**IT6256**

**Assignment 2 Report**

**Logical Database Design**

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**1/ List of tabled implemented:**

Base one the conceptual ER schema provided by Steve McKinlay, here are list of implemented tables:

* H\_ADMISSION
* H\_DIAGNOSIS
* H\_INVOICE
* H\_ITEM
* H\_LABORATORY
* H\_LINE
* H\_PATIENT
* H\_PHYSICIAN
* H\_STAFF
* H\_TEST
* H\_TREATMENT
* H\_VENDOR
* H\_WARD

**2/ Scripts:**

1. **Create tables with primary keys**

Create table H\_Laboratory(

lab\_id number(6) not null,

lab\_name varchar2(50) not null,

constraint pk\_H\_Laboratory primary key (lab\_id)

);

Create table H\_Test(

t\_id number(6) not null,

t\_name varchar2(50) not null,

lab\_id number(6) not null,

pat\_id number(6) not null,

constraint pk\_H\_Test primary key (t\_id)

);

Create table H\_Patient(

pat\_id number(6) not null,

pat\_name varchar2(50) not null,

age number(3) not null,

gender varchar(2) not null,

mobile\_number varchar(10) not null,

address varchar2(50) not null,

constraint pk\_H\_Patient primary key (pat\_id)

);

Create table H\_Invoice(

inv\_no number(6) not null,

admission\_id number(6) not null,

paid\_date date,

constraint pk\_H\_Invoice primary key (inv\_no)

);

Create table H\_Line(

line\_id number(6) not null,

item\_id number(6) not null,

inv\_no number(6) not null,

quantity number(6) not null,

constraint pk\_H\_Line primary key (inv\_no)

);

Create table H\_Item(

item\_id number(6) not null,

item\_name varchar2(50) not null,

vend\_id number(6) not null,

price number(5,2) not null,

constraint pk\_H\_Item primary key (item\_id)

);

Create table H\_Vendor(

vend\_id number(6) not null,

vend\_name varchar2(50) not null,

constraint pk\_H\_Vendor primary key (vend\_id)

);

Create table H\_Staff(

staff\_id number(6) not null,

staff\_name varchar2(50) not null,

ward\_id number(6) not null,

age number(3) not null,

start\_date date,

salary varchar(10) not null,

gender varchar(2) not null,

phone\_number number(10) not null,

constraint pk\_H\_Staff primary key (staff\_id)

);

Create table H\_Ward(

ward\_id number(6) not null,

ward\_name varchar2(50) not null,

constraint pk\_H\_Ward primary key (ward\_id)

);

Create table H\_Admission(

admission\_id number(6) not null,

ward\_id number(6) not null,

pat\_id number(6) not null,

constraint pk\_H\_Admission primary key (admission\_id)

);

Create table H\_Physician(

p\_id number(6) not null,

p\_name varchar2(50) not null,

constraint pk\_H\_Physician primary key (p\_id)

);

Create table H\_Diagnosis(

diagnosis\_id number(6) not null,

admission\_id number(6) not null,

p\_id number(6) not null,

constraint pk\_H\_Diagnosis primary key (diagnosis\_id)

);

Create table H\_Treatment(

treatment\_id number(6) not null,

admission\_id number(6) not null,

p\_id number(6) not null,

constraint pk\_H\_Treatment primary key (treatment\_id)

);

1. **Add foreign keys**

alter table H\_Test

add constraint fk\_H\_Test foreign key (pat\_id)

references H\_Patient (pat\_id);

alter table H\_Test

add constraint fk\_H\_Test\_2 foreign key (lab\_id)

references H\_Laboratory (lab\_id);

alter table H\_Invoice

add constraint fk\_H\_Invoice foreign key (admission\_id)

references H\_Admission (admission\_id);

alter table H\_Line

add constraint fk\_H\_Line foreign key (item\_id)

references H\_Item (item\_id);

alter table H\_Line

add constraint fk\_H\_Line\_2 foreign key (inv\_no)

references H\_Invoice (inv\_no);

alter table H\_Staff

add constraint fk\_H\_Staff foreign key (ward\_id)

references H\_Ward (ward\_id);

alter table H\_Admission

add constraint fk\_H\_Admission foreign key (ward\_id)

references H\_Ward (ward\_id);

alter table H\_Admission

add constraint fk\_H\_Admission\_2 foreign key (pat\_id)

references H\_Patient (pat\_id);

alter table H\_Diagnosis

add constraint fk\_H\_Diagnosis foreign key (admission\_id)

references H\_Admission (admission\_id);

alter table H\_Diagnosis

add constraint fk\_H\_Diagnosis\_2 foreign key (p\_id)

references H\_Physician (p\_id);

alter table H\_Treatment

add constraint fk\_H\_Treatment foreign key (p\_id)

references H\_Physician (p\_id);

alter table H\_Treatment

add constraint Treatment\_2 foreign key (admission\_id)

references H\_Admission (admission\_id);

commit;

