Note: For the following queries, assume that **$variable** is a placeholder for the corresponding variable described by the name. Also assume that **variable\_id.nextval** refers to a sequence generated & used.

Note: For each functionality/feature, consider the listed queries to be done in that order.

**Login Module**

The login module was used by having the user input an username and password into the text field of the loginModule.html page. Then in the LoginModule.php file we check to see if the fields are filled or not then we check to see if the username and password they entered exists in the database through our sql querie statments. Then we start a session to save the information of the currently logged in user.

After that we are redirected to our main page. In our php file for main page, we first start a session and check to see that the user is the same as the one that had just logged in. Then we also get the status of the logged in user and depending on whether they are an admin, scientist, or data curator they will be displayed different options of what modules they can access.

Every type of user is allowed to logout and change their passwords.

The main sql queries used are:

1. **To see if the username and password inputted is valid**

SELECT \* FROM users WHERE users.user\_name = '$\_POST[username]' and users.password = '$\_POST[password]'

**Change PW module**

This module allows users to change their passwords. The user has to enter their old password then their new one and confirm once again on their new password. The php file first checks to see if the user currently trying to access the change pw page is a user that has been logged in, this is done by sessions. Then it will check the fields of the passwords, to see if it is empty or if they new password has been incorrectly inputted. Once that is done we use our sql statement to change the user's password.

The main sql queries used are:

1. **To update the password**

UPDATE users SET password='$password1' WHERE user\_name='$username' AND person\_id=$personid

**User Module**

The user module used 7 main functions:

1. **validatePersonID**
   1. “SELECT \* FROM persons WHERE person\_id= $person\_id”
2. **validateEmail**
   1. “SELECT \* FROM persons WHERE email = $email”
3. **removeSubscriptions**
   1. “SELECT \* FROM subscriptions WHERE person\_id= $person\_id”
   2. “DELETE FROM subscriptions WHERE person\_id = $person\_id”
4. **removeUser**
   1. “DELETE FROM users WHERE user\_name = $username”
5. **removeUserFromPersonID**
   1. “DELETE FROM users WHERE person\_id = $person\_id”
6. **removePerson**
   1. “DELETE FROM persons WHERE person\_id = $person\_id”
7. **validateUsername**
   1. “SELECT \* FROM users WHERE user\_name = $username”

To add a new person:

1. **validateEmail** was used to ensure the unique constraint was not violated
2. “INSERT INTO persons VALUES (person\_id.nextval, $first\_name, $last\_name, $address, $email, $phone\_number)”

To update a person:

1. **validatePersonID** was used to ensure the an existing person id was entered before updating a person
2. “UPDATE persons SET first\_name = $first\_name, last\_name = $last\_name, address = $address, email = $email, phone = $phone WHERE person\_id = $person\_id”
   1. Only the fields that were entered in the form are included in the query

To remove a person:

1. **validatePersonID** was used to ensure the an existing person id was entered before removing a person
2. **removeSubscriptions** was used to remove any subscriptions the person had before removing the person ensure the integrity constraint was not violated
3. **removeUserFromPersonID** was used to remove any user accounts associated with the person to ensure the integrity constraint was not violated
4. **removePerson** was used to remove the person

To display the contents of the persons table:

1. The function **get\_all\_persons** was used to first retrieve all the records in the person table – “SELECT \* FROM persons”

To add a new user account:

1. **validateUsername** was used to ensure the unique constraint was not violated
2. **validatePersonID** was used to ensure the an existing person id was entered
3. “INSERT INTO users VALUES ($username, $password, $role, $person\_id, to\_date($date\_registered, 'dd-mm-yyyy hh24:mi:ss'))”

To update a user account:

1. **validateUsername** was used to ensure an existing username was entered before updating
2. “UPDATE users SET password = $password, role = $role WHERE user\_name = $username”
   1. Only the fields that were entered in the form are included in the query

To remove a user account:

1. **validateUsername** was used to ensure an existing username was entered before removing
2. **removeUser** was used to remove the user account

To display the contents of the users table:

1. The function **get\_all\_users** was used to first retrieve all the records in the users table – “SELECT \* FROM users”

**Sensor Module**

The sensor module used 3 main functions:

1. **validateSensor**
   1. “SELECT \* FROM sensors WHERE sensor\_id = $sensor\_id”
2. **removeSubscriptionsFromSensorID**
   1. “DELETE FROM subscriptions WHERE sensor\_id = $sensor\_id”
3. **removeSensor**
   1. “DELETE FROM sensors WHERE sensor\_id = $sensor\_id”

To add a sensor:

1. “INSERT INTO sensors VALUES ( sensor\_id.nextval, $location, $type, $description)”

To remove a sensor:

1. **validateSensor** was used to ensure an existing sensor id was entered before removing
2. **removeSubscriptionsFromSensorID** was used to remove any subscriptions associated with the sensor to ensure the integrity constraint was not violated
3. **removeSensor** was used to remove the sensor

To display the contents of the sensors table:

1. The function **get\_all\_sensors** was used to first retrieve all the records in the sensors table – “SELECT \* FROM sensors”

**Upload Module**

The upload module allows data curators to upload their data, which are images, audio files and csv files. Images are only accepted in jpg format, audio files are only accepted as wav files and csv files must be in format of sensor id, date, value.

**Images:**

When uploading images, the user is given fields in which they must fill. The first is what image they want to upload and this is done through the html input file type form. Next is the sensor id of the said image they are going to upload. After that is the date, then the description.

Once that is done it will go to our Image.php file which will first use sessions to check that the user currently logged in is a data curator. Then it will get the information of the image that the user wants to upload. It will then check to see if it exceeds 64kb and return an error if it does, then it will check to see if it is in proper format (jpg) and returns an error if it isn't. It will also check to see if a valid sensor id has been inputted.

This is done through the use of the file 'size' and file 'type'. Once it passes the checks, it will get ready to upload the information into the images table. First it will get a new unique id from images by using an sql statement which gets the max image id from images then it will continue on from that. Next it will start inputting the blob file into recorded data and thumbnail respectively. We upload this information by first have empty blobs in the sql statement, then we fill it up by using oci\_new\_descriptor, oci\_bind\_by\_name and savefile.

The main sql queries used are:

**1) To get unique image\_id**

SELECT MAX(image\_id) FROM images

1. **To insert into images table**

INSERT INTO images(image\_id, sensor\_id, date\_created, description, thumbnail, recoreded\_data) VALUES ('$image\_id', '$sensor\_id', to\_date('$date', 'dd-mm-YYYY hh24:mi:ss'), '$description', empty\_blob(), empty\_blob()) returning thumbnail, recoreded\_data into :thumbnail, :recoreded\_data

**Audio:**

The audio php uploading file is similar to that of the image one. The user first fills in the fields of which are what audio file is to be uploaded, the sensor id, the date, length, and description. Then after the fields are filled, it will go to the audio.php file and run the code which will first check again through sessions to see if the currently logged in user is a valid user or not.

Then it will see if an audio file has been uploaded or not. The next check after that is to see if it is a wav file or not. It will also check to see if a valid sensor id has been inputted. If it does not pass these checks, it will prompt the user to retry. Next it will get ready to upload the information into the database. This is done similarily to how we upload images, with first getting an unique audio id, then using an empty blob and oci\_new\_descriptor, oci\_bind\_by\_name and savefile to upload the audio file.

