including data filters, visualization options, and export formats.

### Telemedicine:

* The system must integrate with telemedicine solutions, enabling healthcare providers to offer remote consultations, diagnosis, and treatment to patients.
* The system must allow healthcare providers to manage telemedicine appointments, including booking, rescheduling, and canceling appointments.
* The system must allow healthcare providers to record telemedicine sessions, including patient data, clinical notes, and billing information.

Non-functional Requirements:

### Usability:

* The system must have a user-friendly interface, allowing healthcare providers to access and manage patient data and hospital operations with ease.
* The system must have a responsive design, allowing healthcare providers to access the system from multiple devices, including desktops, laptops, tablets, and mobile phones.

### Performance:

* The system must have high availability, ensuring that healthcare providers can access patient data and hospital operations at all times.
* The system must have fast response times, allowing healthcare providers to perform tasks quickly and efficiently.

### Security:

* The system must comply with industry standards, including HIPAA, ensuring the privacy and security of patient data.
* The system must have role-based access control, allowing healthcare providers to access patient data and hospital operations based on their job responsibilities.
* The system must have audit trail capabilities, allowing healthcare providers to track user activity and detect unauthorized access.

The Hospital Management System (HMS) project has many functional and non-functional requirements, including patient management, resource management, billing and insurance management, employee management, reporting and analytics, telemedicine, usability, performance, and security.

## CHAPTER 2: LITERATURE SURVEY

A literature survey on hospital management systems reveals a significant amount of research and publications on the topic. The following are some key findings from the literature survey:

1. Hospital management systems have been studied extensively in the past decade due to their potential to improve patient outcomes and reduce costs. Researchers have explored various aspects of hospital management systems, including design, implementation, evaluation, and impact on patient care.
2. Hospital management systems have been found to improve hospital operations and patient outcomes. A study by Zeynep et al. (2020) found that the use of hospital management systems led to reduced waiting times, increased patient satisfaction, and improved clinical outcomes.
3. Implementation challenges of hospital management systems have been identified in the literature, including lack of user acceptance, insufficient training, and data integration issues. These challenges can hinder the successful implementation of hospital management systems and reduce their effectiveness.
4. The use of electronic medical records (EMR) has been found to improve patient care outcomes. EMRs allow healthcare providers to access patient information in real-time, reducing errors, improving coordination of care, and reducing healthcare costs. A study by Zhou et al. (2019) found that EMRs improved patient outcomes, including reduced length of stay and decreased mortality rates.
5. The use of mobile health (mHealth) technology in hospital management systems has been explored in recent years. mHealth technology allows healthcare providers to access patient data on their mobile devices, improving care coordination and communication. A study by Liu et al. (2020) found that the use of mHealth technology improved patient outcomes and reduced healthcare costs.
6. The literature also highlights the importance of data security and privacy in hospital management systems. Hospital management systems can be vulnerable to cyber-attacks, which can compromise patient data and hospital operations. Therefore, the implementation of robust security measures is essential to protect patient data and ensure compliance with regulatory requirements.

In conclusion, the literature survey reveals that hospital management systems have significant potential to improve patient outcomes and hospital operations. However, their successful implementation and effectiveness depend on various factors, including user acceptance, training, data integration, and data security. Further research is needed to address these challenges and improve the design and implementation of hospital management systems.

### EXISTING SYSTEM

The existing system for hospital management varies depending on the hospital and the location. Some hospitals use manual systems, while others use electronic systems. The manual system involves paper-based records and documentation, which are often cumbersome, time-consuming, and prone to errors.

In contrast, electronic systems automate hospital operations, streamline workflows, and provide real-time access to patient data and hospital operations. These electronic systems include Hospital Information Systems (HIS), Electronic Medical Records (EMR), and Practice Management Systems (PMS).

HIS is a comprehensive system that manages all aspects of a hospital, including patient registration, appointment scheduling, laboratory tests, radiology, pharmacy, billing, and reporting. EMR is a system that digitizes and stores patient medical records, including diagnosis, treatment, medication, and laboratory results. PMS is a system that manages administrative tasks, including patient billing, insurance claims, and financial reporting.

Despite the benefits of electronic systems, some hospitals still use manual systems or outdated electronic systems that do not meet their current needs. These outdated systems may lack essential features, be incompatible with other systems, or have poor usability and performance. As a result, hospitals may struggle to provide quality care, optimize resources, and meet regulatory requirements.

In summary, the existing system for hospital management varies widely, with some hospitals using manual systems, while others use electronic systems. However, there is a need for hospitals to upgrade their systems to meet current needs and provide quality care.

### COMPARISON OF EXISTING VS PROPOSED SYSTEM

Existing systems in hospital management vary greatly, but they are generally characterized by manual processes or outdated electronic systems that lack essential features and are incompatible with modern technology. The proposed system, on the other hand, is a modern, efficient, and comprehensive Hospital Management System that automates hospital operations and provides real-time access to patient data and hospital operations.

The following are some of the differences between the existing and proposed systems:

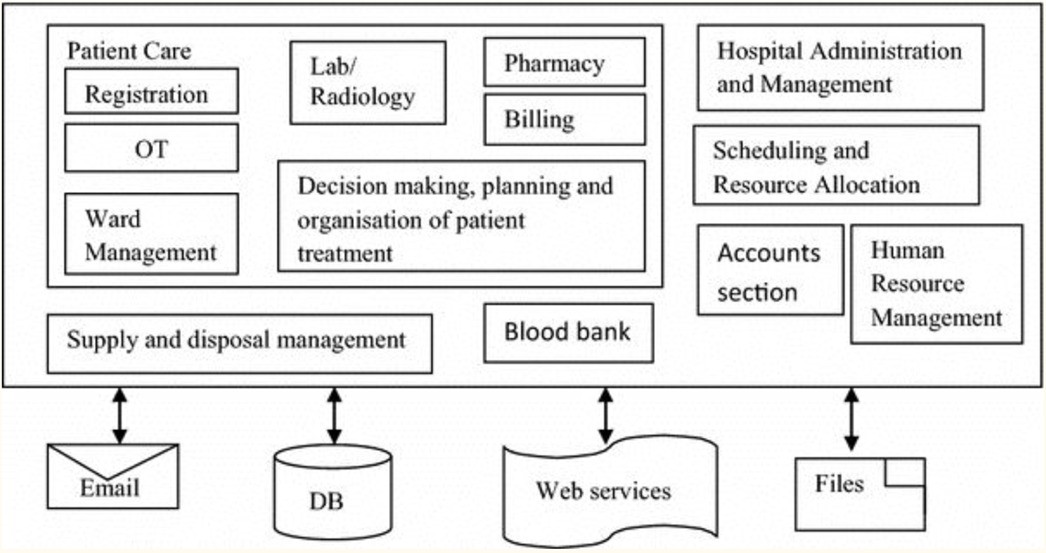
1. Automation: The existing system relies heavily on manual processes, which are time-consuming and prone to errors. In contrast, the proposed system automates most of the hospital's operations, including patient registration, appointment scheduling, laboratory tests, radiology, pharmacy, billing, and reporting. This automation increases efficiency, accuracy, and speed of operations.
2. Accessibility: The existing system may have limited access to patient data and hospital operations, making it difficult for healthcare providers to make informed decisions. In contrast, the proposed system provides real-time access to patient data and hospital operations, enabling healthcare providers to make timely and informed decisions.
3. Integration: The existing system may be incompatible with other systems, making it difficult to share data and collaborate with other healthcare providers. In contrast, the proposed system is designed to be compatible with other healthcare systems, enabling seamless data sharing and collaboration.
4. Security: The existing system may have weak security measures, putting patient data at risk of theft or unauthorized access. In contrast, the proposed system has robust security measures, including encryption and user authentication, to protect patient data from unauthorized access.
5. Scalability: The existing system may be difficult to scale up as the hospital grows or changes. In contrast, the proposed system is designed to be scalable, accommodating changes in the hospital's size and operations.

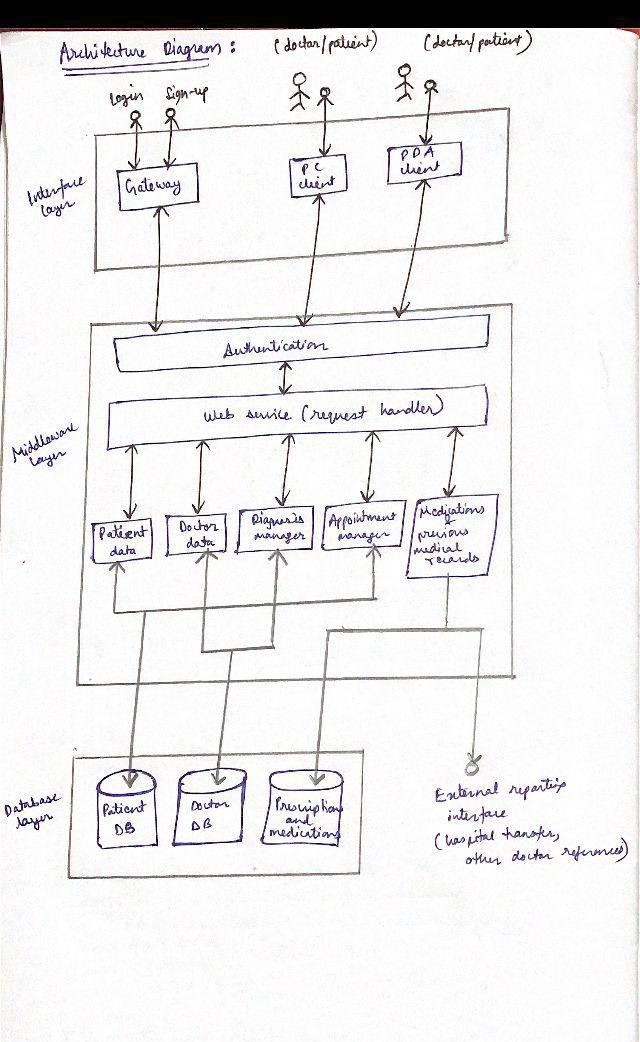
In summary, the proposed system is a significant improvement over the existing system in hospital management. It offers automation, accessibility, integration, security, and scalability, which are essential for providing quality care and meeting regulatory requirements.

## CHAPTER 3: SYSTEM ARCHITECTURE

**AND DESIGN**

### Architecture Diagram:





The Interface layer provides the application with a program with which it can access, communicate and configure the middleware component.

* In the gateway we have a login and sign up feature where the users can sign up with existing credentials or sign up with completely new credentials by creating them first.
* The PC Client and the PDA Client are present, that is both mobile, web and other devices like tablets and iPads will be supported.
* All clients will have to go through the authentication, be it a doctor or a patient. Only upon successful authentication, the patient or the doctor can gain access to the

Hospital Management System interface.

The role of the middleware layer is to enable and ease access to those back-end resources. Middleware programs will typically provide a messaging service for applications to transfer data.

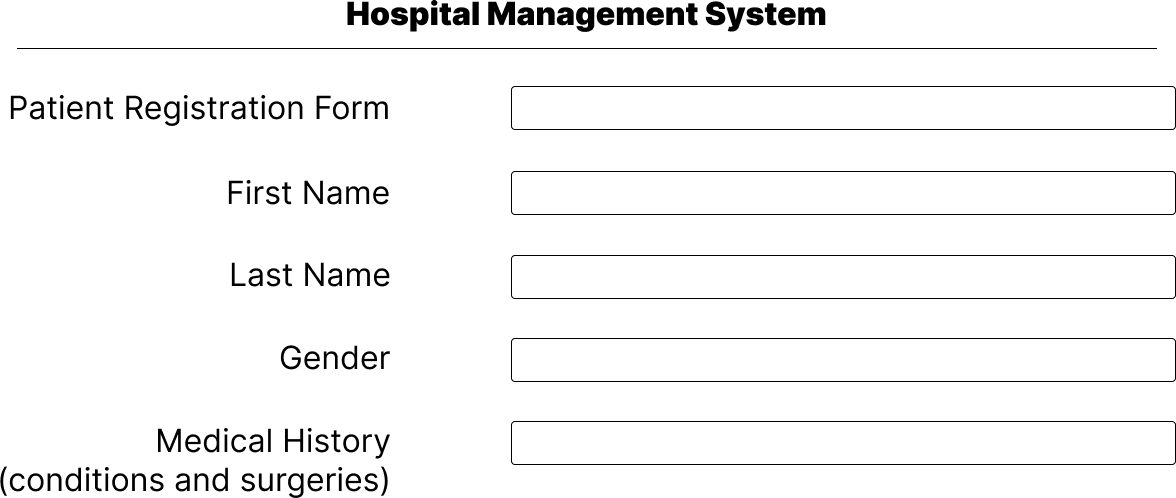
* The Middleware layer has the authentication feature.
* The web service is also known as the request handler which displays the array of available services once the authentication is successful.
* Further we have the Patient Data and the Doctor data which is maintained according to the data entered, modified and retrieved by the users.
* It also works for the process of Diagnosis Manager.
* To book and manage appointments of patients and doctors, where the patients can easily book, modify and cancel their appointments
* Manages medications and previous medical records.

The database layer consists of technologies that give your Web and mobile applications the ability to store and retrieve data. Databases organize data into tables and create relationships between the data in those tables. It consists:

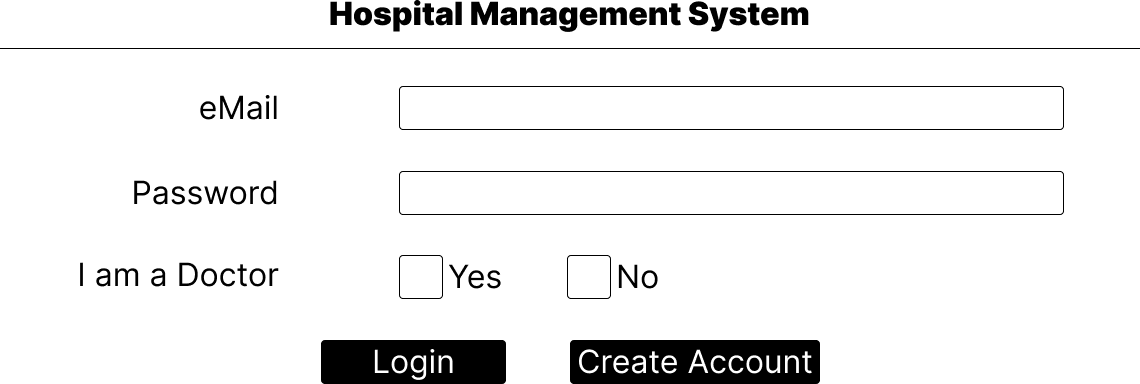
* The Patient Database
* The Doctor Database
* Prescription and Medication
* Patient data and Appointment manager is included under the patient database.
* Doctor data and Diagnosis manager comes under the doctor database.
* Prescription and medication includes medication and other previous medical records.
* Here, it also contains External Reporting Interface which includes any hospital transfer or other doctor references as per the patient’s health and choice.