1. **Create sequences and triggers**

create sequence lab\_s

minvalue 10000

maxvalue 10999

start with 10000

increment by 1

cache 100;

create or replace trigger lab\_id\_gen

before insert on h\_laboratory

for each row

when (new.lab\_id is null)

begin

select lab\_s.nextval

into :new.lab\_id

from dual;

end;

/

create sequence test\_s

minvalue 20000

maxvalue 20999

start with 20000

increment by 1

cache 100;

create or replace trigger t\_id\_gen

before insert on h\_test

for each row

when (new.t\_id is null)

begin

select test\_s.nextval

into :new.t\_id

from dual;

end;

/

create sequence pat\_s

minvalue 30000

maxvalue 30999

start with 30000

increment by 1

cache 100;

create or replace trigger pat\_id\_gen

before insert on h\_patient

for each row

when (new.pat\_id is null)

begin

select pat\_s.nextval

into :new.pat\_id

from dual;

end;

/

create sequence inv\_s

minvalue 40000

maxvalue 40999

start with 40000

increment by 1

cache 100;

create or replace trigger inv\_id\_gen

before insert on h\_invoice

for each row

when (new.inv\_no is null)

begin

select pat\_s.nextval

into :new.inv\_no

from dual;

end;

/

create sequence line\_s

minvalue 50000

maxvalue 50999

start with 50000

increment by 1

cache 100;

create or replace trigger line\_id\_gen

before insert on h\_line

for each row

when (new.line\_id is null)

begin

select line\_s.nextval

into :new.line\_id

from dual;

end;

/

create sequence item\_s

minvalue 60000

maxvalue 60999

start with 60000

increment by 1

cache 100;

create or replace trigger pat\_id\_gen

before insert on h\_patient

for each row

when (new.pat\_id is null)

begin

select pat\_s.nextval

into :new.pat\_id

from dual;

end;

/

create sequence vend\_s

minvalue 70000

maxvalue 70999

start with 70000

increment by 1

cache 100;

create or replace trigger vend\_id\_gen

before insert on h\_vendor

for each row

when (new.vend\_id is null)

begin

select vend\_s.nextval

into :new.vend\_id

from dual;

end;

/

create sequence staff\_s

minvalue 80000

maxvalue 80999

start with 80000

increment by 1

cache 100;

create or replace trigger staff\_id\_gen

before insert on h\_staff

for each row

when (new.staff\_id is null)

begin

select staff\_s.nextval

into :new.staff\_id

from dual;

end;

/

create sequence ward\_s

minvalue 90000

maxvalue 90999

start with 90000

increment by 1

cache 100;

create or replace trigger ward\_id\_gen

before insert on h\_ward

for each row

when (new.ward\_id is null)

begin

select ward\_s.nextval

into :new.ward\_id

from dual;

end;

/

create sequence ad\_s

minvalue 100000

maxvalue 100999

start with 100000

increment by 1

cache 100;

create or replace trigger admission\_id\_gen

before insert on h\_admission

for each row

when (new.admission\_id is null)

begin

select ad\_s.nextval

into :new.admission\_id

from dual;

end;

/

create sequence dia\_s

minvalue 110000

maxvalue 110999

start with 110000

increment by 1

cache 100;

create or replace trigger diagnosis\_id\_gen

before insert on h\_diagnosis

for each row

when (new.diagnosis\_id is null)

begin

select dia\_s.nextval

into :new.diagnosis\_id

from dual;

end;

/

create sequence treat\_s

minvalue 120000

maxvalue 120999

start with 120000

increment by 1

cache 100;

create or replace trigger treatment\_id\_gen

before insert on h\_treatment

for each row

when (new.treatment\_id is null)

begin

select treat\_s.nextval

into :new.treatment\_id

from dual;

end;

/

create sequence p\_s

minvalue 130000

maxvalue 130999

start with 130000

increment by 1

cache 100;

create or replace trigger p\_id\_gen

before insert on h\_physician

for each row

when (new.p\_id is null)

begin

select p\_s.nextval

into :new.p\_id

from dual;

end;

/

commit;

1. **Add check constraints**

Alter table H\_Staff

Add constraint ck\_staff\_salary

Check ( salary > 500);

Alter table H\_Staff

Add constraint ck\_staff\_gender

Check ((gender = 'M') or (gender = 'F'));

Alter table H\_Staff

Add constraint ck\_staff\_age

Check ((age> 18) and (age < 70));

Alter table H\_Line

Add constraint ck\_line\_quan

Check ( quantity < 300 );

Alter table H\_Patient

Add constraint ck\_patient\_MB

Check (mobile\_number not like '%[^0-9]%');

