I implemented the database using the following version of MySQL server

Server version: 5.0.67-community-nt MySQL Community Edition (GPL)

Two schemas are attached with this document

- The first schema is the one with **structure only** and
- The second schema is the one with **structure + data**.
- Both are dumbed in two separate .sql files.
- I used apace server, phpMyAdmin in order to create sql dumb files

Note: When a dumbed sql is executed in a target server the full schema can be created

Tasks undertaken

1. I created a **full normalized relational database**(The ER-diagram is shown on the last page)
2. The database is filled with all the necessary random information.

   I inserted data to the tables in the following order: **Country, Sub-National Zone, District, Village, Farmer, Chicken, Brood, Disease, Disease Outbreak, Egg, and Feeding.**

- For table **Country** I inserted three countries as follows

countryCode	name
et	Ethiopia
tz	Tanzania
ug	Uganda

- For table **Sub National Zone**, I inserted 3 zones for each country(9 rows)

zoneNumber	countryCode	name
1	et	zone_aaa
1	tz	zone_ppp
1	ug	zone_fff
2	et	zone_bbb
2	tz	zone_qqq
2	ug	zone_ggg
3	et	zone_ccc
3	tz	zone_rrr
3	ug	zone_hhh

- For table **Districts**, I inserted:
  - 5 districts for the first zone(1) of the first country(Ethiopia);
  - 5 districts for the first zone(1) of the second country(Tanzania); and
  - 5 districts for the first zone(1) of the third country(Uganda)

(Totally 15 districts)

districtNumber	zoneNumber	countryCode	name
1	1	et	district_aaa
1	1	tz	district_fff
1	1	ug	district_kkk
2	1	et	district_bbb
2	1	tz	district_ggg
2	1	ug	district_lll
3	1	et	district_ccc
3	1	tz	district_hhh
3	1	ug	district_mmm
4	1	et	district_ddd
4	1	tz	district_iii
4	1	ug	district_nnn
5	1	et	district_eee
5	1	tz	district_jjj
5	1	ug	district_ooo

- For table **Villages**, I created:
    - 5 villages for the first district(1) of the first zone(1) of the first country(Ethiopia)
    - 5 villages for the first district(1) of the first zone(1) of the second country(Tanzania)
    - 5 villages for the first district(1) of the first zone(1) of the third country(Uganda)

    (Totally 15 villages)

villageNumber	districtNumer	zoneNumber	countryCode	name
1	1	1	et	village_aaa
1	1	1	tz	village_fff
1	1	1	ug	village_kkk
2	1	1	et	village_bbb
2	1	1	tz	village_ggg
2	1	1	ug	village_lll
3	1	1	et	village_ccc
3	1	1	tz	village_hhh
3	1	1	ug	village_mmm
4	1	1	et	village_ddd
4	1	1	tz	village_iii
4	1	1	ug	village_nnn
5	1	1	et	village_eee
5	1	1	tz	village_jjj
5	1	1	ug	village_ooo

- As **question number 2a** asks, For Farmer, I created 15 framers as follows
    - 5 farmers to the first village of Ethiopia
    - 5 farmers to the first village of Tanzania and
    - 5 farmers to the first village of Uganda

farmerID	farmerName	location	position x	position y	postion z	villageNumber	districtNumber	zoneNumber	countryCode
far_1	Abebe Dinka	Dembi Dolo	25	24	121	1	1	1	et
far_10	tanzaniafarmer5	tanzcity a	230	231	29	1	1	1	tz
far_11	ugandafarmer1	ugacity a	11	25	61	1	1	1	ug
far_12	ugandafarmer2	ugacity b	211	44	255	1	1	1	ug
far_13	ugandafarmer3	ugacity c	56	2	311	1	1	1	ug
far_14	ugandafarmer4	ugacity d	99	33	88	1	1	1	ug
far_15	ugandafarmer5	ugacity c	22	234	333	1	1	1	ug
far_2	Tolosa Kebede	Adama	24	123	77	1	1	1	et
far_3	Tesfay Gidey	Assela	77	124	177	1	1	1	et
far_4	Agonafer Tekle	Dembi Dollo	122	33	132	1	1	1	et
far_5	Shewaye Mesfin	Debrebirhan	11	123	67	1	1	1	et
far_6	tanzaniafarmer1	tanzcity a	232	234	32	1	1	1	tz
far_7	tanzaniafarmer2	tanzcity b	323	23	133	1	1	1	tz
far_8	tanzaniafarmer3	tanzcity c	111	78	288	1	1	1	tz
far_9	tanzaniafarmer4	tanzcity b	321	21	100	1	1	1	tz

