

## Relational Model

Mothers(mramq, mname, mtel, memail, mDOB, mbloodType, maddress, mprofession)

Fathers(fid, framq, fname, ftel, femail, fDOB, fbloodType, faddress, fprofession)

Couples(cid, mramq, fid)

foreign key mramq references Mothers

foreign key fid references Fathers

Pregnancies(cid, birthym, firstexp, secondexp, finalexp, hcid, interested, ppid, bpid)

foreign key cid references Couples

foreign key hcid references HCInstitutions

foreign key bpid references Midwives

foreign key ppid references Midwives

Invitations(cid, hcid)

foreign key cid references Couples

foreign key hcid references HCInstitutions

Registrations(cid, isid, attended)

foreign key cid references Couples

foreign key isid references InfoSessions

Babies(bid, cid, birthym, bname, gender, bbloodType, bDOB, birthTime)

foreign key cid, birthym references Pregnancies

Appointments(aid, cid, birthym, pid, appdate, apptime)

foreign key cid, birthym references Pregnancies

foreign key pid references Midwives

InfoSessions(isid, hcid, pid, sessiondate, sessiontime, language)

foreign key hcid references HCInstitutions

foreign key pid references Midwives

Midwives(pid, hcid, mwname, mwtel, mwemail)

foreign key hcid references HCInstitutions

HCInstitutions(hcid, hcname, hctel, hcemail, hcaddress, website)

CommunityClinics(hcid)

foreign key hcid references HCInstitutions

BirthingCenters(hcid)

foreign key hcid references HCInstitutions

Notes(nid, aid, notedate, notetime, notemsg)  
foreign key aid references Appointments

Technicians(techid, tname, ttel)

Tests(tid, mramq, bid, aid, techid, type, pscrpDate, testDate, examDate, result)  
foreign key mramq references Mothers  
foreign key bid references Babies  
foreign key aid references Appointments  
foreign key techid references Technicians

### Application interaction

a.  $P_0 = 400$

```
db2 => db2 => db2 => SELECT pid FROM midwives WHERE pid = 400

PID
-----

0 record(s) selected.
```

i.

```
lhu26@winter2022-comp421:~/421/p3$ java GoBabbyApp
Please enter your practitioner id [E] to exit:
400
Invalid practitioner id, please try again.
Please enter your practitioner id [E] to exit:
```

ii.

b.  $P_0 = 4001$ ,  $M_1$  (mramq in Mothers) = 'YANC01060003'

```
i. WITH allcouples(cid, mramq) AS (
    SELECT c.cid, c.mramq
    FROM couples c
    WHERE c.mramq = 'YANC01060003'
)
SELECT p.cid, p.birthym, ac.mramq
FROM pregnancies p JOIN allcouples ac ON p.cid = ac.cid
;
```

```
db2 => db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (c
ont.) => db2 (cont.) => db2 (cont.) => WITH allcouples(cid, mramq) AS ( SELECT c
.cid, c.mramq FROM couples c WHERE c.mramq = 'YANC01060003' ) SELECT p.cid, p.bi
rthym, ac.mramq FROM pregnancies p JOIN allcouples ac ON p.cid = ac.cid
```

CID	BIRTHYM	MRAMQ
2003	11/01/2017	YANC01060003
2003	05/02/2022	YANC01060003

2 record(s) selected.

Please enter your practitioner id [E] to exit:

4001

Please enter the date (YYYY-MM-DD) for appointment list [E] to exit:

ii.

Please enter the date (YYYY-MM-DD) for appointment list [E] to exit:  
2022-03-13

1: 10:30:00 B Claire Yang YANC01060003

2: 15:30:00 P Kazunari Ninomiya NINK83060002

Enter the appointment number that you would like to work on.

[E] to exit [D] to go back to another date :

iii.

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

1

For Claire Yang YANC01060003

1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to the appointments.

Enter your choice:

iv.

Enter your choice:

1

2022-03-26 11:50:00 Need to schedule another appointment.

2022-03-26 11:30:00 Baby is good.

2022-03-25 11:30:00 Baby has good movements.

2022-03-24 11:30:00 Mother feels good.

2022-03-20 11:30:00 Couple would prefer home birth.

2022-03-13 20:00:28 good

ForClaire Yang YANC01060003

1. Review notes

2. Review tests

3. Add a note

4. Prescribe a test

5. Go back to the appointments.

Enter your choice:

v.

