

INSTITUTO SUPERIOR TÉCNICO

SISTEMAS DE INFORMAÇÃO E BASE DE DADOS

MEEC

Assignment 2 - Implementing The Database

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1 Database Schema

Listing 1: hospital_create.sql

```
1 --- Assignment 2 - Create
2 --- Group 8
3 --- 63070 Diogo Sardinha
4 --- 84053 Francisco Melo
5 --- 89213 Rodrigo Rego
6
7 DROP TABLE IF EXISTS produced_indicator;
8 DROP TABLE IF EXISTS test_procedure;
9 DROP TABLE IF EXISTS radiography;
10 DROP TABLE IF EXISTS performed;
11 DROP TABLE IF EXISTS procedure_consult;
12 DROP TABLE IF EXISTS indicator;
13 DROP TABLE IF EXISTS prescription;
14 DROP TABLE IF EXISTS medication;
15 DROP TABLE IF EXISTS consult_diagnosis;
16 DROP TABLE IF EXISTS diagnosis_code;
17 DROP TABLE IF EXISTS participation;
18 DROP TABLE IF EXISTS consult;
19 DROP TABLE IF EXISTS animal;
20 DROP TABLE IF EXISTS generalization_species;
21 DROP TABLE IF EXISTS species;
22 DROP TABLE IF EXISTS assistant;
23 DROP TABLE IF EXISTS veterinary;
24 DROP TABLE IF EXISTS client;
25 DROP TABLE IF EXISTS phone_number;
26 DROP TABLE IF EXISTS person;
27
28 CREATE TABLE person
29   (VAT INTEGER,
30    name VARCHAR(255) ,
31    address_street VARCHAR(255) ,
32    address_city VARCHAR(255) ,
33    address_zip INTEGER,
34    PRIMARY KEY (VAT));
35
36 CREATE TABLE phone_number
37   (VAT INTEGER,
38    phone BIGINT,
39    PRIMARY KEY (VAT,phone),
40    FOREIGN KEY (VAT) REFERENCES person(VAT) );
41
42
43 CREATE TABLE client
44   (VAT INTEGER,
45    PRIMARY KEY (VAT),
46    FOREIGN KEY (VAT) REFERENCES person(VAT) ON DELETE CASCADE);
47
48 CREATE TABLE veterinary
49   (VAT INTEGER,
50    specialization VARCHAR(255) ,
51    bio VARCHAR(255) ,
52    PRIMARY KEY (VAT),
53    FOREIGN KEY (VAT) REFERENCES person(VAT) );
54
55 CREATE TABLE assistant
56   (VAT INTEGER,
57    PRIMARY KEY (VAT),
58    FOREIGN KEY (VAT) REFERENCES person(VAT) );
59
60 CREATE TABLE species
61   (name VARCHAR(255) ,
62    description VARCHAR(255) ,
63    PRIMARY KEY (name));
64
65 CREATE TABLE generalization_species
66   (name1 VARCHAR(255) ,
67    name2 VARCHAR(255) ,
68    PRIMARY KEY (name1),
```

```

69 FOREIGN KEY (name1) REFERENCES species(name),
70 FOREIGN KEY (name2) REFERENCES species(name));
71
72 CREATE TABLE animal
73 (name VARCHAR(255),
74 VAT INTEGER,
75 species_name VARCHAR(255),
76 colour VARCHAR(255),
77 gender VARCHAR(255),
78 birth_year YEAR,
79 age INTEGER,
80 PRIMARY KEY (name,VAT),
81 FOREIGN KEY (VAT) REFERENCES client(VAT) ON DELETE CASCADE,
82 FOREIGN KEY (species_name) REFERENCES species(name));
83
84 CREATE TABLE consult
85 (name VARCHAR(255),
86 VAT_owner INTEGER,
87 date_timestamp TIMESTAMP,
88 s VARCHAR(255),
89 o VARCHAR(255),
90 a VARCHAR(255),
91 p VARCHAR(255),
92 VAT_client INTEGER,
93 VAT_vet INTEGER,
94 weight FLOAT(255,4),
95 PRIMARY KEY (name, VAT_owner, date_timestamp),
96 FOREIGN KEY (name,VAT_owner) REFERENCES animal(name,VAT) ON DELETE CASCADE,
97 FOREIGN KEY (VAT_client) REFERENCES client(VAT) ON DELETE CASCADE,
98 FOREIGN KEY (VAT_vet) REFERENCES veterinary(VAT),
99 CHECK(weight > 0));
100
101 CREATE TABLE participation
102 (name VARCHAR(255),
103 VAT_owner INTEGER,
104 date_timestamp TIMESTAMP,
105 VAT_assistant INTEGER,
106 PRIMARY KEY (name, VAT_owner, date_timestamp,VAT_assistant),
107 FOREIGN KEY (name,VAT_owner,date_timestamp) REFERENCES consult(name,VAT_owner,
date_timestamp)ON DELETE CASCADE,
108 FOREIGN KEY (VAT_assistant) REFERENCES assistant(VAT));
109
110 CREATE TABLE diagnosis_code
111 (code VARCHAR(255),
112 name VARCHAR(255),
113 PRIMARY KEY (code));
114
115 CREATE TABLE consult_diagnosis
116 (code VARCHAR(255),
117 name VARCHAR(255),
118 VAT_owner INTEGER,
119 date_timestamp TIMESTAMP,
120 PRIMARY KEY (code , name,VAT_owner, date_timestamp),
121 FOREIGN KEY (name,VAT_owner,date_timestamp) REFERENCES consult(name,VAT_owner,
date_timestamp)ON DELETE CASCADE ON UPDATE CASCADE,
122 FOREIGN KEY (code) REFERENCES diagnosis_code(code) ON DELETE CASCADE ON UPDATE
CASCADE);
123
124 CREATE TABLE medication
125 (name VARCHAR(255),
126 lab VARCHAR(255),
127 dosage VARCHAR(255),
128 PRIMARY KEY(name, lab , dosage));
129
130 CREATE TABLE prescription
131 (code VARCHAR(255),
132 name VARCHAR(255),
133 VAT_owner INTEGER,
134 date_timestamp TIMESTAMP,
135 name_med VARCHAR(255),
136 lab VARCHAR(255),
137 dosage VARCHAR(255),

```

```

138 regime VARCHAR(255) ,
139 PRIMARY KEY(code , name , VAT_owner , date_timestamp ,name_med , lab , dosage) ,
140 FOREIGN KEY (code ,name , VAT_owner , date_timestamp) REFERENCES consult_diagnosis(
141   code ,name , VAT_owner , date_timestamp) ON DELETE CASCADE ON UPDATE CASCADE,
142 FOREIGN KEY (name_med ,lab ,dosage) REFERENCES medication(name ,lab ,dosage) ON DELETE
143   CASCADE ON UPDATE CASCADE);
144
145 CREATE TABLE indicator
146   (name VARCHAR(255) ,
147    reference_value FLOAT(255 ,4) ,
148    units VARCHAR(255) ,
149    description VARCHAR(255) ,
150    PRIMARY KEY (name));
151
152 CREATE TABLE procedure_consult
153   (name VARCHAR(255) ,
154    VAT_owner INTEGER,
155    date_timestamp TIMESTAMP,
156    num INTEGER,
157    descripton VARCHAR(255) ,
158    PRIMARY KEY(name , VAT_owner , date_timestamp , num , descripton) ,
159    FOREIGN KEY (name ,VAT_owner ,date_timestamp) REFERENCES consult(name ,VAT_owner ,
160      date_timestamp)ON DELETE CASCADE);
161
162 CREATE TABLE performed
163   (name VARCHAR(255) ,
164    VAT_owner INTEGER,
165    date_timestamp TIMESTAMP,
166    num INTEGER,
167    VAT_assistant INTEGER,
168    PRIMARY KEY(name , VAT_owner ,date_timestamp ,num , VAT_assistant) ,
169    FOREIGN KEY (name ,VAT_owner ,date_timestamp ,num) REFERENCES procedure_consult(name ,
170      VAT_owner ,date_timestamp ,num)ON DELETE CASCADE,
171    FOREIGN KEY (VAT_assistant) REFERENCES assistant(VAT));
172
173 CREATE TABLE radiography
174   (name VARCHAR(255) ,
175    VAT_owner INTEGER,
176    date_timestamp TIMESTAMP,
177    num INTEGER,
178    file VARCHAR(255) ,
179    PRIMARY KEY(name , VAT_owner ,date_timestamp ,num) ,
180    FOREIGN KEY (name ,VAT_owner ,date_timestamp ,num) REFERENCES procedure_consult(name ,
181      VAT_owner ,date_timestamp ,num)ON DELETE CASCADE);
182
183 CREATE TABLE test_procedure
184   (name VARCHAR(255) NOT NULL,
185    VAT_owner INTEGER NOT NULL,
186    date_timestamp TIMESTAMP NOT NULL,
187    num INTEGER,
188    type VARCHAR(255) NOT NULL CHECK(type IN('blood ','urine ')),
189    PRIMARY KEY(name , VAT_owner ,date_timestamp ,num),
190    FOREIGN KEY (name ,VAT_owner ,date_timestamp ,num) REFERENCES procedure_consult(name ,
191      VAT_owner ,date_timestamp ,num)ON DELETE CASCADE);
192
193 CREATE TABLE produced_indicator
194   (name VARCHAR(255) ,
195    VAT_owner INTEGER,
196    date_timestamp TIMESTAMP,
197    num INTEGER,
198    indicator_name VARCHAR(255) ,
199    value FLOAT(255 ,4) ,
200    PRIMARY KEY(name , VAT_owner ,date_timestamp ,num , indicator_name) ,
201    FOREIGN KEY (name ,VAT_owner ,date_timestamp ,num) REFERENCES test_procedure(name ,
202      VAT_owner , date_timestamp ,num)ON DELETE CASCADE,
203    FOREIGN KEY (indicator_name) REFERENCES indicator(name));

```

NOTA: Foram inseridos *ON DELETE CASCADE* e *ON UPDATE CASCADE* de modo a ser possivel realizar *change 3* e *change 4* respetivamente.