- For Chicken Breed data, I referred the link from **question number 2c** and created 6 chicken breed rows in the **Chicken table**

chickenBreed	size	skinColor	noOfToes	amountOfFeathering	placeOfOrigin
Australorp	21	red	3	medium	Australia
Cubalaya	20	red/black	3	medium	Cuba
Cypriot Chicken	11	black	2	small	Cyprus
Dokki	17	light green	4	small	Egypt
Ingriido	34	yellow	2	medium	Afganistan
Silkie	24	white	2	large	China

- As **question number 2b** asks, For table **Brood**, I just created 3 broods for each of the 5 farmers.

farmerID	chickenBreed	broodType	noOfChickens	DateBought	DateSold
far_1	Australorp	A	100	11/12/2014	17/04/2015
far_3	Australorp	B	21	08/02/2015	02/03/2015
far_1	Cubalaya	A	8	19/01/2015	02/03/2015
far_3	Cubalaya	A	11	10/11/2014	02/03/2015
far_4	Cubalaya	D	25	11/12/2014	17/04/2015
far_1	Cypriot Chicken	C	12	08/02/2015	02/03/2015
far_2	Cypriot Chicken	A	9	17/04/2015	02/03/2015
far_4	Cypriot Chicken	A	14	19/01/2015	02/03/2015
far_2	Dokki	A	21	17/04/2015	02/03/2015
far_5	Dokki	A	21	08/02/2015	17/04/2015
far_3	Ingriido	D	18	22/01/2015	17/04/2015
far_5	Ingriido	A	22	19/01/2015	(Null)
far_2	Silkie	A	13	19/01/2015	02/03/2015
far_4	Silkie	B	22	08/02/2015	(Null)
far_5	Silkie	B	12	22/01/2015	02/03/2015

- I referred the link on **question number 2d** and found diseases.

  Thus, For the **Disease table** I created 7 rows.

diseaseID	diseaseName
1	Amyloidosis
2	Duck Septicaemia
3	Arizonosis
4	Heat Stress
5	Hydropericardium-Hepatitis Syndrome
6	Turkey Viral Hepatitis
7	Haemorrhagic Anaemia

