

COMP421 Project 2

Relational Translation (the Project 1 solution posted on MyCourses)

1. Category(cname , prioritynum)
2. Person(hinsurnum, name, gender, dob, phone, city, postalcd, streetaddr, regdate, cname)
cname references Category
3. Vaccine(vname , waitperiod, doses)
4. VaccLocation(locname, lcity, lpostalcd, lstreetaddr)
5. VaccineBatch(vname, batchno, mfgdate, expydate, numdoses, locname) vname references Vaccine, locname references VaccLocation
6. Vial(vname, batchno, vialid) vname, batchno references VaccineBatch
7. Hospital(locname) locname references VaccLocation
8. Nurse(licensenum, name, locname) locname references Hospital
9. VaccDates(locname, vdate) locname references VaccLocation
10. VaccSlot(locname, vdate, vtime, vslot, hinsurnum, asgndate, licensenum, vname, batchno, vialid) locname, vdate references VaccDates, licensenum references Nurse, hinsurnum references Person, (vname, batchno, vialid) references Vial
11. NurseAssignments(licensenum, locname, vdate) licensenum references Nurse, (locname, vdate) references VaccDates

Pending Constraints

1. The regdate of a person must be earlier than his/her/their asgndate. The asgndate must be earlier than or at the same day as their vdate. And the dob of a person must be earlier than all of them
2. The total number of vialid within a batch cannot exceed this batch's numdoses.
3. The expydate of a batch must be later than its mfgdate (this is solved in part 6 by using ALTER TABLE but when in this step, this constraint does not exist).
4. The model has no way of enforcing that the same vaccine (manufacturer) is administered to a given individual for all the required doses.
5. The model has no way of enforcing that the total number of doses administered to an individual conforms to the number of required doses associated with each vaccine.

SQL Queries

a).

Plain Text

```
1 CONNECT TO cs421;
2 SELECT locname, vdate, vtime, vslot
3 FROM VaccSlot
4 WHERE locname='Jewish General' and vdate='2021-03-20' and hinsurnum IS NULL;
```

```
admin — ssh than6@winter2021-comp421.cs.mcgill.ca — 96x44

db2 => than6@winter2021-comp421[09:38:05]:p2$ db2 -t -v < a.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
? CATALOG DATABASE for help on the CATALOG DATABASE command
? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => db2 (cont.) => SELECT locname, vdate, vtime, vslot FROM VaccSlot WHERE loc
name='Jewish General' and vdate='2021-03-20' and hinsurnum IS NULL

LOCNAME          VDATE          VTIME          VSLLOT
-----
Jewish General   03/20/2021     13:34:00     JG004
Jewish General   03/20/2021     14:55:00     JG003

2 record(s) selected.

db2 => than6@winter2021-comp421[09:38:54]:p2$ |
```

b).

Plain Text

```
1 CONNECT TO cs421;
2 SELECT expirydate
3 FROM VaccineBatch
4 WHERE batchno in (SELECT batchno
5                   FROM VaccSlot
6                   WHERE vdate='2021-02-06' AND hinsurnum in (SELECT hinsurnum
7                                                               FROM Person
8                                                               WHERE name='Jane Doe')));
```

```
admin — ssh than6@winter2021-comp421.cs.mcgill.ca — 96x44

than6@winter2021-comp421[09:37:31]:p2$ db2 -t -v < b.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
  ? CATALOG DATABASE for help on the CATALOG DATABASE command
  ? CATALOG           for help on all of the CATALOG commands.

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interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

      Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
SELECT expirydate FROM VaccineBatch WHERE batchno in (SELECT batchno FROM VaccSlot WHERE vdate='
2021-02-06' AND hinsurnum in (SELECT hinsurnum FROM Person WHERE name='Jane Doe'))

EXPRYDATE
-----
07/07/2021

      1 record(s) selected.

db2 => than6@winter2021-comp421[09:37:49]:p2$ |
```

c).

Plain Text

```
1 CONNECT TO cs421;
2 SELECT count(hinsurnum) AS total
3 FROM VaccSlot
4 WHERE vdate='2021-02-06' and locname IN (SELECT locname
5                                         FROM VaccLocation
6                                         WHERE lcity='Montreal');
```

admin — ssh than6@winter2021-comp421.cs.mcgill.ca — 96x44

```
db2 => than6@winter2021-comp421[09:37:49]:p2$ db2 -t -v < c.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0
```

You can issue database manager commands and SQL statements from the command prompt. For example:

```
db2 => connect to sample
db2 => bind sample.bnd
```

For general help, type: ?.

For command help, type: ? command, where command can be the first few keywords of a database manager command. For example:

```
? CATALOG DATABASE for help on the CATALOG DATABASE command
? CATALOG          for help on all of the CATALOG commands.
```

To exit db2 interactive mode, type QUIT at the command prompt. Outside interactive mode, all commands must be prefixed with 'db2'.