Alter table H\_Staff

Add constraint ck\_patient\_startDay

Check ( start\_date >= (to\_date('31 Dec 2010', 'DD MON YYYY', 'NLS\_DATE\_LANGUAGE = American')));

Alter table H\_Line

Add constraint ck\_line\_quantity

Check ( quantity < 300 );

Alter table H\_Patient

Add constraint uc\_patient unique (mobile\_number);

Alter table H\_Staff

Add constraint uc\_staff unique (phone\_number);

Alter Table H\_Patient

Add constraint uc\_patient\_name\_address UNIQUE (pat\_name, address, mobile\_number );

1. **Add data**

Insert into h\_laboratory

values(lab\_s.nextval, 'Xray');

Insert into h\_laboratory

values(lab\_s.nextval, 'Eyes');

Insert into h\_laboratory

values(lab\_s.nextval, 'Blood');

Insert into h\_laboratory

values(lab\_s.nextval, 'Urine Analyse');

Insert into h\_laboratory

values(lab\_s.nextval, 'Teeth');

Insert into h\_laboratory

values(lab\_s.nextval, 'Surgery');

Insert into h\_vendor

values( vend\_s.nextval, 'Adobe');

Insert into h\_vendor

values( vend\_s.nextval, 'Microsoft');

Insert into h\_vendor

values( vend\_s.nextval, 'Samsung');

Insert into h\_vendor

values( vend\_s.nextval, 'LG');

Insert into h\_vendor

values( vend\_s.nextval, 'Philips');

Insert into h\_vendor

values( vend\_s.nextval, 'Apple');

Insert into h\_item

values( item\_s.nextval, 'Aspirin', '70001', '1.50');

Insert into h\_item

values( item\_s.nextval, 'Viroto eyes drop', '70002','12.00');

Insert into h\_item

values( item\_s.nextval, 'Vitamin C', '70001', '3.69');

Insert into h\_item

values( item\_s.nextval, 'Paradon Extra', '70003', '6.42');

Insert into h\_item

values( item\_s.nextval, 'Fish oil', '70004', '10.11');

Insert into h\_item

values( item\_s.nextval, 'Doxycyline', '70005', '1.27');

Insert into h\_item

values( item\_s.nextval, 'Viagra', '70006', '11.96');

Insert into h\_item

values( item\_s.nextval, 'Iphone X', '70004', '100.11');

Insert into h\_item

values( item\_s.nextval, 'Water bottle', '70005', '3.27');

Insert into h\_item

values( item\_s.nextval, 'Samsung galaxy S8', '70006', '11.96');

Insert into h\_ward

values( ward\_s.nextval, 'Bond');

Insert into h\_ward

values( ward\_s.nextval, 'Blood');

Insert into h\_ward

values( ward\_s.nextval, 'Eyes');

Insert into h\_ward

values( ward\_s.nextval, 'Psychology');

Insert into h\_ward

values( ward\_s.nextval, 'Pulmonology');

Insert into h\_ward

values( ward\_s.nextval, 'Internist');

Insert into h\_staff

values( staff\_s.nextval, 'Will Pham', '90002', ' 25', '6 Jun 2015', '15000', 'M','0226789645');

Insert into h\_staff

values( staff\_s.nextval, 'Brienne Tarth', '90001', ' 42', '9 Feb 2014', '27100', 'F','0209856123');

Insert into h\_staff

values( staff\_s.nextval, 'Melisandre', '90003', ' 26', '12 Aug 2016', '13200', 'F','0221682557');

Insert into h\_staff

values( staff\_s.nextval, 'Viserys Targaryen', '90004', '34 ', '17 Nov 2015', '22500', 'M','0226158645');

Insert into h\_staff

values( staff\_s.nextval, 'Davos Seaworth', '90005', '28 ', '31 Jan 2014', '22500', 'M','0226158200');

Insert into h\_staff

values( staff\_s.nextval, 'Samwell Tarly', '90006', '28 ', '17 Nov 2015', '22500', 'M','0226128285');

Insert into h\_patient

values(pat\_s.nextval, 'Jorah Mormont', '40' , 'M', '0213789422', 'Upper Hutt');

Insert into h\_patient

values(pat\_s.nextval, 'Cersei Lannister', '38' , 'F', '0216094252', 'Petone');

Insert into h\_patient

values(pat\_s.nextval, 'Joffrey Baratheon', '20' , 'M', '0225824782', 'King Landing');

Insert into h\_patient

values(pat\_s.nextval, 'Jon Snow', '30' , 'M', '0216163402', 'Winterfell');

Insert into h\_patient

values(pat\_s.nextval, 'Kal Drogo', '37' , 'M', '0225874782', 'Essos');

Insert into h\_patient

values(pat\_s.nextval, 'Arya Stark', '18' , 'M', '0225814862', 'Kelson');