2 Database Queries

2.1 hospital_query.sql

Listing 2: hospital_query.sql

```
1 — Assignment 2 – Queries
2 — Group 8
3 — 63070 Diogo Sardinha
4 — 84053 Francisco Melo
5 — 89213 Rodrigo Rego
6
7 — Query #1
8 SELECT DISTINCT animal.name as animal_name, powner.name as owner_name, species_name,
   year(current_date)-animal.birth_year as age
9 FROM person powner, person pvet, animal, consult
10 WHERE consult.VAT_vet = pvet.vat
11 AND pvet.name = 'John Smith'
12 AND consult.VAT_owner = animal.VAT
13 AND animal.VAT = powner.VAT
14 AND consult.name=animal.name;
15
16 — Query #2
17 SELECT DISTINCT name, reference_value
18 FROM indicator
19 WHERE units like '%ng%'
20 AND reference_value > 100
21 ORDER BY reference_value DESC;
22
23
24 — Query #3
25 SELECT DISTINCT animal.name as animal_name, person.name as person_name, species_name,
   year(current_date)-animal.birth_year as age
26 FROM animal, consult c, person
27 WHERE animal.name = c.name
28 AND c.VAT_owner = person.VAT
29 AND (o like '%obese%' or o like '%obesity%')
30 AND weight > 30
31 AND date_timestamp IN (SELECT MAX(date_timestamp)
   FROM consult d
   WHERE c.name = d.name
   group by d.name);
32
33
34
35
36
37 — Query #4
38 SELECT DISTINCT person.name, client.VAT, address_street, address_city, address_zip
39 FROM person, client, animal
40 WHERE client.VAT = person.VAT
41 AND client.VAT NOT IN (SELECT DISTINCT client.VAT
   FROM client, animal
   WHERE client.VAT = animal.VAT);
42
43
44
45
46 — Query #5
47 SELECT DISTINCT consult_diagnosis.code, count(distinct prescription.name_med) as
   count_medication
48 FROM consult_diagnosis, prescription
49 WHERE consult_diagnosis.code = prescription.code
50 GROUP BY consult_diagnosis.code
51 ORDER BY count_medication asc;
52
53
54 — Query #6
55 SELECT avg(Assistants), avg(Procedures), avg(Diagnostics), avg(Prescriptions)
56 FROM (SELECT consult.date_timestamp, count(participation.date_timestamp) as
   Assistants
57 FROM consult LEFT OUTER JOIN participation
58 ON consult.date_timestamp = participation.date_timestamp
59 AND consult.VAT_owner = participation.VAT_owner
60 GROUP BY consult.date_timestamp, consult.VAT_vet
61 HAVING YEAR(consult.date_timestamp) = '2017') CA,
```

```

62
63 (SELECT consult.date_timestamp, count(procedure_consult.date_timestamp) as Procedures
64 FROM consult LEFT OUTER JOIN procedure_consult
65 ON consult.date_timestamp = procedure_consult.date_timestamp
66 AND consult.VAT_owner = procedure_consult.VAT_owner
67 GROUP BY consult.date_timestamp, consult.VAT_vet
68 HAVING YEAR(consult.date_timestamp) = '2017') CP,
69
70 (SELECT consult.date_timestamp, count(consult_diagnosis.date_timestamp) as
    Diagnostics
71 FROM consult LEFT OUTER JOIN consult_diagnosis
72 ON consult.date_timestamp = consult_diagnosis.date_timestamp
73 AND consult.VAT_owner = consult_diagnosis.VAT_owner
74 GROUP BY consult.date_timestamp, consult.VAT_vet
75 HAVING YEAR(consult.date_timestamp) = '2017') CD,
76
77 (SELECT consult.date_timestamp, count(prescription.date_timestamp) as Prescriptions
78 FROM consult LEFT OUTER JOIN prescription
79 ON consult.date_timestamp = prescription.date_timestamp
80 AND consult.VAT_owner = prescription.VAT_owner
81 GROUP BY consult.date_timestamp, consult.VAT_vet
82 HAVING YEAR(consult.date_timestamp) = '2017') CPr;
83
84
85 — Query #7
86 SELECT Species, Most_Common_Diagnosis
87 FROM (SELECT Species, D1.name as Most_Common_Diagnosis, MAX(count_diagnosis)
88     FROM (SELECT species_name as Species, diagnosis_code.name, count(
89         consult_diagnosis.code) as count_diagnosis
90             FROM animal, generalization_species, consult_diagnosis, diagnosis_code
91             WHERE (species_name LIKE '%dog%' OR (name1 = species_name AND name2 LIKE
92                 '%dog%'))
93                 AND animal.VAT=consult_diagnosis.VAT_owner
94                 AND animal.name = consult_diagnosis.name
95                 AND diagnosis_code.code = consult_diagnosis.code
96                 GROUP BY species_name, diagnosis_code.name
97                 ORDER BY count_diagnosis DESC) D1
98             GROUP BY Species) D2;
99
100
101 — Query #8
102 (SELECT name
103 FROM client NATURAL JOIN veterinary NATURAL JOIN person)
104 UNION
105 (SELECT name
106 FROM client NATURAL JOIN assistant NATURAL JOIN person);
107
108 — Query #9
109 SELECT person.name, address_street, address_city, address_zip
110 FROM person, animal, generalization_species
111 WHERE species_name LIKE '%bird%'
112 OR (name1 = species_name AND name2 LIKE '%bird%')
113 AND animal.VAT = person.VAT
114 and animal.vat not in ( SELECT person.vat
115                         FROM animal, generalization_species, person
116                         WHERE animal.species_name NOT LIKE '%bird%'
117                         AND (name1 = species_name AND name2 NOT LIKE '%bird%')
118                         AND animal.VAT = person.VAT);

```

NOTA: Uma vez que a *age* inserida na base de dados foi calculado a partir do ano em que foi inserido o animal, optamos por calcular novamente na execução do *Query 1* e *Query 2* de modo a

obter a idade correta.

2.2 Resultado das Queries

2.2.1 Resultado da Query 1

```
MySQL [ist425353]> -- Query #1
MySQL [ist425353]> SELECT DISTINCT animal.name as animal_name, powner.name as owner_name, species_name, year(current_date)-animal.birth_year as age
   > FROM person powner, person pvet, animal, consult
   > WHERE consult.VAT_vet = pvet.vat
   > AND pvet.name = 'John Smith'
   > AND consult.VAT_owner = animal.VAT
   > AND animal.VAT = powner.VAT
   > AND consult.name=animal.name;
   > name2 LIKE '%bird%'
   > AND animal.VAT = person.VAT
   > and animal.vat not in ( SELECT person.vat
      > FROM animal, generalization_species, person
      > WHERE animal.species_name NOT LIKE '%bird%'
      > AND (name1 = species_name AND name2 NOT LIKE '%bird%')
      > AND animal.VAT = person.VAT);
+-----+-----+-----+-----+
| animal_name | owner_name | species_name | age |
+-----+-----+-----+-----+
| Bailey     | Fabe St. Louis | Persian       | 1  |
| Scooby    | Lorette Fildes | Bichon Frise  | 5  |
| Scooby    | John Smith      | Golden Retriever | 4  |
| Waffles   | Vikky Mellem   | Golden Fish   | 4  |
+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Figure 1: Resultado da Query 1

2.2.2 Resultado da Query 2

```
MySQL [ist425353]> -- Query #2
MySQL [ist425353]> SELECT DISTINCT name, reference_value
   > FROM indicator
   > WHERE units like '%mg%'
   > AND reference_value > 100
   > ORDER BY reference_value DESC;
+-----+-----+
| name          | reference_value |
+-----+-----+
| Sodium        | 320.0000      |
| Benzodiazepinas | 200.0000      |
| Nitrites      | 110.0000      |
+-----+-----+
3 rows in set (0.00 sec)
```

Figure 2: Resultado da Query 2

NOTA - Usamos *mg* em substituição de *miligrams*

2.2.3 Resultado da Query 3

```
MySQL [ist425353]> -- Query #3
MySQL [ist425353]> SELECT DISTINCT animal.name as animal_name, person.name as person_name, species_name, year(current_date)-animal.birth_year as age
-> FROM animal, consult c, person
-> WHERE animal.name = c.name
-> AND c.VAT_owner = person.VAT
-> AND (o like '%obese%' or o like '%obesity%')
-> AND weight > 30
-> AND date_timestamp IN (SELECT MAX(date_timestamp)
-> FROM consult d
-> WHERE c.name = d.name
-> group by d.name);
+-----+-----+-----+
| animal_name | person_name      | species_name | age   |
+-----+-----+-----+
| Lassie     | Frederick Girodier | Labrador     | 3    |
+-----+-----+-----+
1 row in set (0.00 sec)
```

Figure 3: Resultado da Query 3

2.2.4 Resultado da Query 4

```
MySQL [ist425353]> -- Query #4
MySQL [ist425353]> SELECT DISTINCT person.name, client.VAT, address_street, address_city, address_zip
-> FROM person, client, animal
-> WHERE client.VAT = person.VAT
-> AND client.VAT NOT IN (SELECT DISTINCT client.VAT
-> FROM client, animal
-> WHERE client.VAT = animal.VAT);
+-----+-----+-----+-----+
| name      | VAT      | address_street | address_city | address_zip |
+-----+-----+-----+-----+
| Erika Bindon | 135113869 | 276 Hoepker Avenue | Saint Paul | 55108 |
| Kalie Milmoe | 241819611 | 5 Elgar Lane | Richmond | 23289 |
| Bartlet Lardiner | 794475858 | 983 Hoepker Hill | Phoenix | 85072 |
+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

Figure 4: Resultado da Query 4

2.2.5 Resultado da Query 5

```
MySQL [ist425353]> -- Query #5
MySQL [ist425353]> SELECT DISTINCT consult_diagnosis.code, count(distinct prescription.name_med) as count_medication
ON
-> FROM consult_diagnosis, prescription
-> WHERE consult_diagnosis.code = prescription.code
-> GROUP BY consult_diagnosis.code
-> ORDER BY count_medication asc;
+-----+
| code | count_medication |
+-----+
| I-IIInf |          1 |
| T-B    |          1 |
| b-BB   |          2 |
| O-KF   |          2 |
+-----+
4 rows in set (0.00 sec)
```

