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 and 3. Alternatively, the user may register a new user, by pressing the button "Register new client".

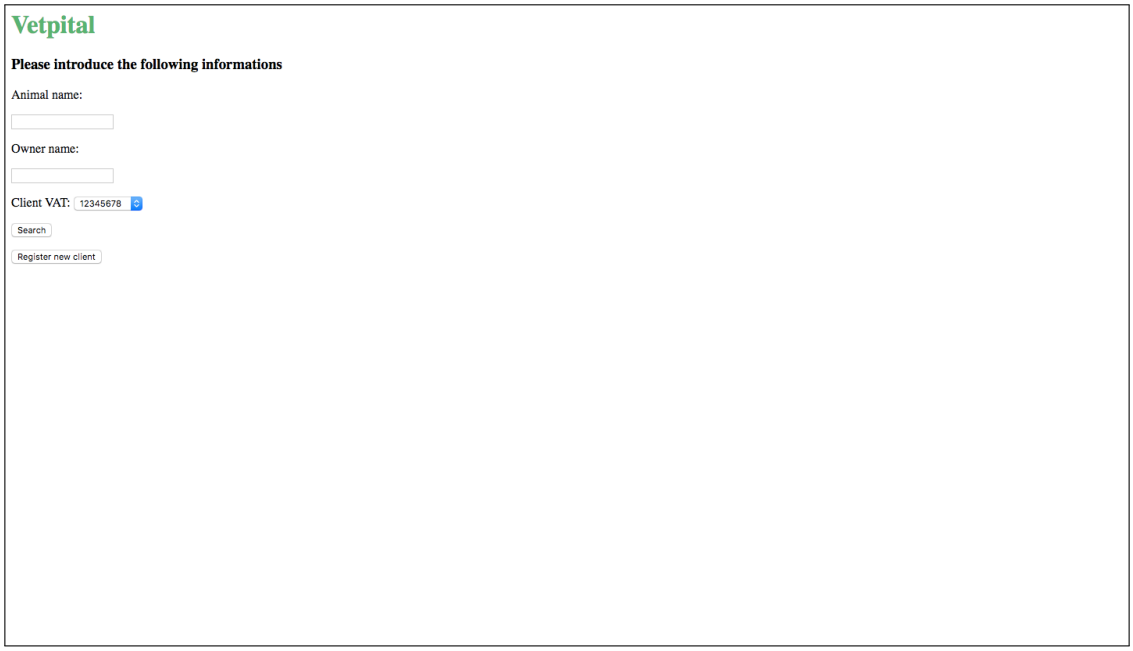


Figure 2: Interface shown when searching for animals in the veterinary database.

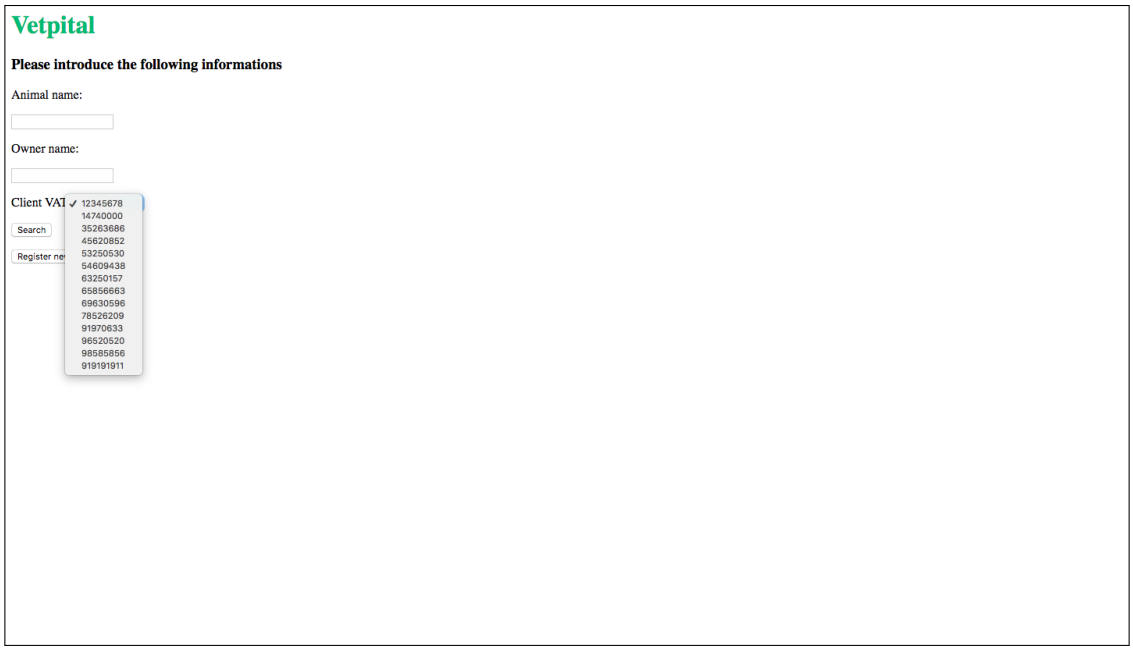


Figure 3: Selecting a client VAT while searching for animals in the veterinary database.

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);
```

```
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).

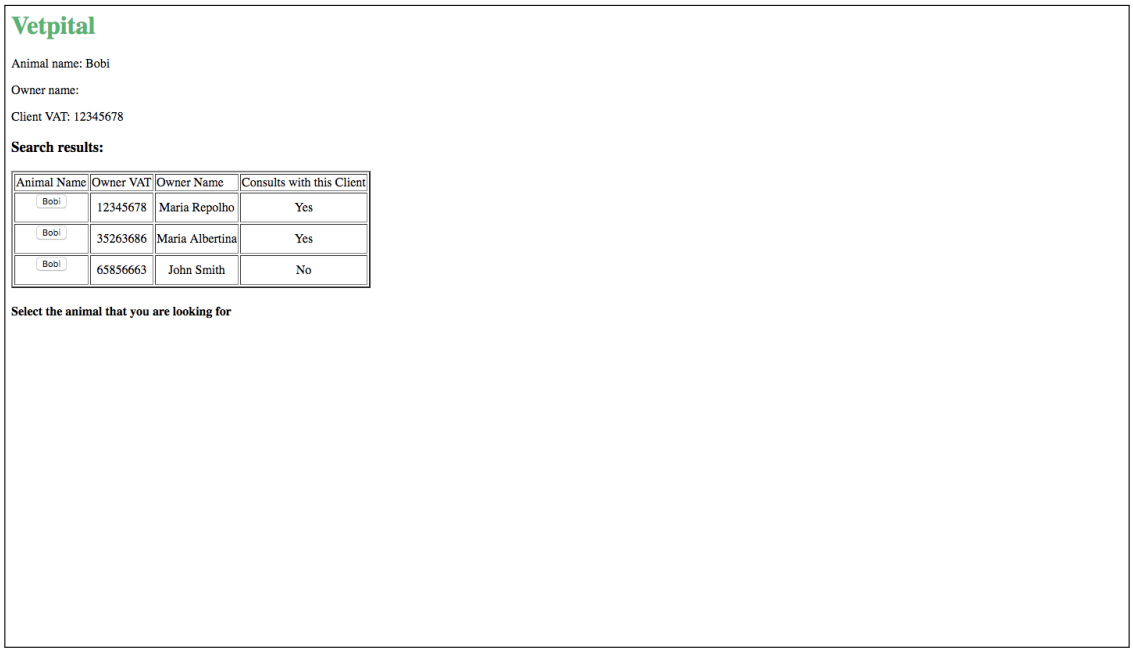


Figure 4: Interface shown when searching for animals in the veterinary database.