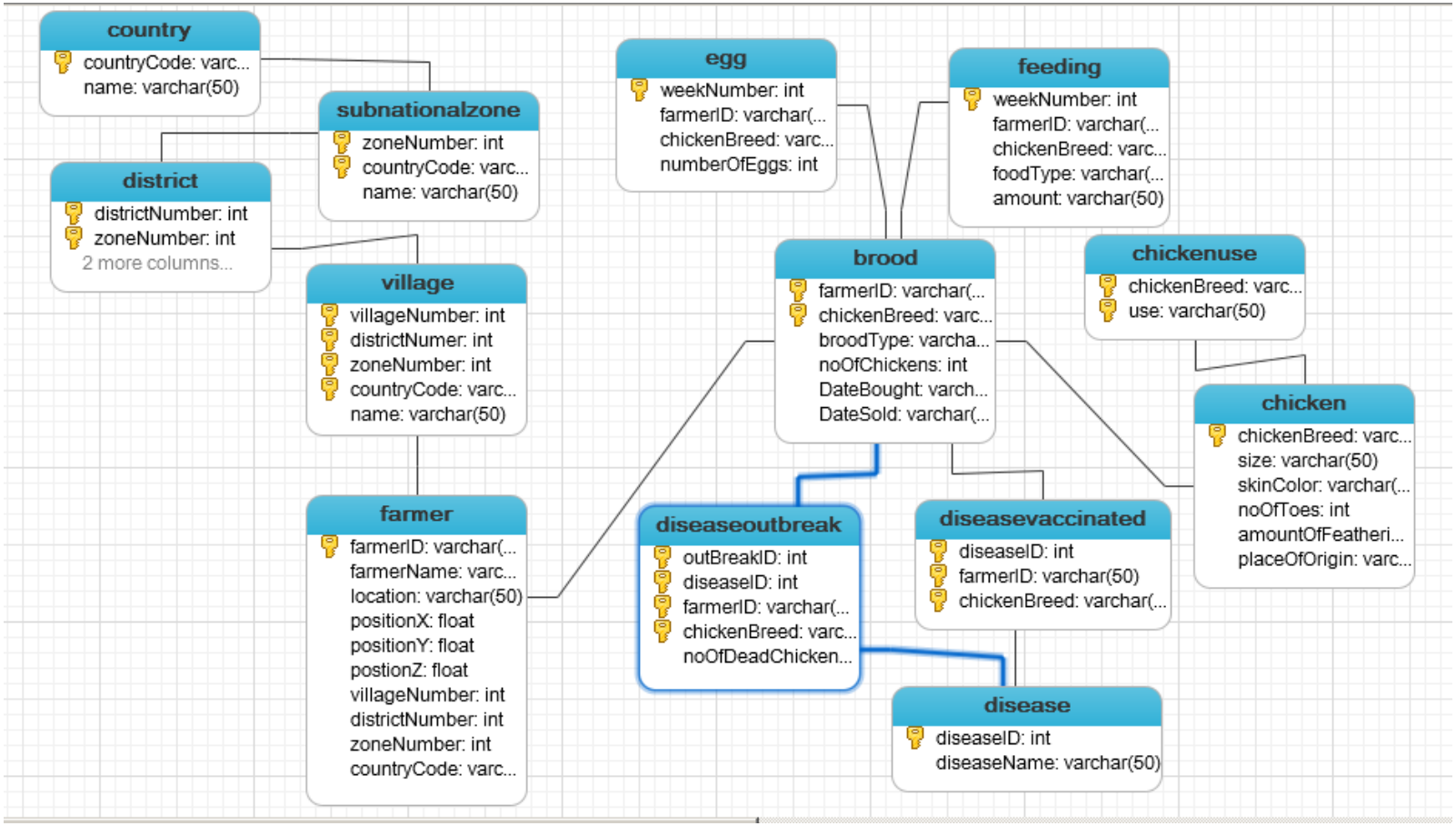
- As **question number 2e** asks**,** I created a table called **Diseaseoutbreak.** In the table I created :
    - Three rows to show, The first brood of the first farmer affected by a disease 3 times
    - Three rows to show, The first brood of the second farmer affected by a disease 3 times

outBreakID	diseaseID	farmerID	chickenBreed	noOfDeadChickens
1	3	far_1	Australorp	10
2	3	far_1	Australorp	2
3	4	far_1	Australorp	7
1	5	far_2	Cypriot Chicken	4
2	5	far_2	Cypriot Chicken	3
3	5	far_2	Cypriot Chicken	11

- As **question number 2f** asks, there is a table called **Eggs.** I created number of **eggs per week** for
    - For just one brood of the first farmer(far_1)
    - The table I found on the link works for 100 chickens therefore the first brood of the first farmer is made 100. You can see it in the broods table screen shot above. The next figure shows the eggs table.

weekNumber	farmerID	chickenBreed	numberOfEggs
21	far_1	Australorp	20
22	far_1	Australorp	40
23	far_1	Australorp	72
24	far_1	Australorp	136
25	far_1	Australorp	208
26	far_1	Australorp	260
27	far_1	Australorp	296
28	far_1	Australorp	336
29	far_1	Australorp	352
30	far_1	Australorp	368
31	far_1	Australorp	376

- Finally, the ER Diagram is shown below, all relationships are one to many.
- I used Navicat GUI to create these schema
- I used composite keys which contain more than one candidate key together.



Answers for Question 3

a. Show a list of all farmers and their locations. (GPS coordinates, village, district, country)

In order to accomplish this task, I wrote a set of nested inner joins, and the query is as follows

```
SELECT farmer.farmerName, farmer.positionx, farmer.positiony,
farmer.postionz, district.districtNumber, district.name,
subnationalzone.zoneNumber, subnationalzone.name,
village.villageNumber, village.name, country.countryCode,
country.name
FROM country INNER JOIN (((subnationalzone INNER JOIN district
ON (subnationalzone.countryCode = district.countryCode) AND
(subnationalzone.zoneNumber = district.zoneNumber)) INNER JOIN
village ON (district.countryCode = village.countryCode) AND
(district.zoneNumber = village.zoneNumber) AND
(district.districtNumber = village.districtNumer)) INNER JOIN
farmer ON (village.countryCode = farmer.countryCode) AND
(village.zoneNumber = farmer.zoneNumber) AND
(village.districtNumer = farmer.districtNumber) AND
(village.villageNumber = farmer.villageNumber)) ON
(farmer.countryCode = country.countryCode) AND
(country.countryCode = subnationalzone.countryCode);
```