Figure 5: Resultado da Query 5

2.2.6 Resultado da Query 6

```
MySQL [ist425353]> -- Query #6
MySQL [ist425353]> SELECT avg(Assistants), avg(Procedures), avg(Diagnostics), avg(Prescriptions)
-> FROM (SELECT consult.date_timestamp, count(participation.date_timestamp) as Assistants
-> FROM consult LEFT OUTER JOIN participation
-> ON consult.date_timestamp = participation.date_timestamp
-> AND consult.VAT_owner = participation.VAT_owner
-> GROUP BY consult.date_timestamp, consult.VAT_vet
-> HAVING YEAR(consult.date_timestamp) = '2017') CA,
->
-> (SELECT consult.date_timestamp, count(procedure_consult.date_timestamp) as Procedures
-> FROM consult LEFT OUTER JOIN procedure_consult
-> ON consult.date_timestamp = procedure_consult.date_timestamp
-> AND consult.VAT_owner = procedure_consult.VAT_owner
-> GROUP BY consult.date_timestamp, consult.VAT_vet
-> HAVING YEAR(consult.date_timestamp) = '2017') CP,
->
-> (SELECT consult.date_timestamp, count(consult_diagnosis.date_timestamp) as Diagnostics
-> FROM consult LEFT OUTER JOIN consult_diagnosis
-> ON consult.date_timestamp = consult_diagnosis.date_timestamp
-> AND consult.VAT_owner = consult_diagnosis.VAT_owner
-> GROUP BY consult.date_timestamp, consult.VAT_vet
-> HAVING YEAR(consult.date_timestamp) = '2017') CD,
->
-> (SELECT consult.date_timestamp, count(prescription.date_timestamp) as Prescriptions
-> FROM consult LEFT OUTER JOIN prescription
-> ON consult.date_timestamp = prescription.date_timestamp
-> AND consult.VAT_owner = prescription.VAT_owner
-> GROUP BY consult.date_timestamp, consult.VAT_vet
-> HAVING YEAR(consult.date_timestamp) = '2017') CPR;
+-----+-----+-----+-----+
| avg(Assistants) | avg(Procedures) | avg(Diagnostics) | avg(Prescriptions) |
+-----+-----+-----+-----+
|      0.5000 |       1.5000 |      0.6667 |       0.8333 |
+-----+-----+-----+-----+
1 row in set (0.01 sec)
```

Figure 6: Resultado da Query 6

2.2.7 Resultado da Query 7

```
MySQL [ist425353]> -- Query #7
MySQL [ist425353]> SELECT Species, Most_Common_Diagnosis
-> FROM (SELECT Species, D1.name as Most_Common_Diagnosis, MAX(count_diagnosis)
-> FROM (SELECT species_name as Species, diagnosis_code.name, count(consult_diagnosis.code) as count_diagnosis
-> FROM animal, generalization_species, consult_diagnosis, diagnosis_code
-> WHERE (species_name LIKE '%dog%' OR (name1 = species_name AND name2 LIKE '%dog%'))
-> AND animal.VAT=consult_diagnosis.VAT_owner
-> AND animal.name = consult_diagnosis.name
-> AND diagnosis_code.code = consult_diagnosis.code
-> GROUP BY species_name, diagnosis_code.name
-> ORDER BY count_diagnosis DESC) D1
-> GROUP BY Species) D2;
+-----+-----+
| Species | Most_Common_Diagnosis |
+-----+-----+
| Australian Shepherd | Kidney Failure |
| Bichon Frise | Kidney Failure |
| Border Collie | Imunology - Intestinal Infection |
| Labrador | Body - Obesity |
| Terrier | Bone - Broken Bone |
+-----+-----+
5 rows in set (0.00 sec)
```

Figure 7: Resultado da Query 7

2.2.8 Resultado da Query 8

```
MySQL [ist425353]> -- Query #8
MySQL [ist425353]> (SELECT name
-> FROM client NATURAL JOIN veterinary NATURAL JOIN person)
-> UNION
-> (SELECT name
-> FROM client NATURAL JOIN assistant NATURAL JOIN person);
+-----+
| name      |
+-----+
| John Smith    |
| Maritsa Tichner |
| Bartlet Lardiner |
| Hillary Oguz    |
| Boris Clark    |
+-----+
5 rows in set (0.00 sec)
```

Figure 8: Resultado da Query 8

2.2.9 Resultado da Query 9

```
MySQL [ist425353]> -- Query #9
MySQL [ist425353]> SELECT person.name, address_street, address_city, address_zip
-> FROM person, animal, generalization_species
-> WHERE species_name LIKE '%bird%'
-> OR (name1 = species_name AND name2 LIKE '%bird%')
-> AND animal.VAT = person.VAT
-> and animal.vat not in ( SELECT person.vat
->                         FROM animal, generalization_species, person
->                         WHERE animal.species_name NOT LIKE '%bird%'
->                         AND (name1 = species_name AND name2 NOT LIKE '%bird%')
->                         AND animal.VAT = person.VAT);
+-----+-----+-----+-----+
| name      | address_street     | address_city | address_zip |
+-----+-----+-----+-----+
| Elmo MacGuigan | 759 Nevada Terrace | New Orleans | 70149 |
+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

Figure 9: Resultado da Query 9

3 Database Indexes

Listing 3: hospital_indexes.sql

```
1 — Assignment 2 – Indexes
2 — Group 8
3 — 63070 Diogo Sardinha
4 — 84053 Francisco Melo
5 — 89213 Rodrigo Rego
6
7 — For Query 1
8 CREATE INDEX name_index ON
9 person(name);
10
11 CREATE INDEX vat_vet_index ON
12 consult(VAT_vet);
13
14 CREATE INDEX animal_vat_index ON
15 animal(VAT);
16
17 CREATE INDEX animal_name_index ON
18 animal(name);
19
20
21 — For Query 2
22 CREATE INDEX units_index ON
23 indicator(units);
```

- **Query 1:**

Use index on *person* to find
person.name = 'John Smith' as pvet;
Use index on *consult* to find
consult.VAT_vet = pvet.VAT;
Use index on *animal* to find
animal.VAT = *consult.VAT_owner* and *animal.name* = *consult.name*;
test for *animal.VAT* = *person.VAT*;

These indexes would ease the computational effort in case of a highly populated database, since the main computational expense in this query coincides with the search on the animal, person and consult tables.

- **Query 2:**

Use index on *units* to find
units LIKE '%mg%'; test for *reference_value* > 100 and order by descent;

An index on *units* was chosen to make it computationally easier to find units like %mg%, since the main computational expense in this query is finding strings like %mg%.

4 Database Changes

Listing 4: hospital_changes.sql

```
1 — Assignment 2 – Changes
2 — Group 8
3 — 63070 Diogo Sardinha
4 — 84053 Francisco Melo
5 — 89213 Rodrigo Rego
6
7 — Change #1
8 UPDATE person
9 SET address_street = 'Av. Rovisco Pais, 1049-001', address_city ='Lisboa'
10 WHERE VAT IN (
11     SELECT VAT FROM
12         (SELECT VAT
13             FROM person NATURAL JOIN client
14             WHERE name = 'John Smith'
15         ) AS person_client_vat
16 );
17
18
19 — Change #2
20 UPDATE indicator
21 SET reference_value = reference_value * 1.1
22 WHERE units LIKE '%mg%'
23 AND name IN (SELECT indicator_name
24                 FROM produced_indicator NATURAL JOIN test_procedure
25                 WHERE type='blood');
26
27
28 — Change #3
29 DELETE FROM client
30 WHERE VAT IN (SELECT VAT FROM person WHERE name = 'John Smith');
31
32 DELETE FROM person
33 WHERE VAT NOT IN (SELECT VAT FROM veterinary)
34 AND VAT NOT IN (SELECT VAT FROM assistant)
35 AND VAT NOT IN (SELECT VAT FROM client);
36
37 — Change #4
38 SELECT code
39 FROM diagnosis_code
40 WHERE name LIKE '%kidney failure%';
41
42 INSERT INTO diagnosis_code VALUES('O-ESRD', 'End-Stage Renal Disease');
43
44 UPDATE consult_diagnosis
45 SET code = (SELECT code FROM diagnosis_code WHERE name LIKE '%End-Stage Renal Disease
46     %'),
47     name = name,
48     VAT_owner = VAT_owner,
49     date_timestamp = date_timestamp
50 WHERE code = (SELECT code FROM diagnosis_code WHERE name LIKE '%kidney failure%')
51 AND (name, VAT_owner, date_timestamp) IN (SELECT name, VAT_owner, date_timestamp
52                                         FROM produced_indicator
53                                         WHERE indicator_name LIKE '%creatinine
54     level%' AND value > 1);
```

4.1 Resultado da Change 1

MySQL [ist163070]> SELECT * FROM person ORDER BY name;					MySQL [ist163070]> SELECT * FROM person NATURAL JOIN client ORDER BY person.name;				
VAT	name	address_street	address_city	address_zip	VAT	name	address_street	address_city	address_zip
123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49560	123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49560
794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072	794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072
700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848	700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848
827601181	Con McAusland	5528 Basil Avenue	Honolulu	96850	607945198	Elmo MacGuigan	276 Hoepker Avenue	New Orleans	70149
607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
135113869	Fabe St. Louis	276 Hoepker Avenue	Saint Paul	55108	633821481	Fabe St. Louis	567 Haas Lane	Milwaukee	53285
633821481	Fabrice St. Louis	2507 Thompson Trail	Detroit	48211	27070 Thompson Trail	Detroit	46 Golden Leaf Park	Nashville	37215
657771157	Frederick Girodier	27070 Thompson Trail	Detroit	48211	141597822	Lorette Fildes	4879 Springs Road	Washington	20067
287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215	141597822	Lorette Fildes	1 Lighthouse Bay Circle	Little Rock	72284
176716688	Hillary Oguz	7 Elka Plaza	Grand Rapids	49560	789658446	Maritsa Tichner	7 Elka Plaza	Grand Rapids	49560
849906464	John Smith	700-4000 Tempus St.	Cleveland	60044	897771157	Frederick Girodier	700-4000 Tempus St.	Cleveland	60044
839906464	John Smith	765-4786 Tempus St.	Cleveland	65944	287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215
5777088490	John Smith	998 Macpherson Circle	Cincinnati	45254	176716688	Hillary Oguz	7 Elka Plaza	Grand Rapids	49560
657289218	Julian Riddle	Port Avenue 4	Radebeul	37766	5777088490	John Smith	998 Macpherson Circle	Cincinnati	45254
241819611	Kalie Milroe	5 Elgar Lane	Richmond	23289	849906464	John Smith	700-4000 Tempus St.	Cleveland	60044
688810229	Kim Garton	30736 Elmside Center	Sunnyvale	94089	241819611	Kalie Milroe	5 Elgar Lane	Richmond	23289
246943762	Koenraad Rottenbury	678 Manitowish Terrace	Chicago	66619	141597822	Lorette Fildes	4879 Springs Road	Washington	20067
407363612	Lee Bryant	Mauris Avenue 2	San Demetrio Coronae	52748	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
141597822	Lorette Fildes	4079 Springs Road	Washington	28067	744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444
283275555	Luke Gibson	Porttitor Avenue 1	Firenze	85656	744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444
789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284	15 rows in set (0.00 sec)				
744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444					

Figure 10: Tabelas antes da Change 1