### Front-End UI

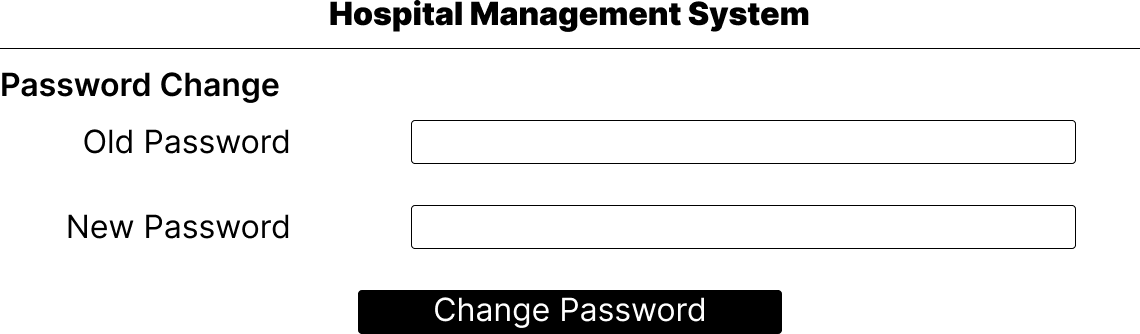
**Screen-1**



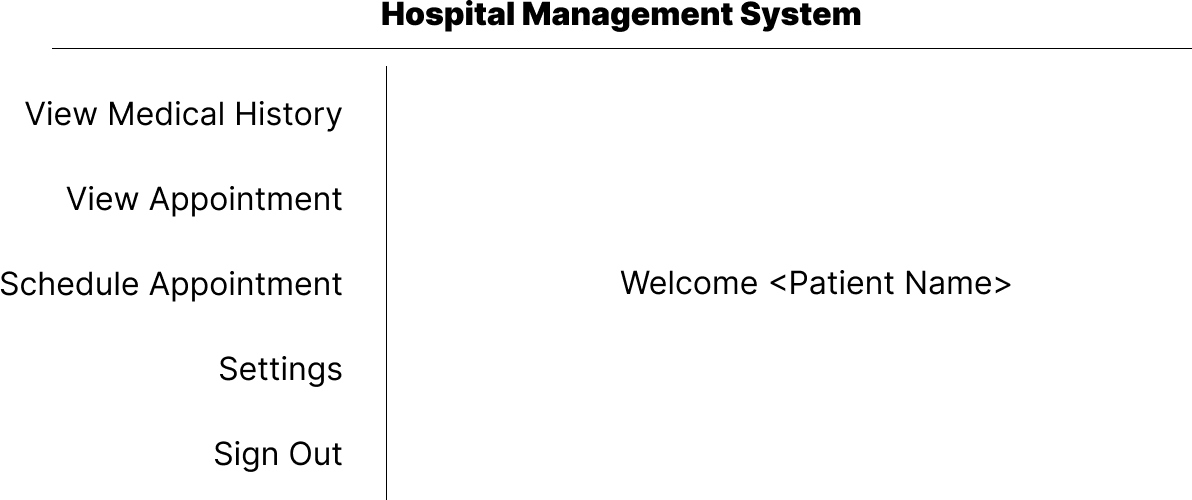
### Screen-2



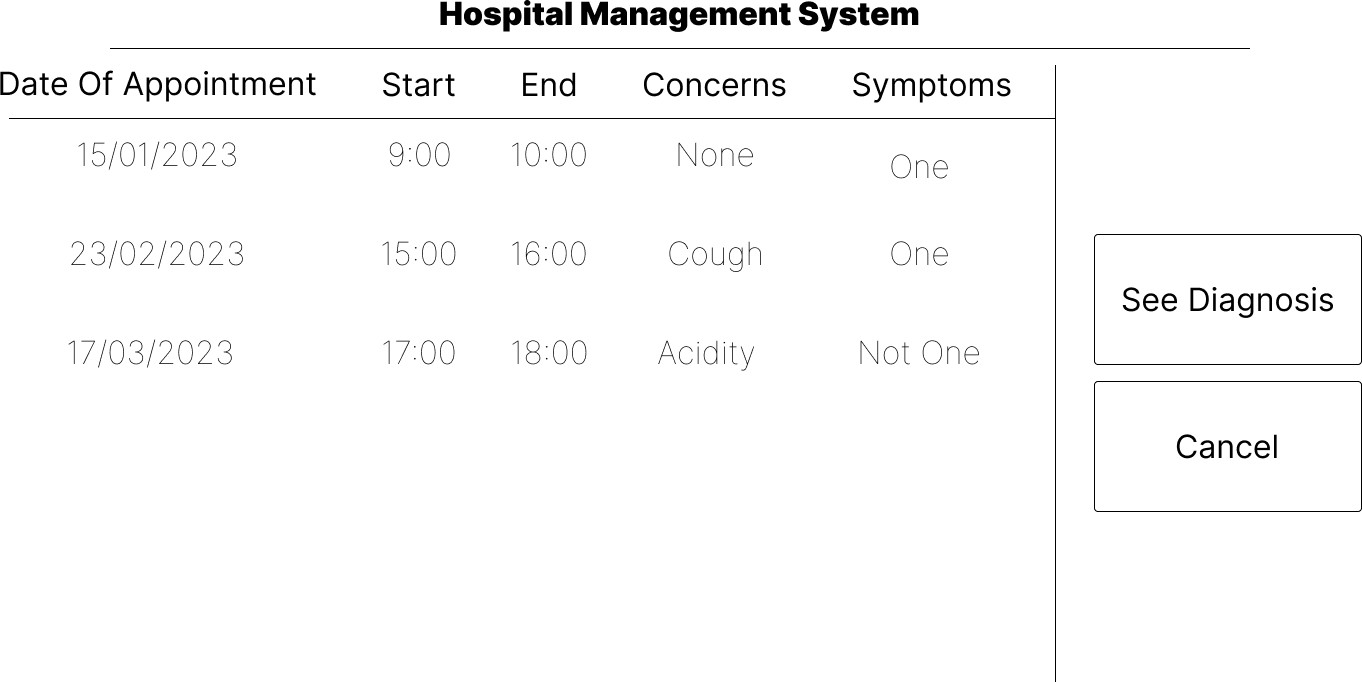
**Screen-3**



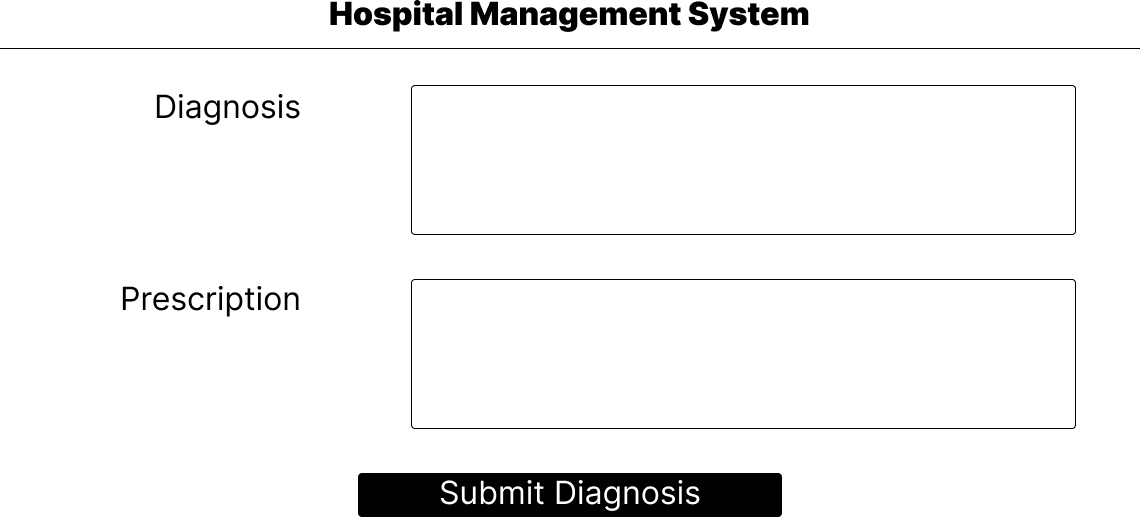
### Screen-4



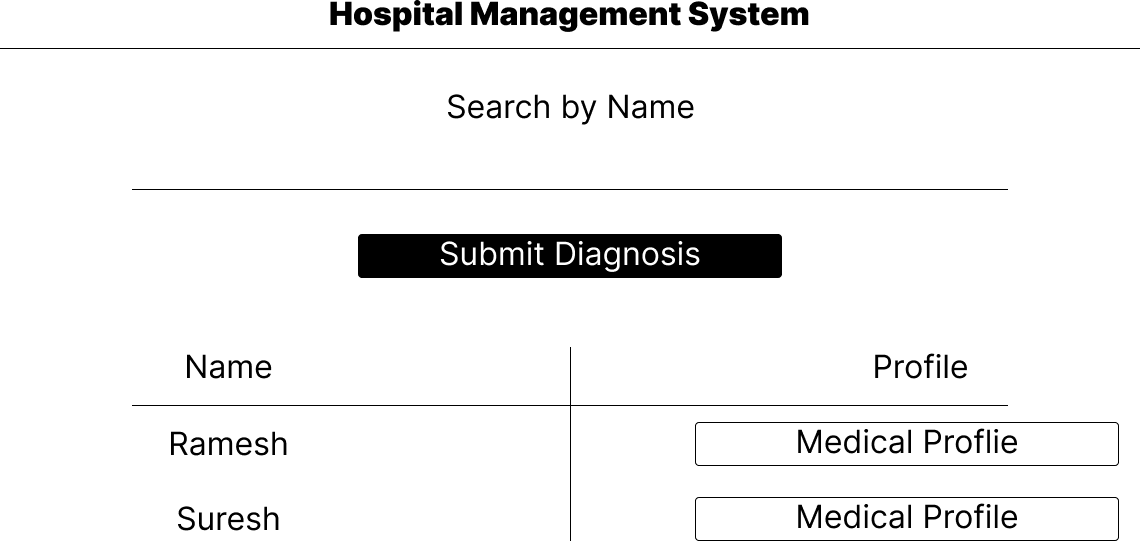
**Screen-5**



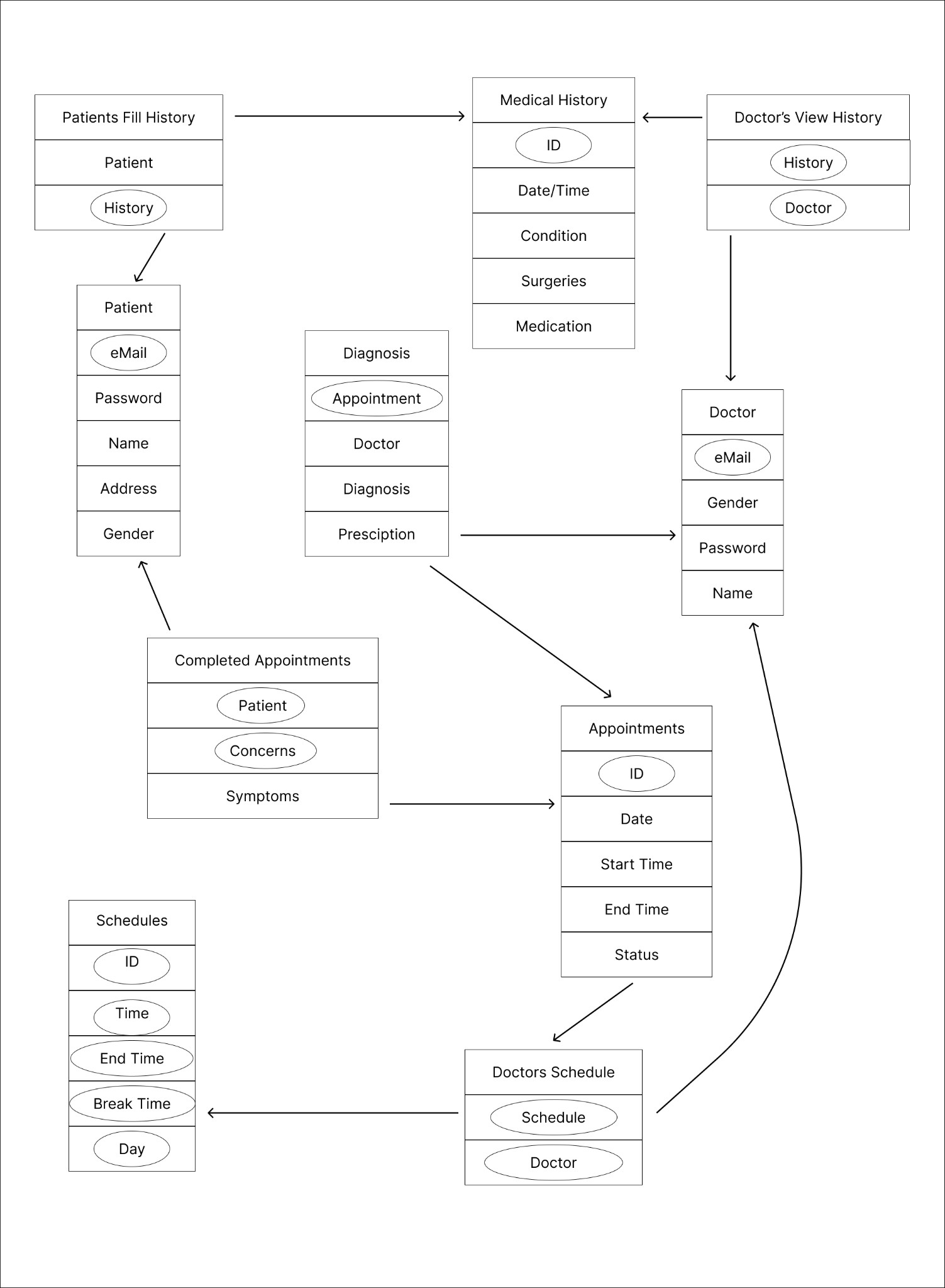
### Screen-6



**Screen-7**

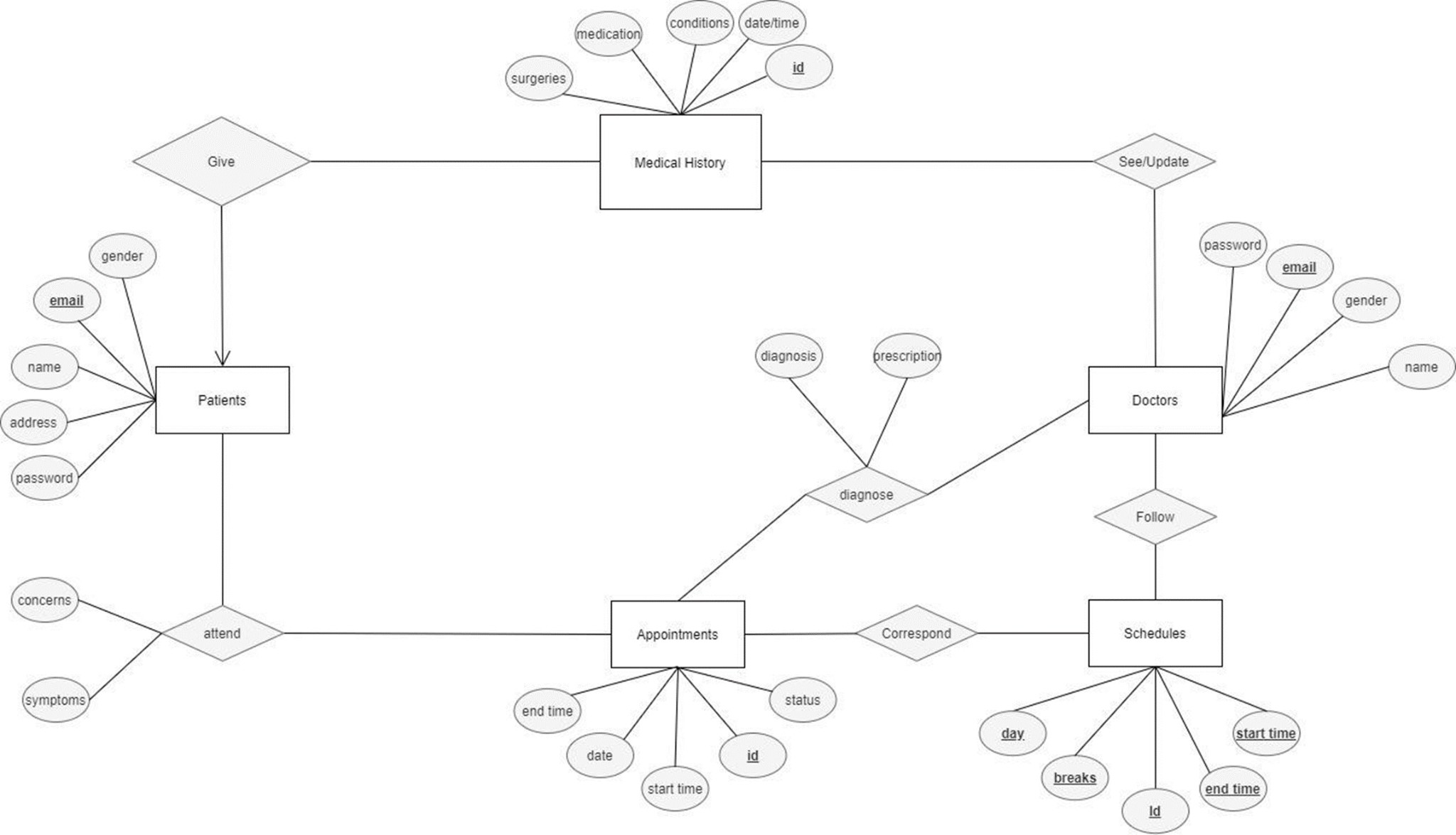


### Back End Database Management System:



* 1. **ER Diagram & Use Case Diagram:**

### ER Diagram:



The above shown ER diagram has the following entities:

* Medical History: Id, date/time, conditions, medication and surgeries.
* Doctors: Email, password, gender and name.
* Schedules: Start time, end time, Id, breaks, and day.
* Appointments: Id, status, start time, date and end time.
* Patients: Email, gender, name, address and password. The above ER diagram has the following relationships:
* Give: Patients give the medical history.
* See/Update: Doctors see or update the medical history of the patient.
* Follow: Doctors follow schedules.
* Correspond: Appointments correspond to schedules.
* Diagnose: Doctors diagnose patients in the appointments.
* Attend: Patients attend the appointments

The first step is to identify the entity sets. As per the requirements, we will have some main

entities. For example, if we are required to observe which patient goes to which hospital or whether they have a previous record or not, or if you simply want to analyze the number of patients a doctor treats.

The second step is to map out the attributes of the entities, (including the identification of key attributes). The key attributes for each entity have been listed below:

Medical History: Id, date/time, conditions, medication, and surgeries. Doctors: email, password, gender, and name.

Schedules: start time, end time, Id, breaks, and day. Appointments: ID, status, start time, date, and end time. Patients: email, gender, name, address, and password.