To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

```
db2 => CONNECT TO cs421
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421
```

```
db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => SELECT count(hinsurnum) AS total
FROM VaccSlot WHERE vdate='2021-02-06' and locname IN (SELECT locname FROM VaccLocation WHERE lcity='Montreal')
```

TOTAL

4

1 record(s) selected.

```
db2 => than6@winter2021-comp421[09:38:05]:p2$ |
```


d).

Plain Text

```
1 CONNECT TO cs421;
2 SELECT name, phone, hinsurnum
3 FROM Person
4 WHERE hinsurnum IN (SELECT hinsurnum
5                     FROM VaccSlot
6                     WHERE vdate < '2021-02-01'
7                     GROUP BY hinsurnum
8                     HAVING count(hinsurnum)=1);
```

```
admin — ssh than6@winter2021-comp421.cs.mcgill.ca — 96x44
than6@winter2021-comp421[09:36:37]:p2$ db2 -t -v < d.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
  ? CATALOG DATABASE for help on the CATALOG DATABASE command
  ? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
SELECT name, phone, hinsurnum FROM Person WHERE hinsurnum IN (SELECT hinsurnum FROM VaccSlot WH
ERE vdate < '2021-02-01' GROUP BY hinsurnum HAVING count(hinsurnum)=1)

NAME                PHONE                HINSURNUM
-----
John J Foster       450-525-6603       192166445
Ivan M Kennedy      819-765-0977       341772598
Donald J Brown      514-913-9374       680393717
Yanira C Wilson     418-568-1800       704263052

4 record(s) selected.
```

e).

Plain Text

```
1 CONNECT TO cs421;
2 SELECT cname, count(hinsurnum) AS total
3 FROM (SELECT Person.hinsurnum, cname
4       FROM Person, VaccSlot
5       WHERE vdate < '2021-02-26' AND Person.hinsurnum = VaccSlot.hinsurnum) AS X
6 GROUP BY cname;
```

```
admin — ssh than6@winter2021-comp421.cs.mcgill.ca — 99x46
db2 => than6@winter2021-comp421[09:50:59]:p2$ db2 -t -v < e.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
  ? CATALOG DATABASE for help on the CATALOG DATABASE command
  ? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => SELECT cname, count(hinsurnum) A
S total FROM (SELECT Person.hinsurnum, cname FROM Person, VaccSlot WHERE vdate < '2021-02-26' AND P
erson.hinsurnum = VaccSlot.hinsurnum) AS X GROUP BY cname

CNAME                                                    TOTAL
-----
Children below 10                                         1
Elderly                                                  4
Essential Service Workers                               2
Everybody else                                           1
Health Care workers                                     4
Immunologically Compromised                             2
Teachers                                                 3
Those in physical proximity to first priority           3

8 record(s) selected.
```

Montreal Nurses

Include the view definition SQL (as plain text).

Plain Text

```
1 CONNECT TO cs421;
2 CREATE VIEW mtlnurses (licensenum, name, locname, lpostalcd, lstreetaddr)
3 AS SELECT licensenum, name, Nurse.locname, lpostalcd, lstreetaddr
4 FROM Nurse, VaccLocation
5 WHERE Nurse.locname=VaccLocation.locname AND lcity='Montreal';
```

Screenshot of the view creation being a success.

```
than6@winter2021-comp421[09:43:42]:p2$ db2 -t -v < 5.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
  ? CATALOG DATABASE for help on the CATALOG DATABASE command
  ? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => CREATE VIEW mtlnurses (licensenum, name, loc
name, lpostalcd, lstreetaddr) AS SELECT licensenum, name, Nurse.locname, lpostalcd, lstreetaddr
FROM Nurse, VaccLocation WHERE Nurse.locname=VaccLocation.locname AND lcity='Montreal'
DB20000I The SQL command completed successfully.
```


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

```
CONNECT TO cs421;
SELECT *
FROM mtlnurses;
```

```
db2 => than6@winter2021-comp421[09:51:50]:p2$ db2 -t -v < 5sub.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
prompt. For example:
  db2 => connect to sample
  db2 => bind sample.bnd

For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
  ? CATALOG DATABASE for help on the CATALOG DATABASE command
  ? CATALOG           for help on all of the CATALOG commands.

To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => db2 (cont.) => SELECT * FROM mtlnurses
```

