# COMP378 Project

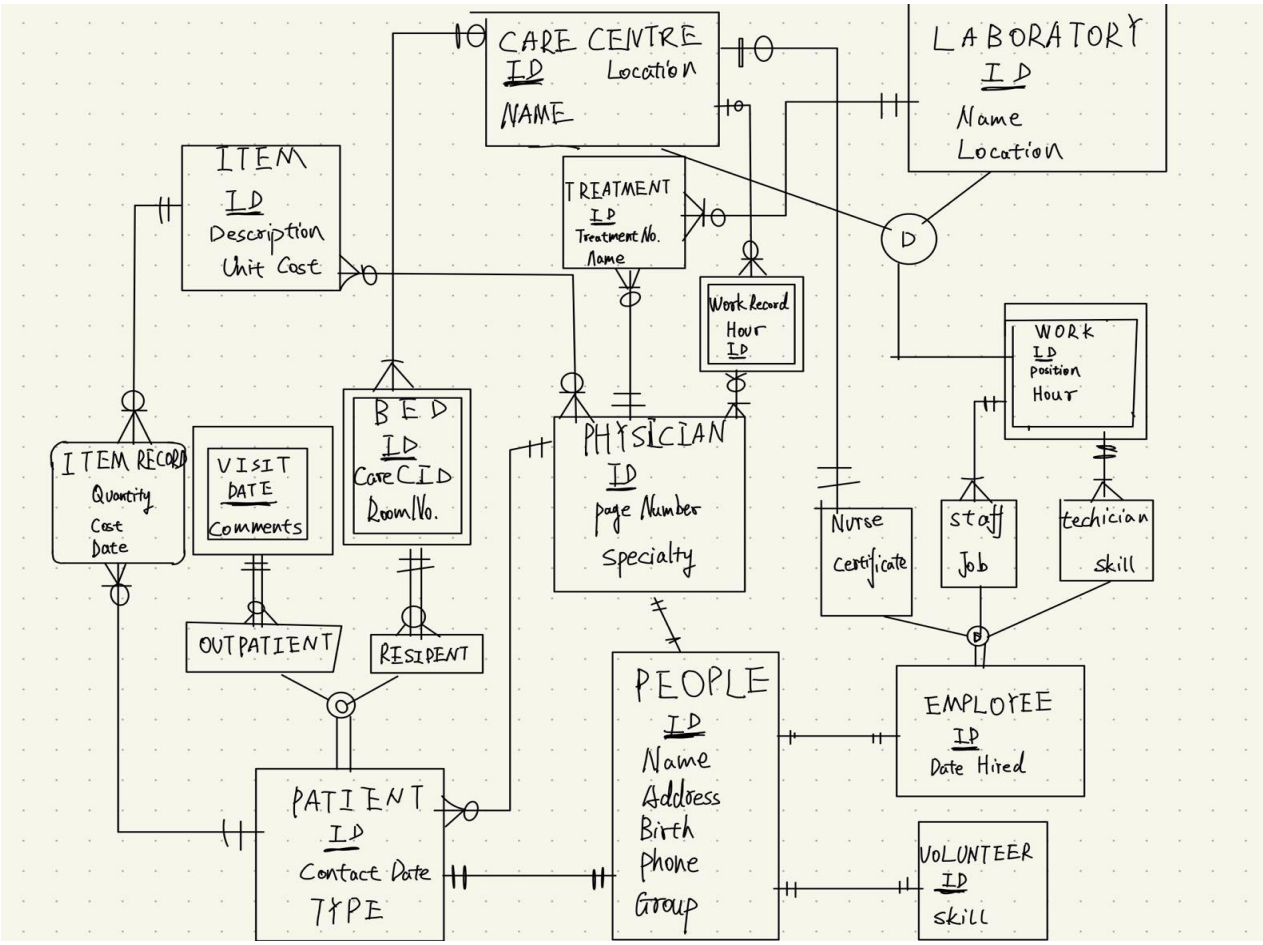
Q1.

A) . Yes, it is very important, build a supertype can improve database's performance. For example in RVH, patient is supertype of outpatient and resident, we do not need to define outpatient and resident again while we already did for patient.

B) .Yes. Business rules are the most foundation of a company. But with time is changing, rules are changing too. If RVH want to keep a good profit and long term growth, their business rules have to be adapted with time.

C).YES, there are some weak entities. For example, the instance "visit" is a weak entity, it depends on outpatient and it exist only if outpatient exist.

D).




E) . Yes, for example this EER Diagram can be reused if they want. And universal data models would save extremely large amount of time, developer just need to change models based on customers' requirement.

