

COMP 421 (Winter 2022)
Namdar Kabolinejad
260893536

Relational Model

Mothers (HcId, Name, Phone, DoB, Addr, Email, Profession, DueD, BloodT)

Fathers (Fid, Name, Phone, DoB, Profession, Addr, Email, BooldT, Hid)

Couples (Cid, HcId, Fid, Appr) {HcId referencing Mother}

Pregnancies (Cid, Num, PrimID, BackupID, Status, Bid, Interested, HomeBirth)

{Cid referencing Couples}

{Bid referencing BirthCenter}

{PrimID, BackupID referencing Midwife}

Facilities (Hid, Name, Addr, Email, Phone, Web)

CommClinic (Hid) {Hid referencing Facilities}

BirthCenter (Hid, Capacity) {Hid referencing Facilities}

Midwives (MidId, Hid, Name, Phone, Email) {Hid referencing Facilities}

Technicians (TechId, Name, Phone)

Babies (Bid, Cid, Num, Name, Gender, DOB, BTime, BloodT)

{Num, Cid referencing Pregnancy}

Appointments (Aid, Num, Cid, Date, Time, MidId)

{MidId referencing Midwife} {Num, Cid referencing Pregnancy}

InfoSess (lid, MidId, Date, Time, Lang, Capacity){MidId referencing Midwife}

InfoRegistration (lid, Cid, Attended)

{Cid referencing Couple}

{lid referencing InfoSess}

Due Dates (Cid, Num, ApproxD, Info)

{Num, Cid referencing Pregnancy}

Notes (Aid, Date, Time, Text) {Aid referencing Appointment}

Tests (Tid, MidId, Num, Cid, Ttype, PresDate, SampDate, LabDate, TechId, Bid, Resultst)

{MidId referencing Midwife}

{Cid, Num referencing Pregnancy}

{Bid referencing Baby}

{TechId referencing Technicain}

Pending constraints

Even with using CHECKs, NOT NULLs, UNIQUE, FOREIGN KEYs, ... there are some constraints that remain in our model.

- There are some data that need to be provided as we go ahead in the process, for example, the secondary midwife, the blood type of the baby, ... there is no way to enforce such that this info gets provided on time or correctly.
- Even with some CHECKs put in place, there are some constraints we can't check. For example
 - Calendar overlap between records, e.g. if a Midwife is being appointed for an info session and a meeting at the same time
 - We can't enforce that a couple has shown interest and has been approved when being assigned a midwife
 - A pregnancy with Homebirth can also be associated with a Birthcenter
 - A couple can only be involved in a single pregnancy in the same time period
 - A mother can be involved in multiple pregnancies at the same time (with different couples)
 - ...
- There are other restrictions that should be checked and verified in the application code

SQL Queries

A.

```
SELECT A.Date, A.Time, M.HcId, M.Name, M.Phone
FROM Midwife W, Appointment A, Pregnancy P, Couple C, Mother M
WHERE W.Name = 'Marion Girard'
  AND A.MidId = W.MidId
  AND A.Date >= DATE '2022-03-21'
  AND A.Date <= DATE '2022-03-25'
  AND P.cid = A.Cid AND P.Num = A.Num
  AND C.Cid = P.Cid
  AND M.HcId = C.HcId
;
```

```

namdar — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 111x21
~ — ssh nkabol@winter2022-comp421.cs.mcgill.ca
~/Desktop/421-P2 — -bash

db2 => SELECT A.Date, A.Time, M.HcId, M.Name, M.Phone
FROM Midwife W, Appointment A, Pregnancy P, Couple C, Mother M
WHERE W.Name = 'Marion Girard'
      AND A.MidId = W.MidId
      AND A.Date >= DATE'2022-03-21'
      AND A.Date <= DATE'2022-03-25'
      AND P.cid = A.Cid AND P.Num = A.Num
      AND C.Cid = P.Cid
      AND M.HcId = C.HcId
[;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (
cont.) => db2 (cont.) =>

DATE          TIME          HCID          NAME          PHONE
-----
03/24/2022 13:30:00          1 Victoria Gutierrez 5745566311
03/21/2022 14:30:00          1 Victoria Gutierrez 5745566311

2 record(s) selected.

db2 =>

```

B.

```

SELECT T.LabDate, T.Results
FROM Tests T, Mother M, Couple C
WHERE T.Ttype = 'Blood Iron'
      AND T.cid = C.cid
      AND C.HcId = M.HcId
      AND T.Num = 2
      AND M.Name = 'Victoria Gutierrez'
;