The result is shown below

farmerName	positionx	positiony	postionz	districtNumber	name	zoneNumber	name1	villageNumber	name2	countryCode	name3
Abebe Dinka	25	24	121	1	district_aaa	1	zone_aaa	1	village_aaa	et	Ethiopia
tanzaniafarmer5	230	231	29	1	district_fff	1	zone_ppp	1	village_fff	tz	Tanzania
ugandafarmer1	11	25	61	1	district_kkk	1	zone_fff	1	village_kkk	ug	Uganda
ugandafarmer2	211	44	255	1	district_kkk	1	zone_fff	1	village_kkk	ug	Uganda
ugandafarmer3	56	2	311	1	district_kkk	1	zone_fff	1	village_kkk	ug	Uganda
ugandafarmer4	99	33	88	1	district_kkk	1	zone_fff	1	village_kkk	ug	Uganda
ugandafarmer5	22	234	333	1	district_kkk	1	zone_fff	1	village_kkk	ug	Uganda
Tolosa Kebede	24	123	77	1	district_aaa	1	zone_aaa	1	village_aaa	et	Ethiopia
Tesfay Gidey	77	124	177	1	district_aaa	1	zone_aaa	1	village_aaa	et	Ethiopia
Agonafer Tekle	122	33	132	1	district_aaa	1	zone_aaa	1	village_aaa	et	Ethiopia
Shewaye Mesfin	11	123	67	1	district_aaa	1	zone_aaa	1	village_aaa	et	Ethiopia
tanzaniafarmer1	232	234	32	1	district_fff	1	zone_ppp	1	village_fff	tz	Tanzania
tanzaniafarmer2	323	23	133	1	district_fff	1	zone_ppp	1	village_fff	tz	Tanzania
tanzaniafarmer3	111	78	288	1	district_fff	1	zone_ppp	1	village_fff	tz	Tanzania
tanzaniafarmer4	321	21	100	1	district_fff	1	zone_ppp	1	village_fff	tz	Tanzania

b. Show a list of all farmers keeping layers chicken brood. In addition, show the age of the brood and the number of chickens on the brood

For my case, I identified chicken broods by using brood type field letters A, B, C.

Therefore instead of layers chicken brood I wrote the query using **Type A broods** for instance.

```
SELECT farmer.farmerName, brood.noOfChickens, brood.DateBought,
brood.DateSold, brood.broodType
FROM farmer INNER JOIN brood ON farmer.farmerID = brood.farmerID
WHERE (((brood.broodType)="A"));
```

Here is the result of the query

farmerName	noOfChickens	DateBought	DateSold	broodType
Abebe Dinka	100	11/12/2014	17/04/2015	A
Abebe Dinka	8	19/01/2015	02/03/2015	A
Tolosa Kebede	9	17/04/2015	02/03/2015	A
Tolosa Kebede	21	17/04/2015	02/03/2015	A
Tolosa Kebede	13	19/01/2015	02/03/2015	A
Tesfay Gidey	11	10/11/2014	02/03/2015	A
Agonafer Tekle	14	19/01/2015	02/03/2015	A
Shewaye Mesfin	21	08/02/2015	17/04/2015	A
Shewaye Mesfin	22	19/01/2015	(Null)	A

c. Show a list of all diseases which have affected the chickens from 1 particular country and the months when the disease was recorded and how many chickens died from each outbreak

```
SELECT disease.diseaseName, diseaseoutbreak.outBreakID,
diseaseoutbreak.noOfDeadChickens, country.name

FROM country, disease INNER JOIN diseaseoutbreak ON
disease.diseaseID = diseaseoutbreak.diseaseID

WHERE (((country.name)="Ethiopia"));
```

Here is the result

diseaseName	outBreakID	noOfDeadChickens	name
Arizonosis	1	10	Ethiopia
Arizonosis	2	2	Ethiopia
Heat Stress	3	7	Ethiopia
Hydropericardium-Hepatitis Syı	1	4	Ethiopia
Hydropericardium-Hepatitis Syı	2	3	Ethiopia
Hydropericardium-Hepatitis Syı	3	11	Ethiopia

I have attached sql script (.sql file) which contains all the 3 queries