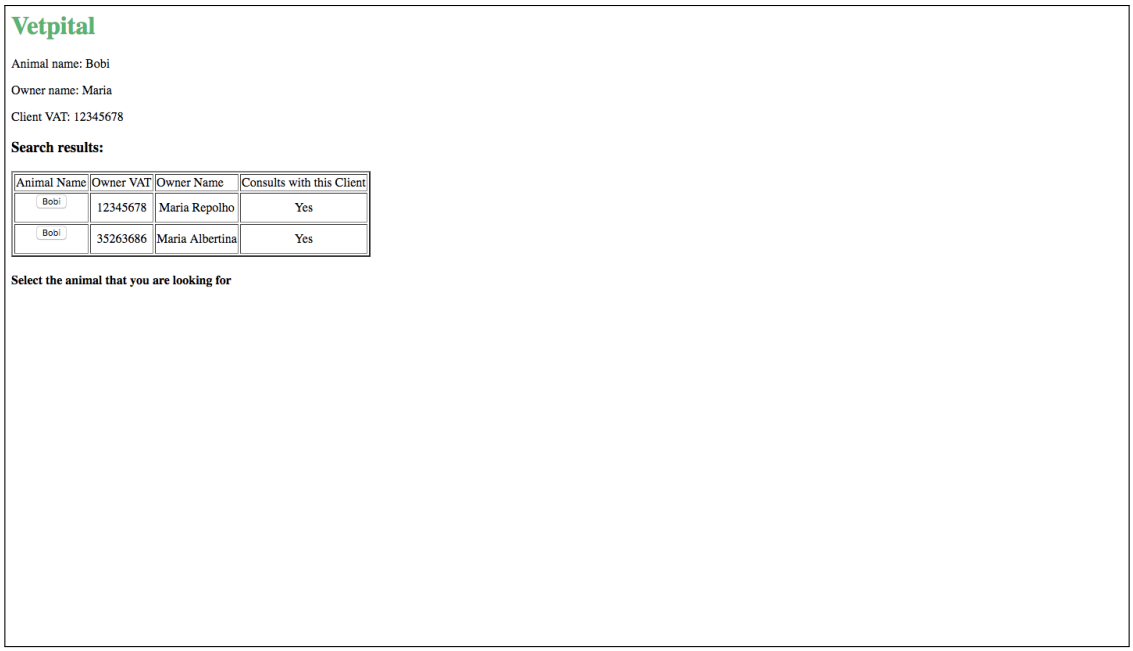


Figure 5: Interface shown when searching for animals in the veterinary database, belonging to someone with "Maria" on their name.

