

Relational Model

1. Midwives (midwife name, midwife email, midwife phone number, midwife practitioner id, HI id)

HI id is a foreign key referring to Health Institutions

2. Health Institutions (HI name, HI email, HI phone number, HI website, HI address, HI id)

3. Clinics (HI id)

HI id is a foreign key referring to Health Institutions

4. Birthing Centers (HI id)

HI id is a foreign key referring to Health Institutions

5. Parents (parent id, m hcardid, father id)

m hcardid is a foreign key referring to Mothers

father id is a foreign key referring to Fathers

6. Technicians (t id, t name, t phone number)

7. Mothers (m name, m hcardid, m date of birth, m address, m phone number, m email, m profession, blood type)

8. Fathers (father id, f name, f hcardid, f date of birth, f address, f phone number, f email, f profession, blood type)

9. Appointment (appointment id, aDate, aTime, pregnancy number, parent id, midwife practitioner id, HI id)

pregnancy number, parent id are foreign keys referring to Pregnancies

midwife practitioner id is a foreign key referring to Midwives

HI id is a foreign key referring to Health Institutions

10. Medical Tests (test id, type, test prescribed date, sample taken date, lab work done date, result, pregnancy number, parent id, midwife practitioner id, baby id, technician id)

pregnancy number, parent id are foreign keys referring to Pregnancies

midwife practitioner id is a foreign key referring to Midwives

baby id is a foreign key referring to Babies

technician id is a foreign key referring to Technicians

11. Information Sessions (IS id, ISDate, ITime, language, midwife practitioner id)

midwife practitioner id is a foreign key referring to Midwives

12. Info Session Registration (IS id, parent id, attendance)

13. Notes (note id, date, time, content, pregnancy number, parent id)

pregnancy number, parent id are foreign keys referring to Pregnancies

14. Pregnancies (parent id, pregnancy times, expected time frame for birth (year-month), due date based on last menstrual period, due date based on ultrasound test, final estimated due date, interested, homebirth, primary midwife practitioner id, backup midwife practitioner id, HI id)

parent id is a foreign key referring to Parents

primary midwife practitioner id is a foreign key referring to Primary Midwives

backup midwife practitioner id is a foreign key referring to Backup Midwives

HI id is a foreign key referring to Birthing Centers

15. Babies (baby id, date of birth, time of birth, gender, blood type, bname, pregnancy number, parent id)

pregnancy number, parent id are foreign keys referring to Pregnancies

Application Interaction

(a) i.

```
db2 => SELECT name FROM midwives WHERE practitioner_id = 0;
```

NAME

Favorites

Folders

0 record(s) selected.

ii.

```
jzhou70:~/COMP421/project3$ java GoBabbyApp
Please enter your practitioner id [E] to exit: 0
Invalid practitioner id.
Please enter your practitioner id [E] to exit: █
```

(b) i. Assume M_1 is Candice Head with hcardid = 8128.

```
db2 => CREATE UNIQUE INDEX index_phone ON mothers(phone) INCLUDE (address);
DB20000I The SQL command completed successfully.
db2 => SELECT hcardid, mname FROM mothers
WHERE hcardid IN ( SELECT hcardid FROM parents p
                  WHERE parent_id IN ( SELECT DISTINCT parent_id FROM pregnanci
es
                                     WHERE pregnancy_num >= 2))
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;
```

| HCARDID | MNAME |
|---------|--------------------|
| 8128 | Candice Head |
| 4643 | Victoria Gutierrez |
| 7610 | Sona Beahm |
| 5981 | Joyce Whitlock |
| 6041 | Pamela Ingram |
| 8826 | Elizabeth Weist |
| 1232 | Sharron Brown |
| 2201 | Rhonda Bark |

8 record(s) selected.

ii.

```
Please enter your practitioner id [E] to exit: 1003
Midwife's name: Pat Cola

Please enter the date for appointment list [E] to exit: █
```

iii.

```
Please enter the date for appointment list [E] to exit: 2022-02-05
1: 10:10:00, B, Candice Head (8128).
2: 13:30:00, P, Maria Nelson (7539).

Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date: █
```

iv.

```

Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date: 1
For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

v.