```
MySQL [ist163070]> UPDATE person
->      SET address_street = 'Av. Rovisco Pais, 1049-001', address_city ='Lisboa'
->      WHERE VAT IN (
->          SELECT VAT FROM
->              (SELECT VAT
->                  FROM person NATURAL JOIN client
->                  WHERE name = 'John Smith'
->              ) AS person_client_vat
->      );
Query OK, 2 rows affected (0.00 sec)
Rows matched: 2  Changed: 2  Warnings: 0
```

Figure 11: Change 1

MySQL [ist163070]> SELECT * FROM person ORDER BY name;					MySQL [ist163070]> SELECT * FROM person NATURAL JOIN client ORDER BY person.name;				
VAT	name	address_street	address_city	address_zip	VAT	name	address_street	address_city	address_zip
123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49560	123456788	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072
794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072	794475858	Bartlet Lardiner	983 Hoepker Hill	Grand Rapids	49560
700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848	700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848
827601181	Con McAusland	5528 Basil Avenue	Honolulu	96850	607945198	Elmo MacGuigan	276 Hoepker Avenue	New Orleans	70149
607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
135113869	Fabe St. Louis	276 Hoepker Avenue	Saint Paul	55108	633821481	Fabe St. Louis	567 Haas Lane	Milwaukee	53285
633821481	Fabrice St. Louis	2507 Thompson Trail	Detroit	48211	27070 Thompson Trail	Detroit	46 Golden Leaf Park	Nashville	37215
657771157	Frederick Girodier	27070 Thompson Trail	Detroit	48211	141597822	Lorette Fildes	4879 Springs Road	Washington	20067
287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215	141597822	Lorette Fildes	1 Lighthouse Bay Circle	Little Rock	72284
176716688	Hillary Oguz	7 Elka Plaza	Grand Rapids	49560	789658446	Maritsa Tichner	7 Elka Plaza	Grand Rapids	49560
849906464	John Smith	Av. Rovisco Pais, 1049-001	Lisboa	60044	897771157	Frederick Girodier	700-4000 Tempus St.	Cleveland	60044
839906464	John Smith	765-4786 Tempus St.	Cleveland	65944	287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215
5777088490	John Smith	Av. Rovisco Pais, 1049-001	Lisboa	60044	176716688	Hillary Oguz	7 Elka Plaza	Grand Rapids	49560
657289218	Julian Riddle	Port Avenue 4	Radebeul	37766	5777088490	John Smith	998 Macpherson Circle	Cincinnati	45254
241819611	Kalie Milroe	5 Elgar Lane	Richmond	23289	849906464	John Smith	700-4000 Tempus St.	Cleveland	60044
688810229	Kim Garton	30736 Elmside Center	Sunnyvale	94089	241819611	Kalie Milroe	5 Elgar Lane	Richmond	23289
246943762	Koenraad Rottenbury	678 Manitowish Terrace	Chicago	66619	141597822	Lorette Fildes	4879 Springs Road	Washington	20067
407363612	Lee Bryant	Mauris Avenue 2	San Demetrio Coronae	52748	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
141597822	Lorette Fildes	4079 Springs Road	Washington	28067	744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444
283275555	Luke Gibson	Porttitor Avenue 1	Firenze	85656	744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444
789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284	15 rows in set (0.01 sec)				
744022880	Vikky Melliem	963 Reinke Court	Muskegon	49444					

Figure 12: Tabelas depois da Change 1

4.2 Resultado da Change 2

MySQL [ist163070]> SELECT name, reference_value, units FROM indicator ORDER BY name;			MySQL [ist163070]> SELECT * FROM produced_indicator NATURAL JOIN test_procedure -> WHERE type='blood' ORDER BY indicator_name;						
name	reference_value	units	VAT_owner	date_timestamp	num	indicator_name	value	type	
Benzodiazepinas	200.0000	mg/dL	Buddy	287747154	2017-11-06 09:30:00	1	Creatinine level	2.0000	blood
Bilirubin	0.1000	mg/dL	Scooby	141597822	2014-04-23 14:15:00	1	Creatinine Level	3.0000	blood
Creatinine level	100.0000	ng/ML	Simba	577708490	2017-08-15 10:30:00	1	Creatinine Level	3.0000	blood
Erythrocyte	40.0000	% of RBC	Lassie	897771157	2017-11-06 09:30:00	1	Creatinine level	0.5000	blood
Glucose	0.0000	mg/dL	Buddy	287747154	2017-11-06 09:30:00	1	Erythrocyte	49.0000	blood
Ketones	0.0000	mg/dL	Lassie	897771157	2017-11-06 09:30:00	1	Erythrocyte	40.0000	blood
Lymphocytes	30.0000	% of WBC	Lassie	897771157	2017-11-06 09:30:00	1	Lymphocytes	40.0000	blood
Monocytes	6.0000	% of WBC	Lassie	897771157	2017-11-06 09:30:00	1	Lymphocytes	42.0000	blood
Neutrophils	50.0000	% of WBC	Buddy	287747154	2017-11-06 09:30:00	1	Monocytes	10.0000	blood
Nitrites	110.0000	mg/dL	Lassie	897771157	2017-11-06 09:30:00	1	Monocytes	10.0000	blood
pH	7.0000		Buddy	287747154	2017-11-06 09:30:00	1	Neutrophils	45.0000	blood
Potassium	15.0000	mg/dL	Buddy	287747154	2017-11-06 09:30:00	1	Neutrophils	55.0000	blood
Protein	50.0000	mg/dL	Lassie	897771157	2017-11-06 09:30:00	1	Potassium	13.0000	blood
Sodium	320.0000	mg/dL	Buddy	287747154	2017-11-06 09:30:00	1	Potassium	18.0000	blood
Specific Gravity	1.0300	mg/dL	Lassie	897771157	2017-11-06 09:30:00	1	Sodium	325.0000	blood
Urine Clarity	2.5000		Buddy	287747154	2017-11-06 09:30:00	1	Sodium	318.0000	blood
Urobilinogen	0.6000	mg/dL	Lassie	897771157	2017-11-06 09:30:00	1	Vitamin D	79.0000	blood
Vitamin D	75.0000	ng/mL	Buddy	287747154	2017-11-06 09:30:00	1	Vitamin D	60.0000	blood

Figure 13: Tabelas antes da Change 2

```
MySQL [ist163070]> UPDATE indicator
-> SET reference_value = reference_value * 1.1
-> WHERE units LIKE '%mg%'
-> AND name IN (SELECT indicator_name
->                  FROM produced_indicator NATURAL JOIN test_procedure
->                 WHERE type='blood');
Query OK, 2 rows affected (0.00 sec)
Rows matched: 2  Changed: 2  Warnings: 0
```

Figure 14: Change 2

MySQL [ist163070]> SELECT name, reference_value, units FROM indicator ORDER BY name;		
name	reference_value	units
Benzodiazepinas	200.0000	mg/dL
Bilirubin	0.1000	mg/dL
Creatinine level	100.0000	ng/ML
Erythrocyte	40.0000	% of RBC
Glucose	0.0000	mg/dL
Ketones	0.0000	mg/dL
Lymphocytes	30.0000	% of WBC
Monocytes	6.0000	% of WBC
Neutrophils	50.0000	% of WBC
Nitrites	110.0000	mg/dL
pH	7.0000	
Potassium	16.5000	mg/dL
Protein	50.0000	mg/dL
Sodium	352.0000	mg/dL
Specific Gravity	1.0300	mg/dL
Urine Clarity	2.5000	
Urobilinogen	0.6000	mg/dL
Vitamin D	75.0000	ng/mL

Figure 15: Tabelas depois da Change 2

4.3 Resultado da Change 3

MySQL [ist163070]> SELECT * FROM person ORDER BY name;					MySQL [ist163070]> SELECT * FROM person NATURAL JOIN client ORDER BY person.name;				
VAT	name	address_street	address_city	address_zip	VAT	name	address_street	address_city	address_zip
123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49568	794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072
794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072	123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49568
700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848	700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848
827601181	Con McAusland	5528 Basil Avenue	Honolulu	96858	607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149
607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
633821041	Fabe St. Louis	567 Haas Lane	Saint Paul	55108	287747154	Hardy Ollive	46 Golden Leaf Park	Detroit	48211
897771157	Frederick Girodier	27070 Thompson Trail	Detroit	48211	633821481	Fabe St. Louis	567 Haas Lane	Milwaukee	53285
287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215	899086464	John Smith → ASS	700-4000 Tempus St.	Cleveland	49566
76716608	Hillary Oguz	7 Elka Plaza	Grand Rapids	49568	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
407363612	Lee Bryant	567 Haas Lane	Milwaukee	53285	899086464	John Smith → ASS	700-4000 Tempus St.	Cleveland	49566
141597822	Lorette Fildes	San Demetrio Corone	Washington	20067	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
283275555	Luke Gibson	46 Golden Leaf Park	Nashville	37215	141597822	Lorette Fildes	4079 Springs Road	Washington	20067
698810229	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
246943762	Koenraad Rottenbury	567 Haas Lane	Muskegon	49444	744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444
407363612	Lee Bryant	567 Haas Lane	Milwaukee	53285	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
141597822	Lorette Fildes	7 Elka Plaza	Grand Rapids	49568	141597822	Lorette Fildes	4079 Springs Road	Washington	20067
283275555	Luke Gibson	7 Elka Plaza	Grand Rapids	49568	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284	744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444
744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444	15 rows in set (0.00 sec)				

Figure 16: Tabelas antes da Change 3

```
MySQL [ist163070]> DELETE FROM client
-> WHERE VAT IN (SELECT VAT FROM person WHERE name = 'John Smith');
Query OK, 2 rows affected (0.01 sec)