```

```

421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 116x18
~/Desktop/421-P2 — -bash
...ktop/421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca

db2 =>
db2 => SELECT T.LabDate, T.Results
FROM Tests T, Mother M, Couple C
WHERE T.Ttype = 'Blood Iron'
      AND T.cid = C.cid
      AND C.HcId = M.HcId
      AND T.Num = 2
      AND M.Name = 'Victoria Gutierrez'
[;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>

LABDATE      RESULTS
-----
03/27/2022 Blood Iron OK
02/17/2022 Blood Iron Not OK

2 record(s) selected.

db2 =>

```

C.

```

WITH numBirth(FName, Num) AS(
  SELECT F.Name, COUNT(B.Name)
  FROM Facilities F, Midwife W, Pregnancy P, Mother M, Couple C, Baby B
  WHERE F.Hid = W.Hid
        AND P.PrimID = W.MidId
        AND C.Cid = P.Cid

```

```

        AND M.HcId = C.HcId
        AND B.Cid = P.Cid
        AND B.Num = P.Num
        AND M.DueD >= DATE '2022-07-01'
        AND M.DueD < DATE '2022-08-01'
        AND P.Num >= ALL(
            SELECT P1.Num
            FROM Pregnancy P1
            WHERE P1.Cid = C.Cid
        )
    GROUP BY F.Name
)
SELECT DISTINCT F.Name,CASE
    WHEN NOT EXISTS (
        SELECT *
        FROM numBirth NB
        WHERE NB.FName = F.Name
    ) THEN 0
    ELSE (
        SELECT NB.Num
        FROM numBirth NB
        WHERE NB.FName = F.Name
    )

    END AS NumBirths
FROM Facilities F
ORDER BY NumBirths DESC
;

```

```
421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 105x61
~/Desktop/421-P2 — -bash    ...l@winter2022-comp421.cs.mcgill.ca +

;
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
DB20000I The SQL command completed successfully.
db2 =>
db2 =>
db2 =>
db2 => WITH numBirth(FName, Num) AS(
  SELECT F.Name, COUNT(B.Name)
  FROM Facilities F, Midwife W, Pregnancy P, Mother M, Couple C, Baby B
  WHERE F.Hid = W.Hid
    AND P.PrimID = W.MidId
    AND C.Cid = P.Cid
    AND M.HcId = C.HcId
    AND B.Cid = P.Cid
    AND B.Num = P.Num
    AND M.DueD >= DATE'2022-07-01'
    AND M.DueD < DATE'2022-08-01'
    AND P.Num >= ALL(
      SELECT P1.Num
      FROM Pregnancy P1
      WHERE P1.Cid = C.Cid
    )
  GROUP BY F.Name
)
SELECT DISTINCT F.Name,CASE
  WHEN NOT EXISTS (
    SELECT *
    FROM numBirth NB
    WHERE NB.FName = F.Name
  ) THEN 0
  ELSE (
    SELECT NB.Num
    FROM numBirth NB
    WHERE NB.FName = F.Name
  )
END AS NumBirths
FROM Facilities F
ORDER BY NumBirths DESC
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
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db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>

NAME                                NUMBIRTHS
-----
Lac-Saint-Louis                      1
Concordia Medical Center              0
Doula Kimberly                       0
Jeanne Mance                         0
Leval Clinic                         0
Maison de naissance                  0
McGill Hospital                      0
My Clinic                            0
The Final Clinic                     0
Two Doulas                           0

10 record(s) selected.

db2 => █
```

D.

```
SELECT M.HcId, M.Name, M.Phone
FROM Midwife W, Facilities F, Pregnancy P, Mother M
WHERE W.Hid = F.Hid
  AND F.Name = 'Lac-Saint-Louis'
  AND P.PrimID = W.MidId
  AND P.Hid = M.HcId
```

;

```

421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 116x23
~/Desktop/421-P2 — -bash
...ktop/421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca +
SQL0545N The requested operation is not allowed because a row does not
satisfy the check constraint "NKABOL.TESTS.SQL220223062746530".
SQLSTATE=23513
db2 =>
db2 =>
db2 => SELECT M.HcId, M.Name, M.Phone
FROM Midwife W, Facilities F, Pregnancy P, Mother M
WHERE W.Hid = F.Hid
      AND F.Name = 'Lac-Saint-Louis'
      AND P.PrimID = W.MidId
      AND P.Hid = M.HcId
      AND P.Done = False
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>