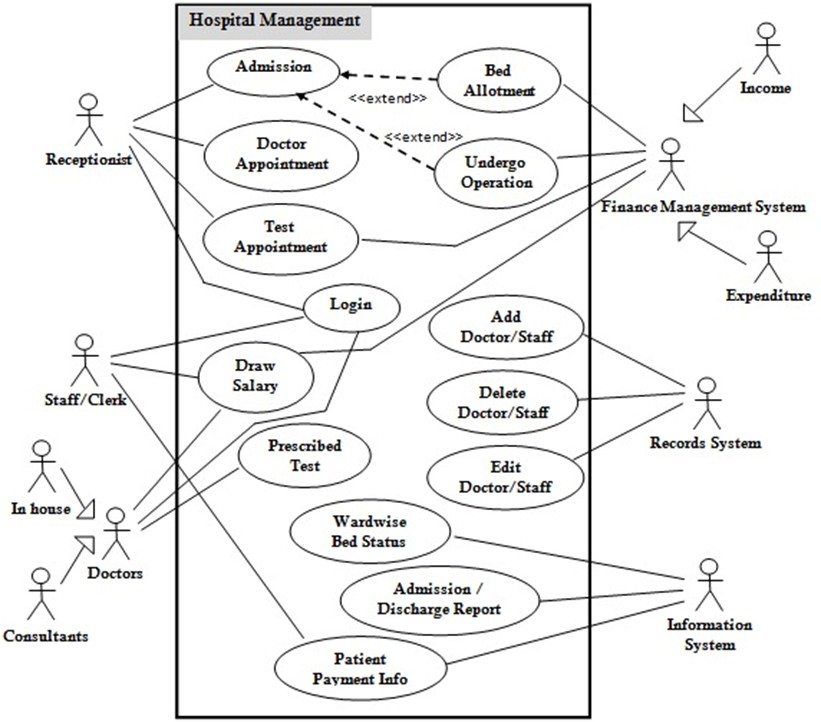
Identify the type of relationship that exists between the entities. This can be done by identifying primary and foreign keys. For example, if the hospital table makes a foreign key reference to the patient ID of the patient table, then both of them will be joined together.

Based on the cardinalities, you have to place the appropriate sign.

Once we have identified all the relationships, it is time to map out the lines.

* Since a hospital has multiple patients, it is a one-to-many relationship.
* Since a single hospital has many doctors, the relationship that exists is one-to-many.
* Since a doctor is associated with many patients, it is a one-to-many relationship.
* Since a single patient has multiple medical records, it is a one-to-many relationship. The last step is to combine all the relationships and draw a complete ER diagram.

### Use-Case Diagram:



A use case diagram is a visual representation of the interactions between actors (users) and the system to achieve specific goals or tasks. In the context of a hospital management system, a use case diagram would illustrate the various interactions between the hospital staff, patients, and the system to perform tasks related to hospital management. Here is an example of a use case diagram for a hospital management system:

In this diagram, there are three primary actors: the patient, the hospital staff, and the system administrator. The use case diagram shows how these actors interact with the system to achieve specific tasks.

1. Patient Use Cases: The patient can interact with the system to perform tasks such as registering, making appointments, viewing medical reports, and paying bills.
2. Hospital Staff Use Cases: The hospital staff can interact with the system to perform tasks such as managing patient records, scheduling appointments, ordering laboratory tests, administering medication, and generating reports.
3. System Administrator Use Cases: The system administrator can interact with the system to perform tasks such as managing user accounts, maintaining system security, and updating the system.

Each use case is represented as an oval shape in the diagram, and the lines connecting the actors and use cases show the interactions between them. For example, the patient actor can interact with the system to perform the 'Register' use case, which involves providing personal information and creating a patient record in the system.

Overall, a use case diagram for a hospital management system helps to illustrate the various interactions between the actors and the system to perform specific tasks, providing a clear and concise overview of the system's functionality.

## CHAPTER-4

**MODULES AND FUNCTIONALITIES**

### Modules:

* + - Patient registering on the system
    - Doctor registering on the system
    - Log In Screen
    - Password Reset Screen
    - Patient Home Screen
    - Patient Viewing History
    - Patient Viewing Appointments
    - Patient Scheduling Appointment
    - Doctor Home Screen
    - Doctor Viewing Appointment
    - Doctor Giving Diagnosis
    - Doctor Viewing Patient History

### Functionalities

A hospital management system (HMS) is a software application designed to help healthcare providers manage various aspects of hospital operations. Some of the key functionalities of an HMS include:

* + - 1. Patient Management: The HMS should have the capability to manage patient data, including patient registration, appointment scheduling, and medical history. The system should also allow for easy access to patient data for doctors, nurses, and other healthcare providers.
      2. Electronic Medical Records (EMR): The HMS should be able to store and manage electronic medical records (EMR) for all patients, including medical history, diagnosis, treatment plans, medication orders, and lab results.
      3. Billing and Payment: The HMS should be able to handle billing and payment processes, including insurance claims processing, invoice generation, and payment tracking.
      4. Inventory Management: The HMS should be able to manage hospital inventory, including medical supplies, drugs, and equipment. This includes tracking inventory levels, ordering supplies when necessary, and maintaining a record of inventory usage.
      5. Scheduling and Resource Management: The HMS should be able to manage hospital resources, including staff scheduling, room allocation, and equipment availability.
      6. Reporting and Analytics: The HMS should be able to generate reports and analytics on various aspects of hospital operations, including patient outcomes, resource utilization, and financial performance.
      7. Security and Compliance: The HMS should be able to ensure compliance with various regulatory

requirements, including data security, privacy, and confidentiality of patient information.

Overall, an HMS should provide healthcare providers with a comprehensive suite of tools to manage hospital operations efficiently, while also ensuring the highest quality of patient care.

### Connectivity used for Database Access:

Database connectivity acts as the communication interface between the software and the underlying database of the application.

In this project, we are using the relational database connectivity which is used to publish data from a relational database or to deliver data to a relational database. Relational database connection types use ODBC or native database drivers to access data at run time, and they use JDBC to access metadata at design time.

Any of the following connections can be used:

* + - Microsoft SQL Server. Connects to databases through ODBC or through the native
    - database driver.
    - Oracle. Connects to databases through the native database driver. (most probably we will use Oracle server connection as it is being implemented in the lab as well)
    - IBM DB2. Connects to databases through the native database driver.

### Tables

* + 1. *Administrator Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| a\_id | int(50 | Primary Key |
| a\_name | varchar(20) | Not Null |
| gender | varchar(10) | Not Null |

* + 1. *Doctor Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| Doctor\_id | int(5) | Primary Key |
| Doctor\_name | varchar(20) | Not Null |
| Dept | varchar(15) | Not Null |
| a\_id | int(5) | Foreign Key |

* + 1. *Staff Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| s\_name | varchar(15) | Not Null |
| s\_id | int(5) | Primary Key |
| NID | int(12) | Not Null |
| salary | int(5) | Not Null |
| a\_id | int(5) | Foreign Key |

* + 1. *Lab Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| lab\_no | int(5) | Primary Key |
| Patient\_id | int(5) | Not Null |
| weight | int | Not Null |
| Doctor\_id | int(5) | Foreign Key |
| date | Date/Time[6] | Not Null |
| category | varchar(15) | Not Null |
| patient\_type | varchar(15) | Not Null |
| amount | int(10) | Not Null |

* + 1. *Inpatient Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| Patient\_id | int(5) | Primary Key |
| name | varchar(20) | Not Null |
| gender | varchar(10) | Not Null |
| address | varchar(20) | Not Null |
| room\_no | int(5) | Not Null |
| date\_of\_admit | Date/Time[6] | Not Null |
| date\_of\_discharge | Date/Time[6] | Not Null |
| advance | int(10) | Not Null |
| lab\_no | int(5) | Foreign Key |
| Doctor\_id | int(5) | Foreign Key |

* + 1. *Outpatient Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| Patient\_id | int(5) | Primary Key |
| date | Date/Time | Not Null |
| lab\_no | int(5) | Foreign Key |

* + 1. *Room Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data Type | Relationships |
| room\_no | int(5) | Primary Key |
| room\_type | varchar(10) | Not Null |
| status | varchar(10) | Not Null |
| Patient\_id | int(5) | Foreign Key |

* + 1. *Bill Table:*

|  |  |  |
| --- | --- | --- |
| Fields | Data type | Relationship |
| bill\_no | int(50) | Primary Key |
| Patient\_id | int(5) | Foreign Key |
| patient\_type | Varchar(10) | Allow Null |
| doctor\_charge | int | Not Null |
| medicine\_charge | int | Not Null |
| room\_charge | int | Not Null |
| operation\_charge | int | Allow Null |
| number\_of\_days | int | Allow Null |
| nursing\_charge | int | Allow Null |
| advance | int | Allow Null |
| health\_card | Varchar(50) | Allow Null |
| lab\_charge | int | Allow Null |
| bill | int | Not Null |

# CHAPTER-5 CODING AND TESTING

### Frontend:

App.js

import React,{useEffect, useState} from "react"; import {

BrowserRouter as Router, Switch,

Route

} from "react-router-dom"; import Home from './Home'; import LogIn from './logIn.js';

import CreateAccount from './CreateAccount.js'; import SchedulingAppt from './schedulingAppt.js'; import ViewMedHist from './ViewMedHist.js'; import DocHome from './DocHome.js';

import ViewOneHistory from './ViewOneHistory.js'; import Settings from './Settings.js';

import DocSettings from './DocSettings.js';

import PatientsViewAppt from './PatientsViewAppt.js'; import NoMedHistFound from './NoMedHistFound.js'; import DocViewAppt from './DocViewAppt.js';

import MakeDoc from './MakeDoc.js'; import Diagnose from './Diagnose.js';

import ShowDiagnoses from './ShowDiagnoses.js';

export default function App() {

let [component, setComponent] = useState(<LogIn />) useEffect(()=>{ fetch("http://localhost:3001/userInSession")

.then(res => res.json())

.then(res => {

let string\_json = JSON.stringify(res);

let email\_json = JSON.parse(string\_json); let email = email\_json.email;

let who = email\_json.who; if(email === ""){ setComponent(<LogIn />)

}

else{ if(who==="pat"){

setComponent(<Home />)

}

else{ setComponent(<DocHome />)

}

}

});

}, [])

return (

<Router>

<div>

<Switch>

<Route path="/NoMedHistFound">

<NoMedHistFound />

</Route>

<Route path="/MakeDoc">

<MakeDoc />

</Route>

<Route path="/Settings">

<Settings />

</Route>

<Route path="/MedHistView">

<ViewMedHist />

</Route>

<Route path="/scheduleAppt">

<SchedulingAppt />

</Route>

<Route path="/showDiagnoses/:id" render={props=><ShowDiagnoses {...props} />} />

<Route path="/Diagnose/:id" render={props=><Diagnose {...props} />} />

<Route name="onehist" path="/ViewOneHistory/:email" render={props=><ViewOneHistory {...props}

/>}/>

<Route path="/Home">

<Home />

</Route>

<Route path="/createAcc">

<CreateAccount />

</Route>

<Route path="/DocHome">

<DocHome />

</Route>

<Route path="/PatientsViewAppt">

<PatientsViewAppt />

</Route>

<Route path="/DocSettings">

<DocSettings />

</Route>

<Route path="/ApptList">

<DocViewAppt />

</Route>

<Route path="/">

{component}

</Route>

</Switch>

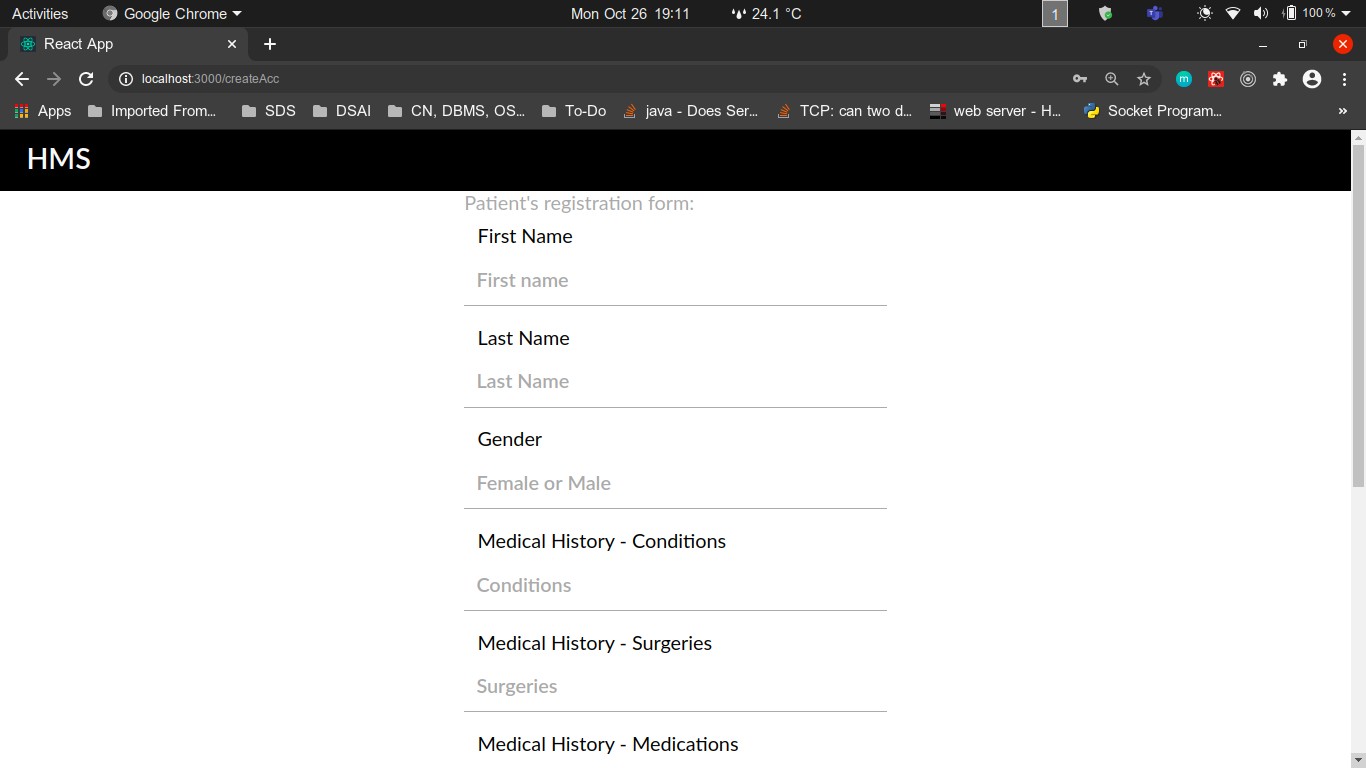
</div>

</Router>

);

}

### Patients registering on the system:



import React, { Component} from 'react'; import {

Box, Button, Heading, Grommet, FormField, Form,

Text

} from 'grommet';

import './App.css';

const theme = { global: { colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const AppBar = (props) => (

<Box tag='header' direction='row' align='center'

justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

export class CreateAccount extends Component { constuctor() {

}

render() {

return (

<Grommet theme={theme} full>

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Box fill align="center" justify="top">

<Box width="medium">

<Text color = "#AAAAAA">Patient's registration form:</Text>

<Form

onReset={event => console.log(event)} method="post"

onSubmit={({ value }) => { console.log("Submit", value);

fetch("http://localhost:3001/checkIfPatientExists?email=" + value.email)

.then(res => res.json())

.then(res => { console.log(res.data[0]);

if ((res.data[0])) {

window.alert("An account is already associated with that email."); console.log("no user found");

} else {

fetch("http://localhost:3001/makeAccount?name=" + value.firstName + "&lastname=" + value.lastName + "&email=" + value.email

+ "&password=" + value.password + "&address=" + value.address + "&gender=" + value.gender

+ "&conditions=" + value.conditions + "&medications=" + value.medications + "&surgeries=" + value.surgeries);

window.location = "/Home";

}

});

}}>

<FormField label="First Name" name="firstName"

placeholder="First name" required

validate={{ regexp: /^[a-z]/i }} />

<FormField label="Last Name" name="lastName" required

placeholder="Last Name" validate={{ regexp: /^[a-z]/i }} />

<FormField label="Gender" name="gender"

placeholder="Female or Male" required />

<FormField

label="Medical History - Conditions" name="conditions"

placeholder="Conditions"

/>

<FormField

label="Medical History - Surgeries" name="surgeries" placeholder="Surgeries"

/>

<FormField

label="Medical History - Medications" name="medications" placeholder="Medications"

/>

<FormField label="Address" name="address" placeholder="Address" required />

<FormField label="Email" name="email" type="email" placeholder="Email" required />

<FormField label="Password" name="password" placeholder="Password" required

validate={{ regexp: /^(?=.{8,})(?=.\*[0-9]{2})/, message: "@ least 8 characters containing 2 digits" }}

/>

<Box direction="row" align="center" >

<Button

style={{ textAlign: 'center' }} label="Cancel" fill="horizontal"

href="/" />

<Button

label="Sign Up" fill="horizontal" type="submit" primary />

</Box>

<Box

align="center" pad="small">

<Text>Are you a doctor?</Text>

<Button primary

label="I'm a doctor" href="/MakeDoc" />

</Box>

</Form>

</Box>

</Box>

</Grommet>

);

}

}

export default CreateAccount;

### Doctors registering on the system:

import React, { Component, useState } from 'react'; import {

Box, Button, Heading, Grommet, Grid, Text,

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const SidebarButton = ({ label, ...rest }) => (

<Button plain {...rest}>

{({ hover }) => (

<Box

background={hover ? "#DADADA" : undefined} pad={{ horizontal: "large", vertical: "medium" }}

>

<Text size="large">{label}</Text>

</Box>

)}

</Button>

);

const SidebarButtons = () => {

const [active, setActive] = useState(); return (

<Grommet full theme={theme}>

<Box fill direction="row">

<Box background="brand">

{["Appointments", "View Patients", "Settings", "Sign Out"].map(label => (

<SidebarButton key={label} label={label} active={label === active} onClick={() => {

if (label === "Appointments") { window.location = "/ApptList"

}

else if (label === "Sign Out") { fetch("http://localhost:3001/endSession"); window.location = "/"