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

```
<html>
        <body>
                <h1><a href = "http://web.tecnico.ulisboa.pt/ist181579/sibd/
                    proj/HomePage.php" style="color:MediumSeaGreen;text-
                    decoration:␣none;">Vetpital</a></h1>
<?php
        # Establishing the connection with the database
        $host = "db.tecnico.ulisboa.pt";
        $user = "ist181579";
        $pass = "utfv5127";
        $dsn = "mysql:host=$host;dbname=$user";
        try
        {
                $connection = new PDO($dsn, $user, $pass);
        }
        catch(PDOException $exception)
        {
                echo("<p>Error:␣");
                echo($exception->getMessage());
                echo("</p>");
                exit();
```

```
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['
```

```
    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
```

```
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".

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 partial information appears (figure 7). In here, the owner's name, which must be already present in the database, is indicated, as well as its VAT. For this requirement, the user can type a name and after pressing "Save & Get VAT's", the existing owners matching the name are presented as options. Then the animal name is saved and it is requested the rest of the information such the species name, 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" to hold the species name he has selected or the button "Specialize", in order 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, 10 and 11.

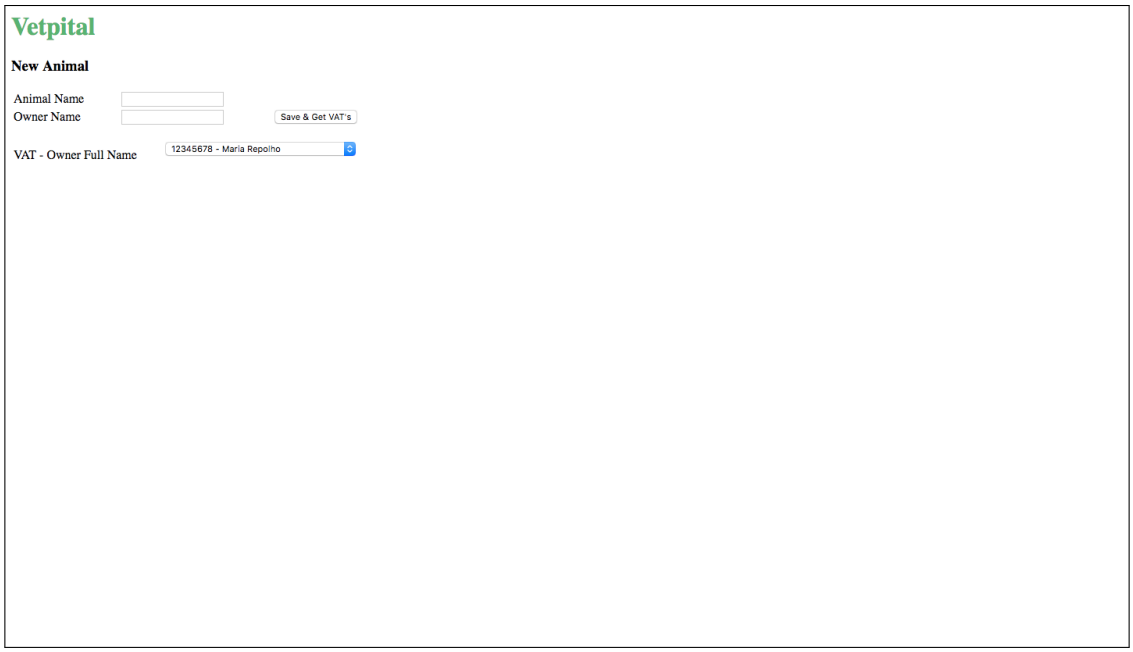


Figure 7: Initial interface for adding a new animal to the database.

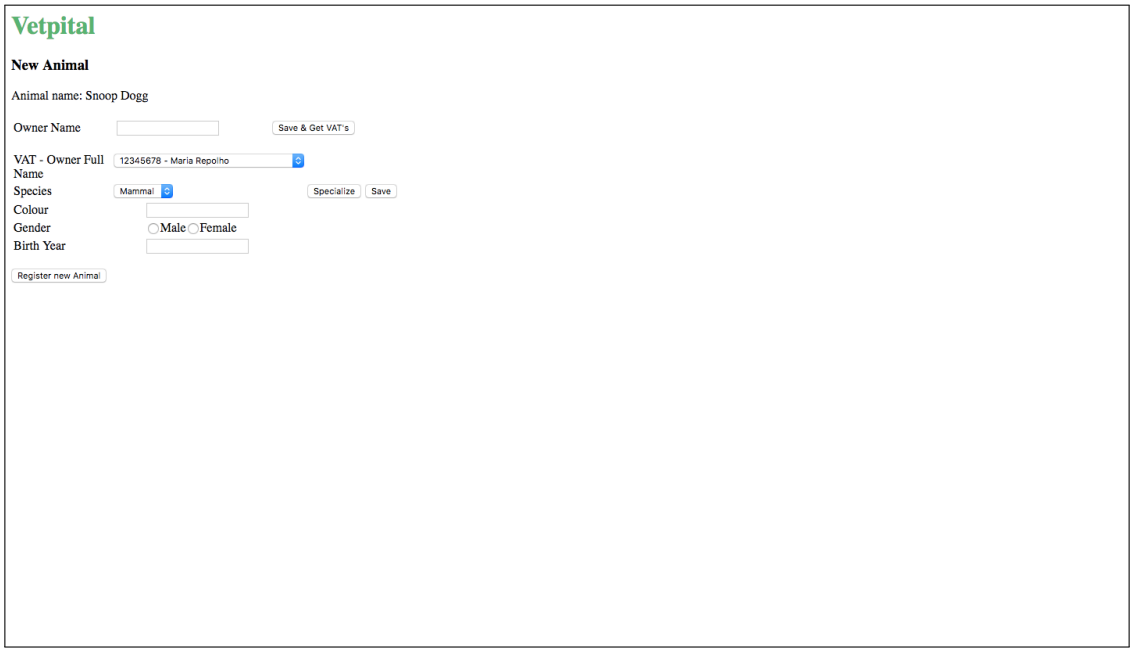


Figure 8: New animal page after defining the animal's name.

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.

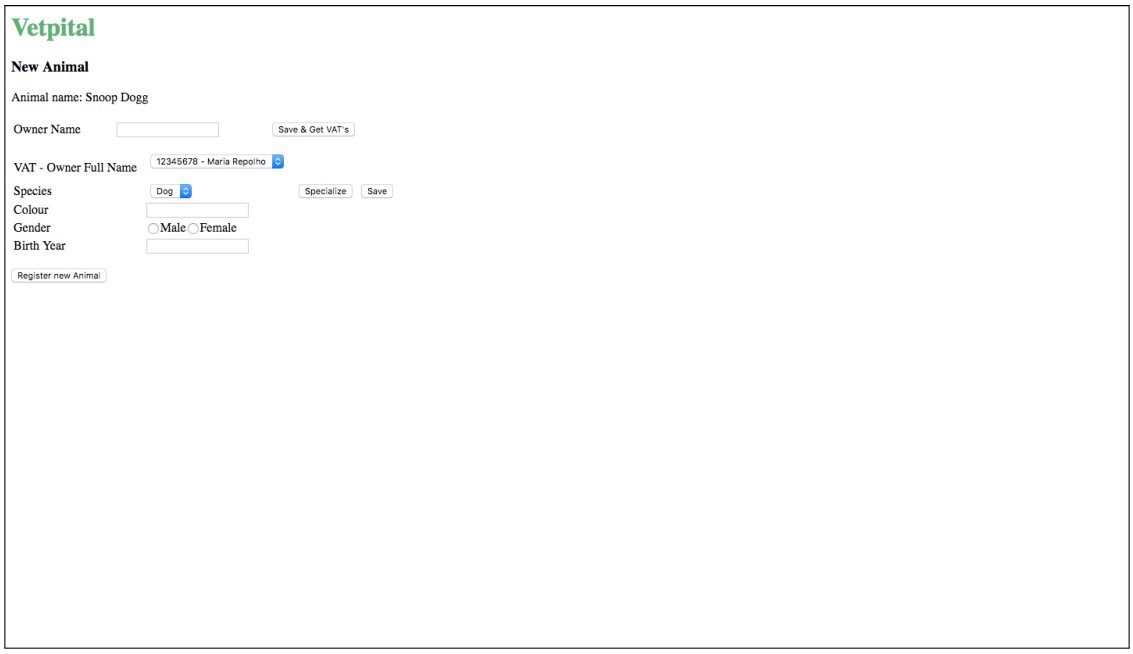


Figure 9: New animal page after specializing the species from "Mammal".

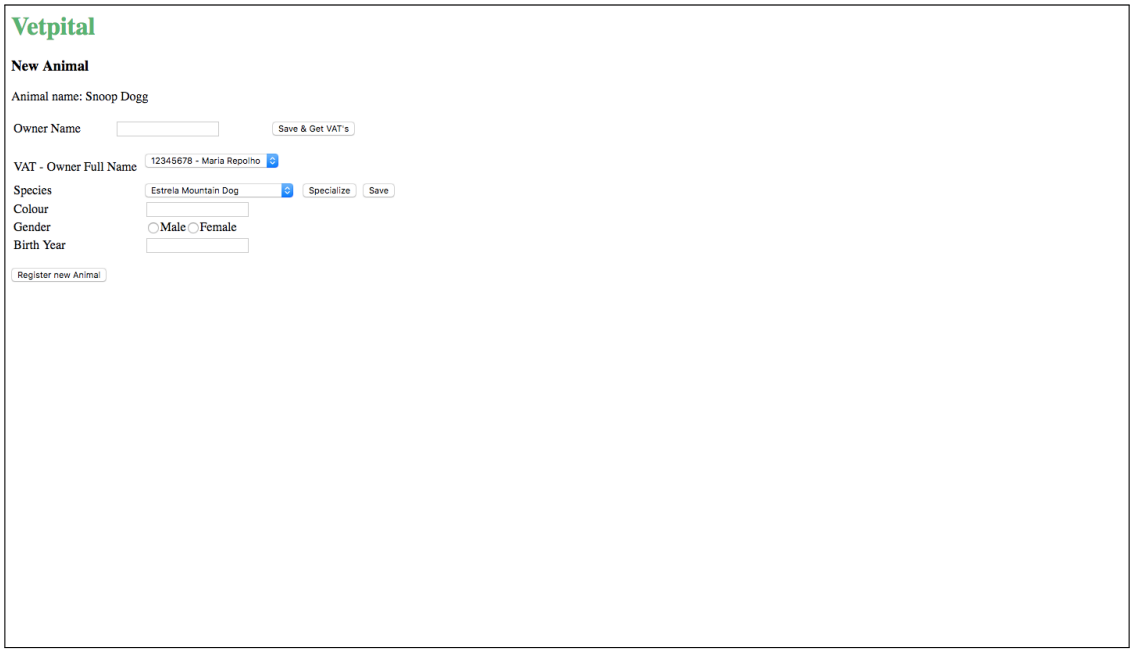


Figure 10: New animal page after specializing the species from "Dog".

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

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

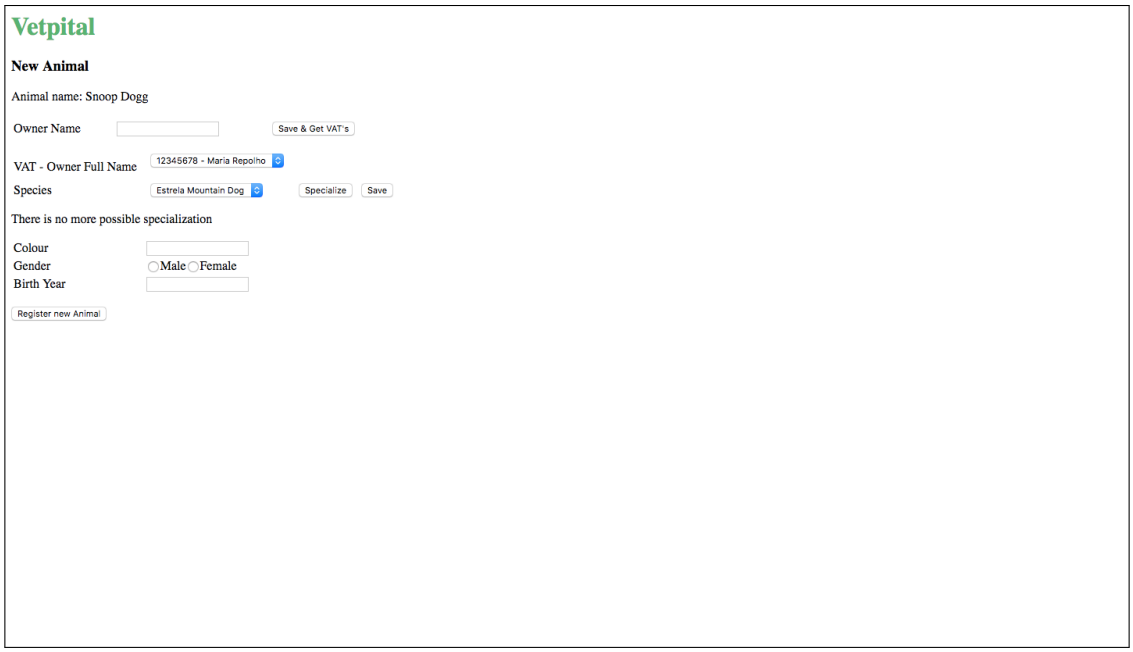


Figure 11: No more specializations found after getting "Estrela Mountain Dog" species.