Q2.

A) .3NF would improve database's performance. Therefore RVH should use normalization in order to get a best database.

B) . Entity integrity: Help user to avoid confusion between two entities.
Referential intergrity: Help user to understand two or more entities' relationship

C) . Person(**ID**,Name,address,Birth,Phone,Group)
Volunteer(**ID**,Skill)
Employee(**ID**,DateHired)
Nurse(**id**,certificate)
Staff(**id**,job)
Techician(**ID**,SKill)
Item(**id**,description,unitcost)
ItemRecord(**ID,PATIEENT.ID**,Quantity,cost,date)
CareCentre(**ID**,name,location)
Laboratory(**id**,name,location)
Patient(**ID**,contact date)
OutPatient(**ID**,VisitDate,Comments)
Resident(**Id**,BedId,careCid,RoomNo);
PHYSICIAN(**ID**,PagerNumber,Specialty);
Treatment(**ID**,name,treamentNo)

D) .
There are some many information to create a physical database design.
1) .Recovery method. Eg,Backup database
2) .Security method. Eg, use firewalls,set up HTTPS proxy server.
3) . Clearly define the attributes, dont confuse users.
4) . Using appropriate Database management System.

E) .

F) .First, track this missing information, use a temporary value , because it may cause significant disaster, and then when user(patient/physician) use it stop them and report an error message. Most important thing is fix this missing information ASAP.

G) . Index has to be represented by an unique value.
Therefore: Treatment ID from Treatment; PhysicianID from Physician.

Q3.

A).

```sql
CREATE TABLE Patients
(pid int PRIMARY KEY,
 name varchar(10),
 address varchar(20),
 telephone varchar(20),
 care_centre_id int
);
 CREATE TABLE Care_centres
 (cid int PRIMARY KEY,
  name varchar(20),
  location varchar (20),
  nurse_charge_id int
 );
 CREATE TABLE Treatments
 (
     tid int PRIMARY KEY,
     patient_id int,
     physician_id int,
     treatment_name varchar(20),
     date date
 );
 CREATE TABLE Nurse
 (
     nid int PRIMARY KEY,
     name varchar(20),
     care_centre_id int,
     certificate_type varchar (20),
     telephone varchar(20),
     salary FLOAT
 );
 CREATE TABLE Physicians
 (
     phid int PRIMARY KEY,
     name varchar (20),
     pager_number int ,
     specialization varchar (20),
     salary FLOAT
 );
```

.

B) .Create INDEX Pindex ON Patients(pid);
Create INDEX Careindex ON Care_centres(cid);
Create INDEX TreatIndex ON Treatments(tid);
Create INDEX NursesIndex ON Nurses(nid);
Create INDEX PhysIndex ON Physicians(phid);

C) .

```
1
2  insert into Care_centres (cid,name,location,nurse_charge_id)
3  values(002,'student care','Athabasca University',001);
4  insert into Treatments (tid,patient_id,physician_id,treatment_name,date)
5  values(998,001,001,'database final','2021-12-10');
6  insert into Nurse (nid,name,care_centre_id,certificate_type,telephone,salary)
7  values(001,'someone',002,'mental',2222222,5000);
8  insert into Physicians(phid,name,pager_number,specialization,salary)
9  values(001,'yiyu',999,'database',9999);
10
```

| | pid [PK] integer | name character varying (10) | address character varying (20) | telephone character varying (20) | care_centre_id integer |
|---|---|---|---|---|---|
| 1 | 1 | chen | 255 maclean cresent | 123456789 | 1 |

| | cid [PK] integer | name character varying (20) | location character varying (20) | nurse_charge_id integer |
|---|---|---|---|---|
| 1 | 2 | student care | Athabasca University | 1 |

Data Output | Explain | Messages | Notifications

| | tid [PK] integer | patient_id integer | physician_id integer | treatment_name character varying (20) | date date |
|---|---|---|---|---|---|
| 1 | 998 | 1 | 1 | database final | 2021-1... |

Data Output | Explain | Messages | Notifications

| | nid [PK] integer | name character varying (20) | care_centre_id integer | certificate_type character varying (20) | telephone character varying (20) | salary double precision |
|---|---|---|---|---|---|---|
| 1 | 1 | someone | 2 | mental | 2222222 | 5000 |

Data Output | Explain | Messages | Notifications

| | phid [PK] integer | name character varying (20) | pager_number integer | specialization character varying (20) | salary double precision |
|---|---|---|---|---|---|
| 1 | 1 | yiyu | 999 | database | 9999 |

D) .

No, it cant answer the request.

First,I inserted more sample data in nurse and care_centres Table.