}

else if (label === "Settings") { window.location = "/DocSettings"

}

else if (label === "View Patients") { window.location = "/MedHistView"

/>

))}

}

setActive(label);

}}

</Box>

</Box>

</Grommet>

);

};

export class DocHome extends Component { componentDidMount() {

}

render() {

const Header = () => (

<Box

tag='header' background='brand' pad='small' elevation='small' justify='between' direction='row'

align='center' flex={false}

style={{borderBottom:"1px solid grey"}}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3'

margin='none'>HMS</Heading></a>

</Box>

);

return (

<Grommet full={true} theme={theme}>

<Box align="left">

<Header/>

<Grid fill

rows={['auto', 'flex']}

columns={['auto', 'flex']} areas={[

{ name: 'sidebar', start: [0, 1], end: [0, 1] },

{ name: 'main', start: [1, 1], end: [1, 1] },

]}>

<Box gridArea="sidebar" width="small" animation={[

{ type: 'fadeIn', duration: 300 },

{ type: 'slideRight', size: 'xlarge', duration: 150 },

]}

>

<SidebarButtons />

</Box>

<Box

gridArea="main" justify="top" align="center">

<Box align="center" pad="large">

<Heading color="#000000">Welcome Doctor

</Heading>

</Box>

</Box>

</Grid>

</Box>

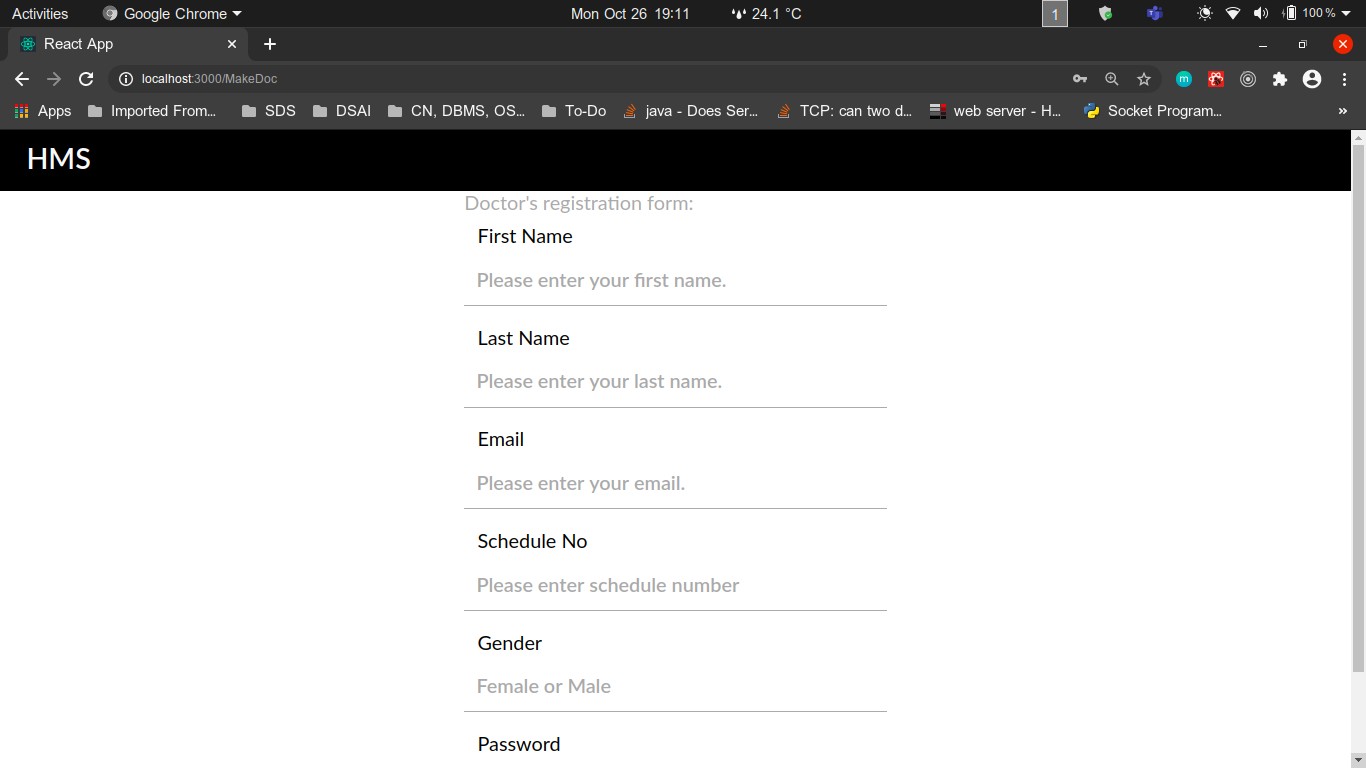
</Grommet>

);

}

}

export default DocHome;



Log in screen:

import React, { Component} from 'react'; import { withRouter } from 'react-router-dom'; import {

Box,

Button, Heading, Grommet, FormField, Form, CheckBox,

} from 'grommet';

import './App.css';

const theme = { global: { colors: {

brand: '#000000',

focus: "#000000",

active: "#000000",

},

font: {

family: 'Lato',

},

},

};

const AppBar = (props) => (

<Box tag='header' direction='row' align='center'

justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

class LogIn extends Component { state = { isDoctor: false }

constuctor() {

this.routeChange = this.routeChange.bind(this);

}

routeChange() {

let path = '/Home'; this.props.history.push(path);

}

render() {

const { isDoctor } = this.state; // If doctor, will query from doctor table

return (

<Grommet theme={theme} full>

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Box fill

align="center" justify="top" pad="medium">

<Box width="medium" pad="medium">

<Form

onReset={event => console.log(event)} onSubmit={({ value }) => { console.log("Submit", value);

if (value.isDoc === true) { fetch("http://localhost:3001/checkDoclogin?email=" + value.email + "&password=" + value.password)

.then(res => res.json())

.then(res => {

if (res.data.length === 0) { window.alert("Invalid Log In");

} else {

window.location = "DocHome"; console.log(res.data);

}

});

} else {

fetch("http://localhost:3001/checklogin?email=" + value.email + "&password=" + value.password)

.then(res => res.json())

.then(res => {

if (res.data.length === 0) { window.alert("Invalid Log In");

} else {

window.location = "/Home"; console.log(res.data);

}

});

}

}

}>

<FormField color="#00739D" label="Email" name="email" type="email"

placeholder = "Please enter your email." required />

<FormField color="#00739D" type='password' label="Password" name="password"

placeholder = "Please enter your password." required />

<FormField component={CheckBox} checked={isDoctor} margin="large" label="I'm a doctor" name="isDoc" onChange={(event) => {

this.setState({ isDoctor: event.target.checked })

}}

/>

<Box direction="column" align="center" >

<Button style={{ textAlign: 'center' , margin:'1rem'}} type="submit" label="Log In" fill="horizontal" primary />

<Button label="Create Account"

style={{ textAlign: 'center' , margin:'0.5rem'}} fill="horizontal"

href="/createAcc" />

</Box>

</Form>

</Box>

</Box>

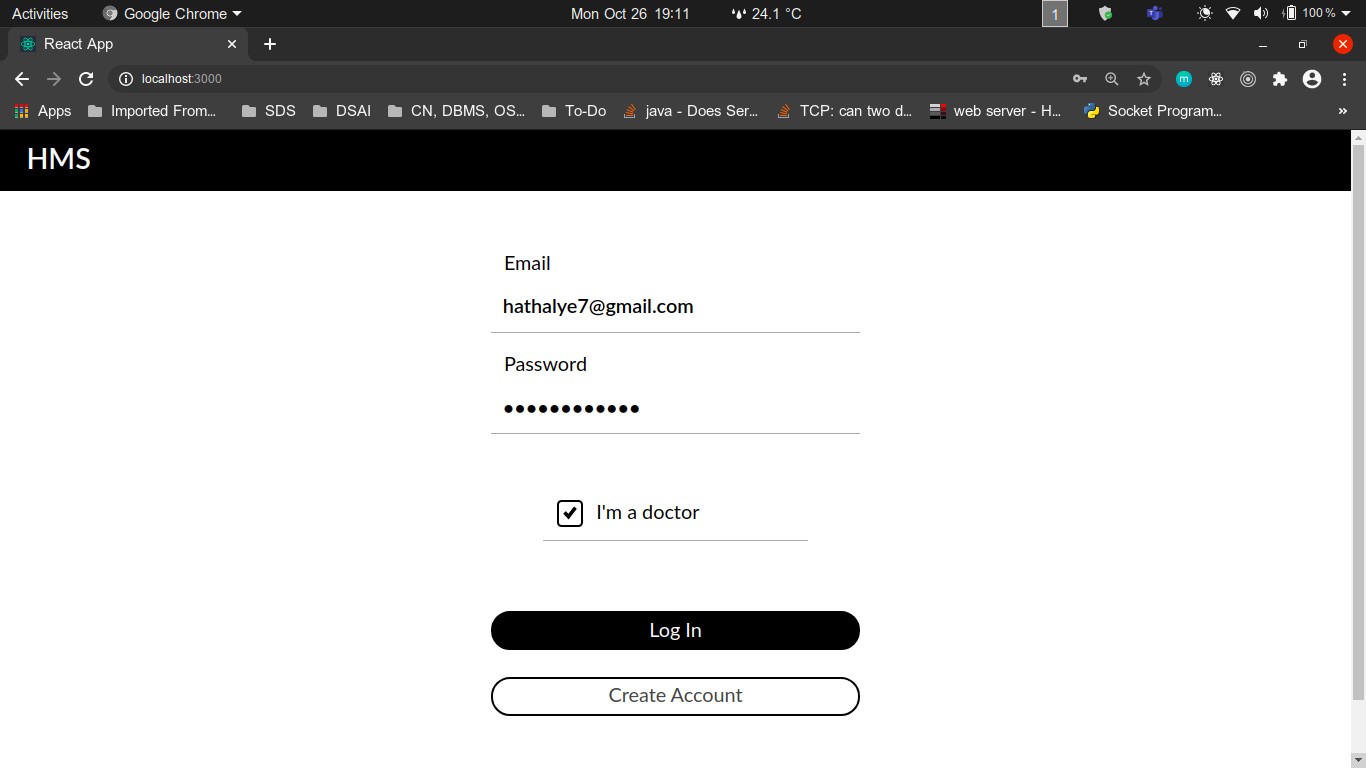
</Grommet>

);

}

}

export default withRouter(LogIn);



### Password Reset Screen:

import React, { Component} from 'react';

import { Box, Button, Heading, Grommet, FormField, Form,

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const AppBar = (props) => (

<Box

tag='header' direction='row' align='center' justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

export class Settings extends Component { constuctor() {

}

render() { return (

<Grommet theme={theme} full>

<Box >

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Box pad="small">

<Form

onSubmit={({ value }) => { let email\_in\_use = ""; console.log(value);

fetch("http://localhost:3001/userInSession")

.then(res => res.json())

.then(res => {

var string\_json = JSON.stringify(res);

var email\_json = JSON.parse(string\_json);

email\_in\_use = email\_json.email; console.log(email\_in\_use); console.log("eg");

fetch("http://localhost:3001/resetPasswordPatient?email=" +

email\_in\_use + "&oldPassword=" + value.oldPassword + "&newPassword=" + value.newPassword, {method: 'POST'})

.then(res => res.json())

.then(res => {

let didUpdate = res.data.affectedRows; if(didUpdate === 0) {

window.alert("Entered your old password incorrectly");

} else {

window.alert("Password Reset Successful");

}

});

});

}}>

<h3>Password Change</h3>

<FormField type='password' label="Old password" name="oldPassword" required

/>

<br />

<FormField

label="New password" name="newPassword" required

/>

<br />

<Button

type="submit" label="Change Password" primary

/>

</Form>

</Box>

</Box>

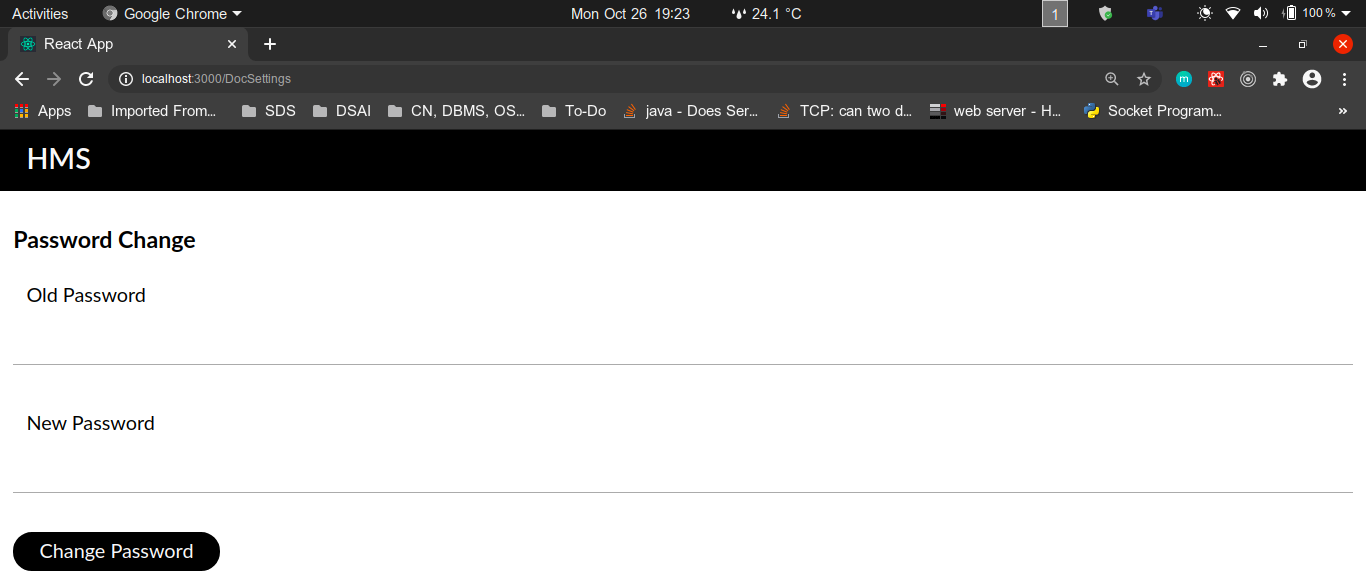
</Grommet>

);

}

}

export default Settings;



### Patient Home Screen:

import React, { Component, useState } from 'react'; import {

Box, Button, Heading, Grommet, Text, Grid

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const SidebarButton = ({ label, ...rest }) => (

<Button plain {...rest}>

{({ hover }) => (

<Box

background={hover ? "#DADADA" : undefined} pad={{ horizontal: "large", vertical: "medium" }}

>

<Text size="large">{label}</Text>

</Box>

)}

</Button>

);

const SidebarButtons = () => {

const [active, setActive] = useState(); return (

<Grommet full theme={theme}>

<Box fill direction="row">

<Box background="brand">

{["View Medical History", "View Appointments", "Schedule Appointment", "Settings", "Sign Out"].map(label => (

<SidebarButton key={label} label={label} active={label === active} onClick={() => {

if (label === "Schedule Appointment") {

window.location = "/scheduleAppt"

}

else if (label === "Sign Out") { fetch("http://localhost:3001/endSession"); window.location = "/"

}

else if (label === "View Appointments") { window.location = "/PatientsViewAppt"

}

else if (label === "View Medical History") { let email\_in\_use = ""; fetch("http://localhost:3001/userInSession")

.then(res => res.json())

.then(res => {

var string\_json = JSON.stringify(res);

var email\_json = JSON.parse(string\_json); email\_in\_use = email\_json.email; console.log("Email In Use Is :" + email\_in\_use);

window.location = "/ViewOneHistory/" + email\_in\_use;

});

}

else if (label === "Settings") { window.location = "/Settings"

}

setActive(label);

}}

/>

))}

</Box>

</Box>

</Grommet>

);

};

export class Home extends Component {

renderName = ({ name, email }) => <div key={email}>{name} {name}</div>

render() {

const Header = () => (

<Box tag='header'

background='brand' pad='small' elevation='small' justify='between' direction='row' align='center' flex={false}

style={{borderBottom:"1px solid grey"}}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</Box>