```
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();
20          }
21
22          # Form that asks the user for the animal's name and the owner's name
23          echo("<form␣action=\"\"␣method=\"post\">");
```

```
24          echo("<h3>New Animal</h3>");
25          echo("<table style=\"width:35%\">");
26          echo("<tr>");
27
28          if(isset($_REQUEST['saveNameAndVAT']) or isset($_REQUEST['
                specialization_request']) or isset($_REQUEST['save_species']) or
                isset($_REQUEST['registerAnimal'])) {
29                  # Get the animal's name
30                  $animal_name = $_REQUEST['animal_name'];
31                  echo("<td><input type='hidden' value='{$animal_name}' name='
                        animal_name'/></td>");
32                  echo("<p>Animal name: {$animal_name}</p>");
33          } else {
34                  # While the user doesn't specify the animal's name, ask for
                        that information
35                  echo("<td><p>Animal Name</p></td>");
36                  echo("<td><input type='text' value='{$animal_name}' name='
                        animal_name'/></td>");
37          }
38
39          echo("<td></td>");
40          echo("</tr>");
41          echo("<tr>");
42          echo("<td><p>Owner Name</p></td>");
43          echo("<td><input type='text' value='{$owner_name}' name='owner_name
                '/></td>");
44          echo("<td><input type='submit' name=\"saveNameAndVAT\" value=\"Save &
                Get VAT's\"/></td>");
45          echo("</tr>");
46          echo("</table>");
47          echo("</form>");
48
49          # Get the client's name
50          if(!empty($_POST['owner_name']))
51          {
52                  $owner_name = $_POST['owner_name'];
53          }
54
55          # Multiple choice form to select the owner of the animal
56          echo("<table style=\"width:35%\">");
57          echo("<td><p>VAT - Owner Full Name</p></td>");
58          echo("<td>");
59          echo("<form action=\"\" method=\"post\">");
```

```
60          echo("<select name='client_vat_option'>");
61
62          # Search for the name associated to the specified VAT
63          if(!empty($_POST['client_vat_option'])){
64                  $sql="SELECT name as NAME FROM person WHERE VAT='{$_POST['
                        client_vat_option']}';";
65                  $result = $connection->query($sql);
66                  if ($result == FALSE)
67                  {
68                          $info = $connection->errorInfo();
69                          echo("<p>Error: {$info[2]}</p>");
70                          exit();
71                  }
72                  foreach($result as $row)
73                  {
74                          $owner_name = $row['NAME'];
75                          echo("<option value=\"{$_POST['client_vat_option
                                ']}\">{$_POST['client_vat_option']} - $owner_name
                                </option>");
76                          echo("<input type='hidden' name='owner_name' value='{
                                $owner_name}' />");
77                  }
78          }
79
80          # Search for the VAT associated to the specified owner name
81          else {
82                  $sql ="CALL get_vat_from_name('$owner_name');";
83                  $result = $connection->query($sql);
84                  if ($result == FALSE)
85                  {
86                          $info = $connection->errorInfo();
87                          echo("<p>Error: {$info[2]}</p>");
88                          exit();
89                  }
90                  foreach($result as $row)
91                  {
92                          $client_vat = $row['VAT'];
93                          $owner_name = $row['NAME'];
94                          echo("<option value=\"$client_vat\">$client_vat - "
                                $owner_name</option>");
95                  }
96          }
97
```

```
98          # Free the result variable for the next queries
99          $result = null;
100
101         echo("</select>");
102         echo("</td>");
103         echo("<td></td>");
104         echo("</tr>");
105
106         # Open the form to write species, color, gender and birth year, after
                selecting the animal's name and owner
107         if(isset($_REQUEST['saveNameAndVAT']) or isset($_REQUEST['
                specialization_request']) or isset($_REQUEST['save_species']) or
                isset($_REQUEST['registerAnimal'])) {
108             $animal_name = $_REQUEST['animal_name'];
109
110             # Selecting the species name
111             echo("<tr>");
112
113             $animal_name = $_REQUEST['animal_name'];
114             $species_name = $_REQUEST['species_name'];
115             $client_vat_option = $_REQUEST['client_vat_option'];
116             $colour = $_REQUEST['colour'];
117             $gender = $_REQUEST['gender'];
118             $birth_year = $_REQUEST['birth_year'];
119
120             if((!isset($_REQUEST['specialization_request']) and (!isset(
                    $_REQUEST['save_species'])))){
121                 echo("<td><p>Species</p></td>");
122                 echo("<td><select name=\"species_name\">");
123
124                 # Get the most generic species names
125                 $sql ="CALL more_general();";
126                 $result = $connection->query($sql);
127                 if ($result == FALSE)
128                 {
129                     $info = $connection->errorInfo();
130                     echo("<p>Error: {$info[2]}</p>");
131                     exit();
132                 }
133                 foreach($result as $row)
134                 {
135                     $species_name_ = $row['species_name'];
136                     echo("<option value=\"$species_name_\">
```