MySQL [ist163070]>
MySQL [ist163070]> DELETE FROM person
-> WHERE VAT NOT IN (SELECT VAT FROM veterinary)
-> AND VAT NOT IN (SELECT VAT FROM assistant)
-> AND VAT NOT IN (SELECT VAT FROM client);
Query OK, 1 row affected (0.00 sec)
```

Figure 17: Change 3

MySQL [ist163070]> SELECT * FROM person ORDER BY name;					MySQL [ist163070]> SELECT * FROM person NATURAL JOIN client ORDER BY person.name;				
VAT	name	address_street	address_city	address_zip	VAT	name	address_street	address_city	address_zip
123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49568	123456788	Bartlet Lardiner	7 Elka Plaza	Grand Rapids	49568
794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072	794475858	Bartlet Lardiner	983 Hoepker Hill	Phoenix	85072
700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848	700170646	Boris Clark	Dean Avenue 3	Cercepiccola	76848
827601181	Con McAusland	5528 Basil Avenue	Honolulu	96858	607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149
607945198	Elmo MacGuigan	759 Nevada Terrace	New Orleans	70149	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
633821041	Fabe St. Louis	567 Haas Lane	Saint Paul	55108	287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215
897771157	Frederick Girodier	27070 Thompson Trail	Detroit	48211	633821481	Fabe St. Louis	567 Haas Lane	Milwaukee	53285
287747154	Hardy Ollive	46 Golden Leaf Park	Nashville	37215	899086464	John Smith → ASS	700-4000 Tempus St.	Cleveland	49566
176716608	Hillary Oguz	7 Elka Plaza	Grand Rapids	49568	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
839908646	John Smith → ASS	700-4000 Tempus St.	Cleveland	49566	141597822	Lorette Fildes	4079 Springs Road	Washington	20067
577788490	John Smith → ASS	998 Macpherson Circle	Cincinnati	45254	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
572789210	Julian Riddle	Port Avenue 4	Radebeul	37766	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
241819611	Kalie Milmoe	5 Elgar Lane	Richmond	23289	141597822	Lorette Fildes	4079 Springs Road	Washington	20067
698810229	Kim Garton	30736 Elmside Center	Sunnyvale	94889	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
246943762	Koenraad Rottenbury	678 Manitoish Terrace	Chicago	60619	744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444
407363612	Lee Bryant	Mauris Avenue 2	San Demetrio Corone	52748	135113869	Erika Bindon	276 Hoepker Avenue	Saint Paul	55108
141597822	Lorette Fildes	4079 Springs Road	Washington	20067	141597822	Lorette Fildes	4079 Springs Road	Washington	20067
283275555	Luke Gibson	Porttitor Avenue 1	Firenze	85656	789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284
789658446	Maritsa Tichner	1 Lighthouse Bay Circle	Little Rock	72284	744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444
744022800	Vikky Mellom	963 Reinke Court	Muskegon	49444	13 rows in set (0.00 sec)				

Figure 18: Tabelas depois da Change 3

- É importante referir que o segundo `DELETE` foi adicionado de modo a cumprir com a **integrity constraint** "RI: All persons are either clients, veterinary doctor, or assistants". Se o `John Smith` for apenas um `client` terá de ser eliminado de `person` também.

4.4 Resultado da Change 4

```
MySQL [ist163070]> SELECT * FROM consult_diagnosis;
+-----+-----+-----+-----+
| code | name | VAT_owner | date_timestamp |
+-----+-----+-----+-----+
| B-Ob | Flipflop | 123456788 | 2018-01-15 10:30:00 |
| I-IIInf | Flipflop | 123456788 | 2018-02-04 15:30:00 |
| I-IIInf | Flipflop | 123456788 | 2018-03-04 09:00:00 |
| I-IIInf | Kiki | 123456788 | 2016-12-20 14:15:00 |
| B-Ob | Lassie | 897771157 | 2017-11-06 09:30:00 |
| b-BB | Peanut | 897771157 | 2017-11-20 11:00:00 |
| O-KF | Scooby | 141597822 | 2014-04-23 14:15:00 |
| O-KF | Simba | 577708490 | 2017-08-15 10:30:00 |
| T-B | Waffles | 744022800 | 2017-12-20 15:30:00 |
| B-Ob | Yara | 789658446 | 2018-01-10 09:30:00 |
| I-IIInf | Yara | 789658446 | 2018-02-04 12:30:00 |
+-----+-----+-----+-----+
11 rows in set (0.00 sec)
```

Figure 19: Tabelas antes da Change 4

```
MySQL [ist163070]> SELECT code
    -> FROM diagnosis_code
    -> WHERE name LIKE '%kidney failure%';
+-----+
| code |
+-----+
| O-KF |
+-----+
1 row in set (0.00 sec)

MySQL [ist163070]> INSERT INTO diagnosis_code VALUES('0-ESRD', 'End-Stage Renal Disease');
Query OK, 1 row affected (0.00 sec)

MySQL [ist163070]> UPDATE consult_diagnosis
    -> SET code = (SELECT code FROM diagnosis_code WHERE name LIKE '%End-Stage Renal Disease%'),
    ->     name = name,
    ->     VAT_owner = VAT_owner,
    ->     date_timestamp = date_timestamp
    -> WHERE code = (SELECT code FROM diagnosis_code WHERE name LIKE '%kidney failure%')
    -> AND (name, VAT_owner, date_timestamp) IN (SELECT name, VAT_owner, date_timestamp
    ->                                         FROM produced_indicator
    ->                                         WHERE indicator_name LIKE '%creatinine level%'
    ->                                         AND value > 1);
Query OK, 2 rows affected (0.00 sec)
Rows matched: 2  Changed: 2  Warnings: 0
```

Figure 20: Change 4

```
MySQL [ist163070]> SELECT * FROM consult_diagnosis;
+-----+-----+-----+-----+
| code | name | VAT_owner | date_timestamp |
+-----+-----+-----+-----+
| B-Ob | Flipflop | 123456788 | 2018-01-15 10:30:00 |
| I-IIInf | Flipflop | 123456788 | 2018-02-04 15:30:00 |
| I-IIInf | Flipflop | 123456788 | 2018-03-04 09:00:00 |
| I-IIInf | Kiki | 123456788 | 2016-12-20 14:15:00 |
| B-Ob | Lassie | 897771157 | 2017-11-06 09:30:00 |
| b-BB | Peanut | 897771157 | 2017-11-20 11:00:00 |
| O-KF | Scooby | 141597822 | 2014-04-23 14:15:00 |
| O-ESRD | Simba | 577708490 | 2017-08-15 10:30:00 |
| T-B | Waffles | 744022800 | 2017-12-20 15:30:00 |
| B-Ob | Yara | 789658446 | 2018-01-10 09:30:00 |
| I-IIInf | Yara | 789658446 | 2018-02-04 12:30:00 |
+-----+-----+-----+-----+
11 rows in set (0.00 sec)
```

Figure 21: Tabelas depois da Change 4

4.5 Nota: Possível Alternativa à Implementação das Changes

Decidimos usar ON ... CASCADE nas Várias FOREIGN KEYs de forma a facilitar e automatizar as alterações das linhas que estão dependentes de varias tabelas. O uso ON ... CASCADE retira a existência de uma Safety Net relacionada com as FOREIGN KEYs que actua no caso de ,por engano, se apagar um campo de um atributo presente numa FOREIGN KEY que sucessivamente apagará milhões de outras linhas na base de dados. Mas como não há restrições nesse sentido no enunciado, optamos por usar os benefícios de ON ... CASCADE. Em Alternativa caso a Database Schema (Listing 1) hospital_create.sql não tivesse sido implementada com ON DELETE CASCADE nas várias FOREIGN KEYs, teríamos de executar as varias alterações começando pelas child rows que não tivessem nenhuma child e acabar nas parent rows que já não tivessem nenhuma child. Por exemplo na Change 4 (Figure 20) executaríamos a seguinte sequencia de passos caso tivéssemos a ausência de ON UPDATE CASCADE nas Várias FOREIGN KEYs da nossa Database Schema:

1. INSERT INTO consult_diagnosis
2. INSERT INTO prescription
3. DELETE FROM prescription
4. DELETE FROM consult_diagnosis

5 Database Views

Listing 5: hospital_views.sql

```
1 — Assignment 2 – Views
2 — Group 8
3 — 63070 Diogo Sardinha
4 — 84053 Francisco Melo
5 — 89213 Rodrigo Rego
6
7 — View #1
8 CREATE VIEW dim_date AS
9   SELECT date_timestamp, day(date_timestamp) AS day, month(date_timestamp) AS month,
10      year(date_timestamp) AS year
11    FROM consult;
12
13 — View #2
14 CREATE VIEW dim_animal AS
15   SELECT name AS animal_name, VAT AS animal_vat, species_name AS species, year(
16      current_date)-animal.birth_year AS age
17    FROM animal;
18
19 — View #3
20 CREATE VIEW facts_consults AS
21   SELECT DISTINCT animal_name AS name, animal_vat AS vat, dim_date.date_timestamp AS
22      timestamp, count(distinct P.num) AS num_procedures, count(distinct name_med) AS
23      num_medications
24    FROM procedure_consult P
25    RIGHT OUTER JOIN
26      consult ON (consult.name = P.name AND consult.VAT_owner = P.VAT_owner AND consult.
27      date_timestamp = P.date_timestamp)
28    LEFT OUTER JOIN
29      prescription Prs ON (consult.name = Prs.name AND consult.VAT_owner = Prs.VAT_owner
      AND consult.date_timestamp = Prs.date_timestamp),
      dim_date, dim_animal
      WHERE animal_name = consult.name AND animal_vat = consult.VAT_owner AND dim_date.
      date_timestamp = consult.date_timestamp
      GROUP BY name, vat, timestamp;
```

6 Database Test Data

Listing 6: hospital_populate.sql