);

return (

<Grommet full={true} theme={theme} >

<Box fill={true}>

<Header/>

<Grid fill

rows={['auto', 'flex']}

columns={['auto', 'flex']} areas={[

{ name: 'sidebar', start: [0, 1], end: [0, 1] },

{ name: 'main', start: [1, 1], end: [1, 1] },

]}>

<Box gridArea="sidebar" width="small" animation={[

{ type: 'fadeIn', duration: 300 },

{ type: 'slideRight', size: 'xlarge', duration: 150 },

]}

>

<SidebarButtons />

</Box>

<Box gridArea="main" justify="top" align="center">

<Box align="center" pad="large">

<Heading color="#000000">Welcome Patient

</Heading>

</Box>

</Box>

</Grid>

</Box>

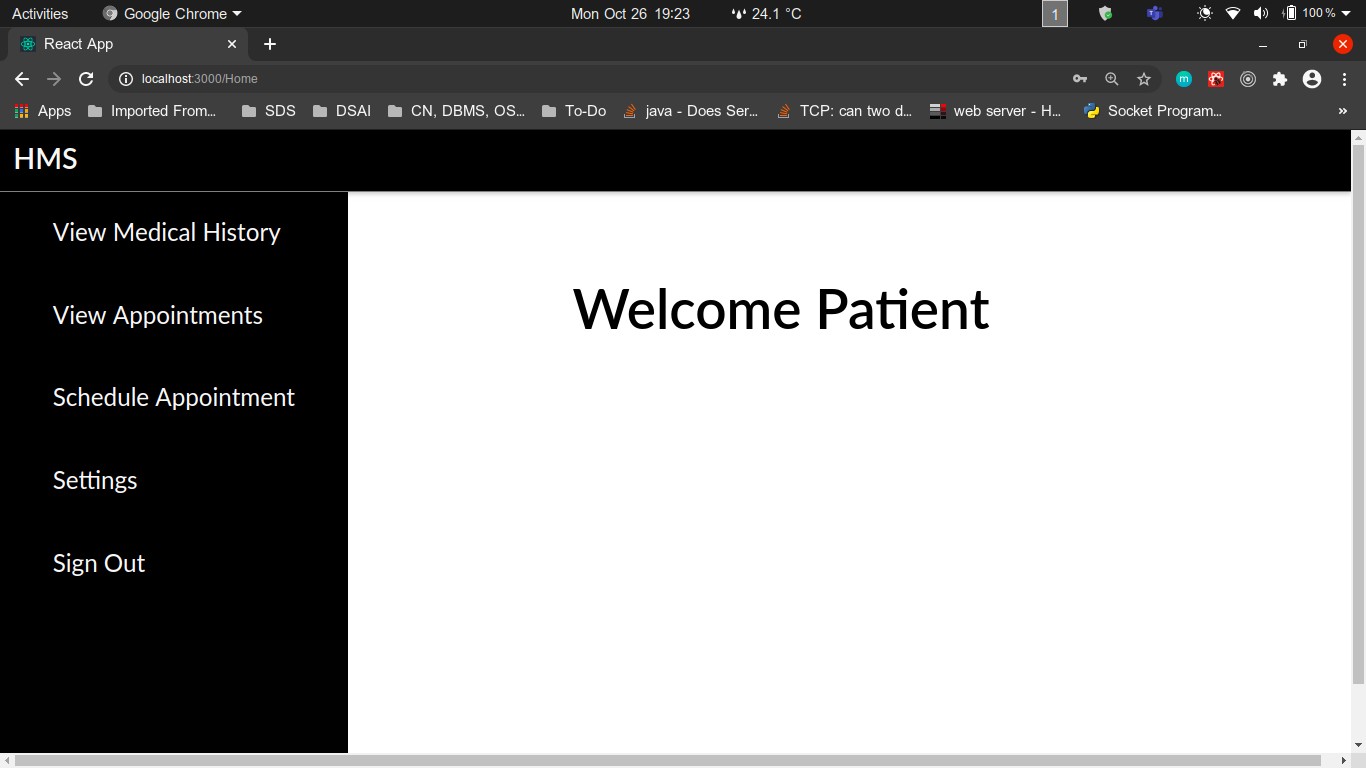
</Grommet>

);

}

}

export default Home;



### Patient Viewing History:

import React, { Component} from 'react';

import { Box, Heading, Grommet, Table, TableBody, TableCell, TableRow

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

export class ViewOneHistory extends Component { state = { medhiststate: [], medhiststate2: []} componentDidMount() {

const { email } = this.props.match.params; this.allDiagnoses(email); this.getHistory(email);

}

getHistory(value) {

let email = "'" + value + "'"; fetch('http://localhost:3001/OneHistory?patientEmail='+ email)

.then(res => res.json())

.then(res => this.setState({ medhiststate: res.data }));

}

allDiagnoses(value) {

let email = "'" + value + "'"; fetch('http://localhost:3001/allDiagnoses?patientEmail='+ email)

.then(res => res.json())

.then(res => this.setState({ medhiststate2: res.data }));

}

render() {

const { medhiststate } = this.state; const { medhiststate2 } = this.state; const Header = () => (

<Box

tag='header' background='brand' pad='small' elevation='small' justify='between' direction='row' align='center' flex={false}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3'

margin='none'>HMS</Heading></a>

</Box>

);

const Body = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

{medhiststate.map(patient =>

<Table>

<TableBody>

<TableRow>

<TableCell scope="row">

<strong>Name</strong>

</TableCell>

<TableCell>{patient.name}</TableCell>

<TableCell></TableCell>

<TableCell><strong>Email</strong></TableCell>

<TableCell>{patient.email}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

<strong>Gender</strong>

</TableCell>

<TableCell>

{patient.gender}

</TableCell>

<TableCell />

<TableCell>

<strong>Address</strong>

</TableCell>

<TableCell>{patient.address}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Conditions</strong>

</TableCell>

<TableCell>{patient.conditions}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Surgeries</strong>

</TableCell>

<TableCell>{patient.surgeries}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Medications</strong>

</TableCell>

<TableCell>{patient.medication}

</TableCell>

</TableRow>

</TableBody>

</Table>

)}

</div>

<hr />

</div>

);

const Body2 = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

{medhiststate2.map(patient =>

<div>

<Table>

<TableBody>

<TableRow>

<TableCell scope="row">

<strong>Date</strong>

</TableCell>

<TableCell>{patient.date.split('T')[0]}</TableCell>

<TableCell></TableCell>

<TableCell><strong>Doctor</strong></TableCell>

<TableCell>{patient.doctor}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

<strong>Concerns</strong>

</TableCell>

<TableCell>

{patient.concerns}

</TableCell>

<TableCell />

<TableCell>

<strong>Symptoms</strong>

</TableCell>

<TableCell>{patient.symptoms}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Diagnosis</strong>

</TableCell>

<TableCell>{patient.diagnosis}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Prescription</strong>

</TableCell>

<TableCell>{patient.prescription}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

</TableBody>

</Table>

<hr />

</div>

)}

</div>

</div>

);

return (

<Grommet full={true} theme={theme}>

<Box fill={true}>

<Header />

<Body />

<Body2 />

</Box>

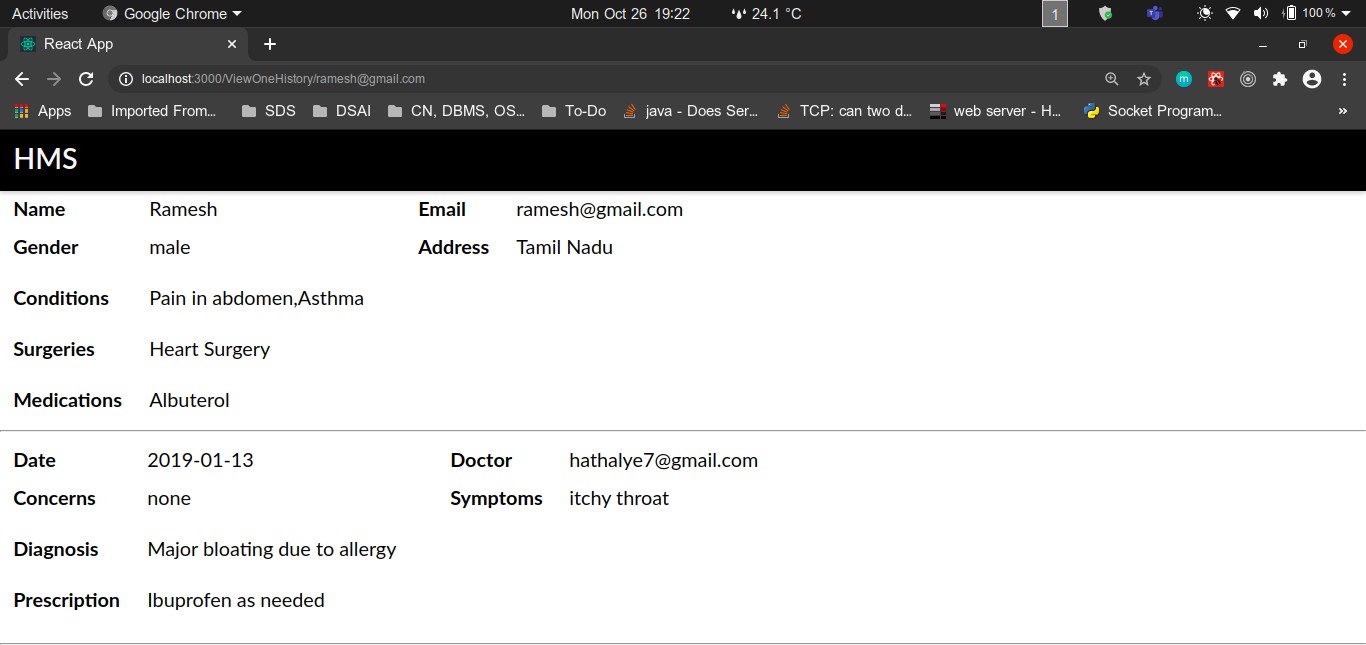
</Grommet>

);

}

}

export default ViewOneHistory;



### Patient Viewing Appointments

import React, { Component} from 'react';

import { Box, Heading, Grommet, Button

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const AppBar = (props) => (

<Box

tag='header' direction='row' align='center' justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

export class PatientsViewAppointments extends Component { state = { appointmentsState: [] }

componentDidMount() { this.getNames("");

}

getNames(value) {

let patName = value; console.log(patName); fetch("http://localhost:3001/userInSession")

.then(res => res.json())

.then(res => {

var string\_json = JSON.stringify(res);

var email\_json = JSON.parse(string\_json); let email\_in\_use = email\_json.email;

fetch('http://localhost:3001/patientViewAppt?email=' + email\_in\_use)

.then(res => res.json())

.then(res => {

this.setState({ appointmentsState: res.data });

});

});

}

render() {

const { appointmentsState } = this.state; const Body = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

<table className="table table-hover">

<thead>

<tr>

<th>Date of Appointment</th>

<th>Start Time</th>

<th>End Time</th>

<th>Concerns</th>

<th>Symptoms</th>

<th>Status</th>

</tr>

</thead>

<tbody>

{appointmentsState.map(patient =>

<tr key={patient.user}>

<td align="center" >

{new Date(patient.theDate).toLocaleDateString().substring(0, 10)}

</td>

<td align="center" >{patient.theStart.substring(0, 5)}</td>

<td align="center" >{patient.theEnd.substring(0, 5)}</td>

<td align="center">{patient.theConcerns} </td>

<td align="center">{patient.theSymptoms}</td>

<td align="center">{patient.status}</td>

<td>

<Button label="See Diagnosis" href={`/showDiagnoses/${patient.ID}`}

></Button>

</td>

<td>

{ patient.status==="NotDone"?

<Button label="Cancel"

onClick = {() => { fetch('http://localhost:3001/deleteAppt?uid='+ patient.ID) window.location.reload()

}}

></Button>

:

<Button label="Delete" onClick = {() => {

fetch('http://localhost:3001/deleteAppt?uid='+ patient.ID) window.location.reload()

}}

></Button>

}

</td>

</tr>

)}

</tbody>

</table>

</div>

</div>

);

return (

<Grommet theme={theme} full>

<Box >

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Body />

</Box>

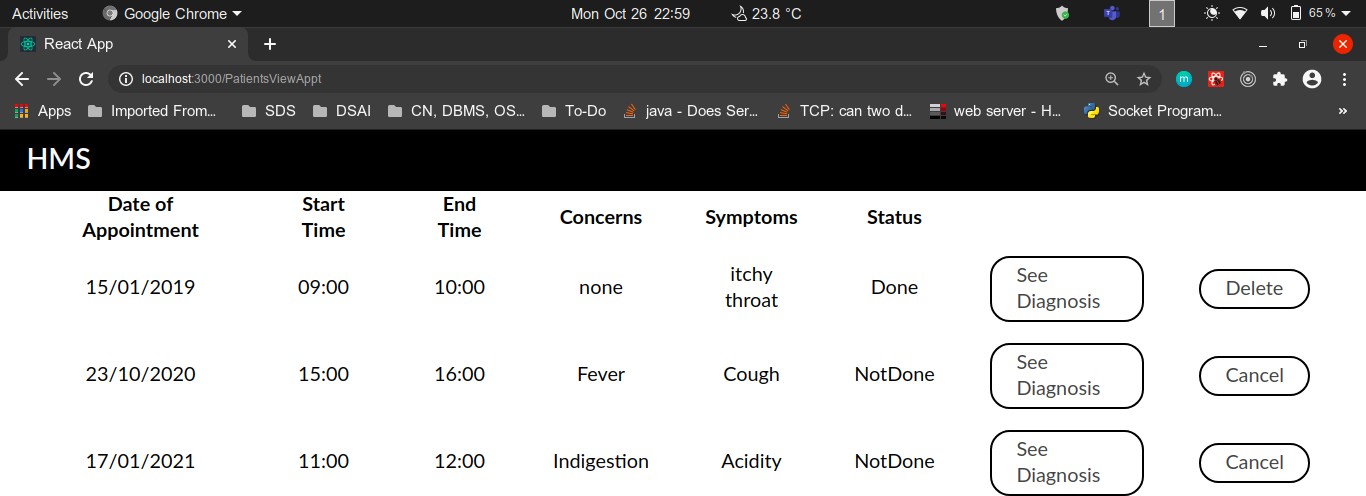
</Grommet>

);

}

}

export default PatientsViewAppointments;



### Patient Scheduling Appointment:

import React, { Component, useState, useEffect } from 'react'; import {

Schedule,

} from 'grommet-icons'; import {

Box, Button, Heading, Form, Text, TextArea, Grommet, Calendar,

DropButton, MaskedInput, Keyboard, Select

} from 'grommet'; import './App.css'; const theme = { global: {

colors: {

brand: '#000000',

focus: "#000000",

active: "#000000",

},

font: {

family: 'Lato',

},

},

};

var theDate; var theTime; var endTime;

var theConcerns; var theSymptoms; var theDoc;

const AppBar = (props) => (

<Box tag='header' direction='row' align='center'

justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

const DropContent = ({ date: initialDate, time: initialTime, onClose }) => { const [date, setDate] = React.useState();

const [time, setTime] = React.useState();

const close = () => { theDate = date; theTime = time;

//time is string, store it as [hour, min]

let parsedTime = theTime.split(":");

//parse hr string to in and add one hour to start hour let startHour = parseInt(parsedTime[0], 10);

let endHour = startHour + 1;

//rejoin into string

endTime = `${endHour}:00`;

console.log(endTime); console.log(theDate) console.log(theTime);

onClose(date || initialDate, time || initialTime);

};

return (

<Box align="center">

<Calendar animate={false} date={date || initialDate} onSelect={setDate}

showAdjacentDays={false} required

/>

<Box flex={false} pad="medium" gap="small">

<Keyboard required

onEnter={event => {

event.preventDefault(); // so drop doesn't re-open close();

}}

>

<MaskedInput mask={[

{

length: [1, 2], options: [

"0",

"1",

"2",

"3",

"4",

"5",

"6",

"7",

"8",

"9",

"10",

"11",

"12",

"13",

"14",

"15",

"16",

"17",

"18",

"19",

"20",

"21",

"22",

"23",

],

regexp: /^1[1-2]$|^[0-9]$/, placeholder: "hh"

},

{ fixed: ":" },

{

length: 2,

options: ["00"],

regexp: /^[0-5][0-9]$|^[0-9]$/, placeholder: "mm"

}

]}

value={time || initialTime} name="maskedInput"

onChange={event => setTime(event.target.value)} required

/>

</Keyboard>

<Box flex={false}>

<Button label="Done" onClick={close} color="#00739D" />

</Box>

</Box>

</Box>

);

};

const DateTimeDropButton = () => { const [date, setDate] = React.useState();

const [time, setTime] = React.useState(""); const [open, setOpen] = React.useState();

const onClose = (nextDate, nextTime) => { setDate(nextDate);

setTime(nextTime); setOpen(false);

setTimeout(() => setOpen(undefined), 1);

};

return (

<Grommet theme={theme}>

<Box align="center" pad="large">

<DropButton open={open}

onClose={() => setOpen(false)} onOpen={() => setOpen(true)} dropContent={

<DropContent date={date} time={time} onClose={onClose} />

}

>

<Box direction="row" gap="small" align="center" pad="small">

<Text color={date ? undefined : "dark-5"}>

{date

? `${new Date(date).toLocaleDateString()} ${time}`

: "Select date & time"}

</Text>

<Schedule />

</Box>

</DropButton>

</Box>

</Grommet>

);

};

const ConcernsTextArea = () => {

const [value, setValue] = React.useState("");

const onChange = event => { setValue(event.target.value); theConcerns = event.target.value;

};

return (

<Grommet theme={theme}>

<Box width="medium" height="xsmall"

>

<TextArea

placeholder="Enter your concerns..." value={value} onChange={onChange}

fill required />

</Box>

</Grommet>

);

};

const SymptomsTextArea = () => {

const [value, setValue] = React.useState("");

const onChange = event => { setValue(event.target.value); theSymptoms = event.target.value;

};

return (

<Grommet theme={theme}>

<Box width="medium" height="xsmall"

>

<TextArea

placeholder="Enter your symptoms..." value={value} onChange={onChange} fill

required />

</Box>

</Grommet>

);

};

function DoctorsDropdown() {

const [value, setValue] = useState(); const [doctorsList, setList] = useState([]); useEffect(() => { fetch("http://localhost:3001/docInfo")

.then(res => res.json())

.then(res => { let arr = []

res.data.forEach(i => {

let tmp = `${i.name} (${i.email})`; arr.push(tmp);

});

setList(arr);

});