```
                                $species_name_</option>");
137                     }
138
139                     echo("</select>");
140                     echo("</td>");
141                     echo("<td><input type='submit' value=\"Specialize\"
                            name=\"specialization_request\"/></td>");
142                     echo("<td><input type='submit' value=\"Save\" name=\"
                            save_species\"/></td>");
143
144                     # Free the result variable for the next queries
145                     $result = null;
146             } elseif (!isset($_REQUEST['save_species'])) {
147                     echo("<td><p>Species</p></td>");
148                     echo("<td><select name=\"species_name\">");
149
150                     # Get a subspecies name from the previous generic
                            species
151                     $sql ="CALL more_specific('{$_POST['species_name']}');
                            ";
152                     $result = $connection->query($sql);
153                     if ($result == FALSE)
154                     {
155                             $info = $connection->errorInfo();
156                             echo("<p>Error: {$info[2]}</p>");
157                             exit();
158                     }
159                     if($result->rowCount() == 0){
160                             echo("<option value=\"{$_POST['species_name
                                    ']}\">{$_POST['species_name']}</option>");
161                             echo("<input type='hidden' value='yes' name='
                                    final_specialization'/>");
162                             echo("<input type='hidden' value='{$_POST['
                                    client_vat_option']}' name='
                                    client_vat_option'/>");
163                     } else {
164                             foreach($result as $row)
165                             {
166                                     $species_name_ = $row['species_name'];
167                                     echo("<option value=\"$species_name_
                                            \">$species_name_</option>");
168                             }
169                     }
```

```
170
171                     echo("</select>");
172                     echo("</td>");
173                     echo("<td><input type='submit' value=\"Specialize\"
                            name=\"specialization_request\"/></td>");
174                     echo("<td><input type='submit' value=\"Save\" name=\"
                            save_species\"/></td>");
175
176                     # Free the result variable for the next queries
177                     $result = null;
178             }
179             elseif (isset($_REQUEST['save_species'])) {
180                     # Print the species name after the user saved the
                            specified species
181                     echo("<p>Species: {$species_name}</p>");
182             }
183
184             echo("<input type='hidden' value='{$animal_name}' name='
                    animal_name'/>");
185             echo("<input type='hidden' value='{$owner_name}' name='
                    owner_name'/>");
186             echo("<input type='hidden' value='{$colour}' name='colour'/>")
                    ;
187             echo("<input type='hidden' value='{$gender}' name='gender'/>")
                    ;
188             echo("<input type='hidden' value='{$birth_year}' name='
                    birth_year'/>");
189             echo("</tr>");
190             echo("</form>");
191             echo("</table>");
192
193             if($_POST['final_specialization'] == 'yes'){
194                     echo("<p>There is no more possible specialization</p>"
                            );
195             }
196
197             echo("<table style=\"width:35%\">");
198
199             # Form to get the animal's colour, gender and birth year, with
                    a final button to register the animal
200             echo("<form action=\"\" method=\"post\">");
201             echo("<tr>");
202             echo("<td><p>Colour</p></td>");
```

```
203                 echo("<td><input type='text' name='colour' default={$colour
                        }/></td>");
204                 echo("</tr>");
205                 echo("<tr>");
206                 echo("<td><p>Gender</p></td>");
207                 echo("<td><input type=\"radio\" value=\"Male\" name=\"gender
                        \">Male");
208                 echo("<input type=\"radio\" name=\"gender\" value=\"Female\"/>
                        Female</td>");
209                 echo("</tr>");
210                 echo("<tr>");
211                 echo("<td><p>Birth Year</p></td>");
212                 echo("<td><input type='number' name='birth_year' default={
                        $birth_year}/></td>");
213                 echo("</tr>");
214                 echo("</table>");
215                 echo("<input type='hidden' value='{$animal_name}' name='
                        animal_name'/>");
216                 echo("<input type='hidden' value='{$species_name}' name='
                        species_name'/>");
217                 echo("<input type='hidden' value='{$client_vat_option}' name='
                        client_vat_option'/>");
218                 echo("<p><input type=\"submit\" value=\"Register new Animal\"
                        name=\"registerAnimal\"/></p>");
219                 echo("</form>");
220
221                 $all_filled=1;
222
223                 # Confirm if all the required inputs are filled
224                 if(empty($animal_name)) $all_filled=0;
225                 if(empty($species_name)) $all_filled=0;
226                 if(empty($client_vat_option)) $all_filled=0;
227                 if(empty($colour)) $all_filled=0;
228                 if(empty($gender)) $all_filled=0;
229                 if(empty($birth_year)) $all_filled=0;
230
231                 # Only run the prepared animal creation statement if all the
                        required inputs are filled
232                 if($all_filled){
233                         $sql = "INSERT INTO animal(name,VAT,species_name,
                                colour,gender,birth_year) VALUES(?,?,?,?,?,?);";
234                         $sth = $connection->prepare($sql);
235
```

```
236                         if ($sth == FALSE) {
237                                 $info = $connection->errorInfo();
238                                 echo("<p>Error: {$info[2]}</p>");
239                                 exit();
240                         } else {
241                                 $sth->execute(array($animal_name,
                                        $client_vat_option, $species_name, $colour
                                        , $gender, $birth_year));
242                                 $result = $sth->num_rows;
243                         }
244
245                         # Terminate the connection to the database
246                         $connection = null;
247
248                         # Send the user to the new consult registration page
249                         echo("<form id='jsform' action='register_consult.php'
                                method='post'>");
250                         echo("<input type='hidden' value='{$animal_name}' name
                                ='animal'/>");
251                         echo("<input type='hidden' value='{$client_vat_option
                                }' name='owner_vat'/>");
252                         echo("<input type='hidden' value='{$client_vat_option
                                }' name='client_vat'/>");
253                         echo("</form>");
254                         echo("<script type='text/javascript'>");
255                         echo("document.getElementById('jsform').submit();");
256                         echo("</script>");
257                 }
258         }
259 ?>
260         </body>
261 </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 12, 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).

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

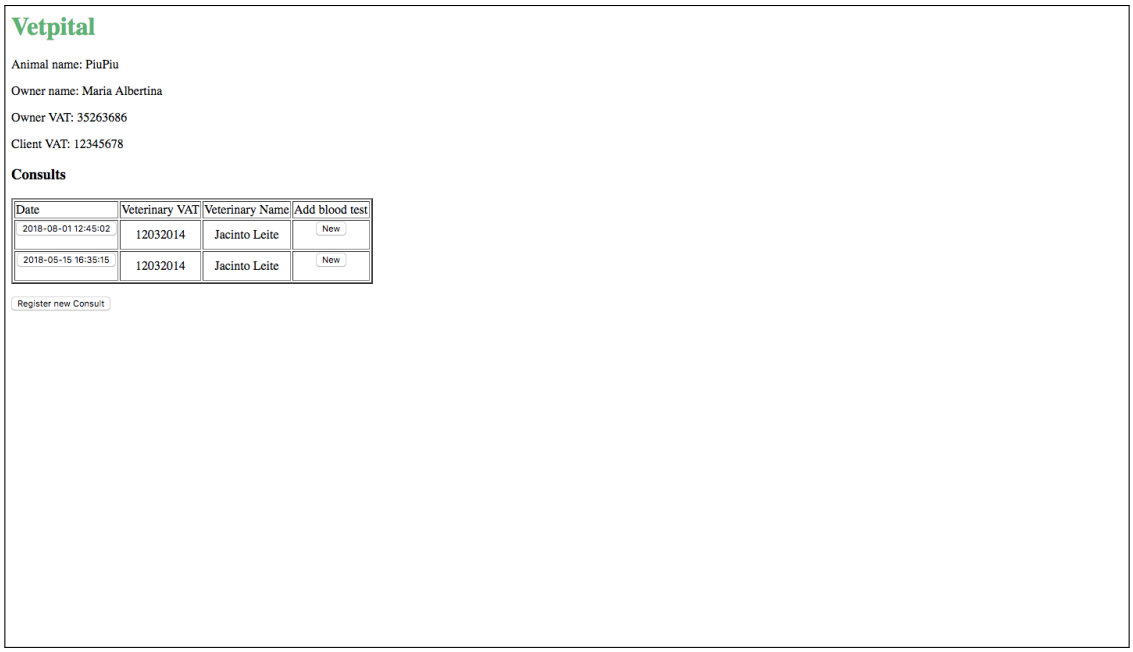


Figure 12: Retrived consults after selecting the animal named "PiuPiu", of owner "Maria Albertina", from the animal search page (section 1).

```
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();
20         }
```

```
21
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>");
32
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>");
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='{
```