Data Output

| | nid [PK] integer | name character varying (20) | care_centre_id integer | certificate_type character varying (20) | telephone character varying (20) | salary double precision |
|---|---|---|---|---|---|---|
| 1 | 1 | someone | 2 | mental | 2222222 | 5000 |
| 2 | 2 | A | 2 | RN | 123354 | 8902.11 |
| 3 | 3 | B | 1 | RN | 111111 | 3658.99 |
| 4 | 4 | C | 2 | RN | 333333 | 6977.15 |
| 5 | 5 | D | 1 | RN | 444444 | 4329.28 |
| 6 | 6 | E | 2 | RN | 123355 | 5597.68 |
| 7 | 7 | F | 1 | NN | 55555 | 45648.36 |

Data Output

| | cid [PK] integer | name character varying (20) | location character varying (20) | nurse_charge_id integer |
|---|---|---|---|---|
| 1 | 2 | student care | Athabasca University | 1 |
| 2 | 1 | Second Student care | ATHABASCA University | 2 |

Here is my new code to solve the request.

Query Editor | Query History | Explain

```
1  DROP VIEW Nurse_summary;
2  CREATE VIEW NURSE_SUMMARY(D,C,TOTAL_S,AVERAGE_S) AS
3  SELECT cid AS D,
4  count (nid) AS c,
5  SUM(Nurse.salary) AS TOTAL_S,
6  AVG(Nurse.salary) AS AVERAGE_S
7  FROM Care_centres ,Nurse
8  WHERE cid = Nurse.care_centre_id
9  AND certificate_type = 'RN'
10 GROUP BY cid;
11
12 SELECT * from NURSE_SUMMARY;
```

This is output of request.

Data Output

| | d integer | c bigint | total_s double precision | average_s double precision |
|---|---|---|---|---|
| 1 | 1 | 2 | 7988.2699999999995 | 3994.1349999999998 |
| 2 | 2 | 3 | 21476.940000000002 | 7158.9800000000005 |

E) .

1).It is totally ok.

Data Output

| | d integer | c bigint | total_s double precision | average_s double precision |
|---|---|---|---|---|
| 1 | 1 | 2 | 7988.2699999999995 | 3994.1349999999998 |
| 2 | 2 | 3 | 21476.940000000002 | 7158.9800000000005 |

2). Code is ok, but my sample code doesnt match, therefore no output.

Data Output

| | d integer | c bigint |
|---|---|---|

But I change s>10000, there is a matched output.

Data Output

| | d integer | c bigint |
|---|---|---|
| 1 | 2 | 3 |

Change to s>100

Data Output

| | d integer | c bigint |
|---|---|---|
| 1 | 1 | 2 |
| 2 | 2 | 3 |

3).Code is ok, but my sample data doesnt match any.

Data Output

| | d integer | average_s double precision |
|---|---|---|

I changed d=2

Data Output

| | d integer | average_s double precision |
|---|---|---|
| 1 | 2 | 7158.9800000000005 |

4) .

The code doesnt work. There is an error, update cant be used on View which includes GROUPBY.

Messages

```
ERROR: 错误:  无法更新视图"nurse_summary"
DETAIL:  包含 GROUP BY 的视图列不能自动更新.
HINT:  启用对视图的更新操作，需要提供INSTEAD OF UPDATE触发器或者一个
无条件的 ON UPDATE DO INSTEAD 规则.


SQL state: 55000
```

5) .

Code doesnt work. Delete cant be used on View

Messages

```
ERROR: 错误:  无法删除视图"nurse_summary"
DETAIL:  包含 GROUP BY 的视图列不能自动更新.
HINT:  启用从视图删除数据，需要提供一个INSTEAD OF DELETE 触发器或者
个无条件的 ON DELETE DO INSTEAD 规则.


SQL state: 55000
```

F).

Data Output

| | pno integer | pname character varying (10) | carecentername character varying (20) | nursename character varying (20) | treatid integer | treatname character varying (20) | physid integer | date date |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | chen | Second Student care | A | 998 | database final | 1 | 2021-12-10 |

```
Create VIEW Q3F(PNO,Pname,CareCenterName,NurseName,TreatId,Treatname,PhysId,DATE) AS
SELECT PID,P.NAME,C.NAME,N.NAME,tid,treatment_name,phid,date
FROM Patients AS P,Care_centres AS C,Treatments AS T,Nurse as N,Physicians as PHY
Where P.Care_centre_id = CID AND C.nurse_charge_id = nid AND T.patient_id = pid AND t.PHYSICIAN_ID = phid;

SELECT * FROM Q3F;
```