}, []);

const onChange = event => { setValue(event.value);

let doc = event.value.match(/\((.\*)\)/)[1]; theDoc = doc;

};

return (

<Select options={doctorsList} value={value} placeholder="Select Doctor" onChange={onChange} fill required

/>

);

}

export class SchedulingAppt extends Component { constuctor() {

}

render() { return (

<Grommet theme={theme} full>

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Box align="center" pad="small" gap="small">

<Form

onSubmit={({ value }) => {

//probably fetch uid here, add one fetch("http://localhost:3001/userInSession")

.then(res => res.json())

.then(res => {

var string\_json = JSON.stringify(res);

var email\_json = JSON.parse(string\_json); let email\_in\_use = email\_json.email;

fetch("http://localhost:3001/checkIfApptExists?email=" + email\_in\_use + "&startTime=" + theTime

+ "&date=" + theDate + "&docEmail=" + theDoc)

.then(res => res.json())

.then(res => {

if ((res.data[0])) {

window.alert("Appointment Clash! Try another doctor or date/time");

} else { fetch("http://localhost:3001/genApptUID")

.then(res => res.json())

.then(res => {

var string\_json = JSON.stringify(res); var uid\_json = JSON.parse(string\_json); let gen\_uid = uid\_json.id; console.log(gen\_uid);

fetch("http://localhost:3001/schedule?time=" + theTime + "&endTime=" + endTime + "&date=" + theDate + "&concerns=" + theConcerns + "&symptoms=" + theSymptoms + "&id=" + gen\_uid + "&doc=" + theDoc).then((x)=>{

fetch("http://localhost:3001/addToPatientSeeAppt?email=" + email\_in\_use + "&id=" +

gen\_uid +

}

});

})

});

"&concerns=" + theConcerns + "&symptoms=" + theSymptoms).then((x)=>{ window.alert("Appointment successfully scheduled!");

});

});

}}

>

<Box align="center" gap="small">

<DoctorsDropdown />

</Box>

<DateTimeDropButton>

</DateTimeDropButton>

<ConcernsTextArea />

<br />

<SymptomsTextArea />

<br />

<Box align="center" pad="small" gap="small">

<Button

label="Attempt To Schedule" type="submit"

primary

/>

</Box>

</Form>

</Box>

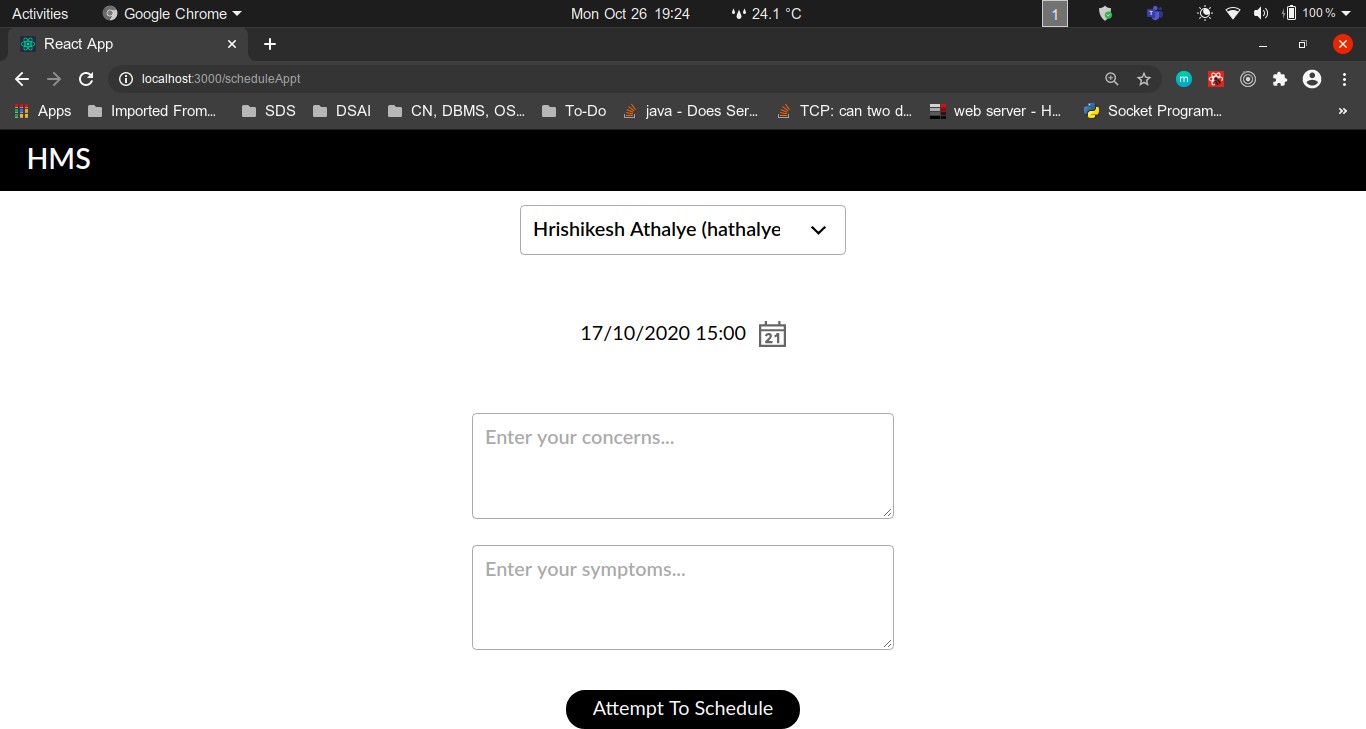
</Grommet>

);

}

}

export default SchedulingAppt;



Doctor Home Screen:

import React, { Component, useState } from 'react'; import {

Box, Button, Heading, Grommet, Grid, Text,

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

const SidebarButton = ({ label, ...rest }) => (

<Button plain {...rest}>

{({ hover }) => (

<Box

background={hover ? "#DADADA" : undefined} pad={{ horizontal: "large", vertical: "medium" }}

>

<Text size="large">{label}</Text>

</Box>

)}

</Button>

);

const SidebarButtons = () => {

const [active, setActive] = useState();

return (

<Grommet full theme={theme}>

<Box fill direction="row">

<Box background="brand">

{["Appointments", "View Patients", "Settings", "Sign Out"].map(label => (

<SidebarButton key={label} label={label} active={label === active} onClick={() => {

if (label === "Appointments") { window.location = "/ApptList"

}

else if (label === "Sign Out") { fetch("http://localhost:3001/endSession"); window.location = "/"

}

else if (label === "Settings") { window.location = "/DocSettings"

}

else if (label === "View Patients") { window.location = "/MedHistView"

/>

))}

}

setActive(label);

}}

</Box>

</Box>

</Grommet>

);

};

export class DocHome extends Component { componentDidMount() {

}

render() {

const Header = () => (

<Box

tag='header' background='brand' pad='small' elevation='small' justify='between' direction='row' align='center' flex={false}

style={{borderBottom:"1px solid grey"}}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3'

margin='none'>HMS</Heading></a>

</Box>

);

return (

<Grommet full={true} theme={theme}>

<Box align="left">

<Header/>

<Grid fill

rows={['auto', 'flex']}

columns={['auto', 'flex']} areas={[

{ name: 'sidebar', start: [0, 1], end: [0, 1] },

{ name: 'main', start: [1, 1], end: [1, 1] },

]}>

<Box gridArea="sidebar" width="small" animation={[

{ type: 'fadeIn', duration: 300 },

{ type: 'slideRight', size: 'xlarge', duration: 150 },

]}

>

<SidebarButtons />

</Box>

<Box

gridArea="main" justify="top" align="center">

<Box align="center" pad="large">

<Heading color="#000000">Welcome Doctor

</Heading>

</Box>

</Box>

</Grid>

</Box>

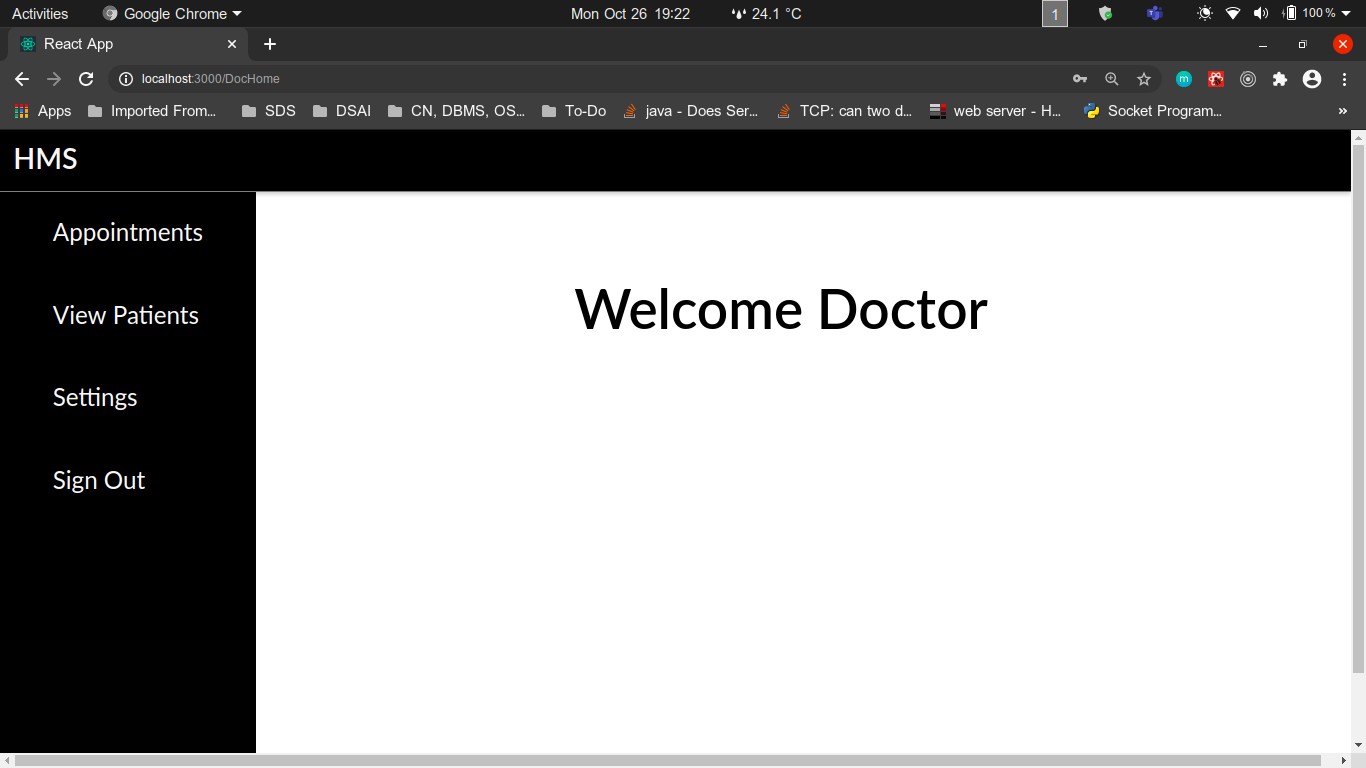
</Grommet>

);

}

}

export default DocHome;



Doctor Viewing Appointment:

import React, { Component} from 'react'; import {

Box, Button, Heading, Grommet,

} from 'grommet';

import './App.css';

const theme = { global: { colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

export class DocViewAppt extends Component { state = { apptlist: [] }

componentDidMount() { this.getNames();

}

getNames() { fetch('http://localhost:3001/doctorViewAppt')

.then(res => res.json())

.then(res => this.setState({ apptlist: res.data }));

}

render() {

const { apptlist } = this.state; const Header = () => (

<Box

tag='header' background='brand' pad='small' elevation='small' justify='between' direction='row' align='center' flex={false}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3'

margin='none'>HMS</Heading></a>

</Box>

);

const Body = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

<table className="table table-hover">

<thead>

<tr>

<th>ID</th>

<th>Name</th>

<th>Date</th>

<th>Start Time</th>

<th>Concerns</th>

<th>Symptoms</th>

<th>Status</th>

</tr>

</thead>

<tbody>

{apptlist.map(appt =>

<tr key={appt.name}>

<td>{appt.id}</td>

<td>{appt.name}</td>

<td>{new Date(appt.date).toLocaleDateString().substring(0,10)} </td>

<td>{appt.starttime}</td>

<td>{appt.concerns}</td>

<td>{appt.symptoms}</td>

<td>{appt.status}</td>

<td>

<Button label="Diagnose" href={`/Diagnose/${appt.id}`}

></Button>

</td>

<td>

{appt.status === "NotDone"?

<Button label="Cancel" onClick = {() => {

fetch('http://localhost:3001/deleteAppt?uid='+ appt.id) window.location.reload();

}}

></Button>

:<div></div>}

</td>

</tr>

)}

</tbody>

</table>

</div>

</div>

);

return (

<Grommet full={true} theme = {theme}>

<Header />

<Box fill={true}>

<Body />

</Box>

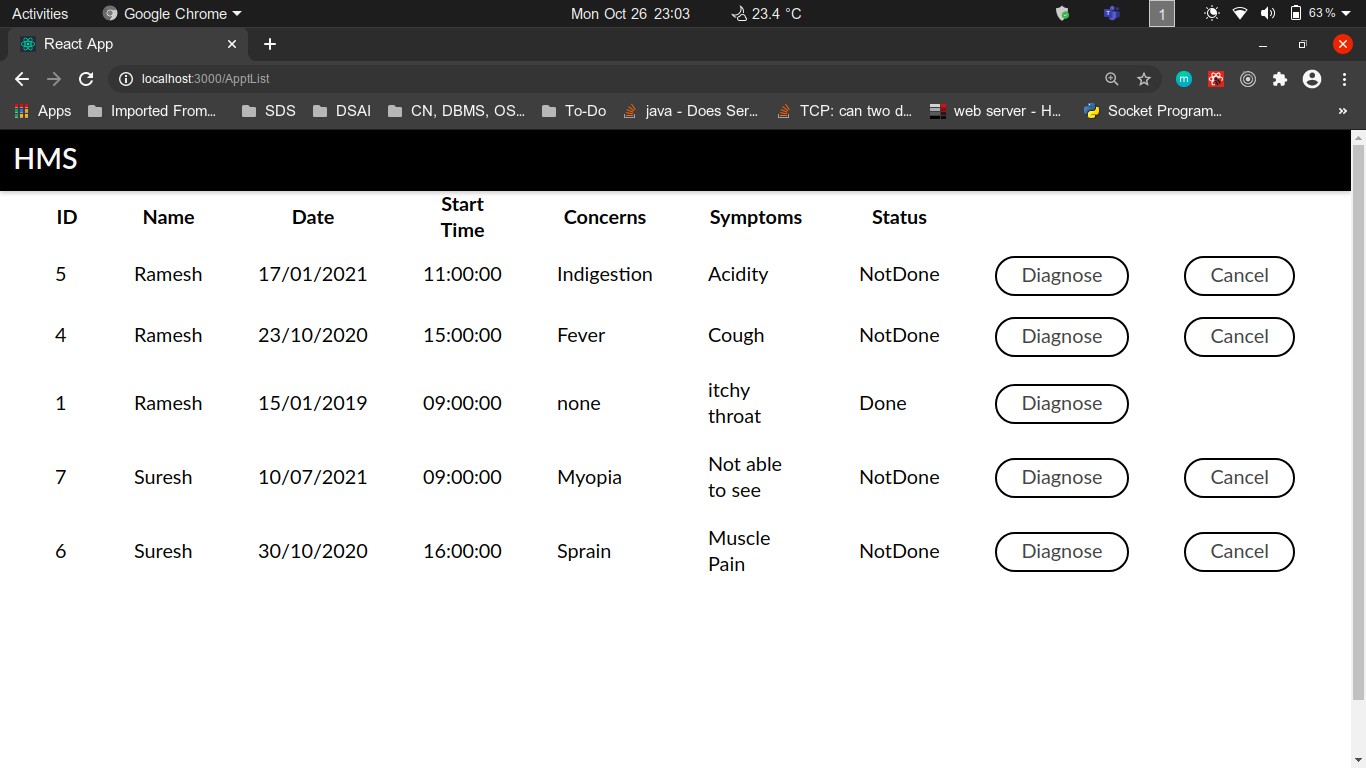
</Grommet>

);

}

}

export default DocViewAppt;



### Doctor giving diagnosis:

import React, { Component } from 'react'; import {

Box, Button, Heading, Form, TextArea, Grommet

} from 'grommet'; import './App.css'; const theme = { global: {

colors: {

brand: '#000000',

focus: "#000000",

active: "#000000",

},

font: {

family: 'Lato',

},

},

};

var diagnosis; var prescription; var id;

const AppBar = (props) => (

<Box tag='header' direction='row' align='center'

justify='between' background='brand'

pad={{ left: 'medium', right: 'small', vertical: 'small' }} style={{ zIndex: '1' }}

{...props} />

);

const DiagnosisTextArea = () => {

const [value, setValue] = React.useState(" ");

const onChange = event => { setValue(event.target.value); diagnosis = event.target.value;

};

return (

<Grommet theme={theme}>

<h4>Diagnosis</h4>

<TextArea

placeholder="Enter Diagnosis" label="Enter Diagnosis" value={value} onChange={onChange}

style={{width:"50vw", height:"12vw"}} fill

required />

</Grommet>

);

};

const PrescriptionTextArea = () => {

const [value, setValue] = React.useState(" "); const onChange = event => { setValue(event.target.value);

prescription = event.target.value;