Insert into h\_patient

values(pat\_s.nextval, 'Theon Greyjoy', '28' , 'M', '0225880962', 'Koro Koro');

Insert into h\_test

values(test\_s.nextval, 'Lung X-Ray', '10001','30001');

Insert into h\_test

values(test\_s.nextval, 'Head CT Scan', '10001','30001');

Insert into h\_test

values(test\_s.nextval, 'Lipit Test', '10003','30002');

Insert into h\_test

values(test\_s.nextval, 'Eyes cheking', '10002','30003');

Insert into h\_test

values(test\_s.nextval, 'Braces', '10004','30004');

Insert into h\_test

values(test\_s.nextval, 'Urine test', '10002','30007');

Insert into h\_physician

values( p\_s.nextval, 'Dat');

Insert into h\_physician

values( p\_s.nextval, 'Daenerys');

Insert into h\_physician

values( p\_s.nextval, 'Hannibal');

Insert into h\_physician

values( p\_s.nextval, 'Pennywise');

Insert into h\_physician

values( p\_s.nextval, 'Jack Reaper');

Insert into h\_physician

values( p\_s.nextval, 'Jaqen Hghar');

Insert into h\_admission

values (ad\_s.nextval, '90001', '30001');

Insert into h\_admission

values (ad\_s.nextval, '90002', '30003');

Insert into h\_admission

values (ad\_s.nextval, '90003', '30002');

Insert into h\_admission

values (ad\_s.nextval, '90004', '30007');

Insert into h\_admission

values (ad\_s.nextval, '90005', '30006');

Insert into h\_admission

values (ad\_s.nextval, '90001', '30005');

Insert into h\_admission

values (ad\_s.nextval, '90002', '30004');

Insert into h\_diagnosis

values( dia\_s.nextval,'100003', '130004');

Insert into h\_diagnosis

values( dia\_s.nextval,'100001', '130005');

Insert into h\_diagnosis

values( dia\_s.nextval,'100002', '130006');

Insert into h\_diagnosis

values( dia\_s.nextval,'100004', '130007');

Insert into h\_diagnosis

values( dia\_s.nextval,'100005', '130005');

Insert into h\_treatment

values( treat\_s.nextval,'100002', '130002');

Insert into h\_treatment

values( treat\_s.nextval,'100003', '130005');

Insert into h\_treatment

values( treat\_s.nextval,'100005', '130004');

Insert into h\_treatment

values( treat\_s.nextval,'100003', '130005');

Insert into h\_treatment

values( treat\_s.nextval,'100001', '130006');

Insert into h\_invoice

values( inv\_s.nextval, '100002', '25 Oct 2016');

Insert into h\_invoice

values( inv\_s.nextval, '100003', '28 Oct 2016');

Insert into h\_invoice

values( inv\_s.nextval, '100001', '17 Nov 2016');

Insert into h\_invoice

values( inv\_s.nextval, '100004', '19 Nov 2016');

Insert into h\_invoice

values( inv\_s.nextval, '100002', '21 Nov 2016');

Insert into h\_invoice

values( inv\_s.nextval, '100003', '22 Nov 2016');

Insert into h\_line

values( line\_s.nextval, '60001', '40001', '25');

Insert into h\_line

values( line\_s.nextval, '60003', '40002', '30');

Insert into h\_line

values( line\_s.nextval, '60004', '40003', '10');

Insert into h\_line

values( line\_s.nextval, '60005', '40006', '18');

Insert into h\_line

values( line\_s.nextval, '60006', '40005', '20');

Insert into h\_line

values( line\_s.nextval, '60007', '40004', '17');

commit;

1. **Create views**

CREATE VIEW test\_view AS

SELECT t\_id, t\_name, lab\_name, pat\_name

FROM h\_test , h\_laboratory, h\_patient

where h\_test.lab\_id = h\_laboratory.lab\_id

and h\_test.pat\_id = h\_patient.pat\_id

with read only;

CREATE VIEW VIEWER2 AS

SELECT d.diagnosis\_id , d.admission\_id , p.pat\_name , w.ward\_name, ph.p\_name

FROM h\_admission a, h\_patient p , h\_ward w, h\_physician ph, h\_diagnosis d

where a.pat\_id = p.pat\_id

and a.ward\_id = w.ward\_id

and d.admission\_id = a.admission\_id

and d.p\_id = ph.p\_id

with read only;

CREATE VIEW viewer3 AS

SELECT inv.inv\_no , inv.paid\_date, a.admission\_id, i.item\_name, l.quantity, v.vend\_name

FROM h\_admission a , h\_invoice inv, h\_line l , h\_item i, h\_vendor v

where inv.admission\_id = a.admission\_id

and inv.inv\_no = l.inv\_no

and l.item\_id = i.item\_id

and i.vend\_id = v.vend\_id

with read only;