```
1 -- Assignment 2 - Populate
2 -- Group 8
3 -- 63070 Diogo Sardinha
4 -- 84053 Francisco Melo
5 -- 89213 Rodrigo Rego
6
7 --Populate the database
8 INSERT INTO person VALUES (577708490, 'John Smith', '998 Macpherson Circle', 'Cincinnati', 45254);
9 INSERT INTO person VALUES (789658446, 'Maritsa Tichner', '1 Lighthouse Bay Circle', 'Little Rock', 72204);
10 INSERT INTO person VALUES (246943762, 'Koenraad Rottenbury', '678 Manitowish Terrace', 'Chicago', 60619);
11 INSERT INTO person VALUES (680810229, 'Kim Garton', '30736 Elmside Center', 'Sunnyvale', 94089);
12 INSERT INTO person VALUES (827601181, 'Con McAusland', '5528 Basil Avenue', 'Honolulu', 96850);
13 INSERT INTO person VALUES (897771157, 'Frederick Girodier', '27070 Thompson Trail', 'Detroit', 48211);
14 INSERT INTO person VALUES (141597822, 'Lorette Fildes', '4079 Springs Road', 'Washington', 20067);
15 INSERT INTO person VALUES (287747154, 'Hardy Ollive', '46 Golden Leaf Park', 'Nashville', 37215);
16 INSERT INTO person VALUES (607945198, 'Elmo MacGuigan', '759 Nevada Terrace', 'New Orleans', 70149);
17 INSERT INTO person VALUES (135113869, 'Erika Bindon', '276 Hoepker Avenue', 'Saint Paul', 55108);
18 INSERT INTO person VALUES (241819611, 'Kalie Milmoe', '5 Elgar Lane', 'Richmond', 23289);
19 INSERT INTO person VALUES (633821481, 'Fabe St. Louis', '567 Haas Lane', 'Milwaukee', 53285);
20 INSERT INTO person VALUES (744022800, 'Vikky Mellem', '963 Reinke Court', 'Muskegon', 49444);
21 INSERT INTO person VALUES (794475858, 'Bartlet Lardiner', '983 Hoepker Hill', 'Phoenix', 85072);
22 INSERT INTO person VALUES (176716608, 'Hillary Oguz', '7 Elka Plaza', 'Grand Rapids', 49560);
23 INSERT INTO person VALUES (123456788, 'Bartlet Lardiner', '7 Elka Plaza', 'Grand Rapids', 49560);
24 INSERT INTO person VALUES (283275555, 'Luke Gibson', 'Porttitor Avenue 1', 'Firenze', 85656);
25 INSERT INTO person VALUES (407363612, 'Lee Bryant', 'Mauris Avenue 2', 'San Demetrio Corone', 52740);
26 INSERT INTO person VALUES (700170646, 'Boris Clark', 'Dean Avenue 3', 'Cercepiccola', 76848);
27 INSERT INTO person VALUES (657289210, 'Julian Riddle', 'Port Avenue 4', 'Radebeul', 37766);
28 INSERT INTO person VALUES (839906464, 'John Smith', '765-4786 Tempus St.', 'Cleveland', 65944);
29 INSERT INTO person VALUES (849906464, 'John Smith', '700-4000 Tempus St.', 'Cleveland', 60044);
30
31 INSERT INTO phone_number VALUES (577708490, 3979331174);
32 INSERT INTO phone_number VALUES (789658446, 8936220604);
33 INSERT INTO phone_number VALUES (246943762, 5271842306);
34 INSERT INTO phone_number VALUES (680810229, 4261969611);
35 INSERT INTO phone_number VALUES (827601181, 3597853857);
36 INSERT INTO phone_number VALUES (897771157, 2859362509);
37 INSERT INTO phone_number VALUES (141597822, 5993603401);
38 INSERT INTO phone_number VALUES (287747154, 5214220545);
39 INSERT INTO phone_number VALUES (607945198, 6367462510);
40 INSERT INTO phone_number VALUES (135113869, 2187887871);
41 INSERT INTO phone_number VALUES (241819611, 1247015695);
42 INSERT INTO phone_number VALUES (633821481, 3143426892);
43 INSERT INTO phone_number VALUES (744022800, 9156390911);
44 INSERT INTO phone_number VALUES (794475858, 6523906266);
45 INSERT INTO phone_number VALUES (176716608, 4732696800);
46 INSERT INTO phone_number VALUES (789658446, 1381350727);
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47 INSERT INTO phone_number VALUES (141597822, 9131626460);
48 INSERT INTO phone_number VALUES (744022800, 1185107317);
49 INSERT INTO phone_number VALUES (123456788, 3798396280);
50 INSERT INTO phone_number VALUES (283275555, 237468988);
51 INSERT INTO phone_number VALUES (407363612, 620369640);
52 INSERT INTO phone_number VALUES (700170646, 337217347);
53 INSERT INTO phone_number VALUES (657289210, 335829218);
54 INSERT INTO phone_number VALUES (839906464, 890350122);
55
56 INSERT INTO client VALUES (897771157);
57 INSERT INTO client VALUES (141597822);
58 INSERT INTO client VALUES (287747154);
59 INSERT INTO client VALUES (607945198);
60 INSERT INTO client VALUES (135113869);
61 INSERT INTO client VALUES (241819611);
62 INSERT INTO client VALUES (633821481);
63 INSERT INTO client VALUES (744022800);
64 INSERT INTO client VALUES (794475858);
65 INSERT INTO client VALUES (577708490);
66 INSERT INTO client VALUES (789658446);
67 INSERT INTO client VALUES (176716608);
68 INSERT INTO client VALUES (123456788);
69 INSERT INTO client VALUES (700170646);
70 INSERT INTO client VALUES (849906464);

71
72
73 INSERT INTO veterinary VALUES (577708490, 'Surgery', 'Graduated in 2012 from University
    of Pennsylvania School of Veterinary Medicine. Works in the hospital since 2015.');
74 INSERT INTO veterinary VALUES (789658446, 'Dermatology', 'Graduated in 2005 from LSU
    School of Veterinary Medicine. Works in the hospital since 2009.');
75 INSERT INTO veterinary VALUES (246943762, 'Internal Medicine', 'Graduated in 2011 from
    University of Pennsylvania School of Veterinary Medicine. Works in the hospital
    since 2012.');
76 INSERT INTO veterinary VALUES (680810229, 'Anesthesia', 'Graduated in 2016 from LSU
    School of Veterinary Medicine. Works in the hospital since 2015.');
77 INSERT INTO veterinary VALUES (827601181, 'Radiology', 'Graduated in 2001 from UC Davis
    School of Veterinary Medicine. Works in the hospital since 2002.');

78
79 INSERT INTO assistant VALUES (176716608);
80 INSERT INTO assistant VALUES (123456788);
81 INSERT INTO assistant VALUES (283275555);
82 INSERT INTO assistant VALUES (407363612);
83 INSERT INTO assistant VALUES (700170646);
84 INSERT INTO assistant VALUES (657289210);
85 INSERT INTO assistant VALUES (839906464);

86
87 INSERT INTO species VALUES ('Fish', 'Saltwater or freshwater');
88 INSERT INTO species VALUES ('Mammal', 'Any small, medium or large sized mammal');
89 INSERT INTO species VALUES ('Dog', 'Mammal: 4 legs, medium size');
90 INSERT INTO species VALUES ('Cat', 'Mammal: 4 legs, small size');
91 INSERT INTO species VALUES ('Bird', 'Birds that can or cannot fly');
92 INSERT INTO species VALUES ('Reptile', 'Ectothermic and amniote vertebrates');
93 INSERT INTO species VALUES ('Snake', 'A legless reptile, can be venomous');
94 INSERT INTO species VALUES ('Golden Fish', 'Small freshwater fish');
95 INSERT INTO species VALUES ('Rabbit', 'A domesticated mammal with long ears of the
    order Lagomorpha');
96 INSERT INTO species VALUES ('Iguana', 'A reptile from tropical regions');
97 INSERT INTO species VALUES ('Parrot', 'Vividly coloured bird with a strong and curved
    bill');
98 INSERT INTO species VALUES ('Cockatoo', 'Small vividly coloured bird with showy
    crests and curved bill');
99 INSERT INTO species VALUES ('Crossed Breed', 'A cross between cat or dog breeds. Can
    be small, medium or large sized');
100 INSERT INTO species VALUES ('Golden Retriever', 'Dog breed - Large Sized');
101 INSERT INTO species VALUES ('Bichon Frise', 'Dog Breed - Small Sized');
102 INSERT INTO species VALUES ('Border Collie', 'Dog Breed - Medium Sized');
103 INSERT INTO species VALUES ('Australian Shepherd', 'Dog Breed - Medium Sized');
104 INSERT INTO species VALUES ('Terrier', 'Dog Breed - Medium Sized');
105 INSERT INTO species VALUES ('Labrador', 'Dog Breed - Large Sized');
106 INSERT INTO species VALUES ('Siamese', 'Cat Breed - Short Hair Length');
107 INSERT INTO species VALUES ('Persian', 'Cat Breed - Long Hair Length');

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108 INSERT INTO species VALUES ('Bengal', 'Cat Breed – Short Hair Length');
109 INSERT INTO species VALUES ('American Bobtail', 'Cat Breed – Long Hair Length');
110 INSERT INTO species VALUES ('Sphynx', 'Cat Breed – Short Hair Length');
111 INSERT INTO species VALUES ('Siberian', 'Cat Breed – Long Hair Length');
112 INSERT INTO species VALUES ('American Shorthair', 'Cat Breed – Short Hair Length');
113
114
115 INSERT INTO generalization_species VALUES ('Snake', 'Reptile');
116 INSERT INTO generalization_species VALUES ('Golden Fish', 'Fish');
117 INSERT INTO generalization_species VALUES ('Rabbit', 'Mammal');
118 INSERT INTO generalization_species VALUES ('Iguana', 'Reptile');
119 INSERT INTO generalization_species VALUES ('Parrot', 'Bird');
120 INSERT INTO generalization_species VALUES ('Cockatoo', 'Bird');
121 INSERT INTO generalization_species VALUES ('Crossed Breed', 'Mammal');
122 INSERT INTO generalization_species VALUES ('Golden Retriever', 'Dog');
123 INSERT INTO generalization_species VALUES ('Bichon Frise', 'Dog');
124 INSERT INTO generalization_species VALUES ('Border Collie', 'Dog');
125 INSERT INTO generalization_species VALUES ('Australian Shepherd', 'Dog');
126 INSERT INTO generalization_species VALUES ('Terrier', 'Dog');
127 INSERT INTO generalization_species VALUES ('Labrador', 'Dog');
128 INSERT INTO generalization_species VALUES ('Siamese', 'Cat');
129 INSERT INTO generalization_species VALUES ('Persian', 'Cat');
130 INSERT INTO generalization_species VALUES ('Bengal', 'Cat');
131 INSERT INTO generalization_species VALUES ('American Bobtail', 'Cat');
132 INSERT INTO generalization_species VALUES ('Sphynx', 'Cat');
133 INSERT INTO generalization_species VALUES ('Siberian', 'Cat');
134 INSERT INTO generalization_species VALUES ('American Shorthair', 'Cat');
135 INSERT INTO generalization_species VALUES ('Dog', 'Mammal');
136 INSERT INTO generalization_species VALUES ('Cat', 'Mammal');

137
138 INSERT INTO animal VALUES('Lassie',897771157,'Labrador','Brown','Female',2015,(YEAR(
    CURRENT_DATE) - birth_year));
139 INSERT INTO animal VALUES('Pluto',897771157,'Dog','Black','Male',2010,(YEAR(
    CURRENT_DATE) - birth_year));
140 INSERT INTO animal VALUES('Peanut',897771157,'Terrier','Black','Male',2017,(YEAR(
    CURRENT_DATE) - birth_year));
141 INSERT INTO animal VALUES('Charlie',141597822,'Iguana','Green','Male',2017,(YEAR(
    CURRENT_DATE) - birth_year));
142 INSERT INTO animal VALUES('Buddy',287747154,'Mammal','Grey','Female',2013,(YEAR(
    CURRENT_DATE) - birth_year));
143 INSERT INTO animal VALUES('Peanut',607945198,'Parrot','Red','Male',2010,(YEAR(
    CURRENT_DATE) - birth_year));
144 INSERT INTO animal VALUES('Charlie',633821481,'Cat','Yellow','Male',2015,(YEAR(
    CURRENT_DATE) - birth_year));
145 INSERT INTO animal VALUES('Bailey',633821481,'Persian','Grey','Female',2017,(YEAR(
    CURRENT_DATE) - birth_year));
146 INSERT INTO animal VALUES('Waffles',744022800,'Golden Fish','Red','Female',2014,(YEAR(
    CURRENT_DATE) - birth_year));
147 INSERT INTO animal VALUES('Simba',577708490,'Australian Shepherd','Black, White and
    brown','Male',2010,(YEAR(CURRENT_DATE) - birth_year));
148 INSERT INTO animal VALUES('Mufasa',789658446,'Siberian','Grey','Male',2015,(YEAR(
    CURRENT_DATE) - birth_year));
149 INSERT INTO animal VALUES('Pumba',176716608,'Crossed Breed','Brown','Male', 2016,
    (YEAR(CURRENT_DATE) - birth_year));
150 INSERT INTO animal VALUES('Kiki',123456788,'Cockatoo','Red, blue, yellow','Female
    ', 2016, (YEAR(CURRENT_DATE) - birth_year));
151 INSERT INTO animal VALUES('Flipflop',123456788,'Border Collie','Black and white','
    Male',2017,(YEAR(CURRENT_DATE) - birth_year));
152 INSERT INTO animal VALUES('Yara',789658446,'Labrador','Brown','Male',2015,(YEAR(
    CURRENT_DATE) - birth_year));
153 INSERT INTO animal VALUES('Pocas', 700170646,'Rabbit','White','Female', 2018, (
    YEAR(CURRENT_DATE) - birth_year));
154 INSERT INTO animal VALUES('Scooby',577708490,'Golden Retriever','Brown','Male',
    2014, (YEAR(CURRENT_DATE) - birth_year));
155 INSERT INTO animal VALUES('Scooby',141597822,'Bichon Frise','Brown','Male', 2013,
    (YEAR(CURRENT_DATE) - birth_year));
156 INSERT INTO animal VALUES('Sirius',849906464,'Snake','Green','Male', 2015, (YEAR(
    CURRENT_DATE) - birth_year));

157
158
159
160

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161 INSERT INTO consult VALUES('Lassie',897771157,'2017-11-06 09:30:00','Asthma','Obese',
    'Loss of mobility , nose condition , asthamatic','Rigorous diet , daily walks ,
    weekly gradually intense exercise',897771157,246943762,49);
162 INSERT INTO consult VALUES('Buddy',287747154,'2018-11-06 09:30:00','Asthma','Obese',
    'Loss of mobility , lung condition , asthamatic , back muscle strain','Rigorous diet ,
    daily walks , weekly gradually intense exercise',287747154,789658446,29);
163 INSERT INTO consult VALUES('Buddy',287747154,'2017-11-06 09:30:00','Asthma','Obese',
    'Loss of mobility , lung condition , asthamatic , back muscle strain','Rigorous diet ,
    daily walks , weekly gradually intense exercise',287747154,789658446,40);
164 INSERT INTO consult VALUES('Lassie',897771157,'2016-06-20 13:00:00','Skin lesions',
    'Swollen Throat , Elevated Temperatura','Minor Infection','Antibiotic'
    ,141597822,789658446,23);
165 INSERT INTO consult VALUES('Peanut',897771157,'2017-11-20 11:00:00','Leg pain',
    'Possible broken leg','Leg fracture','Leg orthopedic cast and rest'
    ,135113869,827601181,36);
166 INSERT INTO consult VALUES('Kiki',123456788,'2016-12-20 14:15:00','Dehydration',
    'Diarrhea','Intestinal Virus','Diet , Antiviral',123456788,246943762, 0.5);
167 INSERT INTO consult VALUES('Waffles',744022800,'2017-12-20 15:30:00','Big ball in the
    head','Had brain tumor in 2015','Brain tumor','Surgery to remove the tumor'
    ,744022800,577708490,0.1);
168 INSERT INTO consult VALUES('Simba',577708490,'2017-08-15 10:30:00','Fatigue ,
    Shortness of Breath','Fever , Member Swelling , Ammonia Breath','Uremia , Urinary
    Tract Infection , Kidney Failure','Antibiotic , Probiotic , Pain Killers'
    ,577708490,246943762, 15);
169 INSERT INTO consult VALUES('Flipflop',123456788,'2018-01-15 10:30:00','Asthma','Obese
    ','Loss of mobility , lung condition , asthamatic , back muscle strain','Rigorous
    diet , daily walks , weekly gradually intense exercise',123456788,246943762,33);
170 INSERT INTO consult VALUES ('Bailey',633821481,'2018-01-15 12:30:00','Blood in nail',
    'Never had problems','Broken Nail','Ice and speccial glue.Stay at home for a week
    ',633821481,577708490,8);
171 INSERT INTO consult VALUES('Yara',789658446,'2018-1-10 09:30:00','Asthma','Obese',
    'Loss of mobility , nose condition , asthamatic','Rigorous diet , daily walks , weekly
    gradually intense exercise',607945198,789658446,51);
172 INSERT INTO consult VALUES('Yara',789658446,'2018-2-4 12:30:00','Dehydration',
    'Diarrhea','Intestinal Virus','Diet , Antiviral',607945198,246943762,43);
173 INSERT INTO consult VALUES('Flipflop',123456788,'2018-2-4 15:30:00','Dehydration',
    'Diarrhea','Intestinal Virus','Diet , Antiviral',607945198,246943762,28);
174 INSERT INTO consult VALUES('Flipflop',123456788,'2018-3-4 9:00:00','Dehydration',
    'Diarrhea','Intestinal Virus','Diet , Antiviral',123456788,246943762,25);
175 INSERT INTO consult VALUES ('Scooby',577708490,'2015-05-17 11:30:00','Skin lesions',
    'Swollen Throat , Elevated Temperatura','Minor Infection','Antibiotic'
    ,577708490, 789658446, 12);
176 INSERT INTO consult VALUES ('Scooby',577708490,'2016-02-15 12:30:00','Leg pain',
    'Possible broken leg','Leg fracture','Leg orthopedic cast and rest',
    700170646,577708490, 10);
177 INSERT INTO consult VALUES ('Waffles',744022800,'2017-11-21 12:00:00','Fatigue ,
    Shortness of Breath','Fever , Member Swelling , Ammonia Breath','Uremia , Urinary
    Tract Infection , Kidney Failure','Antibiotic , Probiotic , Pain Killers',
    577708490, 789658446, 0.5);
178 INSERT INTO consult VALUES ('Scooby',141597822,'2018-01-22 15:30:00','Big ball in
    the head','Had brain tumor in 2015','Brain tumor','Surgery to remove the tumor'
    ,141597822,577708490, 13.1);
179 INSERT INTO consult VALUES ('Scooby',141597822,'2014-04-23 14:15:00','Dehydration',
    'Diarrhea','Intestinal Virus','Diet , Antiviral',141597822,246943762, 13.5);
180
181
182 INSERT INTO participation VALUES('Buddy',287747154,'2017-11-06 09:30:00',176716608);
183 INSERT INTO participation VALUES('Peanut',897771157,'2017-11-20 11:00:00',176716608);
184 INSERT INTO participation VALUES('Simba',577708490,'2017-08-15 10:30:00',123456788);
185
186 INSERT INTO diagnosis_code VALUES('O-KF', 'Kidney Failure');
187 INSERT INTO diagnosis_code VALUES('B-Ob', 'Body - Obesity');
188 INSERT INTO diagnosis_code VALUES('b-BB', 'Bone - Broken Bone');
189 INSERT INTO diagnosis_code VALUES('I-GInf', 'Imunology - General Infection');
190 INSERT INTO diagnosis_code VALUES('I-IIInf', 'Imunology - Intestinal Infection');
191 INSERT INTO diagnosis_code VALUES('T-B', 'Tumor - Brain Tumor');
192
193 INSERT INTO consult_diagnosis VALUES('B-Ob','Lassie',897771157,'2017-11-06 09:30:00')
    ;
194 INSERT INTO consult_diagnosis VALUES('b-BB','Peanut',897771157,'2017-11-20 11:00:00')
    ;
195 INSERT INTO consult_diagnosis VALUES('I-IIInf','Kiki',123456788,'2016-12-20 14:15:00')