};

return (

<Grommet theme={theme}>

<h4>Prescription</h4>

<TextArea

placeholder="Enter Prescription" label="Enter Prescription" value={value}

style={{width:"50vw", height:"12vw"}}

onChange={onChange} fill required />

</Grommet>

);

};

export class Diagnose extends Component { constructor(props) {

super(props);

id = props.match.params.id;

}

render() { return (

<Grommet theme={theme} full>

<AppBar>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3' margin='none'>HMS</Heading></a>

</AppBar>

<Box align="center" gap="small">

<Form

onSubmit={({ value }) => {

fetch("http://localhost:3001/diagnose?diagnosis=" + diagnosis + "&prescription=" + prescription

+ "&id=" + id).then(()=>{

})

window.alert("Diagnosis Submitted!");

}}

>

<DiagnosisTextArea />

<PrescriptionTextArea />

<br />

<Box align="center">

<Button

label="Submit Diagnosis" type="submit"

primary

/>

</Box>

</Form>

</Box>

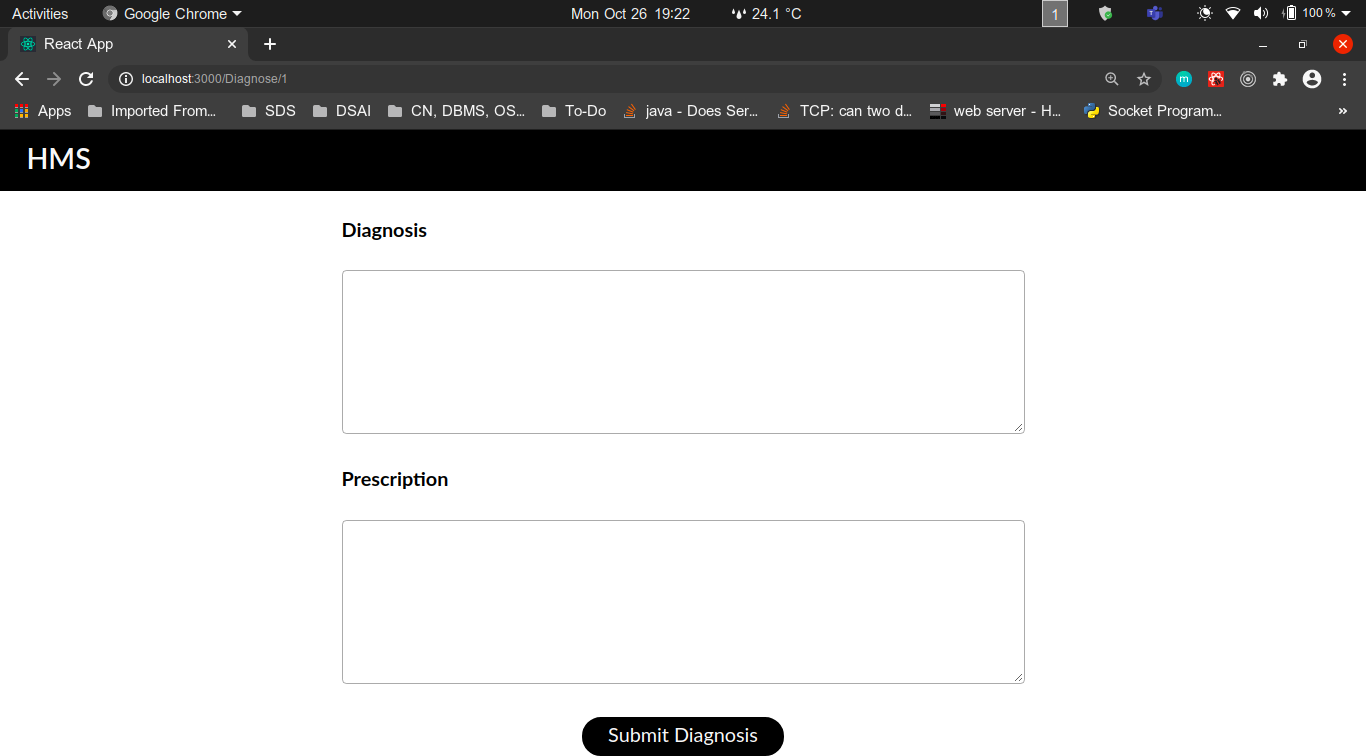
</Grommet>

);

}

}

export default Diagnose;



Doctor Viewing Patient History:

import React, { Component} from 'react';

import { Box, Heading, Grommet, Table, TableBody, TableCell, TableRow

} from 'grommet';

import './App.css';

const theme = { global: {

colors: {

brand: '#000000',

focus: '#000000'

},

font: {

family: 'Lato',

},

},

};

export class ViewOneHistory extends Component { state = { medhiststate: [], medhiststate2: []} componentDidMount() {

const { email } = this.props.match.params; this.allDiagnoses(email); this.getHistory(email);

}

getHistory(value) {

let email = "'" + value + "'"; fetch('http://localhost:3001/OneHistory?patientEmail='+ email)

.then(res => res.json())

.then(res => this.setState({ medhiststate: res.data }));

}

allDiagnoses(value) {

let email = "'" + value + "'"; fetch('http://localhost:3001/allDiagnoses?patientEmail='+ email)

.then(res => res.json())

.then(res => this.setState({ medhiststate2: res.data }));

}

render() {

const { medhiststate } = this.state;

const { medhiststate2 } = this.state; const Header = () => (

<Box

tag='header' background='brand' pad='small' elevation='small' justify='between' direction='row' align='center' flex={false}

>

<a style={{ color: 'inherit', textDecoration: 'inherit'}} href="/"><Heading level='3'

margin='none'>HMS</Heading></a>

</Box>

);

const Body = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

{medhiststate.map(patient =>

<Table>

<TableBody>

<TableRow>

<TableCell scope="row">

<strong>Name</strong>

</TableCell>

<TableCell>{patient.name}</TableCell>

<TableCell></TableCell>

<TableCell><strong>Email</strong></TableCell>

<TableCell>{patient.email}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

<strong>Gender</strong>

</TableCell>

<TableCell>

{patient.gender}

</TableCell>

<TableCell />

<TableCell>

<strong>Address</strong>

</TableCell>

<TableCell>{patient.address}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Conditions</strong>

</TableCell>

<TableCell>{patient.conditions}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Surgeries</strong>

</TableCell>

<TableCell>{patient.surgeries}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Medications</strong>

</TableCell>

<TableCell>{patient.medication}

</TableCell>

</TableRow>

</TableBody>

</Table>

)}

</div>

<hr />

</div>

);

const Body2 = () => (

<div className="container">

<div className="panel panel-default p50 uth-panel">

{medhiststate2.map(patient =>

<div>

<Table>

<TableBody>

<TableRow>

<TableCell scope="row">

<strong>Date</strong>

</TableCell>

<TableCell>{patient.date.split('T')[0]}</TableCell>

<TableCell></TableCell>

<TableCell><strong>Doctor</strong></TableCell>

<TableCell>{patient.doctor}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

<strong>Concerns</strong>

</TableCell>

<TableCell>

{patient.concerns}

</TableCell>

<TableCell />

<TableCell>

<strong>Symptoms</strong>

</TableCell>

<TableCell>{patient.symptoms}</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Diagnosis</strong>

</TableCell>

<TableCell>{patient.diagnosis}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

<TableRow>

<TableCell>

<strong>Prescription</strong>

</TableCell>

<TableCell>{patient.prescription}

</TableCell>

</TableRow>

<TableRow>

<TableCell scope="row">

</TableCell>

</TableRow>

</TableBody>

</Table>

<hr />

</div>

)}

</div>

</div>

);

return (

<Grommet full={true} theme={theme}>

<Box fill={true}>

<Header />

<Body />

<Body2 />

</Box>

</Grommet>

);

}

}

export default ViewOneHistory;

### Backend:

**App.js**

var createError = require('http-errors'); var express = require('express');

var path = require('path');

//Logger that was used for debugging, commented later

// var logger = require('morgan'); var mysql = require('mysql'); var cors = require('cors');

var port = 3001

//Connection Info

var con = mysql.createConnection({ host: 'localhost',

user: 'hathalye7', password: 'hrishikesh', database: 'HMS', multipleStatements: true

});

//Connecting To Database con.connect(function (err) { if (err) throw err;

console.log("Connected to MySQL");

});

//Variables to keep state info about who is logged in var email\_in\_use = "";

var password\_in\_use = ""; var who = "";

var app = express();

app.set('views', path.join( dirname, 'views')); app.set('view engine', 'jade');

// app.use(logger('dev')); app.use(express.json());

app.use(express.urlencoded({ extended: false })); app.use(express.static(path.join( dirname, 'public'))); app.use(cors());

//Signup, Login, Password Reset Related Queries

//Checks if patient exists in database app.get('/checkIfPatientExists', (req, res) => { let params = req.query;

let email = params.email;

let statement = `SELECT \* FROM Patient WHERE email = "${email}"`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Creates User Account app.get('/makeAccount', (req, res) => { let query = req.query;

let name = query.name + " " + query.lastname; let email = query.email;

let password = query.password; let address = query.address;

let gender = query.gender;

let medications = query.medications; let conditions = query.conditions;

let surgeries = query.surgeries; if(medications===undefined){ medications="none"

}

if(conditions===undefined){ conditions="none"

}

if(!surgeries===undefined){ surgeries="none"

}

let sql\_statement = `INSERT INTO Patient (email, password, name, address, gender)

VALUES ` + `("${email}", "${password}", "${name}", "${address}", "${gender}")`; console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) throw error;

else {

email\_in\_use = email; password\_in\_use = password; who="pat";

return res.json({ data: results

})

};

});

sql\_statement='SELECT id FROM MedicalHistory ORDER BY id DESC LIMIT 1;'; console.log(sql\_statement)

con.query(sql\_statement, function (error, results, fields) { if (error) throw error;

else {

let generated\_id = results[0].id + 1;

let sql\_statement = `INSERT INTO MedicalHistory (id, date, conditions, surgeries, medication) VALUES ` + `("${generated\_id}", curdate(), "${conditions}", "${surgeries}", "${medications}")`; console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) throw error;

else {

let sql\_statement = `INSERT INTO PatientsFillHistory (patient, history) VALUES ` + `("${email}",${generated\_id})`; console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) throw error;

else {};

});

};

});

};

});

});

//Checks If Doctor Exists app.get('/checkIfDocExists', (req, res) => { let params = req.query;

let email = params.email;

let statement = `SELECT \* FROM Doctor WHERE email = "${email}"`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Makes Doctor Account app.get('/makeDocAccount', (req, res) => {

let params = req.query;

let name = params.name + " " + params.lastname; let email = params.email;

let password = params.password; let gender = params.gender;

let schedule = params.schedule;

let sql\_statement = `INSERT INTO Doctor (email, gender, password, name) VALUES ` + `("${email}", "${gender}", "${password}", "${name}")`;

console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) throw error;

else {

let sql\_statement = `INSERT INTO DocsHaveSchedules (sched, doctor) VALUES ` + `(${schedule}, "${email}")`;

console.log(sql\_statement); con.query(sql\_statement, function(error){ if (error) throw error;

})

email\_in\_use = email; password\_in\_use = password; who = 'doc';

return res.json({ data: results

})

};

});

});

//Checks if patient is logged in app.get('/checklogin', (req, res) => { let params = req.query;

let email = params.email;

let password = params.password;

let sql\_statement = `SELECT \* FROM Patient WHERE email="${email}" AND password="${password}"`;

console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) {

console.log("error");

return res.status(500).json({ failed: 'error ocurred' })

}

else {

if (results.length === 0) {

} else {

var string = JSON.stringify(results); var json = JSON.parse(string); email\_in\_use = email; password\_in\_use = password;

who = "pat";

}

return res.json({ data: results

})

};

});

});

//Checks if doctor is logged in app.get('/checkDoclogin', (req, res) => { let params = req.query;

let email = params.email;

let password = params.password; let sql\_statement = `SELECT \*

FROM Doctor

WHERE email="${email}" AND password="${password}"`; console.log(sql\_statement);

con.query(sql\_statement, function (error, results, fields) { if (error) {

console.log("eror");

return res.status(500).json({ failed: 'error ocurred' })

}

else {

if (results.length === 0) {

} else {

var string = JSON.stringify(results); var json = JSON.parse(string); email\_in\_use = json[0].email; password\_in\_use = json[0].password; who="doc"; console.log(email\_in\_use); console.log(password\_in\_use);

}

return res.json({ data: results

})

};

});

});

//Resets Patient Password app.post('/resetPasswordPatient', (req, res) => { let something = req.query;

let email = something.email;

let oldPassword = "" + something.oldPassword; let newPassword = "" + something.newPassword; let statement = `UPDATE Patient

SET password = "${newPassword}" WHERE email = "${email}"

AND password = "${oldPassword}";`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Resets Doctor Password app.post('/resetPasswordDoctor', (req, res) => { let something = req.query;

let email = something.email;

let oldPassword = "" + something.oldPassword; let newPassword = "" + something.newPassword; let statement = `UPDATE Doctor

SET password = "${newPassword}" WHERE email = "${email}"

AND password = "${oldPassword}";`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Returns Who is Logged in app.get('/userInSession', (req, res) => {

return res.json({ email: `${email\_in\_use}`, who:`${who}`});

});

//Logs the person out app.get('/endSession', (req, res) => { console.log("Ending session"); email\_in\_use = ""; password\_in\_use = "";

});

//Appointment Related

//Checks If a similar appointment exists to avoid a clash app.get('/checkIfApptExists', (req, res) => {

let cond1, cond2, cond3 = "" let params = req.query;

let email = params.email;

let doc\_email = params.docEmail; let startTime = params.startTime; let date = params.date;

let ndate = new Date(date).toLocaleDateString().substring(0, 10) let sql\_date = `STR\_TO\_DATE('${ndate}', '%d/%m/%Y')`;

//sql to turn string to sql time obj

let sql\_start = `CONVERT('${startTime}', TIME)`;

let statement = `SELECT \* FROM PatientsAttendAppointments, Appointment WHERE patient = "${email}" AND

appt = id AND

date = ${sql\_date} AND starttime = ${sql\_start}` console.log(statement)

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

cond1 = results;

statement=`SELECT \* FROM Diagnose d INNER JOIN Appointment a

ON d.appt=a.id WHERE doctor="${doc\_email}" AND date=${sql\_date} AND status="NotDone"

AND ${sql\_start} >= starttime AND ${sql\_start} < endtime` console.log(statement)

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

cond2 = results;

statement = `SELECT doctor, starttime, endtime, breaktime, day FROM DocsHaveSchedules INNER JOIN Schedule ON DocsHaveSchedules.sched=Schedule.id

WHERE doctor="${doc\_email}" AND day=DAYNAME(${sql\_date}) AND

(DATE\_ADD(${sql\_start},INTERVAL +1 HOUR) <= breaktime OR ${sql\_start} >= DATE\_ADD(breaktime,INTERVAL +1 HOUR));`

//not in doctor schedule console.log(statement)

con.query(statement, function (error, results, fields) {

if (error) throw error; else { if(results.length){

results = []

}

else{

results = [1]

}

return res.json({

data: cond1.concat(cond2,results)

})

};

});

};

});

};

});

//doctor has appointment at the same time - Your start time has to be greater than all prev end times

});

//Returns Date/Time of Appointment app.get('/getDateTimeOfAppt', (req, res) => { let tmp = req.query;

let id = tmp.id;

let statement = `SELECT starttime as start,

endtime as end, date as theDate

FROM Appointment WHERE id = "${id}"`;

console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else { console.log(JSON.stringify(results)); return res.json({

data: results

})

};

});

});

//Patient Info Related

//to get all doctor names app.get('/docInfo', (req, res) => {

let statement = 'SELECT \* FROM Doctor'; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//To return a particular patient history app.get('/OneHistory', (req, res) => { let params = req.query;

let email = params.patientEmail;

let statement = `SELECT gender,name,email,address,conditions,surgeries,medication FROM PatientsFillHistory,Patient,MedicalHistory

WHERE PatientsFillHistory.history=id AND patient=email AND email = ` + email;

console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

}

})

});

//To show all patients whose medical history can be accessed app.get('/MedHistView', (req, res) => {

let params = req.query;

let patientName = "'%" + params.name + "%'"; let secondParamTest = "" + params.variable; let statement = `SELECT name AS 'Name',

PatientsFillHistory.history AS 'ID', email FROM Patient,PatientsFillHistory

WHERE Patient.email = PatientsFillHistory.patient

AND Patient.email IN (SELECT patient from PatientsAttendAppointments NATURAL JOIN Diagnose WHERE doctor="${email\_in\_use}")`;

if (patientName != "''")

statement += " AND Patient.name LIKE " + patientName console.log(statement)

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Returns Appointment Info To patient logged In app.get('/patientViewAppt', (req, res) => {

let tmp = req.query; let email = tmp.email;

let statement = `SELECT PatientsAttendAppointments.appt as ID, PatientsAttendAppointments.patient as user, PatientsAttendAppointments.concerns as theConcerns, PatientsAttendAppointments.symptoms as theSymptoms, Appointment.date as theDate,

Appointment.starttime as theStart, Appointment.endtime as theEnd,

Appointment.status as status

FROM PatientsAttendAppointments, Appointment

WHERE PatientsAttendAppointments.patient = "${email}" AND PatientsAttendAppointments.appt = Appointment.id`;

console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Checks if history exists app.get('/checkIfHistory', (req, res) => {

let params = req.query; let email = params.email;

let statement = "SELECT patient FROM PatientsFillHistory WHERE patient = " + email; console.log(statement)