```

HCID	NAME	PHONE
1	Victoria Gutierrez	5745566311
1	Victoria Gutierrez	5745566311
3	Nancy Domingo	5155567313

```

3 record(s) selected.
db2 =>

```

E.

```
SELECT DISTINCT M.HcId, M.Name, M.Phone
FROM Pregnancy P, Mother M
WHERE P.Hid = M.HcId
      AND (
          SELECT Count(*)
          FROM Baby B
          WHERE B.Cid = P.Cid
              AND B.Num = P.Num ) >= 2
;
```

[illegible]

Midwife Information

A.

```
CREATE VIEW midwifeinfo(MidId, MidName, MidPhone, MidEmail, FacName,
FacAddr) AS
SELECT W.MidId, W.Name, W.Phone, W.Email, F.Name, F.Addr
FROM Midwife W, Facilities F
WHERE W.Hid = F.Hid
;
```

```
namdar — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 111x21
~ — ssh nkabol@winter2022-comp421.cs.mcgill.ca ~/Desktop/421-P2 — -bash

2 record(s) selected.

db2 =>
db2 =>
db2 =>
db2 =>
CREATE VIEW midwifeinfo(MidId, MidName, MidPhone, MidEmail, FacName, FacAddr) AS
SELECT W.MidId, W.Name, W.Phone, W.Email, F.Name, F.Addr
FROM Midwife W, Facilities F
WHERE W.Hid = F.Hid
[db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
DB20000I The SQL command completed successfully.
db2 =>
```

B.

```
SELECT * FROM midwifeinfo LIMIT 5;
```

```
421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 195x14
~/Desktop/421-P2 — -bash ~/Desktop/421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca +

db2 => SELECT * FROM midwifeinfo LIMIT 5;

MIDID      MIDNAME      MIDPHONE      MIDEMAIL      FACNAME      FACADDR
-----
1 Marion Girard 5717782131    Marion.Girard@gmail.com  Lac-Saint-Louis  43 Rue Saint Batist
5 Marry Adams  5432787135    Marry.Adams@gmail.com   Lac-Saint-Louis  43 Rue Saint Batist
2 Marry Gurter  5617782132    Marry.Gurter@gmail.com  Doula Kimberly  344 Rue Laval
3 John Adamson 5717687133    John.Ade@gmail.com      Doula Kimberly  344 Rue Laval
4 Jerry Hudson 5711689134    JerryHud@gmail.com      Jeanne Mance     21 Rue Saint George

5 record(s) selected.

db2 =>
```

C.

```
SELECT * FROM midwifeinfo WHERE FACNAME = 'Lac-Saint-Louis' LIMIT 5;
```

```
421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 195x14
~/Desktop/421-P2 — -bash ~/Desktop/421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca +

5 record(s) selected.

db2 =>
db2 =>
db2 => SELECT * FROM midwifeinfo WHERE FACNAME = 'Lac-Saint-Louis' LIMIT 5;

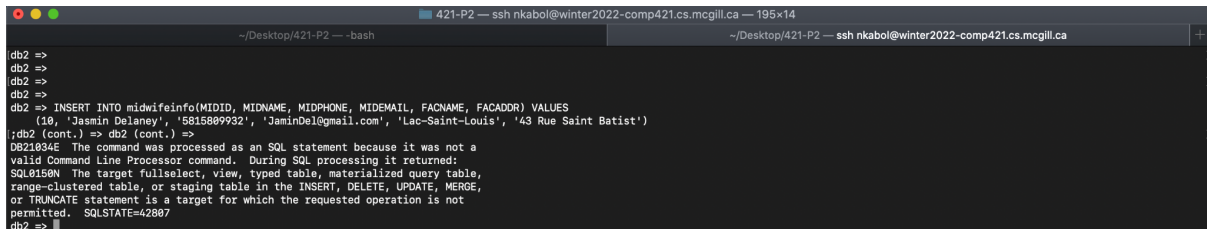
MIDID      MIDNAME      MIDPHONE      MIDEMAIL      FACNAME      FACADDR
-----
1 Marion Girard 5717782131    Marion.Girard@gmail.com  Lac-Saint-Louis  43 Rue Saint Batist
5 Marry Adams  5432787135    Marry.Adams@gmail.com   Lac-Saint-Louis  43 Rue Saint Batist

2 record(s) selected.

db2 =>
```

