Relational Model

1. Category(cname, prioritynum)
2. Person(hinsnum, DOB, DOR, name, phone, gender, streetA, pcode, city, cname)
   Cname reference Category
3. Vaccine(company, doses, waitperiod)
4. Location(Lname, pcode, streetA, city)
5. VaccineBatch(company, batchnum, mandate, expirydate, numdoses, Lname)
   Company references Vaccine, Lname reference Location
6. Vial(company,batchnum, vialnum)
   Company,batchnum references VaccineBatch
7. Hospital(Lname)
   Lname references Location
8. Nurse(CanListNum, Nname, Lname)
   Lname references to Hospital
9. VaccDate(Lname, Sdate)
   Lname reference Location
10. Slot(Stime, Sarea, Sdate, LName, hinsurnum, CanListNum, company,batchnum, vialnum)
    (Lname,sdate) reference to VaccDate
    CanListNum reference to Nurse
    Hinsurnum reference to Person
    (company,batchnum, vialnum) references Vial
11. NurseAssignment(CanListNum, lame, sdate)
    Canlistnum references to Nurse
    (lname, sdate) reference Vaccdate

SQL Queries

Q4

a.

```
SELECT  sarea, stime, sdate, lname
FROM SLOT
WHERE lname = 'Jewish General' AND sdate = '2021-03-20' AND hinsnum IS NULL
ORDER by sarea;
```

```
db2 => SELECT  sarea, stime, sdate, lname FROM slot WHERE lname= 'Jewish General' AND sdate = '2021-03-20' AND hinsnum IS NULL ORDER BY sarea;

SAREA                          STIME    SDATE      LNAME
------------------------------ -------- ---------- ------------------------------
ward-1                         08:00:00 03/20/2021 Jewish General
ward-1                         09:00:00 03/20/2021 Jewish General
ward-2                         08:00:00 03/20/2021 Jewish General
ward-3                         08:00:00 03/20/2021 Jewish General
ward-3                         08:30:00 03/20/2021 Jewish General

  5 record(s) selected.
```

b. SELECT expirydate
FROM VaccineBatch
WHERE VaccineBatch.batchnum = (SELECT batchnum
FROM SLOT
where sdate = '2021-02-06' AND hinsnum = (
SELECT hinsnum
FROM Person
WHERE pname = 'Jane Doe'));

```
db2 => SELECT expirydate FROM VaccineBatch WHERE VaccineBatch.batchnum = (SELECT batchnum F
ROM SLOT  where sdate = '2021-02-06' AND hinsnum = (SELECT hinsnum  FROM Person  WHERE pnam
e = 'Jane Doe')) ;

EXPIRYDATE
----------
01/01/2022

  1 record(s) selected.
```

c. SELECT COUNT(hinsnum) AS Montreal_on_6th_Feb
FROM Slot
WHERE sdate = '2021-02-06' AND lname in (SELECT lname
FROM LOCATION
WHERE city = 'Montreal');

```
db2 => SELECT COUNT(hinsnum) AS Montreal_on_6th_Feb FROM Slot WHERE sdate = '2021-02-06' A
ND lname in (SELECT lname FROM LOCATION WHERE city = 'Montreal') ;

MONTREAL_ON_6TH_FEB
-------------------
                  7

  1 record(s) selected.
```

d. SELECT pname, phone, hinsnum
FROM Person
WHERE hinsnum in (SELECT hinsnum
FROM SLOT
WHERE company = 'Pfizer-BioNTech' AND asgndate <= '2021-02-01'
GROUP BY hinsnum
HAVING COUNT(Slot.hinsnum) = 1)
ORDER BY pname;

```
db2 => SELECT pname, phone, hinsnum FROM Person WHERE hinsnum in (SELECT hins
num FROM SLOT WHERE company = 'Pfizer-BioNTech' AND asgndate <= '2021-02-01'
GROUP BY hinsnum HAVING COUNT(Slot.hinsnum) = 1) ORDER BY pname;

PNAME                          PHONE        HINSNUM
------------------------------ ------------ -----------
Emma Watson                    531-908-0988           2
Oliver Twist                   538-924-0762           5
Saad Shahbaz                   438-924-0766           1

  3 record(s) selected.
```

e. SELECT prioritynum, Category.cname, COUNT(prioritynum) AS Number_of_people_vaccinated
FROM Category
Left Join person
ON Category.cname = Person.cname

Where hinsnum IN (SELECT hinsnum
FROM SLOT)
GROUP BY Category.cname, Category.prioritynum
ORDER BY Category.prioritynum ;

```
db2 => SELECT prioritynum, Category.cname, COUNT(prioritynum) AS Number_of_people_vaccinat
ed FROM Category Left Join person ON Category.cname = Person.cname Where hinsnum IN (SELEC
T hinsnum FROM SLOT) GROUP BY Category.cname, Category.prioritynum ORDER BY Category.prior
itynum;

PRIORITYNUM CNAME                          NUMBER_OF_PEOPLE_VACCINATED
----------- ------------------------------ ---------------------------
          1 Elderly                                                  2
          1 Health Care Worker                                       1
          2 Children                                                 2
          2 Physical proximity 1                                     2
          2 Teacher                                                  1
          3 Physical proximity 2                                     1
          4 Everybody else                                           2

  7 record(s) selected.
```