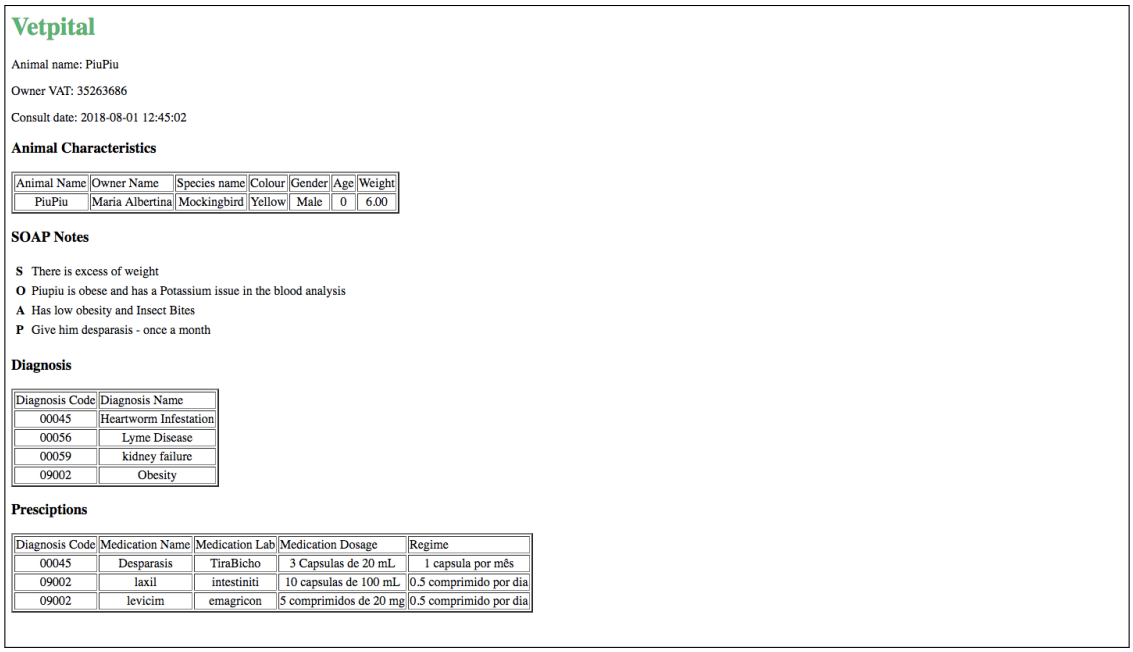
```
                    $animal_name}'/>\n");
57                  echo("<input type='hidden' name='owner_name' value='{
                        $owner_name}'/>\n");
58                  echo("<input type='hidden' name='owner_vat' value='{$ownerVat
                        }'/>\n");
59                  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 13. 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.

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
```



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

```
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          $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>{$row['colour']}</td>");
51                  echo("<td>{$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');";
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 14. 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 15. 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 16

When the "Current Consult" is pressed, the form with the required information to register a consult is presented like in figure 16.

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 17. 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 18.

Figure 14: Initial step in the page for adding consults, as seen from the phase after creating the animal seen on figure 11.

Figure 15: Adding the consult's date, after choosing the "Previous Consult" option.

Figure 16: Adding the veterinary's identification, the animal's current weight and optional vet notes, after choosing the date.

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

```
1 <html>
```

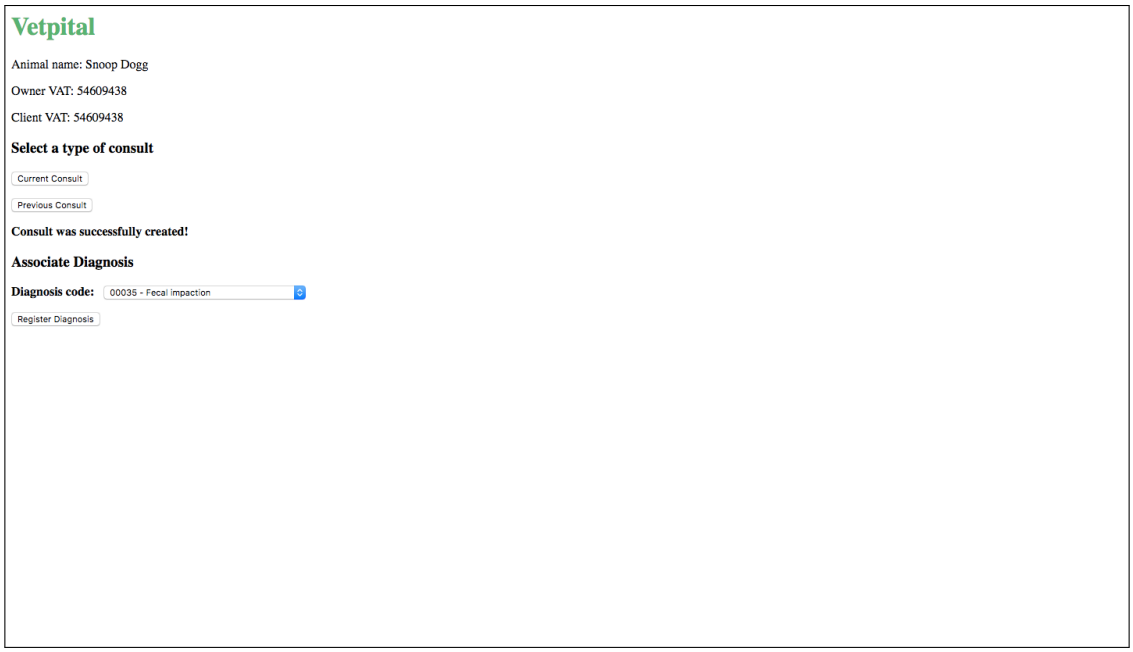


Figure 17: Options to add diagnosis to the consult.

Figure 18: Page shown after successfully adding a diagnosis to the newly created consult.