The main sql queries used are:

**1) To get an unique recording\_id**

SELECT MAX(recording\_id) FROM audio\_recordings

1. **To insert into audio\_recordings**

INSERT INTO audio\_recordings(recording\_id, sensor\_id, date\_created, length, description, recorded\_data) VALUES ('$recording\_id', '$sensor\_id', to\_date('$date', 'dd-mm-YYYY hh24:mi:ss'), '$length', '$description', empty\_blob()) returning recorded\_data into :recorded\_data

**CSV Files:**

What we upload to the database is a csv file of format sensor id, date, and value. These are all on one line separated by a newline and we can have multiple entries by seperating it with newlines. After a csv file is uploaded, in our php file we first check to see if the currently logged in user is a valid data curator. Then we check to see if the file uploaded is valid, i.e. has a size greater than 0 bytes.

Once the checks pass, we then will use an array to store our sql statments that we will execute in a loop later in the code. First we will read from the csv file using fopen and fgetcsv which will then put the sensor id, date and value into a variable. We will then parse these variables into sql statements and then will put it into our array of sql queries. After reading the file is all done, we will then have a loop which will execute all the statements that have been stored in our array.

The main sql queries used are:

**1) To insert the scalar data from csv file**

INSERT INTO scalar\_data VALUES ('$new\_id', '$sensor\_id', to\_date('$date', 'dd-mm-yyyy hh24:mi:ss'), '$value')

**Search Module**

To search:

We did 3 separate queries: one for each of images, audio recordings & scalar data

1. For Images:

“SELECT i.\* FROM images i, sensors s, subscriptions t WHERE t.person\_id = $person\_id AND s.sensor\_id = t.sensor\_id AND i.sensor\_id = s.sensor\_id AND s.sensor\_type = $sensor\_type AND s.location = $sensor\_location AND ( lower(i.description) LIKE $keyword1 OR lower(s.description) LIKE $keyword1 OR lower(i.description) LIKE $keyword2 OR lower(s.description) LIKE $keyword2) AND to\_date(i.date\_created, 'dd-mm-YYYY hh24:mi:ss') >= to\_date(to\_date($start\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss') AND to\_date(i.date\_created, 'dd-mm-YYYY hh24:mi:ss') <= to\_date(to\_date($end\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss')”

1. For audio recordings:

“SELECT a.\* FROM audio\_recordings a, sensors s, subscriptions t WHERE t.person\_id = $person\_id AND s.sensor\_id = t.sensor\_id AND a.sensor\_id = s.sensor\_id AND s.sensor\_type = $sensor\_type AND s.location = $sensor\_location AND ( lower(a.description) LIKE ‘%$keyword1%’ OR lower(s.description) LIKE '%$keyword1%' OR lower(a.description) LIKE ‘%$keyword%’ OR lower(s.description) LIKE ‘%$keyword%’) AND to\_date(a.date\_created, 'dd-mm-YYYY hh24:mi:ss') >= to\_date(to\_date($start\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss') AND to\_date(a.date\_created, 'dd-mm-YYYY hh24:mi:ss') <= to\_date(to\_date($end\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss')”

1. For scalar data:

“SELECT c.id, c.sensor\_id, to\_char(c.date\_created, 'dd/mm/YYYY hh24:mi:ss') as date\_created, c.value FROM scalar\_data c, sensors s, subscriptions t WHERE t.person\_id = $person\_id AND s.sensor\_id = t.sensor\_id AND c.sensor\_id = s.sensor\_id AND s.sensor\_type = $sensor\_type AND s.location = $sensor\_location AND ( lower(s.description) LIKE '%$keyword1%' OR lower(s.description) LIKE '%$keyword2%') AND to\_date(c.date\_created, 'dd-mm-YYYY hh24:mi:ss') >= to\_date(to\_date($start\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss') AND to\_date(c.date\_created, 'dd-mm-YYYY hh24:mi:ss') <= to\_date(to\_date($end\_date, 'YYYY-mm-dd'), 'dd-mm-YYYY hh24:mi:ss')”

* $start\_date & $end\_date are assumed to be in the form YYYY-mm-dd, or example ‘2015-11-23’
* “lower(i.description) LIKE $keyword1 OR lower(s.description) LIKE $keyword1” is done for every keyword and connected via an “OR”