Enter your choice:

2

2022-03-26 [blood iron] bi test good

2022-03-26 [blood oxygen] bo test good

ForClaire Yang YANC01060003

1. Review notes

2. Review tests

3. Add a note

4. Prescribe a test

5. Go back to the appointments.

Enter your choice:

vi.

Enter your choice:  
3  
Please type your observation:  
Condition checks  
ForClaire Yang YANC01060003

1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to the appointments.

Enter your choice:

vii.

viii. **WITH** coupleinf(cid,mramq, fid, birthym, aid) **AS** (  
    **SELECT** c.cid, c.mramq, c.fid, a.birthym, a.aid  
    **FROM** couples c **JOIN** appointments a **ON** c.cid = a.cid **AND**  
    c.mramq = 'YANC01060003'  
)  
**SELECT** n.nid, n.notedate, n.notetime, SUBSTR(n.notemsg, 1, 50) **AS**  
notemsg, ci.cid, ci.birthym, ci.mramq, ci.fid  
**FROM** notes n **JOIN** coupleinf ci **ON** n.aid = ci.aid  
;

db2 => db2 => db2 => db2 => db2 => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => db2 (cont.) => WITH coupleinf(cid,mramq, fid, birthym, aid) AS ( SELECT c.cid, c.mramq, c.fid, a.birthym, a.aid FROM couples c JOIN appointments a ON c.cid = a.cid AND c.mramq = 'YANC01060003' ) SELECT n.nid, n.notedate, n.notetime, SUBSTR(n.notemsg, 1, 50) AS notemsg, ci.cid, ci.birthym, ci.mramq, ci.fid FROM notes n JOIN coupleinf ci ON n.aid = ci.aid

NID	NOTEDATE	NOTETIME	NOTEMSG	CID	BIRTHYM	MRAMQ	FID
9001	03/20/2022	11:30:00	Couple would prefer home birth.	2003	05/02/2022	YANC01060003	1003
9002	03/24/2022	11:30:00	Mother feels good.	2003	05/02/2022	YANC01060003	1003
9003	03/25/2022	11:30:00	Baby has good movements.	2003	05/02/2022	YANC01060003	1003
9004	03/26/2022	11:30:00	Baby is good.	2003	05/02/2022	YANC01060003	1003
9005	03/26/2022	11:50:00	Need to schedule another appointment.	2003	05/02/2022	YANC01060003	1003
9007	03/13/2022	20:00:28	good	2003	05/02/2022	YANC01060003	1003
9011	03/14/2022	18:25:12	Condition checks	2003	05/02/2022	YANC01060003	1003
9010	12/01/2017	12:00:00	Quick check up	2003	11/01/2017	YANC01060003	1003

8 record(s) selected.

The notemsg column is truncated to display only the first 50 characters to improve readability of the screenshot.

Enter your choice:

1

2022-03-26 11:50:00 Need to schedule another appointment.

2022-03-26 11:30:00 Baby is good.

2022-03-25 11:30:00 Baby has good movements.

2022-03-24 11:30:00 Mother feels good.

2022-03-20 11:30:00 Couple would prefer home birth.

2022-03-14 18:25:12 Condition checks

2022-03-13 20:00:28 good

ForClaire Yang YANC01060003

1. Review notes

2. Review tests

3. Add a note

4. Prescribe a test

5. Go back to the appointments.

Enter your choice:

ix.

Enter your choice:

4

Please enter the type of test:

trisomy 21

ForClaire Yang YANC01060003

1. Review notes

2. Review tests

3. Add a note

4. Prescribe a test

5. Go back to the appointments.

Enter your choice:

x.

xi. 

```
WITH coupleinf(cid,mramq, fid, birthym, aid) AS (  
    SELECT c.cid, c.mramq, c.fid, a.birthym, a.aid  
    FROM couples c JOIN appointments a ON c.cid = a.cid AND  
    c.mramq = 'YANC01060003'  
)  
SELECT t.tid, t.type, t.pscrpdte, t.testdate, t.examdate,  
    CASE  
        when t.result IS NOT NULL then SUBSTR(t.result, 1, 20)
```



The result column is truncated to display only the first 20 characters to improve readability of the screenshot.

```
1: 10:30:00 B Claire Yang YANC01060003
2: 15:30:00 P Kazunari Ninomiya NINK83060002
```

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

```
2
ForKazunari Ninomiya NINK83060002
```

1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to the appointments.

Enter your choice:

ii.