```

Enter your choice: 1
2022-01-30 10:35:00 Couple would prefer home birth
2021-12-05 15:55:00 Prescribed a blood iron test
For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

vi.

```

Enter your choice: 2
2022-01-05 [first trimmer ultrasound] Fetal movement alright
2021-11-26 [chorionic villus sampling] No genetic problems found
For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

vii.

```

Enter your choice: 3
Please type your observation: Baby has good movements
For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

viii.

```
db2 => SELECT date, time, LEFT(content, 50) as content, pregnancy_num, fname as couple_info FROM notes, fathers
WHERE parent_id IN ( SELECT parent_id FROM parents
                     WHERE hcardid = 8128 )
AND father_id IN ( SELECT father_id FROM parents
                  WHERE hcardid = 8128 )
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;

DATE          TIME          CONTENT                                PREGNANCY_NUM COUPLE_INFO
-----
02/01/2020 10:16:00 Prescribed a NIPT test                                1 William Banister
01/30/2022 10:35:00 Couple would prefer home birth                      2 William Banister
12/05/2021 15:55:00 Prescribed a blood iron test                       2 William Banister
03/14/2022 19:52:55 Baby has good movements                           2 William Banister
4 record(s) selected.
```

ix.

```
Enter your choice: 1
2022-03-14 19:52:55 Baby has good movements
2022-01-30 10:35:00 Couple would prefer home birth
2021-12-05 15:55:00 Prescribed a blood iron test
For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice: 1
```

x.

```
Enter your choice: 4
Please enter the type of test: trisomy 21

For Candice Head (8128)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice: 1
```

xi.

```

db2 => SELECT prescribed_date, type, LEFT(result, 50) as result, pregnancy_num, fname as couple_info FROM tests, fathers
WHERE parent_id IN ( SELECT parent_id FROM parents
                     WHERE hcardid = 8128 )
AND father_id IN ( SELECT father_id FROM parents
                   WHERE hcardid = 8128 )
AND baby_id IS NULL
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;

PRESCRIBED_DATE TYPE                                RESULT                                PREGNANCY_NUM COUPLE_INFO
-----
01/05/2022      first trimmer ultrasound          Fetal movement alright                2 William Banister
11/26/2021      chorionic villus sampling                     No genetic problems found             2 William Banister
03/14/2022      trisomy 21                                     -                                     2 William Banister
3 record(s) selected.

```

xii.

```

Enter your choice: 5
1: 10:10:00, B, Candice Head (8128).
2: 13:30:00, P, Maria Nelson (7539).
[E] to exit [D] to go back to another date:
Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date:

```

(c) i.

```

db2 => SELECT prescribed_date, type, LEFT(result, 50) as result, pregnancy_num, fname as couple_info FROM tests, fathers
WHERE parent_id IN ( SELECT parent_id FROM parents
                     WHERE hcardid = 7539 )
AND father_id IN ( SELECT father_id FROM parents
                   WHERE hcardid = 7539 )
AND baby_id IS NULL
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;

PRESCRIBED_DATE TYPE                                RESULT                                PREGNANCY_NUM COUPLE_INFO
-----
12/12/2022      blood iron                                     Blood type is A+                       1 Rudy Loring
1 record(s) selected.

```

ii.

```

Please enter the date for appointment list [E] to exit: 2022-02-05
1: 10:10:00, B, Candice Head (8128).
2: 13:30:00, P, Maria Nelson (7539).

Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date: 2
For Maria Nelson (7539)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu

```

iii.

```

Enter your choice: 1
2022-01-06 11:34:00 Decided final estimated date

For Maria Nelson (7539)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

iv.

```

Enter your choice: 4
Please enter the type of test: Group B streptococcus

For Maria Nelson (7539)
1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to previous menu
Enter your choice:

```

v.

```

db2 => SELECT prescribed_date, type, LEFT(result, 50) as result, pregnancy_num, fname as couple_info FROM tests, fathers
WHERE parent_id IN ( SELECT parent_id FROM parents
                     WHERE hcardid = 7539 )
AND father_id IN ( SELECT father_id FROM parents
                  WHERE hcardid = 7539 )
AND baby_id IS NULL
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;

PRESCRIBED_DATE TYPE                                RESULT                                PREGNANCY_NUM COUPLE_INFO
-----
12/12/2022      blood iron                                Blood type is A+                                1 Rudy Loring
03/14/2022      Group B streptococcus                                -                                                1 Rudy Loring
2 record(s) selected.

```

(d) i.

```

Enter your choice: 5
1: 10:10:00, B, Candice Head (8128).
2: 13:30:00, P, Maria Nelson (7539).

Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date:
Please enter the date for appointment list [E] to exit:

```

ii. & iii.

```
Please enter the date for appointment list [E] to exit: 2022-01-16
1: 09:30:00, P, Ruth Corwin (1987).
2: 16:25:00, P, Kathrine Collins (3998).
Enter the appointment number that you would like to work on.
[E] to exit [D] to go back to another date:
```

Indexing

```
Database server      = DB2/LINUX8664 11.5.4.0
SQL authorization ID = JZHOU70
Local database alias = CS421

db2 => CREATE UNIQUE INDEX index_phone ON mothers(phone) INCLUDE (address);
DB20000I The SQL command completed successfully.
```

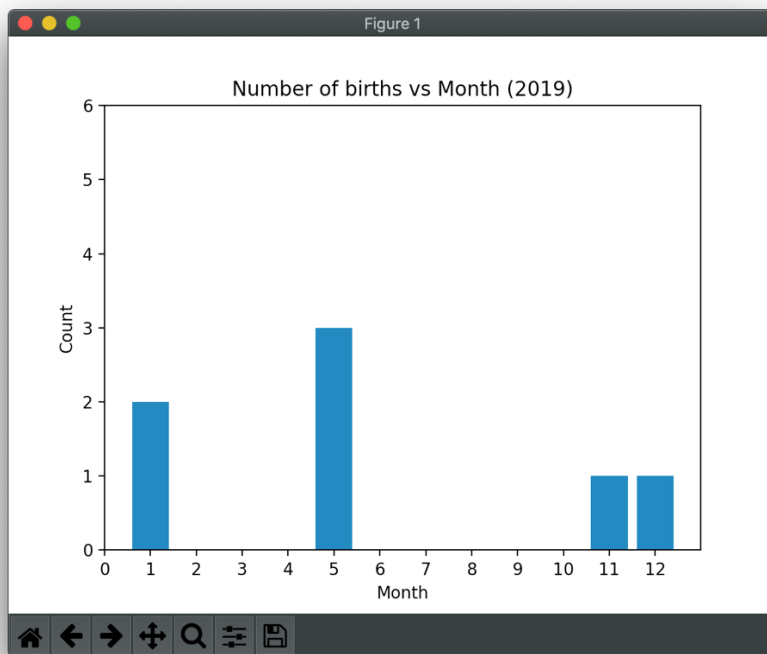

Data Analytics

(1) In 2019:

```
db2 => WITH A(baby_id, month) AS
(
  SELECT baby_id, MONTH(dateofbirth) as month FROM babies
  WHERE dateofbirth IS NOT NULL AND timeofbirth IS NOT NULL
  AND dateofbirth BETWEEN '2019-01-01' AND '2019-12-31'
)
SELECT month, COUNT(*) as count FROM A
GROUP BY month
ORDER BY month
```

| MONTH | COUNT |
|-------|-------|
| 1 | 2 |
| 5 | 3 |
| 11 | 1 |
| 12 | 1 |

4 record(s) selected.

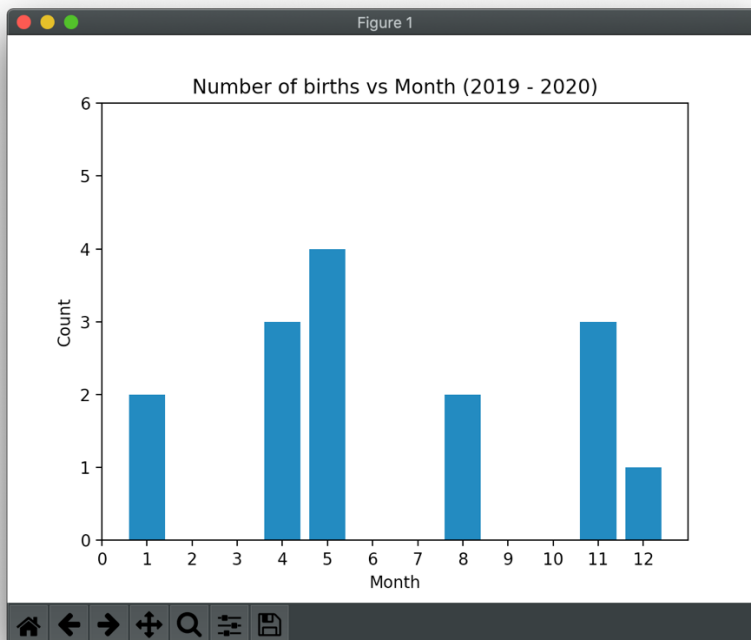


(2) From 2019 to 2020:

```
db2 => WITH A(baby_id, month) AS
(
    SELECT baby_id, MONTH(dateofbirth) as month FROM babies
    WHERE dateofbirth IS NOT NULL AND timeofbirth IS NOT NULL
    AND dateofbirth BETWEEN '2019-01-01' AND '2020-12-31'
)
SELECT month, COUNT(*) as count FROM A
GROUP BY month
ORDER BY month
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.)
) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;
```

| MONTH | COUNT |
|-------|-------|
| 1 | 2 |
| 4 | 3 |
| 5 | 4 |
| 8 | 2 |
| 11 | 3 |
| 12 | 1 |

6 record(s) selected.

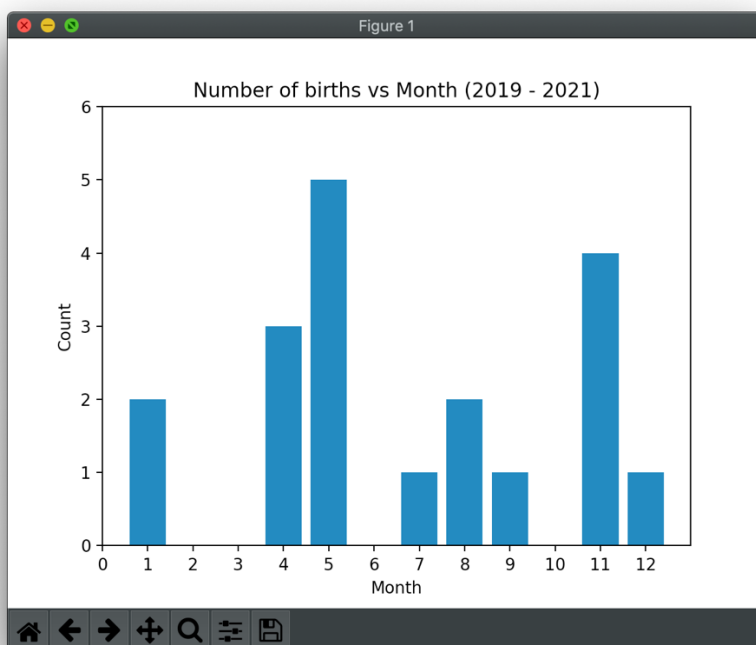


(3) From 2019 to 2021:

```
db2 => WITH A(baby_id, month) AS
(
    SELECT baby_id, MONTH(dateofbirth) as month FROM babies
    WHERE dateofbirth IS NOT NULL AND timeofbirth IS NOT NULL
    AND dateofbirth BETWEEN '2019-01-01' AND '2021-12-31'
)
SELECT month, COUNT(*) as count FROM A
GROUP BY month
ORDER BY month
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.
) => db2 (cont.) => db2 (cont.) => db2 (cont.) => ;

MONTH      COUNT
-----
1          2
4          3
5          5
7          1
8          2
9          1
11         4
12         1

8 record(s) selected.
```



(4) From 2019 to 2020:

```
db2 => WITH A(baby_id, month) AS
(
  SELECT baby_id, MONTH(dateofbirth) as month FROM babies
  WHERE dateofbirth IS NOT NULL AND timeofbirth IS NOT NULL
)
SELECT month, COUNT(*) as count FROM A
GROUP BY month
ORDER BY month
;db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) =>
db2 (cont.) => db2 (cont.) => ;

MONTH      COUNT
-----
1          6
2          3
3          1
4          3
5          5
7          1
8          2
9          1
11         5
12         1

parent_id VALUES
10 record(s) selected.
```