```
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>
```

```php
<?php
        # Establishing the connection with the database
        $host = "db.tecnico.ulisboa.pt";
        $user = "ist181579";
        $pass = "utfv5127";
        $dsn = "mysql:host=$host;dbname=$user";
        try
        {
                $connection = new PDO($dsn, $user, $pass);
        }
        catch(PDOException $exception)
        {
                echo("<p>Error: ");
                echo($exception->getMessage());
                echo("</p>");
                exit();
                }

        # Data received
        $animal_name = $_REQUEST['animal'];
                $ownerVat = $_REQUEST['owner_vat'];
                $clientVat = $_REQUEST['client_vat'];
                # Check received data
                echo("<p>Animal name: {$animal_name} </p>");
                echo("<p>Owner VAT: {$ownerVat} </p>");
                echo("<p>Client VAT: {$clientVat}</p>");

        echo("<h3>Select a type of consult</h3>");
        # Button to create a consult with the actual date
        echo("<form action=\"\" method=\"post\">");
        echo("<input type='hidden' name='animal' value='{$animal_name}'/>\n");
        echo("<input type='hidden' name='owner_vat' value='{$ownerVat}'/>\n");
        echo("<input type='hidden' name='client_vat' value='{$clientVat}'/>\n"
            );
        echo("<p><input type=\"submit\" name=\"btnRegisterActual\" value=\"
            Current Consult\"/></p>");
        echo("</form>");
        # Button to create a consult with a previous date
        echo("<form action=\"\" method=\"post\">");
        echo("<input type='hidden' name='animal' value='{$animal_name}'/>\n");
        echo("<input type='hidden' name='owner_vat' value='{$ownerVat}'/>\n");
        echo("<input type='hidden' name='client_vat' value='{$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");
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");
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                 }
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 12, each consult has an associated "New Blood Test" button. By pressing it, the page from figure 19 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 19: 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 20a 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 20b. 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.

VAT	name	age
12345678	Bobi	5
35263686	Bobi	22
65856663	Bobi	1
69630596	FalaFala	7
54609438	Iris	NULL
63250157	Lantejoulas	18
12345678	Luna	3
78526209	Luna	3
69630596	Malandro	5
54609438	Matumbe	NULL
45620852	Miau	3
96520520	Onitório	5
96520520	Pala	2
54609438	Papinhas	NULL
53250530	Peggy	3
35263686	PiuPiu	0
35263686	Qualquer Coisa	22
98585856	Qualquer Coisa	NULL
45620852	Rapina	4
45620852	Riscas	2
54609438	Snoop Dogg	0

(a) Before the new consult.

VAT	name	age
12345678	Bobi	5
35263686	Bobi	22
65856663	Bobi	1
69630596	FalaFala	7
54609438	Iris	NULL
63250157	Lantejoulas	18
12345678	Luna	3
78526209	Luna	3
69630596	Malandro	5
54609438	Matumbe	9
45620852	Miau	3
96520520	Onitório	5
96520520	Pala	2
54609438	Papinhas	NULL
53250530	Peggy	3
35263686	PiuPiu	0
35263686	Qualquer Coisa	22
98585856	Qualquer Coisa	NULL
45620852	Rapina	4
45620852	Riscas	2
54609438	Snoop Dogg	0

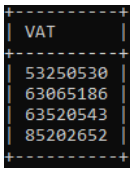
(b) After the new consult.

Figure 20: Age of all animals in the database before and after a new consult.

```
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
12 DELIMITER ;
```

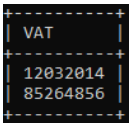
2. Veterinary Not Assistant Triggers

Figure 21 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 22 is shown the result of trying to create a assistant that already is a veterinary, and vice versa.



VAT
53250530
63065186
63520543
85202652

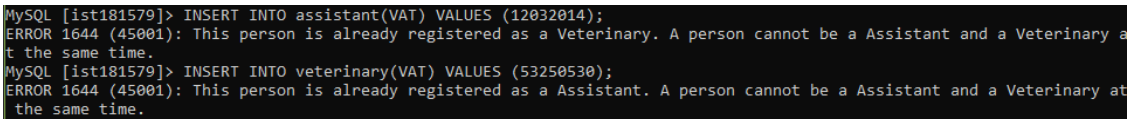
(a) Assistant's VAT



VAT
12032014
85264856

(b) Veterinary's VAT

Figure 21: VAT numbers from persons who are assistant or veterinary.



```
MySQL [ist181579]> INSERT INTO assistant(VAT) VALUES (12032014);
ERROR 1644 (45001): This person is already registered as a Veterinary. A person cannot be a Assistant and a Veterinary a
t the same time.
MySQL [ist181579]> INSERT INTO veterinary(VAT) VALUES (53250530);
ERROR 1644 (45001): This person is already registered as a Assistant. A person cannot be a Assistant and a Veterinary at
 the same time.
```

Figure 22: Results while testing the triggers.

```
1  DELIMITER $$
2
3  CREATE TRIGGER vetNotAssist BEFORE INSERT ON assistant
4  FOR EACH ROW
5  BEGIN
6          DECLARE vet_cannot_be_a_assistant CONDITION FOR SQLSTATE '45001';
7          DECLARE EXIT HANDLER FOR vet_cannot_be_a_assistant
8          BEGIN
9          SIGNAL vet_cannot_be_a_assistant SET MESSAGE_TEXT = 'This person is
               already registered as a Veterinary. A person cannot be a Assistant
               and a Veterinary at the same time.';
10         END;
11 IF EXISTS(
12         SELECT VAT
13         FROM veterinary
14         WHERE veterinary.VAT = new.VAT
15 )THEN
16         SIGNAL vet_cannot_be_a_assistant;
17
18 END IF;
19 END$$
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 23 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 24. This figure also pictures the result obtained when trying to update a phone number with an existing phone number.

VAT	phone
12032014	269358742
12345678	912345670
14740000	999999999
35263686	965423580
45620852	930536378
53250530	+63220185206
54609438	936723009
63065186	918206630
63250157	+351 50666232
63520543	963025225
65856663	920520648
69630596	251068266
78526209	270352066
85202652	210524896
85264856	263596307
91970633	963258741
96520520	936210875
98585856	918520856
919191911	632501578

Figure 23: The phone number from the persons within the database.

```
1 DELIMITER $$
2
3 CREATE TRIGGER phoneNotDuplicateInsert BEFORE INSERT ON phone_number
```

```
MySQL [ist181579]> DELETE FROM phone_number WHERE VAT = 12032014;
INSEQuery OK, 1 row affected (0.01 sec)

MySQL [ist181579]> INSERT INTO phone_number VALUES(12032014,'930536378');
ERROR 1644 (45000): This phone number already exists.
MySQL [ist181579]> INSERT INTO phone_number VALUES(12032014,'123456999');
Query OK, 1 row affected (0.01 sec)

MySQL [ist181579]> UPDATE phone_number SET phone = '930536378' WHERE VAT = 12032014;
ERROR 1644 (45000): This phone number already exists.
```

Figure 24: Results while testing the triggers.

```
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 25a, one can see the dates from the consults where "Miau" was present. The next figure (25b) represents the calculated number of "Miau"'s consults in 2017.

```
+---------------------+
| date_timestamp      |
+---------------------+
| 2016-02-06 14:50:30 |
| 2017-06-15 16:25:16 |
+---------------------+
```

(a) Miau's consults dates.

```
+-------------------------------------------+
| number_consult_year('45620852','Miau','2017') |
+-------------------------------------------+
|                                         1 |
+-------------------------------------------+
```

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

Figure 25: 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 26 show the indicators and the produced indicators before the procedure. After calling the procedure, the result is the one shown in the figure 27.

SE+

name	reference_value	units	description
Blood-Chloride	355.00	milligrams	Medido em mg/dL
Blood-cholesterol	140.00	milligrams	Medido em mg/dL
Blood-Ionized Calcium	4.40	milligrams	Medido em mg/dL
Blood-Magnesium	2.00	milligrams	Medido em mg/dL
Blood-Potassium	17.50	milligrams	Medido em mg/dL
Blood-Sodium	320.00	milligrams	Medido em mg/dL
Blood-Total Calcium	9.00	milligrams	Medido em mg/dL
Blood-Total Serum Iron	100.00	micrograms	Medido em ug/dL
creatinine level	0.50	milligrams	Medido em mg/24h
Urine-pH	6.00	pH	Sem unidade
Urine-Potassium	60.00	millimole	Medido em mmol/24h
Urine-Protein	10.00	milligrams	Medido em mg/dL
Urine-Urea	16.00	grams	Medido em g/24h
Urine-Uric Acid	400.00	milligrams	Medido em mg/24h

(a) indicator's table before the procedure.

name	VAT_owner	date_timestamp	num	indicator_name	value
Bobi	35263686	2018-07-19 19:06:00	42	Number of monocytes	999.99
Bobi	35263686	2018-07-19 19:06:00	42	Number of neutrophils	10.00
Bobi	35263686	2018-07-19 19:06:00	42	White blood cell count	5.00
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Ionized Calcium	4.40
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Sodium	322.00
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Total Serum Iron	150.00
Luna	12345678	2018-12-04 10:48:54	42	Number of monocytes	333.00
Luna	12345678	2018-12-04 10:48:54	42	Number of neutrophils	222.00
Luna	12345678	2018-12-04 10:48:54	42	White blood cell count	111.00
PiuPiu	35263686	2018-08-01 12:45:02	8256	creatinine level	1.10

(b) produced_indicator's table before the procedure.

Figure 26: Tabels before the procedure.

name	reference_value	units	description
Blood-Chloride	35.50	centigrams	Medido em mg/dL
Blood-cholesterol	14.00	centigrams	Medido em mg/dL
Blood-Ionized Calcium	0.44	centigrams	Medido em mg/dL
Blood-Magnesium	0.20	centigrams	Medido em mg/dL
Blood-Potassium	1.75	centigrams	Medido em mg/dL
Blood-Sodium	32.00	centigrams	Medido em mg/dL
Blood-Total Calcium	0.90	centigrams	Medido em mg/dL
Blood-Total Serum Iron	100.00	micrograms	Medido em ug/dL
creatinine level	0.05	centigrams	Medido em mg/24h
Urine-pH	6.00	pH	Sem unidade
Urine-Potassium	60.00	millimole	Medido em mmol/24h
Urine-Protein	1.00	centigrams	Medido em mg/dL
Urine-Urea	16.00	grams	Medido em g/24h
Urine-Uric Acid	40.00	centigrams	Medido em mg/24h

(a) indicator's table after the procedure.

name	VAT_owner	date_timestamp	num	indicator_name	value
Bobi	35263686	2018-07-19 19:06:00	42	Number of monocytes	999.99
Bobi	35263686	2018-07-19 19:06:00	42	Number of neutrophils	10.00
Bobi	35263686	2018-07-19 19:06:00	42	White blood cell count	5.00
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Ionized Calcium	0.44
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Sodium	32.20
Luna	12345678	2018-09-18 15:52:56	6136	Blood-Total Serum Iron	150.00
Luna	12345678	2018-12-04 10:48:54	42	Number of monocytes	333.00
Luna	12345678	2018-12-04 10:48:54	42	Number of neutrophils	222.00
Luna	12345678	2018-12-04 10:48:54	42	White blood cell count	111.00
PiuPiu	35263686	2018-08-01 12:45:02	8256	creatinine level	0.11

(b) produced_indicator's table after the procedure.

Figure 27: 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 $$
3
4  CREATE PROCEDURE AnimalConsultsInfo(IN animal_name VARCHAR(50),IN owner_vat
       INTEGER)
5  /*RETURNS TABLE(date timestamp, vatVet INTEGER, nameVet VARCHAR(100))*/
6  BEGIN
7  /*RETURN TABLE(*/
8           SELECT consult.date_timestamp as date,consult.VAT_vet as vatVet,person
                .name as nameVet
9           FROM consult
10          INNER JOIN veterinary ON consult.VAT_vet = veterinary.VAT
11          INNER JOIN person ON veterinary.VAT = person.VAT
12          WHERE consult.name = animal_name
13          AND consult.VAT_owner = owner_vat
14          ORDER BY consult.date_timestamp DESC;
15 /*)*/
16 END$$
17 DELIMITER ;
```

AnimalInfo

```
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

```
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))
BEGIN
        INSERT INTO _procedure VALUES(animal_name, VAT_owner, date_timestamp,
            num, 'Blood_test');
        INSERT INTO test_procedure VALUES(animal_name, VAT_owner,
            date_timestamp, num, 'blood');
        INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
            date_timestamp, num, "White_blood_cell_count",
            white_blood_cell_count);
        INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
            date_timestamp, num, "Number_of_neutrophils", number_neutrophils);
        INSERT INTO produced_indicator VALUES(animal_name, VAT_owner,
            date_timestamp, num, "Number_of_monocytes", number_monocytes);
        INSERT INTO performed VALUES(animal_name, VAT_owner, date_timestamp,
            num, VAT_assistant);
END$$
DELIMITER ;
```

InsertConsult

```
DROP PROCEDURE InsertConsult;
DELIMITER $$

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

InsertDiagnosis

```
DROP PROCEDURE InsertDiagnosis;
DELIMITER $$

CREATE PROCEDURE InsertDiagnosis(IN code CHAR(5), IN name CHAR(50), IN
    VAT_owner INTEGER, IN date_timestamp TIMESTAMP)
BEGIN
        INSERT INTO consult_diagnosis VALUES(code, name, VAT_owner,
            date_timestamp);
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
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
        FROM consult
        INNER JOIN client ON consult.VAT_owner = client.VAT
        INNER JOIN person ON client.VAT = person.VAT
        WHERE consult.name = animal_name
        AND person.name LIKE CONCAT('%',owner_name,'%');
/*)*/
END$$
DELIMITER ;
        /*DECLARE neg_balance numeric(20,2);
        SELECT sum(balance) into pos_balance
        from account natural join depositor
        where customer_name = c_name;
        select sum(amount) into neg_balance
        from loan natural join borrower
        where customer_name = c_name;

        if pos_balance is NULL then
        set pos_balance = 0;
        end if;
        if neg_balance is NULL then
        set neg_balance = 0;
        end if;
        return pos_balance - neg_balance;*/
/*end$$*/
```

searchQuery

```
DROP PROCEDURE SearchConsultName;
DELIMITER $$

CREATE PROCEDURE SearchConsultName(IN animal_name VARCHAR(50),IN owner_name
    VARCHAR(100),IN clientVat INTEGER)
BEGIN
        SELECT DISTINCT animal.name as animal,animal.VAT as vat,person.name as
            owner
        FROM animal
        INNER JOIN client ON animal.VAT = client.VAT
        INNER JOIN person ON client.VAT = person.VAT
        WHERE animal.name = animal_name
        AND person.name LIKE CONCAT('%',owner_name,'%');
END$$
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 ;
```