Enter your choice:

```
1
2022-03-13 11:50:00 Mother looks good
2022-03-13 11:50:00 Baby looks good
ForKazunari Ninomiya NINK83060002
```

1. Review notes
2. Review tests
3. Add a note
4. Prescribe a test
5. Go back to the appointments.

Enter your choice:

iii.





```

Enter your choice:
5
1: 10:30:00 B Claire Yang YANC01060003
2: 15:30:00 P Kazunari Ninomiya NINK83060002

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

```

i.

ii. (iii)

```

Please enter the date (YYYY-MM-DD) for appointment list [E] to exit:
2022-03-01
1: 10:30:00 P Victoria Gutierrez GUTV92030001
2: 10:40:00 B Alice Pan PANA01002004

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

```

## Indexing

**CREATE INDEX address**

**ON** mothers(**mtel**, **maddress**);

db2 => db2 => db2 => db2 => db2 (cont.) => CREATE INDEX address ON mothers(mtel, maddress)  
DB20000I The SQL command completed successfully.

Multi-attribute index is used to help retrieve a mother's address given a phone number since db2 only supports the INCLUDE keyword for indexing with unique key columns.

## Data Analytics

query:

**SELECT** SUBSTR(**b.bdob**, 1, 7) **AS** yearmonth, COUNT(\*) **AS** numbirths

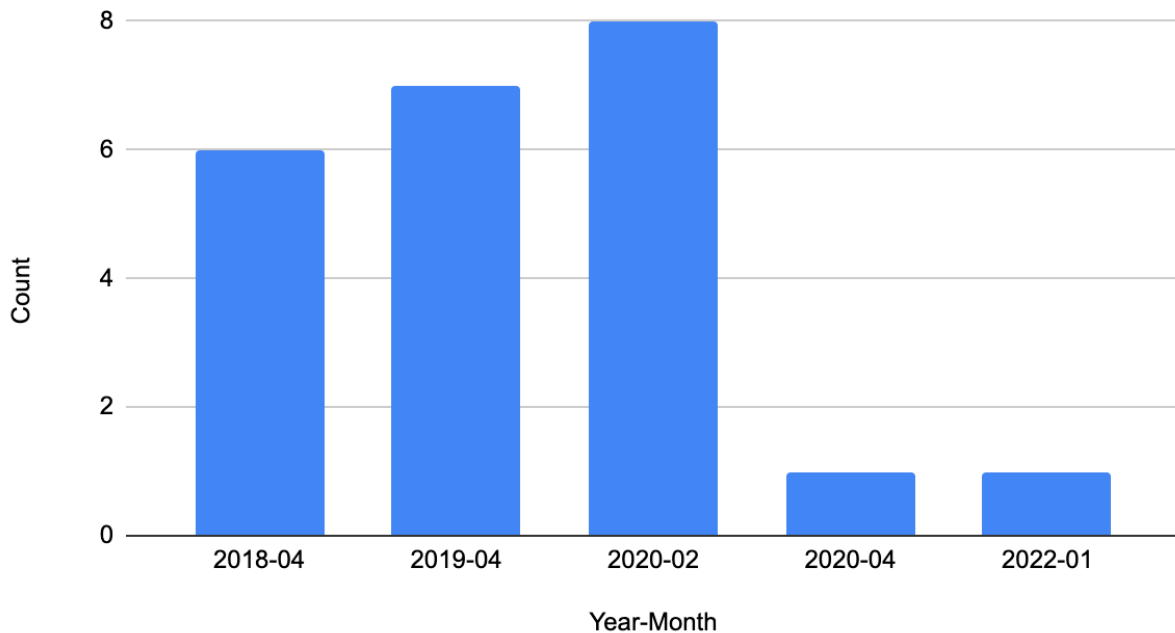
**FROM** babies **b**

**WHERE** **b.bdob** IS NOT NULL

**GROUP BY** SUBSTR(**b.bdob**, 1, 7)

;

Total Number of Births for All Months with At Least 1 Birth



The chart generated has year-month on the x-axis and the count on the y-axis shows the number of births (babies born) in that month. The year was included as the data spans over several years.

The chart was generated using google sheets and it may have a different format as the downloaded version is a .xlsx file (the chart can be formatted differently on a Windows machine and a Mac, also depending on the software used to open the file). Please use the link below to access the google sheet if there is any formatting issue.

[https://docs.google.com/spreadsheets/d/1nTXDx8xeDI8JB\\_WOd49Dbs13Qc7QtKpAr\\_JU4tZrPg0/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1nTXDx8xeDI8JB_WOd49Dbs13Qc7QtKpAr_JU4tZrPg0/edit?usp=sharing)