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//Adds to PatientsAttendAppointment Table app.get('/addToPatientSeeAppt', (req, res) => { let params = req.query;

let email = params.email; let appt\_id = params.id;

let concerns = params.concerns;

let symptoms = params.symptoms;

let sql\_try = `INSERT INTO PatientsAttendAppointments (patient, appt, concerns, symptoms) VALUES ("${email}", ${appt\_id}, "${concerns}", "${symptoms}")`;

console.log(sql\_try);

con.query(sql\_try, function (error, results, fields) { if (error) throw error;

else{

return res.json({ data: results

})

}

});

});

//Schedules Appointment app.get('/schedule', (req, res) => { let params = req.query;

let time = params.time; let date = params.date; let id = params.id;

let endtime = params.endTime; let concerns = params.concerns;

let symptoms = params.symptoms; let doctor = params.doc;

let ndate = new Date(date).toLocaleDateString().substring(0, 10) let sql\_date = `STR\_TO\_DATE('${ndate}', '%d/%m/%Y')`;

//sql to turn string to sql time obj

let sql\_start = `CONVERT('${time}', TIME)`;

//sql to turn string to sql time obj

let sql\_end = `CONVERT('${endtime}', TIME)`;

let sql\_try = `INSERT INTO Appointment (id, date, starttime, endtime, status) VALUES (${id}, ${sql\_date}, ${sql\_start}, ${sql\_end}, "NotDone")`;

console.log(sql\_try);

con.query(sql\_try, function (error, results, fields) { if (error) throw error;

else {

let sql\_try = `INSERT INTO Diagnose (appt, doctor, diagnosis, prescription) VALUES (${id}, "${doctor}", "Not Yet Diagnosed" , "Not Yet Diagnosed")`;

console.log(sql\_try);

con.query(sql\_try, function (error, results, fields) { if (error) throw error;

else{

return res.json({ data: results

})

}

});

}

});

});

//Generates ID for appointment app.get('/genApptUID', (req, res) => {

let statement = 'SELECT id FROM Appointment ORDER BY id DESC LIMIT 1;' con.query(statement, function (error, results, fields) {

if (error) throw error; else {

let generated\_id = results[0].id + 1; return res.json({ id: `${generated\_id}` });

};

});

});

//To fill diagnoses app.get('/diagnose', (req, res) => { let params = req.query;

let id = params.id;

let diagnosis = params.diagnosis;

let prescription = params.prescription;

let statement = `UPDATE Diagnose SET diagnosis="${diagnosis}", prescription="${prescription}" WHERE appt=${id};`;

console.log(statement)

con.query(statement, function (error, results, fields) {

if (error) throw error; else {

let statement = `UPDATE Appointment SET status="Done" WHERE id=${id};`; console.log(statement)

con.query(statement, function (error, results, fields){ if (error) throw error;

})

};

});

});

//To show diagnoses app.get('/showDiagnoses', (req, res) => { let id = req.query.id;

let statement = `SELECT \* FROM Diagnose WHERE appt=${id}`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//To show appointments to doctor app.get('/doctorViewAppt', (req, res) => { let a = req.query;

let email = a.email;

let statement = `SELECT a.id,a.date, a.starttime, a.status, p.name, psa.concerns, psa.symptoms FROM Appointment a, PatientsAttendAppointments psa, Patient p

WHERE a.id = psa.appt AND psa.patient = p.email

AND a.id IN (SELECT appt FROM Diagnose WHERE doctor="${email\_in\_use}")`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//To show diagnoses to patient app.get('/showDiagnoses', (req, res) => { let id = req.query.id;

let statement = `SELECT \* FROM Diagnose WHERE appt=${id}`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//To Show all diagnosed appointments till now app.get('/allDiagnoses', (req, res) => {

let params = req.query;

let email = params.patientEmail;

let statement =`SELECT date,doctor,concerns,symptoms,diagnosis,prescription FROM

Appointment A INNER JOIN (SELECT \* from PatientsAttendAppointments NATURAL JOIN Diagnose WHERE patient=${email}) AS B ON A.id = B.appt;`

console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

return res.json({ data: results

})

};

});

});

//To delete appointment app.get('/deleteAppt', (req, res) => { let a = req.query;

let uid = a.uid;

let statement = `SELECT status FROM Appointment WHERE id=${uid};`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

else {

results = results[0].status if(results == "NotDone"){

statement = `DELETE FROM Appointment WHERE id=${uid};`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

});

}

else{ if(who=="pat"){

statement = `DELETE FROM PatientsAttendAppointments p WHERE p.appt = ${uid}`; console.log(statement);

con.query(statement, function (error, results, fields) { if (error) throw error;

});

}

}

};

});

return;

});

// If 404, forward to error handler app.use(function (req, res, next) {

next(createError(404));

});

// error handler

app.use(function (err, req, res, next) {

// set locals, only providing error in development res.locals.message = err.message;

res.locals.error = req.app.get('env') === 'development' ? err : {};

// render the error page res.status(err.status || 500); res.render('error');

});

module.exports = app;

# CHAPTER 6 RESULTS AND DISCUSSIONS

### Results

Our Hospital Management System project aimed to develop a software application that would streamline hospital operations and improve patient care. The system we developed includes functionalities such as patient registration, appointment scheduling, medical records management, billing and payment management, inventory management, reporting and analytics, electronic prescribing, laboratory management, online patient portal, and staff management.

We conducted a comprehensive testing and validation process to ensure that the system is working as expected. This included unit testing, integration testing, and user acceptance testing. The testing revealed a few minor bugs, which we were able to address promptly, resulting in a robust and reliable system.

Comparing our Hospital Management System with other similar systems currently in use in the healthcare industry, we found that our system offers several advantages. First, our system includes an electronic prescribing feature that allows doctors to prescribe medication electronically and send the prescription directly to a pharmacy, reducing errors and improving patient safety. Second, our system includes an online patient portal that allows patients to view their medical records, request prescription refills, and communicate with medical professionals, improving patient engagement and satisfaction. Finally, our system includes reporting and analytics features that provide hospital administrators with valuable insights into hospital operations, patient outcomes, and financial performance.

Feedback from users who tested our system was overwhelmingly positive. Users found the system easy to use, intuitive, and effective. They appreciated the various features of the system, including the patient portal and electronic prescribing, which helped improve patient care and reduce administrative burdens.

### Discussions

Based on our findings, we believe that our Hospital Management System has the potential to significantly improve hospital operations and patient care. In particular, our system can reduce errors, increase efficiency, improve patient engagement and satisfaction, and provide valuable insights into hospital operations and financial performance. However, we recognize that there are limitations to our project, such as scalability issues and the need for additional features, which we plan to address in future work.

We acknowledge that there are other hospital management systems available in the market, but our system offers several unique advantages over these systems, such as the electronic prescribing feature and the patient portal. These features improve the patient experience, reduce the risk of errors, and increase efficiency in hospital operations.

In conclusion, our Hospital Management System project has been a success, and we believe that it has the potential to make a significant impact on the healthcare industry. We hope that our system will be adopted by

hospitals and medical facilities around the world, leading to improved patient care and better health outcomes. The positive feedback from users and the advantages our system offers over other similar systems demonstrate the potential of our Hospital Management System to revolutionize the healthcare industry.

# CHAPTER-7

**CONCLUSION AND FUTURE ENHANCEMENTS**

### Conclusion

In conclusion, effective database management is crucial for hospitals to provide quality healthcare services to patients. The use of a hospital management system can help healthcare providers streamline their processes, improve patient outcomes, and reduce healthcare costs. The integration of emerging technologies such as AI-powered chatbots, wearable health devices, and blockchain can enhance the functionality of a hospital management system and improve the overall patient experience. Additionally, advanced scheduling algorithms, automated inventory management, and real-time location tracking can help optimize resource utilization and reduce waste and inefficiencies. By continually improving and updating their database management processes, hospitals can ensure that they are providing the highest quality of care to their patients.

### Future Enhancements

There are several potential enhancements that could be implemented in a hospital management system to improve its efficiency and effectiveness. Here are a few suggestions:

* + 1. Integration with wearable health devices: With the rise of wearable health devices such as fitness trackers, smartwatches, and medical sensors, integrating these devices into a hospital management system can provide valuable health data to physicians and other healthcare professionals. This data can be used to monitor patients remotely and make more informed treatment decisions.
    2. Implementation of AI-powered chatbots: AI-powered chatbots can help automate routine tasks such as appointment scheduling and patient inquiries. This can free up hospital staff to focus on more complex tasks and improve the overall patient experience.
    3. Electronic Health Records (EHR) with blockchain technology: Blockchain technology can improve data security, privacy, and interoperability by providing a tamper-resistant, decentralized database that can securely store and share EHR data between different healthcare providers and stakeholders.
    4. Telemedicine capabilities: Telemedicine enables patients to connect with healthcare providers remotely, which can be particularly useful for patients who live in remote or underserved areas. Integrating telemedicine capabilities into a hospital management system can help improve access to care and reduce healthcare costs.
    5. Predictive analytics and data visualization tools: By analyzing large amounts of patient data, predictive analytics can help identify patients at high risk of developing certain conditions or diseases. Data visualization tools can then be used to present this information in a clear and actionable format, allowing healthcare professionals to take proactive measures to prevent or manage these conditions.
    6. IoT-enabled medical devices: IoT-enabled medical devices can be used to monitor patients remotely, gather real-time health data, and automate certain tasks. Integrating these devices into a hospital management system can help improve patient outcomes, reduce hospital readmissions, and optimize

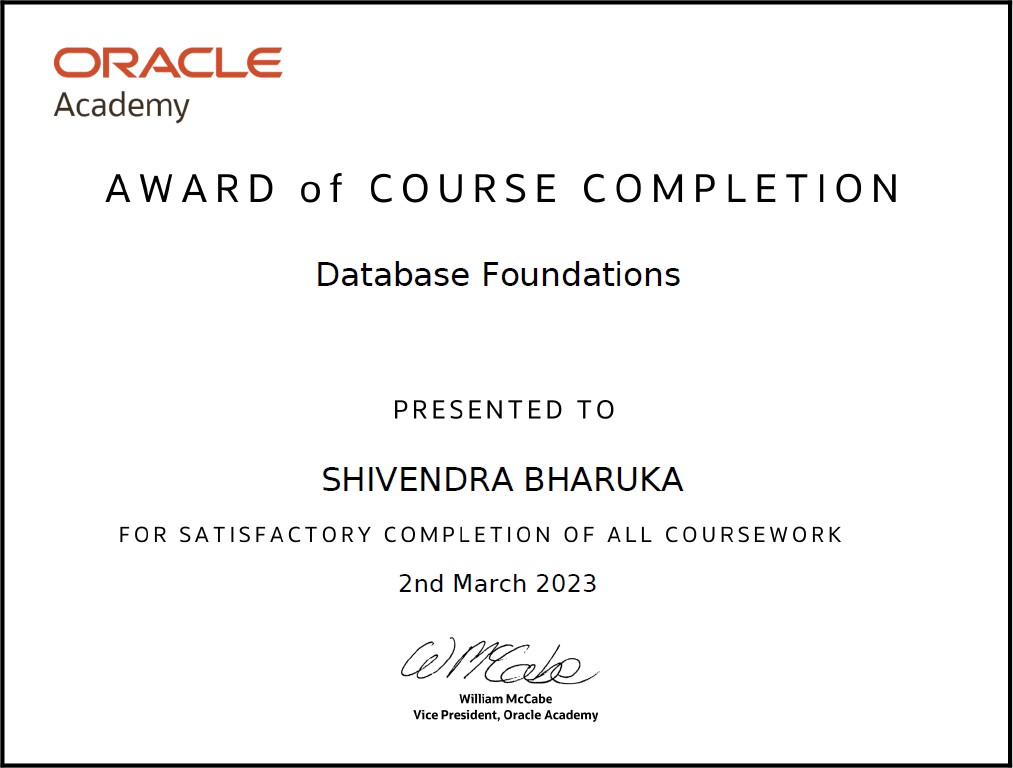
resource utilization.

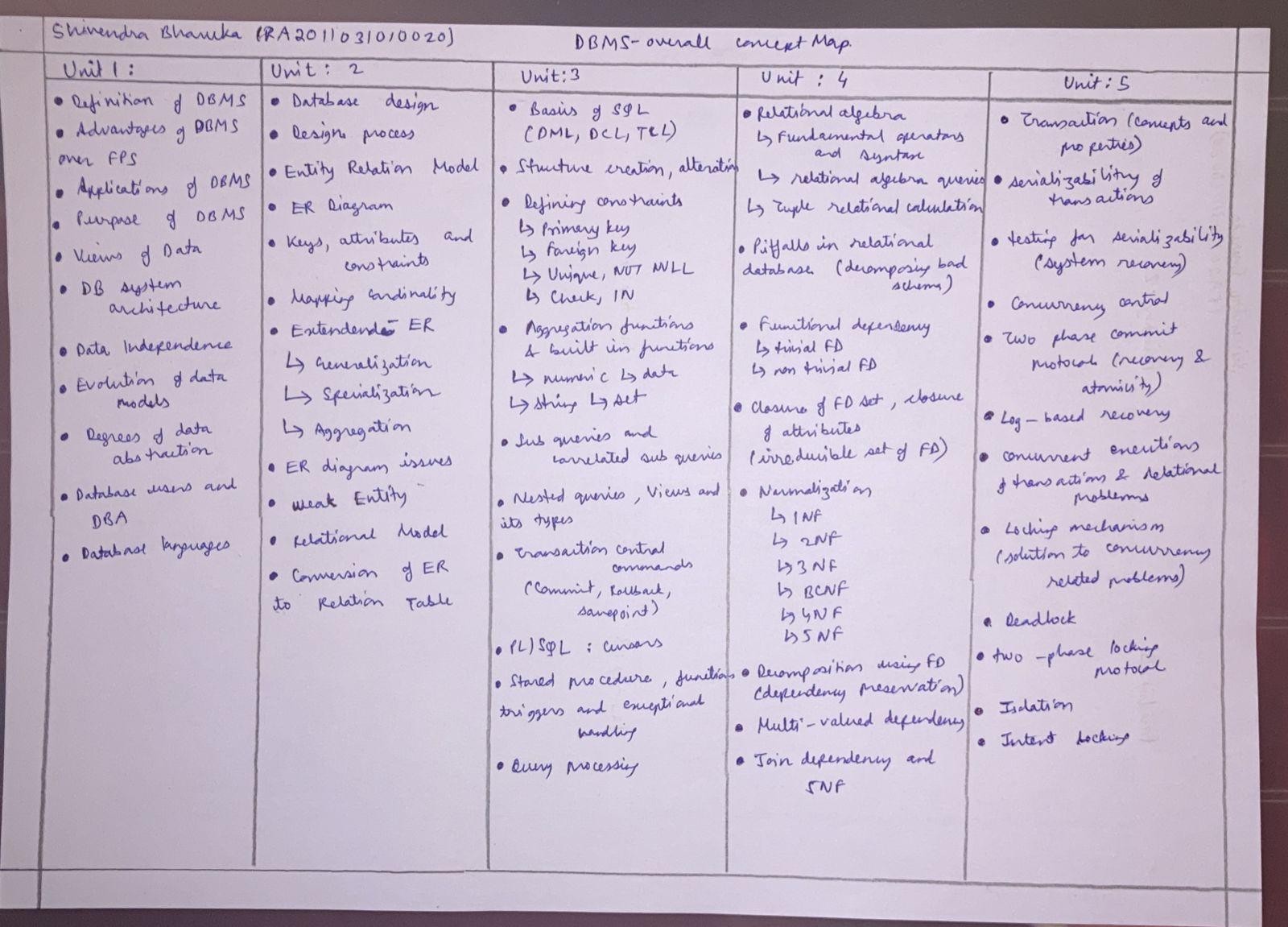
* + 1. Patient engagement tools: Implementing patient engagement tools, such as patient portals or mobile apps, can help patients become more involved in their own care. These tools can allow patients to access their health records, schedule appointments, communicate with healthcare providers, and receive health education resources.
    2. Advanced scheduling algorithms: Advanced scheduling algorithms can optimize the use of hospital resources such as operating rooms, medical equipment, and staff schedules. By taking into account factors such as patient acuity, physician availability, and equipment availability, these algorithms can help reduce wait times and improve patient outcomes.
    3. Automated inventory management: Automating inventory management can help hospitals more accurately track and manage their supplies and equipment. By using RFID or other tracking technologies, hospitals can streamline their supply chain processes and reduce waste and inefficiencies.
    4. Virtual reality training for healthcare professionals: Virtual reality training can provide healthcare professionals with realistic, hands-on training experiences in a safe and controlled environment. This can be particularly useful for high-stress, high-risk scenarios such as surgical procedures.
    5. Real-time location tracking: Real-time location tracking can be used to track patients, staff, and equipment within a hospital. This can help improve patient safety, reduce wait times, and optimize resource utilization.
    6. Patient-centered care pathways: Patient-centered care pathways can help ensure that patients receive the appropriate care at the appropriate time, while minimizing unnecessary tests or procedures. By taking into account patient preferences, values, and goals, these pathways can help improve patient outcomes and reduce healthcare costs.

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CLASS ACTIVITIES:

