Information Systems and Databases

Project Part 3

Group 34

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A Web Application Using the Database

For the final project of the course Information Systems and Databases, the previously defined veterinary database is paired with a web application solution, in order to have a user friendly interaction with the data. The homepage is hosted in the url http://web.tecnico.ulisboa.pt/ist181579/sibd/proj/HomePage.php, which shows the interface seen on figure 1.

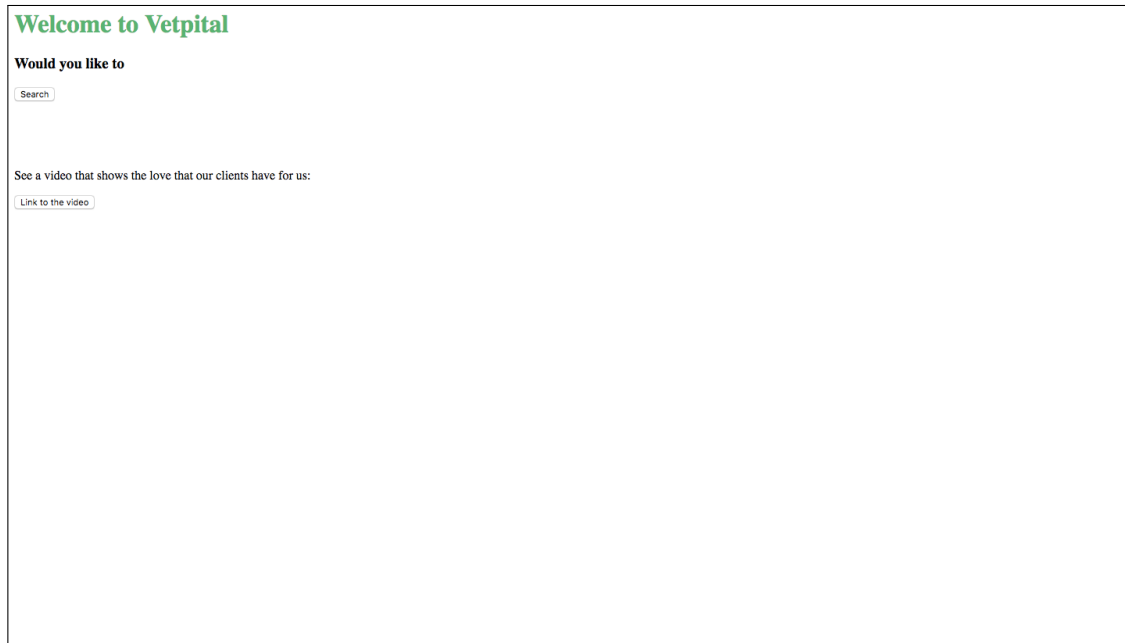Figure 1: Homepage interface of the veterinary database.

The PHP code that generates the homepage is shown bellow.

```
1   <html>
2           <body>
3                   <h1 style="color:MediumSeaGreen;">Welcome to Vetpital</h1>
4                   <h3>Would you like to</h3>
5                   <form action="Search.php" method="get">
6                           <p><input type="submit" value="Search"/></p>
7                   </form>
8                   <br>
9                   <br>
10                  <br>
11                  <form action="https://www.instagram.com/p/Bq1XlcjAvr3/?
                        utm_source=ig_share_sheet&igshid=143zsnmqhmbij" method="
                        get">
12                          <p>See a video that shows the love that our clients
                                have for us:</p>
13                          <p><input type="submit" value="Link_to_the_video"/></p
```

```
                                    >
14                    </form>
15              </body>
16  </html>
```

In the following pages, the main features of the application are demonstrated, according to the project requirements. Non trivial decisions are explained in more detail.

1. Searching for animals

When choosing the option "Search" from the home page, shown in figure 1, a new page appears with options to search for an animal, by introducing its name and, optionally, define the owner name to filter the results and the VAT of a client, to see if it has any register of ever bringing the animal to a consult. To see the search results, one has to press the button "Search", as seen in figure 2. Alternatively, the user may register a new user, by pressing the button "Register new client".

Figure 2: Interface shown when searching for animals in the veterinary database.

Figure 3: Selecting a client VAT while searching for animals in the veterinary database.

The PHP code that generates the animal search web page is shown bellow.

```
1  <html>
2          <body>
3                  <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                        proj/HomePage.php" style="color:MediumSeaGreen;text−
                        decoration:_none;">Vetpital</a></h1>
4                  <form action="ResultSearch.php" method="post">
5                       <h3>Please introduce the following informations</h3>
6                       <p>Animal name: </p>
7                       <input type="text" name="animal_name"/>
8                       <p>Owner name: </p>
9                       <input type="text" name="owner_name"/>
10                      <p>Client VAT:
11                              <select name="client_vat">
12  <?php
13                  # Establishing the connection with the database
14                  $host = "db.tecnico.ulisboa.pt";
15                  $user = "ist181579";
16                  $pass = "utfv5127";
17                  $dsn = "mysql:host=$host;dbname=$user";
18                  try
19                  {
20                          $connection = new PDO($dsn, $user, $pass);
```

```php
21                    }
22                    catch(PDOException $exception)
23                    {
24                            echo("<p>Error: ");
25                            echo($exception->getMessage());
26                            echo("</p>");
27                            exit();
28                    }
29
30                    # Get the existent clients VAT
31                    $sql = "SELECT VAT FROM client ORDER BY VAT";
32                    $result = $connection->query($sql);
33                    if ($result == FALSE)
34                    {
35                            $info = $connection->errorInfo();
36                            echo("<p>Error: {$info[2]}</p>");
37                            exit();
38                    }
39                    foreach($result as $row)
40                    {
41                            $client_vat = $row['VAT'];
42                            echo("<option value=\"$client_vat\">$client_vat</
                                option>");
43                    }
44          $connection = null;
45  ?>
46                                        </select>
47                            </p>
48                            <p><input type="submit" value="Search"/></p>
49                    </form>
50                    <form action="new_client.php" method="post">
51                            <p><input type="submit" value="Register new client"
                                /></p>
52                            <input type="hidden" value="Search.php" name="from"/>
53                    </form>
54          </body>
55  </html>
```

When the indicated parameters match with animals registered in the database, a new page is displayed. In figure 4, an example is seen, after searching for animals named "Bobi", that might have been brought in to a consult by the client with VAT "12345678". In this case, one can see three animals named "Bobi", one belonging to the owner "Maria Repolho", which has VAT "12345678" and has taken her animal at least once to a consult (which is why the column "Consults with this Client" appears with value "Yes"), one belonging to "Maria Albertina", that was also brough in at least once by Maria Repolho that has VAT "12345678",

and one belonging to owner "John Smith". If a filter is applied on the owner name, in the input box from the interface of figure 2, the application only displays the results which have associated owners with names that contain the specified input name. For instance, when writing "Maria" in the owner name of the animal search, now only the "Bobi"'s belonging to "Maria Repolho" or "Maria Albertina" are returned (figure 5).

Vetpital

Animal name: Bobi

Owner name:

Client VAT: 12345678

Search results:

Animal Name	Owner VAT	Owner Name	Consults with this Client
Bobi	12345678	Maria Repolho	Yes
Bobi	35263686	Maria Albertina	Yes
Bobi	65856663	John Smith	No

Select the animal that you are looking for

Figure 4: Interface shown when searching for animals in the veterinary database.

Vetpital

Animal name: Bobi

Owner name: Maria

Client VAT: 12345678

Search results:

Animal Name	Owner VAT	Owner Name	Consults with this Client
Bobi	12345678	Maria Repolho	Yes
Bobi	35263686	Maria Albertina	Yes

Select the animal that you are looking for

Figure 5: Interface shown when searching for animals in the veterinary database, belonging to someone with "Maria" on their name.

The PHP code that generates this animal search results page is shown bellow.

```
1  <html>
2          <body>
3                  <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                       proj/HomePage.php" style="color:MediumSeaGreen;text−
                       decoration:_none;">Vetpital </a></h1>
4  <?php
5          # Establishing the connection with the database
6          $host = "db.tecnico.ulisboa.pt";
7          $user = "ist181579";
8          $pass = "utfv5127";
9          $dsn = "mysql:host=$host;dbname=$user";
10         try
11         {
12                 $connection = new PDO($dsn, $user, $pass);
13         }
14         catch(PDOException $exception)
15         {
16                 echo("<p>Error:_");
17                 echo($exception−>getMessage());
18                 echo("</p>");
19                 exit();
```

```php
20              }
21
22              # Data received
23              $animal_name = $_REQUEST['animal_name'];
24              $owner_name = $_REQUEST['owner_name'];
25              $clientVat = $_REQUEST['client_vat'];
26              echo("<p>Animal name: {$animal_name} </p>");
27              echo("<p>Owner name: {$owner_name} </p>");
28              echo("<p>Client VAT: {$clientVat} </p>");
29              echo("<h3>Search results: </h3>");
30
31              # Check for animals that match the search keys
32              $sql = "CALL SearchConsultName('$animal_name','$owner_name','
                    $clientVat');";
33              $result = $connection->query($sql);
34              if ($result == FALSE)
35              {
36                      $info = $connection->errorInfo();
37                      echo("<p>Error: {$info[2]}</p>");
38                      exit();
39              }
40              if ($result->rowCount() == 0)
41              {
42                      echo("<h4>There was no animal found <form action='new_animal.
                        php' method='post'>\n<p><input type='submit' value='
                        Register New Animal'/><input type='hidden' value='{
                        $animal_name}' name='animal_name'/><input type='hidden' 
                        value='{$owner_name}' name='owner_name'/></p>\n</form></h4
                        >");
43
44              }else{
45                      # Print the results from the search
46                      echo("<table border=\"2\">");
47                      echo("<tr><td>Animal Name</td><td>Owner VAT</td><td>Owner Name
                        </td><td>Consults with this Client</td></tr>");
48                      foreach($result as $row)
49                      {
50                              echo("<tr align='center'>");
51                              echo("<td align='center'><form action='
                                display_consults.php' method='post'>\n");
52                              echo("<input type='hidden' name='animal' value='{$row
                                ['animal']}'/>\n");
53                              echo("<input type='hidden' name='owner' value='{$row['
```

```php
                        owner ']}'/>\n");
54                      echo("<input type='hidden' name='ownerVat' value='{
                            $row['vat']}'/>\n");
55                      echo("<input type='hidden' name='clientVat' value='{
                            $clientVat}'/>\n");
56                      echo("<input type='submit' value='{$row['animal']}'/>\
                            n</form></td>");
57                      echo("<td>{$row['vat']}</td>");
58                      echo("<td>{$row['owner']}</td>");
59
60                      # Establishing the connection with the database
61                      $host = "db.tecnico.ulisboa.pt";
62                      $user = "ist181579";
63                      $pass = "utfv5127";
64                      $dsn = "mysql:host=$host;dbname=$user";
65                      try
66                      {
67                              $connection_2 = new PDO($dsn, $user, $pass);
68                      }
69                      catch(PDOException $exception)
70                      {
71                              echo("<p>Error: ");
72                              echo($exception->getMessage());
73                              echo("</p>");
74                              exit();
75                      }
76
77                      $sql_2 = "CALL consult_with_client ('$animal_name','{
                            $row['vat']}','$clientVat');";
78                      $this_result = $connection_2->query($sql_2);
79                      if ($this_result == FALSE)
80                      {
81                              $info = $connection->errorInfo();
82                              echo("<p>Error: {$info[2]}</p>");
83                              exit();
84                      }
85                      if ($this_result->rowCount() == 0)
86                      {
87                              $consults_with_client = 0;
88                      } else {
89                              $consults_with_client = 1;
90                      }
91
```

```php
 92                             $this_result = NULL;
 93                             if($consults_with_client == 1){echo("<td>Yes</td>");}
 94                             else{echo("<td>No</td>");}
 95                             echo("</tr>");
 96                             $connection_2=NULL;
 97                     }
 98                 echo("</table>");
 99                 echo("<h4>Select the animal that you are looking for</h4>");
100                 $result = NULL;
101         }
102
103         $connection = null;
104 ?>
105         </body>
106 </html>
```
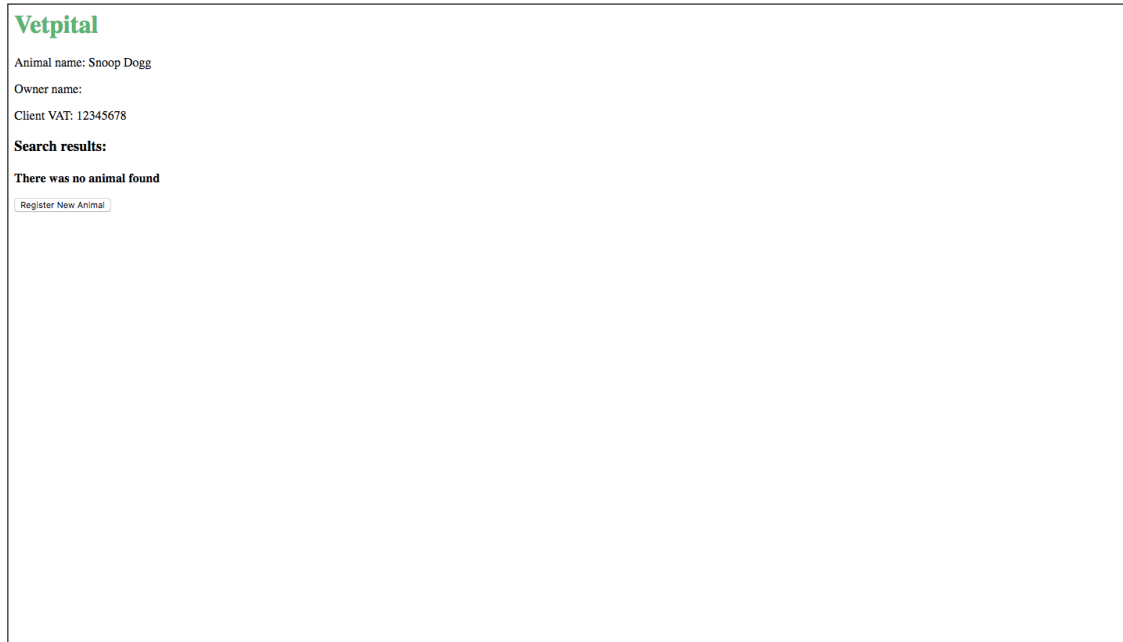
2. Adding new animals

When searching for an animal name that doesn't exist, a message indicating that no results are found is displayed, as figure 6 shows. In this scenario, it's possible to add the animal to the database, with the name used in the search, by pressing the button "Register New Animal".

Vetpital

Animal name: Snoop Dogg

Owner name:

Client VAT: 12345678

Search results:

There was no animal found

Register New Animal

Figure 6: Message and button displayed when no animal with the specifyied name is found.

When adding a new animal, first a form to introduce the animal's basic information appears (figure 7). In here, the owner's name, which must be already present in the database, is indicated, as well as the animal's species, colour, gender and birth year. In the case of the species data, there are multiple options available. Initially, the most generic species are selected (e.g. mammal, bird, etc). This is done in SQL by finding the species names that only appear on the right side (second argument) of the "generalization_species" relation. Then, the user has to click the button "Save Specialize", in order to save the actual specie and to see more specific species (e.g. dog, cat, etc). This translates in SQL code to find all the names that appear to the left of the selected generic species, in the "generalization_species" relation. In the case of a dog for instance, this specialization goes all the way from mammal to the dog's race (e.g. Estrela mountain dog, boxer, etc), as seen in figures 7, 8, 9 and 10.

Figure 7: Initial interface for adding a new animal to the database.

Figure 8: New animal page after specializing the species from "Mammal".

After creating the animal record, the user is taken to the page corresponding to the process of adding new consults. This segment is explained in more detail in section 5.

Figure 9: New animal page after specializing the species from "Dog".

Figure 10: No more specializations found after getting "Estrela Mountain Dog" species.

The PHP code that supports this animal registration page is shown bellow.

```
1  <html>
2          <body>
```

```
 3                      <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                           proj/HomePage.php" style="color:MediumSeaGreen;text-
                           decoration:_none;">Vetpital</a></h1>
 4                      <form action="" method="post">
 5                              <h3>New Animal</h3>
 6                              <table style="width:35%">
 7                                      <tr>
 8                                              <td><p>Animal Name</p></td>
 9  <?php
10                                              $animal_name = $_REQUEST['animal_name'
                                                   ];
11                                              if (!empty($_POST['animal_name'])){
                                                   $animal_name = $_POST['animal_name
                                                   '];}
12                                              echo("<td><input _type='text'_value='{
                                                   $animal_name}'_name='animal_name
                                                   '/></td>");
13  ?>
14                                      <td></td>
15                                      </tr>
16                                      <tr>
17                                              <td><p>Owner Name</p></td>
18  <?php
19                                              $owner_name = $_REQUEST['owner_name'];
20                                              if (!empty($_POST['client_name'])){
                                                   $owner_name = $_POST['client_name'
                                                   ];}
21                                              echo("<td><input _type='text'_value='{
                                                   $owner_name}'_name='client_name
                                                   '/></td>");
22  ?>
23                                              <td><input type='submit' value="Get_
                                                   VAT's"/></td>
24                                      </tr>
25                              </table>
26                      </form>
27                      <table style="width:35%">
28                              <td><p>VAT - Full Name</p></td>
29                              <td>
30                      <form action="" method="post">
31                      <select name='client_vat_option'>
32  <?php
33                      # Establishing the connection with the database
```

```php
34                    $host = "db.tecnico.ulisboa.pt";
35                    $user = "ist181579";
36                    $pass = "utfv5127";
37                    $dsn = "mysql:host=$host;dbname=$user";
38                    try
39                    {
40                            $connection = new PDO($dsn, $user, $pass);
41                    }
42                    catch(PDOException $exception)
43                    {
44                            echo("<p>Error: ");
45                            echo($exception->getMessage());
46                            echo("</p>");
47                            exit();
48                    }
49
50                    # Get the existent client's VAT
51                    $client_name = $_POST['client_name'];
52                    $animal_name = $_POST['animal_name'];
53                    if(!empty($_POST['client_vat_option'])){
54                            $sql="SELECT name as NAME FROM person WHERE VAT='{
                                $_POST['client_vat_option']}';";
55                            $result = $connection->query($sql);
56                            if ($result == FALSE)
57                            {
58                                    $info = $connection->errorInfo();
59                                    echo("<p>Error: {$info[2]}</p>");
60                                    exit();
61                            }
62                            foreach($result as $row)
63                            {
64                                    $client_name_procedure = $row['NAME'];
65                                    echo("<option value=\"{$_POST['
                                        client_vat_option']}\">{$_POST['
                                        client_vat_option']} - 
                                        $client_name_procedure</option>");
66                                    echo("<input type='hidden' name='
                                        client_name_procedure' value='{
                                        $client_name_procedure}'/>");
67                            }
68                    } else {
69                            $sql ="CALL get_vat_from_name('$client_name');";
70                            $result = $connection->query($sql);
```

```php
71                              if ($result == FALSE)
72                              {
73                                      $info = $connection->errorInfo();
74                                      echo("<p>Error:_{$info[2]}</p>");
75                                      exit();
76                              }
77                              foreach($result as $row)
78                              {
79                                      $client_vat_procedure = $row['VAT'];
80                                      $client_name_procedure = $row['NAME'];
81                                      echo("<option_value=\"$client_vat_procedure\">
                                            $client_vat_procedure_-_
                                            $client_name_procedure</option>");
82                              }
83                      }
84                      $connection = null;
85  ?>
86
87                                      </select>
88                              </td>
89                              <td></td>
90                      </tr>
91                      <tr>
92                              <td><p>Species</p></td>
93                              <td><select name="species_name">
94  <?php
95  if(!isset($_POST['specialization_request'])){
96          # Establishing the connection with the database
97          $host = "db.tecnico.ulisboa.pt";
98          $user = "ist181579";
99          $pass = "utfv5127";
100         $dsn = "mysql:host=$host;dbname=$user";
101         try
102         {
103                 $connection = new PDO($dsn, $user, $pass);
104         }
105         catch(PDOException $exception)
106         {
107                 echo("<p>Error:_");
108                 echo($exception->getMessage());
109                 echo("</p>");
110                 exit();
111         }
```

```php
112
113             # Get the existent client's VAT
114             $sql ="CALL more_general();";
115             $result = $connection->query($sql);
116             if ($result == FALSE)
117             {
118                     $info = $connection->errorInfo();
119                     echo("<p>Error: {$info[2]}</p>");
120                     exit();
121             }
122             foreach($result as $row)
123             {
124                     $species_name_ = $row['species_name'];
125                     echo("<option value=\"$species_name_\">$species_name_</option>
                        ");
126             }
127             $connection = null;
128 } else {
129             # Establishing the connection with the database
130             $host = "db.tecnico.ulisboa.pt";
131             $user = "ist181579";
132             $pass = "utfv5127";
133             $dsn = "mysql:host=$host;dbname=$user";
134             try
135             {
136                     $connection = new PDO($dsn, $user, $pass);
137             }
138             catch(PDOException $exception)
139             {
140                     echo("<p>Error: ");
141                     echo($exception->getMessage());
142                     echo("</p>");
143                     exit();
144             }
145
146             # Get the existent client's VAT
147             $sql ="CALL more_specific('{$_POST['species_name']}');";
148             $result = $connection->query($sql);
149             if ($result == FALSE)
150             {
151                     $info = $connection->errorInfo();
152                     echo("<p>Error: {$info[2]}</p>");
153                     exit();
```

```php
154                }
155            if($result->rowCount()== 0){
156                    echo("<option_value=\"{$_POST['species_name']}\">{$_POST['
                            species_name']}</option>");
157                    echo("<input_type='hidden'_value='yes'_name='
                            final_specialization'/>");
158                    echo("<input_type='hidden'_value='{$_POST['client_vat_option
                            ']}'_name='client_vat_option'/>");
159        } else {
160
161                    foreach($result as $row)
162                    {
163                            $species_name_ = $row['species_name'];
164                            echo("<option_value=\"$species_name_\">$species_name_
                                </option>");
165                    }
166            }
167            $connection = null;
168 }
169 ?>
170                                </select>
171                            </td>
172                            <td><input type='submit' value="Specialize" name="
                                specialization_request"/></td>
173 <?php
174        echo("<input_type='hidden'_value='{$_POST['animal_name']}'_name='
                animal_name'/>");
175        echo("<input_type='hidden'_value='{$_POST['client_name']}'_name='
                client_name'/>");
176 ?>
177                                    </tr>
178                            </form>
179                    </table>
180 <?php
181        if($_POST['final_specialization'] == 'yes'){
182            echo("<p>There_is_no_more_possible_specialization</p>");
183        }
184 ?>
185
186                    <table style="width:35%">
187                            <form action="" method="post">
188                                <tr>
189                                        <td><p>Colour</p></td>
```

```
190                                                      <td><input type='text' name='colour'
                                                            /></td>
191                                       </tr>
192                                       <tr>
193                                              <td><p>Gender</p></td>
194                                              <td><input type="radio" value="Male"
                                                     name="gender">Male
195                                              <input type="radio" name="gender"
                                                     value="Female"/>Female</td>
196                                       </tr>
197                                       <tr>
198                                              <td><p>Birth Year</p></td>
199                                              <td><input type='text' name='
                                                     birth_year'/></td>
200                                       </tr>
201                                </table>
202                                <p><input type="submit" value="Register_new_Animal"
                                       /></p>
203 <?php
204         echo("<input_type='hidden'_value='{$_POST['animal_name']}'_name='
                animal_name'/>");
205         echo("<input_type='hidden'_name='client_name_procedure'_value='{$_POST
                ['client_name_procedure']}'/>");
206         echo("<input_type='hidden'_value='{$_POST['species_name']}'_name='
                species_name'/>");
207         echo("<input_type='hidden'_value='{$_POST['client_vat_option']}'_name
                ='client_vat_option'/>");
208 ?>
209                      </form>
210 <?php
211
212         $all_filled=1;
213
214         if(empty($_POST['animal_name']))  $all_filled=0;
215         if(empty($_POST['species_name']))  $all_filled=0;
216         if(empty($_POST['client_vat_option']))  $all_filled=0;
217         if(empty($_POST['colour']))  $all_filled=0;
218         if(empty($_POST['gender']))  $all_filled=0;
219         if(empty($_POST['birth_year']))  $all_filled=0;
220
221         if($all_filled){
222                 # Establishing the connection with the database
223                 $host = "db.tecnico.ulisboa.pt";
```

```php
224                    $user = "ist181579";
225                    $pass = "utfv5127";
226                    $dsn = "mysql:host=$host;dbname=$user";
227                    try
228                    {
229                            $connection = new PDO($dsn, $user, $pass);
230                    }
231                    catch(PDOException $exception)
232                    {
233                            echo("<p>Error: ");
234                            echo($exception->getMessage());
235                            echo("</p>");
236                            exit();
237                    }
238
239                    $sql = "INSERT_INTO_animal(name,VAT,species_name,colour,gender
                             ,birth_year)_VALUES(?,?,?,?,?,?);";
240                    $sth = $connection->prepare($sql);
241
242                    if ($sth == FALSE) {
243                            $info = $connection->errorInfo();
244                            echo("<p>Error: {$info[2]}</p>");
245                            exit();
246                    } else {
247                            $sth->execute(array($_POST['animal_name'],$_POST['
                                 client_vat_option'],$_POST['species_name'],$_POST[
                                 'colour'],$_POST['gender'],$_POST['birth_year']));
248                            $result = $sth->num_rows;
249                    }
250                    $connection = null;
251
252
253                    #Sends the person to register a new consult
254                    echo("<form_id='jsform'_action='register_consult.php'_method='
                             post'>");
255                    echo("<input_type='hidden'_value='{$_POST['animal_name']}'_
                             name='animal'/>");
256                    echo("<input_type='hidden'_value='{$_POST['client_vat_option
                             ']}'_name='owner_vat'/>");
257                    echo("<input_type='hidden'_value='{$_POST['client_vat_option
                             ']}'_name='client_vat'/>");
258                    echo("</form>");
259                    echo("<script_type='text/javascript'>");
```

```
260                              echo("document.getElementById('jsform').submit();");
261                    echo("</script>");
262             }
263
264  ?>
265            </body>
266  </html>
```

3. Searching for consults

After selecting an animal from the animal search page (section 1), the user is sent to the web page presented in figure 11, where it is shown some information from the selection process with the purpose of confirmation. Then, the consults involving the considered animal are also listed, where it is possible to add a new blood test for a specific consult with the button "New" (see section 6 for more details). If the user desires to know more details about a specific consult, the button with the date should be pressed. Last but certainly not least, there is the button "Register New Consult" which opens a new page to support this functionality (more information on adding new consults on section 5).

Figure 11: Retrived consults after selecting the animal named "PiuPiu", of owner "Maria Albertina", from the animal search page (section 1).

The PHP code that generates this consult search page is shown bellow.

```
1  <html>
2          <body>
3                  <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                       proj/HomePage.php" style="color:MediumSeaGreen;text-
```

```php
                        decoration:_none;">Vetpital</a></h1>
4  <?php
5          # Establishing the connection with the database
6           $host = "db.tecnico.ulisboa.pt";
7           $user = "ist181579";
8           $pass = "utfv5127";
9           $dsn = "mysql:host=$host;dbname=$user";
10          try
11          {
12                  $connection = new PDO($dsn, $user, $pass);
13          }
14          catch(PDOException $exception)
15          {
16                  echo("<p>Error:_");
17                  echo($exception->getMessage());
18                  echo("</p>");
19                  exit();
20          }

22          # Data received
23          $animal_name = $_REQUEST['animal'];
24          $owner_name = $_REQUEST['owner'];
25          $ownerVat = $_REQUEST['ownerVat'];
26          $clientVat = $_REQUEST['clientVat'];
27                  echo("<p>Animal_name:_{$animal_name}_</p>");
28          echo("<p>Owner_name:_{$owner_name}_</p>");
29          echo("<p>Owner_VAT:_{$ownerVat}_</p>");
30          echo("<p>Client_VAT:_{$clientVat}_</p>");
31          echo("<h3>Consults_</h3>");

33          # Check for animals that match the search keys
34          $sql = "CALL_AnimalConsultsInfo('$animal_name','$ownerVat');";
35          $result = $connection->query($sql);
36          if ($result == FALSE)
37          {
38                  $info = $connection->errorInfo();
39                  echo("<p>Error:_{$info[2]}</p>");
40                  exit();
41          }
42          # Print list of consults involving that animal
43          echo("<table_border=\"2\">");
44          echo("<tr><td>Date</td><td>Veterinary_VAT</td><td>Veterinary_Name</td
                ><td>Add_blood_test</td></tr>");
```

22

```php
45              foreach ( $result as $row )
46              {
47                      echo ( "<tr align='center'>" ) ;
48                      echo ( "<td align='center'><form action='consult_info.php'
                            method='post'>\n" ) ;
49                      echo ( "<input type='hidden' name='animal' value='{$animal_name
                            }'/>\n" ) ;
50                      echo ( "<input type='hidden' name='owner_vat' value='{$ownerVat
                            }'/>\n" ) ;
51                      echo ( "<input type='hidden' name='date' value='{$row['date
                            ']}'/>\n" ) ;
52                      echo ( "<input type='submit' value='{$row['date']}'/>\n</form></
                            td>" ) ;
53                      echo ( "<td>{$row['vatVet']}</td>" ) ;
54                      echo ( "<td>{$row['nameVet']}</td>" ) ;
55                      echo ( "<td align='center'><form action='new_blood_test.php'
                            method='post'>\n" ) ;
56                      echo ( "<input type='hidden' name='animal_name' value='{
                            $animal_name}'/>\n" ) ;
57                      echo ( "<input type='hidden' name='owner_name' value='{
                            $owner_name}'/>\n" ) ;
58                      echo ( "<input type='hidden' name='owner_vat' value='{$ownerVat
                            }'/>\n" ) ;
59                      echo ( "<input type='hidden' name='date' value='{$row['date
                            ']}'/>\n" ) ;
60                      echo ( "<input type='submit' value=New>\n</form></td>" ) ;
61                      echo ( "</tr>" ) ;
62              }
63          echo ( "</table>" ) ;
64
65          # New consult button
66          echo ( "<p></p>" ) ;
67          echo ( "<form action='register_consult.php' method='post'>\n" ) ;
68          echo ( "<input type='hidden' name='animal' value='{$animal_name}'/>\n" ) ;
69          echo ( "<input type='hidden' name='owner' value='{$owner_name}'/>\n" ) ;
70          echo ( "<input type='hidden' name='owner_vat' value='{$ownerVat}'/>\n" ) ;
71          echo ( "<input type='hidden' name='client_vat' value='{$clientVat}'/>\n"
                ) ;
72          echo ( "<input type='submit' value='Register new Consult'/>\n</form></td
                >" ) ;
73
74          $result = NULL;
75          $connection = null ;
```

```
76   ?>
77              </body>
78   </html>
```

4. Consult info

When the button with the date is pressed, the flow continues to the page shown in figure 12. Here, it is printed the primary information of a consult just for confirmation. Then, as required, the information about the animal (Species name, Colour, Gender, Age, Weight), the SOAP notes, the list of Diagnosis and the list of Prescriptions are presented.

Vetpital

Animal name: PiuPiu

Owner VAT: 35263686

Consult date: 2018-08-01 12:45:02

Animal Characteristics

Animal Name	Owner Name	Species name	Colour	Gender	Age	Weight
PiuPiu	Maria Albertina	Mockingbird	Yellow	Male	0	6.00

SOAP Notes

S There is excess of weight
O Piupiu is obese and has a Potassium issue in the blood analysis
A Has low obesity and Insect Bites
P Give him desparasis - once a month

Diagnosis

Diagnosis Code	Diagnosis Name
00045	Heartworm Infestation
00056	Lyme Disease
00059	kidney failure
09002	Obesity

Presciptions

Diagnosis Code	Medication Name	Medication Lab	Medication Dosage	Regime
00045	Desparasis	TiraBicho	3 Capsulas de 20 mL	1 capsula por mês
09002	laxil	intestiniti	10 capsulas de 100 mL	0.5 comprimido por dia
09002	levicim	emagricon	5 comprimidos de 20 mg	0.5 comprimido por dia

Figure 12: Detailed consult information regarding a visit of animal "PiuPiu", on the 1 of August of 2018, at 12:45.

The PHP code that generates this consult information page is shown bellow.

```
1   <html>
2              <body>
3                      <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                          proj/HomePage.php" style="color:MediumSeaGreen;text−
                          decoration:_none;">Vetpital</a></h1>
4   <?php
5          # Establishing the connection with the database
6          $host = "db.tecnico.ulisboa.pt";
7          $user = "ist181579";
8          $pass = "utfv5127";
9          $dsn = "mysql:host=$host;dbname=$user";
```

24

```php
10          try
11          {
12                  $connection = new PDO($dsn, $user, $pass);
13          }
14          catch(PDOException $exception)
15          {
16                  echo("<p>Error: ");
17                  echo($exception->getMessage());
18                  echo("</p>");
19                  exit();
20          }
21
22          # Data received
23          $animal_name = $_REQUEST['animal'];
24          $ownerVat = $_REQUEST['owner_vat'];
25          $date = $_REQUEST['date'];
26                  # Check received data
27                  echo("<p>Animal name: {$animal_name} </p>");
28          echo("<p>Owner VAT: {$ownerVat} </p>");
29          echo("<p>Consult date: {$date} </p>");
30
31                  echo("<h3>Animal Characteristics </h3>");
32          # Get the animal information
33          $sql = "CALL AnimalInfo('$animal_name','$ownerVat','$date');";
34          $result = $connection->query($sql);
35          if ($result == FALSE)
36          {
37                  $info = $connection->errorInfo();
38                  echo("<p>Error: {$info[2]} </p>");
39                  exit();
40          }
41          # Display animal information
42                  echo("<table border=\"2\">");
43                  echo("<tr><td>Animal Name</td><td>Owner Name</td><td>Species
                         name</td><td>Colour </td><td>Gender</td><td>Age</td><td>
                         Weight</td></tr>");
44          foreach($result as $row)
45          {
46                  echo("<tr align='center'>");
47                  echo("<td>{$animal_name}</td>");
48                  echo("<td>{$row['name_owner']} </td>");
49                  echo("<td>{$row['species']} </td>");
50                  echo("<td>{$row['colour']} </td>");
```

```php
51                        echo("<td>{$row['gender']}</td>");
52                        echo("<td>{$row['age']}</td>");
53                        echo("<td>{$row['weight']}</td>");
54                        echo("</tr>");
55                }
56            echo("</table>");
57            $result = NULL;
58
59            # Get the soap notes
60            $sql = "CALL SoapInfo('$animal_name','$ownerVat','$date');";
61            $result = $connection->query($sql);
62            if ($result == FALSE)
63            {
64                    $info = $connection->errorInfo();
65                    echo("<p>Error: {$info[2]}</p>");
66                    exit();
67            }
68            if ($result->rowCount() == 0)
69            {
70                    echo("<h3>SOAP Notes</h3>");
71                    echo("<p>There are no SOAP notes</p>");
72            } else
73            {
74                    # Display soap notes
75                    echo("<h3>SOAP Notes</h3>");
76                    echo("<table border=\"0\" cellspacing=\"5\">");
77                    foreach($result as $row)
78                    {
79                            echo("<tr><td style='font-weight:bold'>S</td><td>{$row
                                ['s']}</td></tr>");
80                            echo("<tr><td style='font-weight:bold'>O</td><td>{$row
                                ['o']}</td></tr>");
81                            echo("<tr><td style='font-weight:bold'>A</td><td>{$row
                                ['a']}</td></tr>");
82                            echo("<tr><td style='font-weight:bold'>P</td><td>{$row
                                ['p']}</td></tr>");
83                    }
84                    echo("</table>");
85            }
86            $result = NULL;
87
88            # Get the diagnosis information
89            $sql = "CALL DiagnosisInfo('$animal_name','$ownerVat','$date');";
```

```php
90              $result = $connection->query($sql);
91              if ($result == FALSE)
92              {
93                      $info = $connection->errorInfo();
94                      echo("<p>Error: {$info[2]}</p>");
95                      exit();
96              }
97              # Display diagnosis information
98              echo("<h3>Diagnosis</h3>");
99                      echo("<table border=\"2\">");
100                     echo("<tr><td>Diagnosis Code</td><td>Diagnosis Name</td></tr>"
                            );
101             foreach($result as $row)
102             {
103                     echo("<tr align='center'>");
104                     echo("<td>{$row['code']}</td>");
105                     echo("<td>{$row['name']}</td>");
106                     echo("</tr>");
107             }
108             echo("</table>");
109             $result = NULL;
110
111             # Get the prescriptions information
112             $sql = "CALL PrescriptionsInfo('$animal_name','$ownerVat','$date');";
113             $result = $connection->query($sql);
114             if ($result == FALSE)
115             {
116                     $info = $connection->errorInfo();
117                     echo("<p>Error: {$info[2]}</p>");
118                     exit();
119             }
120             # Display prescriptions information
121             echo("<h3>Presciptions</h3>");
122                     echo("<table border=\"2\">");
123                     echo("<tr><td>Diagnosis Code</td><td>Medication Name</td><td>
                            Medication Lab</td><td>Medication Dosage</td><td>Regime</
                            td></td></tr>");
124             foreach($result as $row)
125             {
126                     echo("<tr align='center'>");
127                     echo("<td>{$row['code']}</td>");
128                     echo("<td>{$row['name_med']}</td>");
129                     echo("<td>{$row['lab']}</td>");
```

```
130                    echo("<td>{$row['dosage']}</td>");
131                    echo("<td>{$row['regime']}</td>");
132                    echo("</tr>");
133             }
134         echo("</table>");
135         $result = NULL;
136         $connection = null;
137  ?>
138             </body>
139  </html>
```

5. Adding new consults

When the user wants to create a new consult, he is confronted with a webpage as represented in figure 13. Again, in the beginning, there are some attributes which are printed just for confirmation. Then the user can choose between registering a consult with the current date or registering a previous consult (useful in cases where the veterinary forgets to register the consult) by using the buttons.

When the "Previous Consult" is pressed, it is asked for a date and hour like in figure 14. This pair should be filled with a previous date than the current one. After this selection the user is directed to the page represented in figure 15

When the "Current Consult" is pressed, the form with the required information to register a consult is presented like in figure 15.

After filling the new consult form and pressing the button "Register Consult", it is asked if the user wants to add a diagnosis to that consult as shown in figure 16. Here, the user is allowed to select one from the list existing in the database. After pressing "Register Diagnosis", the diagnosis is inserted in the consult and it is exhibited another button for the possibility of adding another diagnosis to that consult, see figure 17.

Vetpital

Animal name: Snoop Dogg

Owner VAT: 54609438

Client VAT: 54609438

Select a type of consult

Current Consult

Previous Consult

Figure 13: Initial step in the page for adding consults, as seen from the phase after creating the animal seen on figure 10.

Vetpital

Animal name: Snoop Dogg

Owner VAT: 54609438

Client VAT: 54609438

Select a type of consult

Current Consult

Previous Consult

Previous Consult

Consult date and hour:

dd / mm / yyyy

Proceed

Figure 14: Adding the consult's date, after choosing the "Previous Consult" option.

The PHP code that allows a consult registration is shown bellow.

```
1  <html>
```

Figure 15: Adding the veterinary's identification, the animal's current weight and optional vet notes, after choosing the date.

Figure 16: Options to add diagnosis to the consult.

```
2          <body>
3               <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                    proj/HomePage.php" style="color:MediumSeaGreen;text-
```
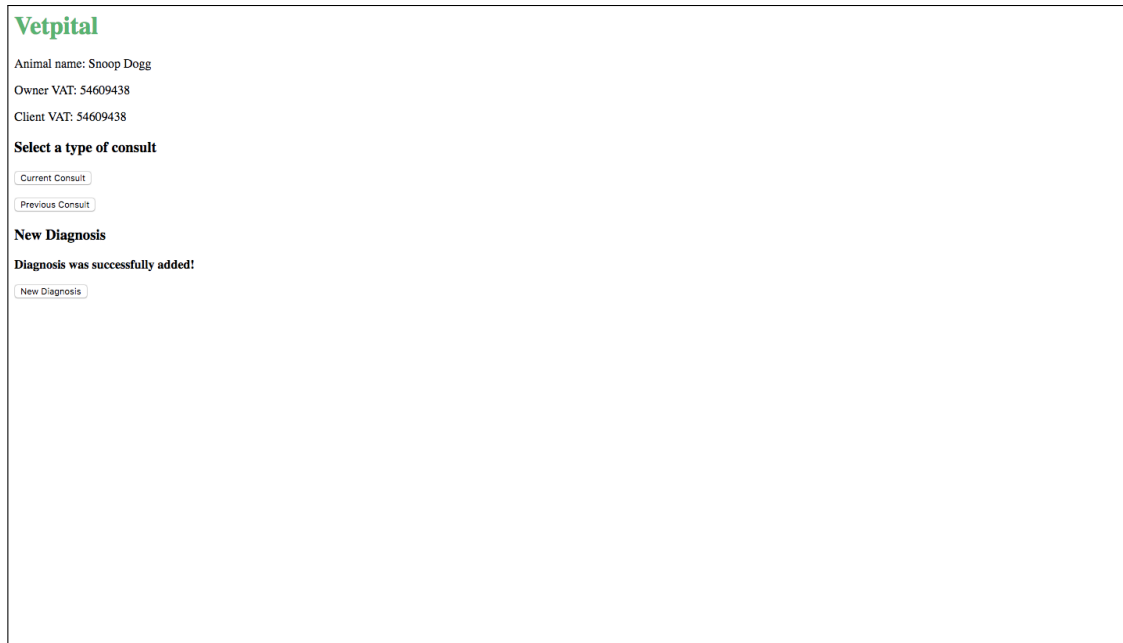
Figure 17: Page shown after successfully adding a diagnosis to the newly created consult.

```
                              decoration:_none;">Vetpital</a></h1>
4   <?php
5           # Establishing the connection with the database
6           $host = "db.tecnico.ulisboa.pt";
7           $user = "ist181579";
8           $pass = "utfv5127";
9           $dsn = "mysql:host=$host;dbname=$user";
10          try
11          {
12                  $connection = new PDO($dsn, $user, $pass);
13          }
14          catch(PDOException $exception)
15          {
16                  echo("<p>Error:_");
17                  echo($exception->getMessage());
18                  echo("</p>");
19                  exit();
20                  }
21
22          # Data received
23          $animal_name = $_REQUEST['animal'];
24                  $ownerVat = $_REQUEST['owner_vat'];
25                  $clientVat = $_REQUEST['client_vat'];
```

```php
26                    # Check received data
27                    echo("<p>Animal_name: {$animal_name} </p>");
28                    echo("<p>Owner_VAT: {$ownerVat} </p>");
29                    echo("<p>Client_VAT: {$clientVat}</p>");
30
31            echo("<h3>Select a type of consult </h3>");
32          # Button to create a consult with the actual date
33          echo("<form action=\"\" method=\"post\">");
34          echo("<input type='hidden' name='animal' value='{$animal_name}'/>\n");
35          echo("<input type='hidden' name='owner_vat' value='{$ownerVat}'/>\n");
36          echo("<input type='hidden' name='client_vat' value='{$clientVat}'/>\n"
                );
37          echo("<p><input type=\"submit\" name=\"btnRegisterActual\" value=\"
                Current Consult\"/></p>");
38          echo("</form>");
39          # Button to create a consult with a previous date
40          echo("<form action=\"\" method=\"post\">");
41          echo("<input type='hidden' name='animal' value='{$animal_name}'/>\n");
42          echo("<input type='hidden' name='owner_vat' value='{$ownerVat}'/>\n");
43          echo("<input type='hidden' name='client_vat' value='{$clientVat}'/>\n"
                );
44          echo("<p><input type=\"submit\" name=\"btnRegisterPrevious\" value=\"
                Previous Consult\"/></p>");
45          echo("</form>");
46
47          $animal_name = $_REQUEST['animal'];
48          $ownerVat = $_REQUEST['owner_vat'];
49          $clientVat = $_REQUEST['client_vat'];
50          $date = $_REQUEST['date_'];
51          $time = $_REQUEST['hour_'];
52          $date_timestamp = $_REQUEST['date_timestamp'];
53          $s = $_REQUEST['s'];
54          $o = $_REQUEST['o'];
55          $a = $_REQUEST['a'];
56          $p = $_REQUEST['p'];
57          $vetVat = $_REQUEST['vet'];
58          $weight = $_REQUEST['weight'];
59          $d_code = $_REQUEST['d_code'];
60
61                  # It is desired a new consult with the actual date
62                  if (isset($_REQUEST['btnRegisterActual']))
63                  {
64                          $date = date("Y-m-d");
```

```php
65                          $time = date("H:i:s");
66                      }
67
68                      # It is desired a new consult with a previous date - select
                             date
69                      if (isset($_REQUEST['btnRegisterPrevious']))
70                      {
71                              $date = date("Y-m-d");
72                      echo("<h3> Previous Consult</h3>");
73                      echo("<form action=\"\" method=\"post\">");
74                      echo("<p>Consult date and hour:</p>");
75                      echo("<input type='date' name='date_' max='{$date}'/>\n");
76                      echo("<input type='hidden' name='animal' value='{$animal_name
                             }'/>\n");
77                      echo("<input type='hidden' name='owner_vat' value='{$ownerVat
                             }'/>\n");
78                      echo("<input type='hidden' name='client_vat' value='{
                             $clientVat}'/>\n");
79                      echo("<p><input type=\"submit\" name=\"btnRegisterPreviousHour
                             \" value=\"Proceed\"/></p>");
80                      echo("</form>");
81                      }
82
83                      # It is desired a new consult with a previous date - select
                             time
84                      if (isset($_REQUEST['btnRegisterPreviousHour']))
85                      {
86                      $CurrentDate = date("Y-m-d");
87                      $time = date("H:i:s");
88                      echo("<h3> Previous Consult</h3>");
89                      echo("<p>Selected date: $date</p>");
90                      echo("<form action=\"\" method=\"post\">");
91                      echo("<p>Consult hour:</p>");
92                              if ($CurrentDate == $date){
93                                              echo("<input type='time' name='hour_'
                                                   max='{$time}'/>\n");
94                              }else{
95                                              echo("<input type='time' name='hour_'
                                                   />\n");
96                              }
97                      echo("<input type='hidden' name='date_' value='{$date}'/>");
98                      echo("<input type='hidden' name='animal' value='{$animal_name
                             }'/>\n");
```

33

```php
 99                    echo("<input type='hidden' name='owner_vat' value='{$ownerVat
                          }'/>\n");
100                    echo("<input type='hidden' name='client_vat' value='{
                          $clientVat}'/>\n");
101                    echo("<p><input type=\"submit\" name=\"Proceed\" value=\"
                          Proceed\"/></p>");
102                    echo("</form>");
103                    }
104
105                    # Collect data required to create a new consult
106                    if (isset($_REQUEST['Proceed']) || isset($_REQUEST['
                          btnRegisterActual']))
107                    {
108                    echo("<h3>New Consult</h3>");
109                    $date_timestamp = $date . " ";
110                    $date_timestamp = $date_timestamp . $time;
111                    echo("<p>$date_timestamp</p>");
112                    echo("<form action=\"\" method=\"post\">");
113                    echo("<p style='font-weight:bold'>Veterinary: <span style='
                          margin-left:0.5em'>");
114                    echo("<select name='vet'>");
115                    $sql = "SELECT person.VAT AS VAT, name FROM veterinary INNER
                          JOIN person ON veterinary.VAT = person.VAT ORDER BY person
                          .VAT";
116                    $result = $connection->query($sql);
117                            if ($result == FALSE)
118                            {
119                                    $info = $connection->errorInfo();
120                                    echo("<p>Error: {$info[2]}</p>");
121                                    exit();
122                            }
123                            foreach($result as $row)
124                            {
125                                    $vet_vat = $row['VAT'];
126                                    $option = $vet_vat . " - ";
127                                    $option = $option . $row['name'];
128                                    echo("<option value=\"$vet_vat\">
                                        $option</option>");
129                            }
130                    echo("</select>");
131                    echo("</p>");
132                    echo("<p style='font-weight:bold'> Weight: <span style='margin
                          -left:2em'>");
```

```
133                    echo("<input type='number' step='0.01' name='weight'/>");
134                    echo("<p style='font-weight:bold'> SOAP Notes:</p>");
135                    echo("<table border=\"0\" cellspacing=\"5\">");
136                    echo("<tr align='center'>");
137                    echo("<tr align='center'><td style='font-weight:bold'> S</td><
                           td><input type='text' name='s'/></td></tr>\n");
138                    echo("<tr align='center'><td style='font-weight:bold'> O</td><
                           td><input type='text' name='o'/></td></tr>\n");
139                    echo("<tr align='center'><td style='font-weight:bold'> A</td><
                           td><input type='text' name='a'/></td></tr>\n");
140                    echo("<tr align='center'><td style='font-weight:bold'> P</td><
                           td><input type='text' name='p'/></td></tr>\n");
141                    echo("</table>");
142                    echo("<input type='hidden' name='animal' value='{$animal_name
                           }'/>\n");
143                    echo("<input type='hidden' name='owner_vat' value='{$ownerVat
                           }'/>\n");
144                    echo("<input type='hidden' name='client_vat' value='{
                           $clientVat}'/>\n");
145                    echo("<input type='hidden' name='date_timestamp' value='{
                           $date_timestamp}'");
146                    echo("<p><input type=\"submit\" name=\"RegisterCons\" value=\"
                           Register Consult\"/></p>");
147                    echo("</form>");
148                    $result = NULL;
149                    }
150
151                    # Register the new consult in the database
152                    if (isset($_REQUEST['RegisterCons']))
153                    {
154                            $sql = "CALL InsertConsult('$animal_name','$ownerVat
                                   ','$date_timestamp','$s','$o','$a','$p','
                                   $clientVat','$vetVat','$weight');";
155                            if ($connection->query($sql) == TRUE){
156                                        echo("<p style='font-weight:bold'>
                                            Consult was successfully created
                                            !</p>");
157                            }else{
158                                    $info = $connection->errorInfo();
159                                    echo("<p>Error: {$info[2]}</p>");
160                                    exit();
161                            }
162                    }
```

```php
163
164                 # Collect diagnosis codes for registration
165                 if (isset($_REQUEST['RegisterCons']) | isset($_REQUEST['
                        CollectDiag']))
166                 {
167                 echo("<h3>Associate Diagnosis</h3>");
168                 echo("<form action=\"\" method=\"post\">");
169
170                 echo("<p style='font-weight:bold'>Diagnosis code: <span style
                        ='margin-left:0.5em'>");
171                 echo("<select name='d_code'>");
172                 $sql = "SELECT code, name FROM diagnosis_code ORDER BY code";
173                 $result = $connection->query($sql);
174                 if ($result == FALSE)
175                         {
176                                     $info = $connection->errorInfo();
177                                     echo("<p>Error: {$info[2]}</p>");
178                                     exit();
179                         }
180                     foreach($result as $row)
181                         {
182                                     $code = $row['code'];
183                                     $option = $code . " - ";
184                                     $option = $option . $row['name'];
185                                     echo("<option value=\"$code\">$option
                                            </option>");
186                         }
187                 echo("</select>");
188                 echo("</p>");
189                 echo("<input type='hidden' name='animal' value='{$animal_name
                        }'/>\n");
190                 echo("<input type='hidden' name='owner_vat' value='{$ownerVat
                        }'/>\n");
191                 echo("<input type='hidden' name='client_vat' value='{
                        $clientVat}'/>\n");
192                 echo("<input type='hidden' name='date_timestamp' value='{
                        $date_timestamp}'");
193                 echo("<p><input type=\"submit\" name=\"RegisterDiag\" value=\"
                        Register Diagnosis\"/></p>");
194                 echo("</form>");
195                 }
196
197                 # Register new diagnosis code
```

```
198                       if ( isset ($_REQUEST [ 'RegisterDiag ' ] ) )
199                       {
200                               echo("<h3>New_Diagnosis</h3>");
201                               $sql = "CALL_InsertDiagnosis ( '$d_code ', '$animal_name
                                          ', '$ownerVat ', '$date_timestamp ');";
202                               if ($connection−>query($sql) == TRUE){
203                                            echo("<p_style='font−weight:bold'>_
                                                Diagnosis_was_successfully_added
                                                !</p>");
204                              } else {
205                                      $info = $connection−>errorInfo ();
206                                      echo("<p>Error:_{$info [2]}</p>");
207                                      exit ();
208                              }
209                       echo("<form_action=\"\"_method=\"post\">");
210                       echo("<input_type='hidden '_name='animal '_value='{$animal_name
                              }'/>\n");
211                       echo("<input_type='hidden '_name='owner_vat '_value='{$ownerVat
                              }'/>\n");
212                       echo("<input_type='hidden '_name='client_vat '_value='{
                              $clientVat}'/>\n");
213                       echo("<input_type='hidden '_name='date_timestamp '_value='{
                              $date_timestamp}'");
214                       echo("<p><input_type=\"submit\"_name=\"CollectDiag\"_value=\"
                              New_Diagnosis\"/></p>");
215                       echo("</form>");
216                       }
217
218          $connection = null;
219  ?>
220            </body>
221  </html>
```

6. Adding a blood test

As seen on figure 11, each consult has an associated "New Blood Test" button. By pressing it, the page from figure 18 pops up. In here, the user can add all the info necessary for a blood test analysis, namely the white blood cell count, number of neutrophils and number of monocytes. As expected, it's also necessary to indicate the VAT of the assistant that performed the test procedure, in order to complete the data that needs to be filled in the database.

Figure 18: Blood test procedure creation form, shown in an example of adding to the consult of animal "Bobi", in 15 of November of 2018.

Functions, Triggers and Stored Procedures

As a way to prove the behavior of the codes corresponding to this chapter, some tests were created. In the following sub-chapters there are figures showing the results of the referred tests.

1. Animal Age Update Trigger

The figure 19a shows the age of all animals before a new consult. Afterwards, a new consult is added to the animal named "Matumbe", that belongs to a person with 54609438 as VAT number. The result of adding the consult is shown in the figure 19b. It should be noted that only the age corresponding to the animal who has the new consult was updated. This behavior was chosen because, if we have a big database, with a lot of animals, it would be very expensive to update all the animals every time a consult is created.

```
1  DELIMITER $$
2
3  CREATE TRIGGER ageUpdate BEFORE INSERT ON consult
4  FOR EACH ROW
5  BEGIN
6          UPDATE animal
7          SET age = YEAR(current_date)-birth_year
8          WHERE name = new.name
9          AND VAT = new.VAT_owner;
10 END$$
11
```

(a) Before the new consult.

(b) After the new consult.

Figure 19: Age of all animals in the database before and after a new consult.

```
12  DELIMITER ;
```

2. Veterinary Not Assistant Triggers

Figure 20 shows the VATs corresponding to the people who are a Veterinary or an Assistant. We should remember that one person cannot be simultaneously an assistant and a Veterinary. In the figure 21 is shown the result of trying to create a assistant that already is a veterinary, and vice versa.

(a) Assistant's VAT

(b) Veterinary's VAT

Figure 20: VAT numbers from persons who are assistant or veterinary.

Figure 21: Results while testing the triggers.

```
1  DELIMITER $$
2
3  CREATE TRIGGER vetNotAssist BEFORE INSERT ON assistant
4  FOR EACH ROW
5  BEGIN
```

39

```
 6          DECLARE vet_cannot_be_a_assistant CONDITION FOR SQLSTATE '45001';
 7          DECLARE EXIT HANDLER FOR vet_cannot_be_a_assistant
 8          BEGIN
 9          SIGNAL vet_cannot_be_a_assistant SET MESSAGE_TEXT = 'This_person_is_
                  already_registered_as_a_Veterinary._A_person_cannot_be_a_Assistant
                  _and_a_Veterinary_at_the_same_time.';
10          END;
11  IF EXISTS(
12          SELECT VAT
13          FROM veterinary
14          WHERE veterinary.VAT = new.VAT
15  )THEN
16          SIGNAL vet_cannot_be_a_assistant;
17
18  END IF;
19  END$$
20
21  CREATE TRIGGER assistNotVet BEFORE INSERT ON veterinary
22  FOR EACH ROW
23  BEGIN
24          DECLARE assistant_cannot_be_a_vet CONDITION FOR SQLSTATE '45001';
25          DECLARE EXIT HANDLER FOR assistant_cannot_be_a_vet
26          BEGIN
27          SIGNAL assistant_cannot_be_a_vet SET MESSAGE_TEXT = 'This_person_is_
                  already_registered_as_a_Assistant._A_person_cannot_be_a_Assistant_
                  and_a_Veterinary_at_the_same_time.';
28          END;
29  IF EXISTS(
30          SELECT VAT
31          FROM assistant
32          WHERE assistant.VAT = new.VAT
33  )THEN
34          SIGNAL assistant_cannot_be_a_vet;
35
36  END IF;
37  END$$
38
39  DELIMITER ;
```

3. Unique Phone Numbers Triggers

Figure 22 shows the existing phone numbers in the database. Removing a number and trying to insert one that already exists, the trigger prevents the duplicate number creation, as seen on figure 23. This figure also

pictures the result obtained when trying to update a phone number with an existing phone number.

Figure 22: The phone number from the persons within the database.

Figure 23: Results while testing the triggers.

```
1  DELIMITER $$
2
3  CREATE TRIGGER phoneNotDuplicateInsert BEFORE INSERT ON phone_number
4  FOR EACH ROW
5  BEGIN
6          DECLARE phone_already_exists CONDITION FOR SQLSTATE '45000';
7          DECLARE EXIT HANDLER FOR phone_already_exists
8          BEGIN
9          SIGNAL phone_already_exists SET MESSAGE_TEXT = 'This_phone_number_
                already_exists.';
10         END;
11 IF EXISTS(
12         SELECT phone
13         FROM phone_number
14         WHERE phone = new.phone
15 )THEN
16         SIGNAL phone_already_exists;
17 END IF;
18 END$$
19
```

```
20  CREATE TRIGGER phoneNotDuplicateUpdate BEFORE UPDATE ON phone_number
21  FOR EACH ROW
22  BEGIN
23          DECLARE phone_already_exists CONDITION FOR SQLSTATE '45000';
24          DECLARE EXIT HANDLER FOR phone_already_exists
25          BEGIN
26          SIGNAL phone_already_exists SET MESSAGE_TEXT = 'This phone number
                    already exists.';
27          END;
28  IF EXISTS(
29          SELECT phone
30          FROM phone_number
31          WHERE phone = new.phone
32  )THEN
33          SIGNAL phone_already_exists;
34  END IF;
35  END$$
36
37  DELIMITER ;
```

4. Yearly Number of Consults Function

In order to visualize the function working, an example is portrayed using the consults corresponding to the animal named "Miau". In figure 24a, one can see the dates from the consults where "Miau" was present. The next figure (24b) represents the calculated number of "Miau"'s consults in 2017.

(a) Miau's consults dates.

(b) Number of Miau's consults in 2017.

Figure 24: Age of all animals in the database before and after a new consult.

```
1  DELIMITER $$
2
3  CREATE FUNCTION number_consult_year(a_vat INTEGER, a_name CHAR(50), c_year YEAR)
4  RETURNS INTEGER
5  BEGIN
6
7          DECLARE count_result INTEGER;
8
9          SELECT COUNT(date_timestamp) INTO count_result
10         FROM consult
```

```
11          WHERE (date_timestamp) IN(
12          SELECT date_timestamp
13          FROM consult
14          WHERE name = a_name
15          AND VAT_owner = a_vat
16          AND YEAR(date_timestamp) = c_year
17          );
18
19          RETURN count_result;
20
21  END$$
22
23  DELIMITER ;
```

5. Milligrams to Centigrams Stored Procedure

The images in figure 25 show the indicators and the produced indicators before the procedure. After calling the procedure, the result is the one shown in the figure 26.

(a) indicator's table before the procedure.

(b) produced_indicator's table before the procedure.

Figure 25: Tabels before the procedure.

(a) indicator's table after the procedure.

(b) produced_indicator's table after the procedure.

Figure 26: Tabels after the procedure.

```
1  DELIMITER $$
2
```

```
3  CREATE PROCEDURE change2centigrams()
4  BEGIN
5          DECLARE ind_name CHAR(30);
6          DECLARE done INT DEFAULT FALSE;
7
8          DECLARE c CURSOR FOR
9          SELECT name
10         FROM indicator
11         WHERE units = 'milligrams';
12         DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;
13
14         OPEN c;
15         REPEAT
16         FETCH c INTO ind_name;
17         IF NOT done THEN
18         UPDATE produced_indicator
19         SET value = value/10
20         WHERE indicator_name = ind_name;
21         END IF;
22         UNTIL done
23         END REPEAT;
24         CLOSE c;
25
26         UPDATE indicator
27         SET units = 'centigrams', reference_value = reference_value/10
28         WHERE units = 'milligrams';
29 END$$
30
31 DELIMITER ;
```

Appendix

AnimalConsultsInfo

```
1  DROP PROCEDURE AnimalConsultsInfo;
2  DELIMITER $$
3
4  CREATE PROCEDURE AnimalConsultsInfo(IN animal_name VARCHAR(50),IN owner_vat
       INTEGER)
5  /*RETURNS TABLE(date timestamp, vatVet INTEGER, nameVet VARCHAR(100))*/
6  BEGIN
7  /*RETURN TABLE(*/
```

```sql
 8          SELECT consult.date_timestamp as date,consult.VAT_vet as vatVet,person
                .name as nameVet
 9          FROM consult
10          INNER JOIN veterinary ON consult.VAT_vet = veterinary.VAT
11          INNER JOIN person ON veterinary.VAT = person.VAT
12          WHERE consult.name = animal_name
13          AND consult.VAT_owner = owner_vat
14          ORDER BY consult.date_timestamp DESC;
15  /*)*/
16  END$$
17  DELIMITER ;
```

AnimalInfo

```sql
 1  DROP PROCEDURE AnimalInfo;
 2  DELIMITER $$
 3
 4  CREATE PROCEDURE AnimalInfo(IN animal_name VARCHAR(50),IN owner_vat INTEGER,
        IN date_ TIMESTAMP)
 5  /*RETURNS TABLE(name_owner VARCHAR(100), species VARCHAR(50), colour  VARCHAR
        (20), gender VARCHAR(20), age INTEGER, weight NUMERIC(5,2))*/
 6  BEGIN
 7  /*RETURN TABLE(*/
 8          SELECT person.name AS name_owner, species_name AS species, colour,
                gender, age, consult.weight AS weight
 9          FROM animal
10          INNER JOIN person ON animal.VAT = person.VAT
11          INNER JOIN consult ON animal.VAT = consult.VAT_owner AND animal.name =
                consult.name
12          WHERE animal.name = animal_name
13          AND animal.VAT = owner_vat
14          AND consult.date_timestamp = date_;
15  /*)*/
16  END$$
17  DELIMITER ;
```

consult_with_client

```sql
 1  DROP PROCEDURE consult_with_client;
 2  DELIMITER $$
 3
 4  CREATE PROCEDURE consult_with_client(IN animal_name VARCHAR(50),IN owner_vat
        INTEGER,IN clientVat INTEGER)
 5  BEGIN
```

```
6            SELECT DISTINCT VAT_client
7            FROM consult
8            WHERE name = animal_name
9            AND VAT_owner = owner_vat
10           AND VAT_client = clientVat;
11 END$$
12 DELIMITER ;
```

DiagnosisInfo

```
1  DROP PROCEDURE DiagnosisInfo;
2  DELIMITER $$
3
4  CREATE PROCEDURE DiagnosisInfo(IN animal_name VARCHAR(50),IN owner_vat INTEGER
       , IN date_ TIMESTAMP)
5  /*RETURNS TABLE(code CHAR(5), name CHAR(100))*/
6  BEGIN
7  /*RETURN TABLE(*/
8            SELECT diagnosis_code.code AS code, diagnosis_code.name AS name
9            FROM consult_diagnosis
10           INNER JOIN diagnosis_code ON consult_diagnosis.code = diagnosis_code.
                code
11           WHERE consult_diagnosis.name = animal_name
12           AND consult_diagnosis.VAT_owner = owner_vat
13           AND consult_diagnosis.date_timestamp = date_;
14 /*)*/
15 END$$
16 DELIMITER ;
```

get_vat_from_name

```
1  DROP PROCEDURE get_vat_from_name;
2  DELIMITER $$
3
4  CREATE PROCEDURE get_vat_from_name(IN owner_name CHAR(100))
5  BEGIN
6            SELECT person.VAT AS VAT, person.name AS NAME
7            FROM person INNER JOIN client USING(VAT)
8            WHERE person.name LIKE CONCAT('%',owner_name,'%');
9  END$$
10 DELIMITER ;
```

GetMaxProcedureNum

```
1  DROP PROCEDURE GetMaxProcedureNum;
```

```
2  DELIMITER $$
3
4  CREATE PROCEDURE GetMaxProcedureNum()
5  BEGIN
6          SELECT max(num)
7          FROM _procedure;
8  END$$
9  DELIMITER ;
```

InsertBloodTest

```
1   DROP PROCEDURE InsertBloodTest;
2   DELIMITER $$
3
4   CREATE PROCEDURE InsertBloodTest(IN animal_name VARCHAR(50), IN VAT_owner
        INTEGER, IN date_timestamp TIMESTAMP, IN num INTEGER, IN VAT_assistant
        INTEGER, IN white_blood_cell_count NUMERIC(5, 2), IN number_neutrophils
        NUMERIC(5, 2), IN number_monocytes NUMERIC(5, 2))
5   BEGIN
6          INSERT INTO _procedure VALUES(animal_name, VAT_owner, date_timestamp,
               num, 'Blood_test');
7          INSERT INTO test_procedure VALUES(animal_name, VAT_owner,
               date_timestamp, num, 'blood');
8          INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
               date_timestamp, num, "White_blood_cell_count",
               white_blood_cell_count);
9          INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
               date_timestamp, num, "Number_of_neutrophils", number_neutrophils);
10         INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
               date_timestamp, num, "Number_of_monocytes", number_monocytes);
11         INSERT INTO performed VALUES(animal_name, VAT_owner, date_timestamp,
               num, VAT_assistant);
12  END$$
13  DELIMITER ;
```

InsertConsult

```
1   DROP PROCEDURE InsertConsult;
2   DELIMITER $$
3
4   CREATE PROCEDURE InsertConsult(IN name CHAR(50), IN VAT_owner INTEGER, IN
        date_timestamp TIMESTAMP, IN s TEXT, IN o TEXT, IN a TEXT, IN p TEXT, IN
        VAT_client INTEGER, IN VAT_vet INTEGER, IN weight NUMERIC(5,2))
5   BEGIN
```

```
6           INSERT INTO consult VALUES(name, VAT_owner, date_timestamp, s, o, a, p
                , VAT_client, VAT_vet, weight);
7   END$$
8   DELIMITER ;
```

InsertDiagnosis

```
1   DROP PROCEDURE InsertDiagnosis;
2   DELIMITER $$
3
4   CREATE PROCEDURE InsertDiagnosis(IN code CHAR(5), IN name CHAR(50), IN
        VAT_owner INTEGER, IN date_timestamp TIMESTAMP)
5   BEGIN
6           INSERT INTO consult_diagnosis VALUES(code, name, VAT_owner,
                date_timestamp);
7   END$$
8   DELIMITER ;
```

more_general

```
1   DROP PROCEDURE more_general;
2   DELIMITER $$
3
4   CREATE PROCEDURE more_general()
5   BEGIN
6           SELECT DISTINCT name2 AS species_name
7           FROM generalization_species
8           WHERE name2 != ALL (
9                   SELECT name1
10                  FROM generalization_species
11          );
12
13  END$$
14  DELIMITER ;
```

more_specific

```
1   DROP PROCEDURE more_specific;
2   DELIMITER $$
3
4   CREATE PROCEDURE more_specific(IN general_name CHAR(50))
5   BEGIN
6           SELECT DISTINCT name1 AS species_name
7           FROM generalization_species
8           WHERE name2 = general_name;
```

```
 9
10  END$$
11  DELIMITER ;
```

PrescriptionsInfo

```
 1  DROP PROCEDURE PrescriptionsInfo;
 2  DELIMITER $$
 3
 4  CREATE PROCEDURE PrescriptionsInfo(IN animal_name VARCHAR(50),IN owner_vat
        INTEGER, IN date_ TIMESTAMP)
 5  /*RETURNS TABLE(code CHAR(5), name_med CHAR(20), lab CHAR(20), dosage CHAR
        (100), regime CHAR(100))*/
 6  BEGIN
 7  /*RETURN TABLE(*/
 8          SELECT code, name_med, lab, dosage, regime
 9          FROM prescription
10          WHERE prescription.name = animal_name
11          AND prescription.VAT_owner = owner_vat
12          AND prescription.date_timestamp = date_;
13  /*)*/
14  END$$
15  DELIMITER ;
```

Project_part2

```
 1  /*1*/
 2  DELIMITER $$
 3
 4  CREATE TRIGGER ageUpdate BEFORE INSERT ON consult
 5  FOR EACH ROW
 6  BEGIN
 7          UPDATE animal
 8          SET age = YEAR(current_date)−birth_year
 9          WHERE name = new.name
10          AND VAT = new.VAT_owner;
11  END$$
12
13  DELIMITER ;
14
15  /*TEST 1*/
16  SELECT VAT, name, age
17  FROM animal;
18
```

```
19  INSERT INTO consult(name,VAT_owner,VAT_client,VAT_vet,weight) VALUES('Bobi'
        ,12345678,12345678,12032014,10);
20
21  /*2*/
22  DROP TRIGGER vetNotAssist;
23  DROP TRIGGER assistNotVet;
24
25  DELIMITER $$
26
27  CREATE TRIGGER vetNotAssist BEFORE INSERT ON assistant
28  FOR EACH ROW
29  BEGIN
30          DECLARE vet_cannot_be_a_assistant CONDITION FOR SQLSTATE '45001';
31          DECLARE EXIT HANDLER FOR vet_cannot_be_a_assistant
32          BEGIN
33          SIGNAL vet_cannot_be_a_assistant SET MESSAGE_TEXT = 'This_person_is_
                already_registered_as_a_Veterinary._A_person_cannot_be_a_Assistant
                _and_a_Veterinary_at_the_same_time.';
34          END;
35  IF EXISTS(
36          SELECT VAT
37          FROM veterinary
38          WHERE veterinary.VAT = new.VAT
39  )THEN
40          SIGNAL vet_cannot_be_a_assistant;
41
42  END IF;
43  END$$
44
45  CREATE TRIGGER assistNotVet BEFORE INSERT ON veterinary
46  FOR EACH ROW
47  BEGIN
48          DECLARE assistant_cannot_be_a_vet CONDITION FOR SQLSTATE '45001';
49          DECLARE EXIT HANDLER FOR assistant_cannot_be_a_vet
50          BEGIN
51          SIGNAL assistant_cannot_be_a_vet SET MESSAGE_TEXT = 'This_person_is_
                already_registered_as_a_Assistant._A_person_cannot_be_a_Assistant_
                and_a_Veterinary_at_the_same_time.';
52          END;
53  IF EXISTS(
54          SELECT VAT
55          FROM assistant
56          WHERE assistant.VAT = new.VAT
```

```
57  )THEN
58          SIGNAL assistant_cannot_be_a_vet;
59
60  END IF;
61  END$$
62
63  DELIMITER ;
64
65  /*TEST 2*/
66  SELECT VAT
67  FROM veterinary;
68
69  SELECT VAT
70  FROM assistant;
71
72  INSERT INTO assistant(VAT) VALUES (12032014);
73
74  /*3*/
75  DROP TRIGGER phoneNotDuplicateInsert;
76  DROP TRIGGER phoneNotDuplicateUpdate;
77
78  DELIMITER $$
79
80  CREATE TRIGGER phoneNotDuplicateInsert BEFORE INSERT ON phone_number
81  FOR EACH ROW
82  BEGIN
83          DECLARE phone_already_exists CONDITION FOR SQLSTATE '45000';
84          DECLARE EXIT HANDLER FOR phone_already_exists
85          BEGIN
86          SIGNAL phone_already_exists SET MESSAGE_TEXT = 'This_phone_number_
                     already_exists.';
87          END;
88  IF EXISTS(
89          SELECT phone
90          FROM phone_number
91          WHERE phone = new.phone
92  )THEN
93          SIGNAL phone_already_exists;
94  END IF;
95  END$$
96
97  CREATE TRIGGER phoneNotDuplicateUpdate BEFORE UPDATE ON phone_number
98  FOR EACH ROW
```

```sql
 99  BEGIN
100          DECLARE phone_already_exists CONDITION FOR SQLSTATE '45000';
101          DECLARE EXIT HANDLER FOR phone_already_exists
102          BEGIN
103          SIGNAL phone_already_exists SET MESSAGE_TEXT = 'This_phone_number_
                    already_exists.';
104          END;
105  IF EXISTS(
106          SELECT phone
107          FROM phone_number
108          WHERE phone = new.phone
109  )THEN
110          SIGNAL phone_already_exists;
111  END IF;
112  END$$
113
114  DELIMITER ;
115
116  /*TEST 3*/
117  SELECT *
118  FROM phone_number;
119
120  DELETE FROM phone_number WHERE VAT = 12032014;
121  INSERT INTO phone_number VALUES(12032014,'930536378');
122  UPDATE phone_number SET phone = '930536378' WHERE VAT = 12032014;
123
124
125  /*4*/
126  DELIMITER $$
127
128  CREATE FUNCTION number_consult_year(a_vat INTEGER,a_name CHAR(50),c_year YEAR)
129  RETURNS INTEGER
130  BEGIN
131
132          DECLARE count_result INTEGER;
133
134          SELECT COUNT(date_timestamp) INTO count_result
135          FROM consult
136          WHERE (date_timestamp) IN(
137          SELECT date_timestamp
138          FROM consult
139          WHERE name = a_name
140          AND VAT_owner = a_vat
```

```
141            AND YEAR( date_timestamp ) = c_year
142            ) ;
143
144            RETURN count_result ;
145
146 END$$
147
148 DELIMITER ;
149
150 /∗5∗/
151 DELIMITER $$
152
153 CREATE PROCEDURE change2centigrams ( )
154 BEGIN
155            DECLARE ind_name CHAR(30) ;
156            DECLARE done INT DEFAULT FALSE;
157
158            DECLARE c CURSOR FOR
159            SELECT name
160            FROM indicator
161            WHERE units = 'milligrams ';
162            DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;
163
164            OPEN c ;
165            REPEAT
166            FETCH c INTO ind_name ;
167            IF NOT done THEN
168            UPDATE produced_indicator
169            SET value = value/10
170            WHERE indicator_name = ind_name ;
171            END IF ;
172            UNTIL done
173            END REPEAT;
174            CLOSE c ;
175
176            UPDATE indicator
177            SET units = 'centigrams ', reference_value = reference_value/10
178            WHERE units = 'milligrams ';
179 END$$
180
181 DELIMITER ;
182
183 /∗ TEST 5 ∗/
```

```
184  SELECT * FROM indicator;
185  SELECT * FROM produced_indicator;
186
187  CALL change2centigrams();
```

searchConsultName

```
 1  DROP PROCEDURE SearchConsultName;
 2  DELIMITER $$
 3
 4  CREATE PROCEDURE SearchConsultName(IN animal_name VARCHAR(50),IN owner_name
       VARCHAR(100),IN clientVat INTEGER)
 5  /*RETURNS TABLE(animal VARCHAR(50), vat INTEGER, owner VARCHAR(100),
       thisClient BOOLEAN)*/
 6  BEGIN
 7  /*RETURN TABLE(*/
 8          SELECT consult.name as animal,consult.VAT_owner as vat,person.name as
                owner, VAT_client = clientVat as thisClient
 9          FROM consult
10          INNER JOIN client ON consult.VAT_owner = client.VAT
11          INNER JOIN person ON client.VAT = person.VAT
12          WHERE consult.name = animal_name
13          AND person.name LIKE CONCAT('%',owner_name,'%');
14  /*)*/
15  END$$
16  DELIMITER ;
17          /*DECLARE neg_balance numeric(20,2);
18          SELECT sum(balance) into pos_balance
19          from account natural join depositor
20          where customer_name = c_name;
21          select sum(amount) into neg_balance
22          from loan natural join borrower
23          where customer_name = c_name;
24
25          if pos_balance is NULL then
26          set pos_balance = 0;
27          end if;
28          if neg_balance is NULL then
29          set neg_balance = 0;
30          end if;
31          return pos_balance − neg_balance;*/
32  /*end$$*/
```

searchQuery

```
1  DROP PROCEDURE SearchConsultName;
2  DELIMITER $$
3
4  CREATE PROCEDURE SearchConsultName(IN animal_name VARCHAR(50),IN owner_name
       VARCHAR(100),IN clientVat INTEGER)
5  BEGIN
6          SELECT DISTINCT animal.name as animal,animal.VAT as vat,person.name as
                   owner
7          FROM animal
8          INNER JOIN client ON animal.VAT = client.VAT
9          INNER JOIN person ON client.VAT = person.VAT
10         WHERE animal.name = animal_name
11         AND person.name LIKE CONCAT('%',owner_name,'%');
12 END$$
13 DELIMITER ;
```

SoapInfo

```
1  DROP PROCEDURE SoapInfo;
2  DELIMITER $$
3
4  CREATE PROCEDURE SoapInfo(IN animal_name VARCHAR(50),IN owner_vat INTEGER, IN
       date_ TIMESTAMP)
5  /*RETURNS TABLE(s TEXT, o TEXT, a TEXT, p TEXT)*/
6  BEGIN
7  /*RETURN TABLE(*/
8          SELECT s, o, a, p
9          FROM consult
10         WHERE consult.name = animal_name
11         AND consult.VAT_owner = owner_vat
12         AND consult.date_timestamp = date_;
13 /*)*/
14 END$$
15 DELIMITER ;
```