Montreal Nurses

1. View definition in SQL:

```
CREATE VIEW mtlnurses(CanLisNum, nname, lname, lpcode, lstreetaddress)
  AS
  SELECT CanLisNum, nname, Hospital.lname, LOCATION.lpcode, LOCATION.lstreetaddress
  FROM Nurse, Location, Hospital
  WHERE Hospital.lname = Location.lname AND Hospital.lname = Nurse.lname AND city =
'Montreal' ;
```

2. Screenshot of the view creation being a success

```
db2 => CREATE VIEW mtlnurses(CanLisNum, nname, lname, lpcode, lstreetaddress) AS SELECT Ca
nLisNum, nname, Hospital.lname, LOCATION.lpcode, LOCATION.lstreetaddress FROM Nurse, Locat
ion, Hospital WHERE Hospital.lname = Location.lname AND Hospital.lname = Nurse.lname AND c
ity = 'Montreal' ;
DB20000I  The SQL command completed successfully.
db2 =>
```

3. Screenshot of a SQL query that selects everything from the view, truncated to just 5 records.

```
db2 => SELECT * FROM mtlnurses LIMIT 5;

CANLISNUM   NNAME                         LNAME                        LPCODE  LSTREETADDRESS
----------- ---------------------------- ---------------------------- ------- ----------------------------------------
   35408957 Sandra Bullek                Jewish General               H3T-1E2 3755 Chemin de la Côte-Sainte-Catherine
   35408958 John Dawson                  Montreal General Hospital    H3G-1A4 1650 Cedar Ave
   35408961 Hugh Jackman                 Jewish General               H3T-1E2 3755 Chemin de la Côte-Sainte-Catherine
   35408962 Tom Hanks                    Montreal General Hospital    H3G-1A4 1650 Cedar Ave
   35408963 Chris Hemsworth              Montreal General Hospital    H3G-1A4 1650 Cedar Ave

  5 record(s) selected.
```

4. Screenshot of a SQL query on the view that limits the previous output to only the nurses working in the hospital Jewish General.

```
db2 => SELECT * FROM mtlnurses WHERE lname = 'Jewish General' LIMIT 5;

CANLISNUM   NNAME                         LNAME                        LPCODE  LSTREETADDRESS
----------- ---------------------------- ---------------------------- ------- ----------------------------------------
   35408957 Sandra Bullek                Jewish General               H3T-1E2 3755 Chemin de la Côte-Sainte-Catherine
   35408961 Hugh Jackman                 Jewish General               H3T-1E2 3755 Chemin de la Côte-Sainte-Catherine

  2 record(s) selected.
```

5. Now try inserting a record into the view (license number, name and a hospital name, etc.,) that has valid domain values for these attributes (e.g. a new nurse, but an existing hospital).

   Inserting:
   INSERT INTO mtlnurses VALUES(35408100,'Jennifer Aniston','Jewish General', 'H3T-1E2', '3755 Chemin de la Côte-Sainte-Catherine');

   Results gotten:

```
db2 => INSERT INTO mtlnurses VALUES(35408100,'Jennifer Aniston','Jewish General', 'H3T-1E2', '3755 Chemin
de la Côte-Sainte-Catherine');
DB21034E  The command was processed as an SQL statement because it was not a
valid Command Line Processor command.  During SQL processing it returned:
SQL0150N  The target fullselect, view, typed table, materialized query table,
range-clustered table, or staging table in the INSERT, DELETE, UPDATE, MERGE,
or TRUNCATE statement is a target for which the requested operation is not
permitted.  SQLSTATE=42807
```

   Why? : SQL did not allow insert into view as they are not allowed by db2 because as seen in class modifications to the view table can cause problems in the data and can corrupt or break parts of data, this is why views do not allow insert or other modifications to the query

Check Constraints

1. Add a CHECK constraint to your respective table to ensure that the expiry date associated with a vaccine batch is past its manufacturing date.

```
db2 => ALTER TABLE VACCINEBATCH ADD CONSTRAINT check_date
CHECK(VaccineBatch.manudate < VaccineBatch.expirydate);
DB20000I  The SQL command completed successfully.
```

2. Response from the database as well as an instance where you try to insert a record that violates this constraint and the database throwing an error

```
db2 => INSERT INTO VACCINEBATCH VALUES ('Pfizer-BioNTech', 1290, '2022-01-01'
, '2021-01-01', '100', 'Jewish General');
DB21034E  The command was processed as an SQL statement because it was not a
valid Command Line Processor command.  During SQL processing it returned:
SQL0545N  The requested operation is not allowed because a row does not
satisfy the check constraint "SSHAHB5.VACCINEBATCH.CHECK_DATE".
SQLSTATE=23513
```

Pending Constraints

1. My SQL automatically does not calculate when the next appointment is due, and asgndate + waitperiod needs to be added to calculating the next appointment for the second dose.
2. As the sql doesn't account for the total number of doses given to the person, the only way possible to calculate the number of doses given to the person is to calculate the number of slots created for the person (keeping in mind that a person cannot cancel an appointment) and that is how the number of doses are counted.