LICENSENUM	NAME	LOCNAME	LPOSTALCD	LSTREETADDR
520757162	Sharon S Fowler	Jewish General	H2K 4J5	4590 Papineau Avenue
292516754	Bob R Bobby	Jewish General	H2K 4J5	4590 Papineau Avenue
118836246	Joshua L Brewer	Jewish General	H2K 4J5	4590 Papineau Avenue
701108441	Violet C Alfonso	Jewish General	H2K 4J5	4590 Papineau Avenue
717627640	Janet W Huynh	Jewish General	H2K 4J5	4590 Papineau Avenue

Screenshot of a SQL query on the view that limits the previous output to only the nurses working in the hospital Jewish General. Truncate the output to just 5 records.

```
CONNECT TO cs421;
SELECT *
FROM mtlnurses
WHERE locname='Jewish General';
```

```
than6@winter2021-comp421[09:48:49]:p2$ db2 -t -v < 5subsub.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0
```

```
You can issue database manager commands and SQL statements from the command
prompt. For example:
db2 => connect to sample
db2 => bind sample.bnd
```

```
For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
? CATALOG DATABASE for help on the CATALOG DATABASE command
? CATALOG for help on all of the CATALOG commands.
```

```
To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.
```

For more detailed help, refer to the Online Reference Manual.

```
db2 => CONNECT TO cs421
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID  = THAN6
Local database alias = CS421
```

```
db2 => db2 (cont.) => db2 (cont.) => SELECT * FROM mtlnurses WHERE locname='Jewish General'
```

LICENSENUM	NAME	LOCNAME	LPOSTALCD	LSTREETADDR
520757162	Sharon S Fowler	Jewish General	H2K 4J5	4590 Papineau Avenue
292516754	Bob R Bobby	Jewish General	H2K 4J5	4590 Papineau Avenue
118836246	Joshua L Brewer	Jewish General	H2K 4J5	4590 Papineau Avenue
701108441	Violet C Alfonso	Jewish General	H2K 4J5	4590 Papineau Avenue
717627640	Janet W Huynh	Jewish General	H2K 4J5	4590 Papineau Avenue

5 record(s) selected.

```
than6@winter2021-comp421[09:48:53]:p2$ |
```

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). Observe what happens. Take a screenshot and turn in that along with the explanation of why this happened.

```
8 record(s) selected.

than6@winter2021-comp421[09:51:59]:p2$ vi 5last.sql
than6@winter2021-comp421[09:54:49]:p2$ db2 -t -v < 5last.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0

You can issue database manager commands and SQL statements from the command
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  db2 => bind sample.bnd

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To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

db2 => CONNECT TO cs421

Database Connection Information

Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421

db2 => INSERT INTO mtlnurses VALUES(123456789, 'Test Name', 'Jewish General', 'H2K 4J5', '4590 Papineau Avenue')
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

than6@winter2021-comp421[09:54:54]:p2$ |
```

Because this view is read-only since it contains more than one table (i.e. Nurse and VaccLocation). Thus, when inserting a value into this view, the system doesn't know which table to update.

Check Constraints

```
db2 => than6@winter2021-comp421[10:12:52]:p2$ db2 -t -v < 6pre.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0
```

You can issue database manager commands and SQL statements from the command prompt. For example:

```
db2 => connect to sample
db2 => bind sample.bnd
```

For general help, type: ?.

For command help, type: ? command, where command can be the first few keywords of a database manager command. For example:

```
? CATALOG DATABASE for help on the CATALOG DATABASE command
? CATALOG           for help on all of the CATALOG commands.
```

To exit db2 interactive mode, type QUIT at the command prompt. Outside interactive mode, all commands must be prefixed with 'db2'.

To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

```
db2 => CONNECT TO cs421
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID  = THAN6
Local database alias = CS421
```

```
db2 => ALTER TABLE VaccineBatch ADD CONSTRAINT expmfg CHECK (expmfgdate > mfgdate)
DB20000I The SQL command completed successfully.
```

```
than6@winter2021-comp421[10:13:15]:p2$ db2 -t -v < 6.sql
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 11.5.4.0
```

You can issue database manager commands and SQL statements from the command prompt. For example:

```
db2 => connect to sample
db2 => bind sample.bnd
```

For general help, type: ?.
For command help, type: ? command, where command can be the first few keywords of a database manager command. For example:

```
? CATALOG DATABASE for help on the CATALOG DATABASE command
? CATALOG           for help on all of the CATALOG commands.
```

To exit db2 interactive mode, type QUIT at the command prompt. Outside interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

```
db2 => CONNECT TO cs421
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = THAN6
Local database alias = CS421
```

```
db2 => INSERT INTO VaccineBatch VALUES('Pfizer-BioNTech', 18,'2020-12-19','2020-06-17', 13, '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 "THAN6.VACCINEBATCH.EXPMFG".  SQLSTATE=23513
```

```
than6@winter2021-comp421[10:13:40]:p2$ |
```