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;
196 INSERT INTO consult_diagnosis VALUES( 'O-KF' , 'Simba' ,577708490 , '2017-08-15 10:30:00' );
197 INSERT INTO consult_diagnosis VALUES( 'T-B' , 'Waffles' ,744022800 , '2017-12-20 15:30:00' )
;
198 INSERT INTO consult_diagnosis VALUES( 'B-Ob' , 'Flipflop' ,123456788 , '2018-01-15 10:30:00'
 );
199 INSERT INTO consult_diagnosis VALUES( 'B-Ob' , 'Yara' ,789658446 , '2018-1-10 09:30:00' );
200 INSERT INTO consult_diagnosis VALUES( 'I-IIInf' , 'Yara' ,789658446 , '2018-2-4 12:30:00' );
201 INSERT INTO consult_diagnosis VALUES( 'I-IIInf' , 'Flipflop' ,123456788 , '2018-2-4 15:30:00'
 );
202 INSERT INTO consult_diagnosis VALUES( 'I-IIInf' , 'Flipflop' ,123456788 , '2018-3-4 9:00:00'
 );
203 INSERT INTO consult_diagnosis VALUES( 'O-KF' , 'Scooby' ,141597822 , '2014-04-23 14:15:00'
 );
204
205
206 INSERT INTO medication VALUES( 'Ceftriaxone' , 'AMSA Laboratories' , '1g/50mL' );
207 INSERT INTO medication VALUES( 'Cefixime' , 'Mediva' , '200mg/5mL' );
208 INSERT INTO medication VALUES( 'PET Pectillin' , 'Lambert Kay' , '118mL' );
209 INSERT INTO medication VALUES( 'Vitamin C Tablets' , 'Vitamedic' , '500mg' );
210 INSERT INTO medication VALUES( 'Frontline Tri-Act' , 'Merial' , '4mL' );
211 INSERT INTO medication VALUES( 'Iodine' , 'Benevolent' , '59mL' );
212 INSERT INTO medication VALUES( 'Rimadyl' , 'Pfizer' , '25mg' );
213 INSERT INTO medication Values( 'Zylkene' , 'Vetoquinol' , '225mg' );
214
215 INSERT INTO prescription VALUES( 'b-BB' , 'Peanut' ,897771157 , '2017-11-20 11:00:00' , '
 Vitamin C Tablets' , 'Vitamedic' , '500mg' , 'One tablet per day for 7 days' );
216 INSERT INTO prescription VALUES( 'b-BB' , 'Peanut' ,897771157 , '2017-11-20 11:00:00' , '
 Zylkene' , 'Vetoquinol' , '225mg' , '2 capsules per day for 15 days' );
217 INSERT INTO prescription VALUES( 'I-IIInf' , 'Kiki' ,123456788 , '2016-12-20 14:15:00' , '
 Cefixime' , 'Mediva' , '200mg/5mL' , '1 Injection per day for 5 days' );
218 INSERT INTO prescription VALUES( 'O-KF' , 'Simba' ,577708490 , '2017-08-15 10:30:00' , '
 Vitamin C Tablets' , 'Vitamedic' , '500mg' , 'One tablet per day for 7 days' );
219 INSERT INTO prescription VALUES( 'O-KF' , 'Simba' ,577708490 , '2017-08-15 10:30:00' , '
 Rimadyl' , 'Pfizer' , '25mg' , '1 chewable capsule every 8 hours for 7 days' );
220 INSERT INTO prescription VALUES( 'T-B' , 'Waffles' ,744022800 , '2017-12-20 15:30:00' , '
 Iodine' , 'Benevolent' , '59mL' , '2mL 3 times a day during 2 months' );
221 INSERT INTO prescription VALUES( 'O-KF' , 'Scooby' ,141597822 , '2014-04-23 14:15:00' , '
 Rimadyl' , 'Pfizer' , '25mg' , '1 chewable capsule every 8 hours for 7 days' );
222
223 INSERT INTO indicator VALUES ( 'Vitamin D' ,75 , 'ng/mL' , 'Values between 20-100 ng/m are
 also acceptable' );
224 INSERT INTO indicator VALUES ( 'Neutrophils' ,50 , '% of WBC' , 'Measured in percentage of
 white blood cells' );
225 INSERT INTO indicator VALUES ( 'Lymphocytes' ,30 , '% of WBC' , 'Measured in percentage of
 white blood cells' );
226 INSERT INTO indicator VALUES ( 'Monocytes' ,6 , '% of WBC' , 'Measured in percentage of
 white blood cells' );
227 INSERT INTO indicator VALUES ( 'Creatinine level' ,100 , 'ng/ML' , 'The value may be
 different for different animals' );
228 INSERT INTO indicator VALUES ( 'Sodium' ,320 , 'mg/dL' , 'Bigger animals can have a higher
 value' );
229 INSERT INTO indicator VALUES ( 'Potassium' ,15 , 'mg/dL' , 'Results can be affected by
 infusion of potassium-containing fluids or an infusion of glucose or insulin.' );
230 INSERT INTO indicator VALUES ( 'Erythrocyte' ,40 , '% of RBC' , 'Measured in percentage of
 red blood cells. Normal values may vary depending on the individual laboratory
 and ages' );
231 INSERT INTO indicator VALUES ( 'pH' ,7 , '' , 'Urine pH is a measure of the hydrogen ion
 concentration in urine' );
232 INSERT INTO indicator VALUES ( 'Protein' ,50 , 'mg/dL' , 'Trace amounts of protein can
 normally be found in urine' );
233 INSERT INTO indicator VALUES ( 'Glucose' ,0 , 'mg/dL' , 'Glucose is not normally found in
 the urine of dogs and cats' );
234 INSERT INTO indicator VALUES ( 'Ketones' ,0 , 'mg/dL' , 'Ketones are produced by lipolysis
 and are filtered by the glomerulus. Should be negative for Ketones' );
235 INSERT INTO indicator VALUES ( 'Urobilinogen' ,0.6 , 'mg/dL' , 'Intestinal bacteria
 convert conjugated bilirubin to urobilinogen' );
236 INSERT INTO indicator VALUES ( 'Bilirubin' ,0.1 , 'mg/dL' , 'Conjugated bilirubin will
 readily travel through the glomerulus into the filtrate. Dogs have low renal
 threshold for bilirubin' );
237 INSERT INTO indicator VALUES ( 'Specific Gravity' ,1.030 , 'mg/dL' , 'Specific Gravity is
 a reflection of solute concentration' );

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238 INSERT INTO indicator VALUES ('Urine Clarity',2.5,'', 'In a scale from 1 to 5 in
     clarity. True reference for most animals, clear to slightly cloudy (Horses - 4,
     cloudy)');
239 INSERT INTO indicator VALUES ('Nitrites',110,'mg/dL', 'Abnormal values may indicate
     infection');
240 INSERT INTO indicator VALUES ('Benzodiazepinas',200,'mg/dL', 'Higher values indicate
     a possible risk of overdosage');
241
242 INSERT INTO procedure_consult VALUES('Peanut',897771157,'2017-11-20 11:00:00',1,'
     Radiography bone part 1 confirmed broken bone');
243 INSERT INTO procedure_consult VALUES('Peanut',897771157,'2017-11-20 11:00:00',2,'
     Radiography bone part 2 confirmed broken bone');
244 INSERT INTO procedure_consult VALUES('Lassie',897771157,'2017-11-06 09:30:00', 1, '
     Blood Analysis');
245 INSERT INTO procedure_consult VALUES('Lassie',897771157,'2017-11-06 09:30:00', 2, '
     Urinalysis');
246 INSERT INTO procedure_consult VALUES('Buddy',287747154,'2017-11-06 09:30:00', 1, '
     Blood Analysis');
247 INSERT INTO procedure_consult VALUES('Buddy',287747154,'2017-11-06 09:30:00', 2, '
     Urinalysis');
248 INSERT INTO procedure_consult VALUES('Waffles',744022800,'2017-12-20 15:30:00',1,'
     Surgical Success');
249 INSERT INTO procedure_consult VALUES ('Simba',577708490,'2017-08-15 10:30:00',2,'
     Urinalysis');
250 INSERT INTO procedure_consult VALUES ('Simba',577708490,'2017-08-15 10:30:00',1,'
     Blood Analysis');
251 INSERT INTO procedure_consult VALUES ('Scooby',141597822,'2014-04-23 14:15:00',1,'
     Blood Analysis');
252
253 INSERT INTO performed VALUES('Peanut',897771157,'2017-11-20 11:00:00',1,176716608);
254 INSERT INTO performed VALUES('Peanut',897771157,'2017-11-20 11:00:00',2,176716608);
255 INSERT INTO performed VALUES('Waffles',744022800,'2017-12-20 15:30:00',1,176716608);
256 INSERT INTO performed VALUES('Waffles',744022800,'2017-12-20 15:30:00',1,123456788);
257
258 INSERT INTO radiography VALUES ('Peanut',897771157,'2017-11-20 11:00:00',1,'C:/ Users/
     VetHospital/Radiography/Images/Peanut_20122017_p01.jpg');
259 INSERT INTO radiography VALUES ('Peanut',897771157,'2017-11-20 11:00:00',2,'C:/ Users/
     VetHospital/Radiography/Images/Peanut_20122017_p02.jpg');
260
261 INSERT INTO test_procedure VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1, '
     blood');
262 INSERT INTO test_procedure VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, '
     urine');
263 INSERT INTO test_procedure VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, '
     blood');
264 INSERT INTO test_procedure VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, '
     urine');
265 INSERT INTO test_procedure VALUES ('Simba',577708490,'2017-08-15 10:30:00',2,'urine')
     ;
266 INSERT INTO test_procedure VALUES ('Simba',577708490,'2017-08-15 10:30:00',1,'blood')
     ;
267 INSERT INTO test_procedure VALUES ('Scooby',141597822,'2014-04-23 14:15:00',1,'blood')
     );
268
269
270 INSERT INTO produced_indicator VALUES('Lassie',897771157,'2017-11-06 09:30:00',1,'
     Vitamin D',79);
271 INSERT INTO produced_indicator VALUES('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Neutrophils',45);
272 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Lymphocytes',40);
273 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Monochytes',10);
274 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Creatinine level',0.5);
275 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Sodium',325);
276 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Potassium',13);
277 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 1,'
     Erythrocyte',40);
278 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, '

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    pH', 6);
279 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Protein', 50);
280 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Glucose', 10);
281 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Ketones', 0.01);
282 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Urobilinogen', 0.5);
283 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Bilirubin', 0.1);
284 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Specific Gravity', 1);
285 INSERT INTO produced_indicator VALUES ('Lassie',897771157,'2017-11-06 09:30:00', 2, 'Urine Clarity', 3.25);
286 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Vitamin D',60);
287 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Neutrophils',55);
288 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Lymphocytes',42);
289 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Monocytes',10);
290 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Creatinine level',2);
291 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Sodium',318);
292 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Potassium',18);
293 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 1, 'Erythrocyte',49);
294 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'pH', 7);
295 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Protein', 55);
296 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Glucose', 7);
297 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Ketones', 0.05);
298 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Urobilinogen', 0.5);
299 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Bilirubin', 0.1);
300 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Specific Gravity', 1.020);
301 INSERT INTO produced_indicator VALUES ('Buddy',287747154,'2017-11-06 09:30:00', 2, 'Urine Clarity', 3);
302 INSERT INTO produced_indicator VALUES('Simba',577708490,'2017-08-15 10:30:00',2, 'Urine Clarity', 3.25);
303 INSERT INTO produced_indicator VALUES('Simba',577708490,'2017-08-15 10:30:00',2,'pH', 6);
304 INSERT INTO produced_indicator VALUES('Simba',577708490,'2017-08-15 10:30:00',1, 'Creatinine Level', 3);
305 INSERT INTO produced_indicator VALUES('Scooby',141597822, '2014-04-23 14:15:00',1, 'Creatinine Level', 3);

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