Relational Model

Mothers (<u>HcId</u>, Name, Phone, DoB, Addr, Email, Profession, DueD, BloodT)

Fathers (<u>Fid</u>, Name, Phone, DoB, Profession, Addr, Email, BooldT, Hid)

Couples (<u>Cid</u>, HcId, Fid, Appr) {HcId referencing Mother}

Pregnancies (<u>Cid, Num</u>, PrimID, BackupID, Status, Bid, Interested, HomeBirth)
{Cid referencing Couples}
{Bid referencing BirthCenter}
{PrimID, BackupID referencing Midwife}

Facilities (<u>Hid</u>, Name, Addr, Email, Phone, Web)

CommClinic (<u>Hid</u>) {Hid referencing Facilities}

BirthCenter (<u>Hid</u>, Capacity) {Hid referencing Facilities}

Midwives (<u>MidId</u>, Hid, Name, Phone, Email) {Hid referencing Facilities}

Technicians (<u>TechId</u>, Name, Phone)

Babies (<u>Bid</u>, Cid, Num, Name, Gender, DOB, BTime, BloodT)
{Num, Cid referencing Pregnancy}

Appointments (<u>Aid</u>, Num, Cid, Date, Time, MidId)
{MidId referencing Midwife} {Num, Cid referencing Pregnancy}

InfoSess (<u>Iid</u>, MidId, Date, Time, Lang, Capacity){MidId referencing Midwife}

InfoRegisteration (<u>Iid, Cid</u>, Attended)
{Cid referencing Couple}
{Iid referencing InfoSess}

Due Dates (<u>Cid</u>, Num, ApproxD, Info)
{Num, Cid referencing Pregnancy}

Notes (<u>Aid, Date, Time</u>, Text) {Aid referencing Appointment}

Tests (<u>Tid</u>, 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, FOREGN KEYs, … there are some constraints that remain in out 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 varified in the application code

SQL Queries
A.

```sql
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 => 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'
;
```

```
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
;
```

```
;
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.) =>
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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
```

```
   AND P.Done = False
;
```

```
● ● ●                     📁 421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 116×23
         ~/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.) => 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
;
```

```
● ● ●                     📁 421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca — 116×23
         ~/Desktop/421-P2 — -bash              ...ktop/421-P2 — ssh nkabol@winter2022-comp421.cs.mcgill.ca   +
          3 Nancy Domingo               5155567313

  3 record(s) selected.

db2 => 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
[;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.]
) =>

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

  2 record(s) selected.

db2 => ▊
```

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
;
```


B.

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


C.

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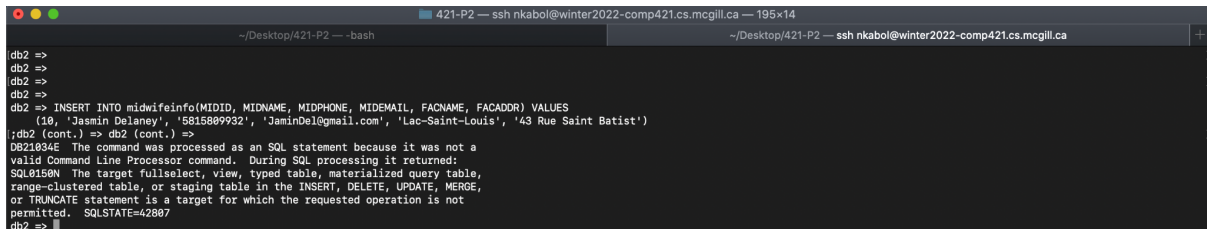
D.

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


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
);
```

```
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')
;
```