D.

```
INSERT INTO midwifeinfo(MIDID, MIDNAME, MIDPHONE, MIDEMAIL, FACNAME,
FACADDR) VALUES
(10, 'Jasmin Delaney', '5815809932', 'JaminDel@gmail.com',
'Lac-Saint-Louis', '43 Rue Saint Batist')
;
```

A screenshot of a terminal window with a dark background. The window title is "421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 195x14". The prompt is "~/.Desktop/421-P2 — -bash". The user has entered several commands: "db2 =>", "db2 =>", "db2 =>", and "db2 =>". The final command is "db2 => INSERT INTO midwifeinfo(MIDID, MIDNAME, MIDPHONE, MIDEMAIL, FACNAME, FACADDR) VALUES (10, 'Jasmin Delaney', '5815809932', 'JaminDel@gmail.com', 'Lac-Saint-Louis', '43 Rue Saint Batist')". The output shows an error: "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". The prompt "db2 =>" is visible at the bottom.

```
db2 =>
db2 =>
db2 =>
db2 =>
db2 => INSERT INTO midwifeinfo(MIDID, MIDNAME, MIDPHONE, MIDEMAIL, FACNAME, FACADDR) VALUES
(10, 'Jasmin Delaney', '5815809932', 'JaminDel@gmail.com', 'Lac-Saint-Louis', '43 Rue Saint Batist')
;db2 (cont.) => db2 (cont.) =>
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
db2 =>
```

Check Constraints

```
CREATE TABLE Tests
(
    Tid          INT NOT NULL,
    MidId        INT NOT NULL,
    Num          INT NOT NULL,
    Cid          INT NOT NULL,
    Ttype        VARCHAR(50) NOT NULL,
    PresDate     DATE NOT NULL,
    SampDate     DATE,
    LabDate      DATE,
    TechId       INT,
    Bid          INT,
    Results      VARCHAR(2000),

    CHECK(NOT LabDate < PresDate),

    PRIMARY KEY (Tid),
    FOREIGN KEY (MidId) REFERENCES Midwife,
    FOREIGN KEY (Cid, Num) REFERENCES Pregnancy,
    FOREIGN KEY (Bid) REFERENCES Baby,
    FOREIGN KEY (TechId) REFERENCES Technician
);
```



```
421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 195x34
~/Desktop/421-P2 — -bash
satisfy the check constraint "NKABOL.TESTS.SQL22822386256958".
SQLSTATE=23513
db2 => drop table tests;
DB20000I The SQL command completed successfully.
db2 =>
db2 =>
db2 =>
db2 => CREATE TABLE Tests
(
  Tid          INT NOT NULL,
  MidId        INT NOT NULL,
  Num          INT NOT NULL,
  Cid          INT NOT NULL,
  Ttype        VARCHAR(50) NOT NULL,
  PresDate     DATE NOT NULL,
  SampDate     DATE,
  LabDate      DATE,
  TechId       INT,
  Bid          INT,
  Results      VARCHAR(2000),
  CHECK(NOT LabDate < PresDate),
  PRIMARY KEY (Tid),
  FOREIGN KEY (MidId) REFERENCES Midwife,
  FOREIGN KEY (Cid, Num) REFERENCES Pregnancy,
  FOREIGN KEY (Bid) REFERENCES Baby,
  FOREIGN KEY (TechId) REFERENCES Technician
);
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
DB20000I The SQL command completed successfully.
db2 => db2 =>
```

```
INSERT INTO Tests(Tid, MidId, Num, Cid, Ttype, PresDate, SampDate, LabDate,
TechId, Bid, Results) VALUES
  (1, 1, 2, 1, 'Blood Iron', DATE'2022-03-24', DATE'2022-03-26',
DATE'2022-03-20', 1, NULL, 'Blood Iron OK')
;
```

```
421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 195x15
~/Desktop/421-P2 — -bash
);
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
DB20000I The SQL command completed successfully.
db2 => db2 =>
db2 =>
db2 => INSERT INTO Tests(Tid, MidId, Num, Cid, Ttype, PresDate, SampDate, LabDate, TechId, Bid, Results) VALUES
  (1, 1, 2, 1, 'Blood Iron', DATE'2022-03-24', DATE'2022-03-26', DATE'2022-03-20', 1, NULL, 'Blood Iron OK')
;db2 (cont.) => db2 (cont.) =>
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 "NKABOL.TESTS.SQL228223862746538".
SQLSTATE=23513
db2 =>
```