USC LIMS Software

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Installation Guide

1 Introduction

This section will explain the LIMS software and its applicability to laboratories that utilizes sample tracking and information management.

A Laboratory Information Management System (LIMS) is software that gathers and manages information within laboratories. The USC LIMS software manages sample information between different testing stations to streamline the laboratory work process and testing procedure. The software also utilizes barcode technology for tagging and tracking of samples.

1.1 User Roles

The system can be accessed by four (4) different types of users. Each user has its own interface in which their roles are established. The customer is any user who access the system via the Internet by going to the designated domain name. The customer has no login privileges and can only view web pages and track their samples through a number code search.

The remaining three (3) users have privileges that allow them to control information within the system.

The Administrator is responsible for overseeing the entire work process and has the highest privilege of all user types allowing them to edit and destroy or delete data within the system.

The Analyst is responsible for tagging and tracking samples that are received by the testing stations. The analyst are also responsible for the use of the barcode scanners.

The Secretary is responsible for inputting information regarding clients and samples, and for printing the barcode stickers which will be used for tagging and tracking.

1.2 Implementation

The USC LIMS is a customized system that follows a rigid workflow and must require continual updates and maintenance to ensure that the system can continue to work smoothly and so that unforeseen problems may be dealt with efficiently. An extensive revision of the code must be done if ever there will be major changes in the organization's business process.

2 Requirements

This section will provide an overview of the software and hardware prerequisites for the software installation.

2.1 Software Requirements

The software required to install and operate the system will include the following:

- Windows 7, Windows 8, Windows 8.1, Windows 10+ (Windows)
- OS X Yosemite 10.10 or later (Mac)
- Composer
- XAMPP
- Code Editor (Sublime Text or Visual Studio Code)
- Web browser (preferably Google Chrome)
- Git

2.2 Minimum Hardware Requirements

These will be the minimum requirements for the hardware in order to run the required software that is used by the system:

- 1.8 GHz or faster processor. Dual-core or better recommended
- 2 GB of RAM; 4 GB of RAM recommended
- Hard disk space: up to 130 GB of available space, depending on features installed; typical installations require 20-50 GB of free space.
- Video card that supports a minimum display resolution of 720p (1280 by 720)

2.3 Setup

If the system unit you are using meet the minimum requirements for the hardware, you can start by setting up the software required for installing the application. Download each software and carefully follow through with its installation wizard.

2.3.1 Web Browser

It is recommended that Google Chrome be used as the browser for access. If you do not have Chrome installed you can download it by using the built-in web browser that comes with your operating system. Search for 'Google Chrome' in the search field and click on the link that starts with 'www.google.com…' to make sure you are downloading from the legitimate source.
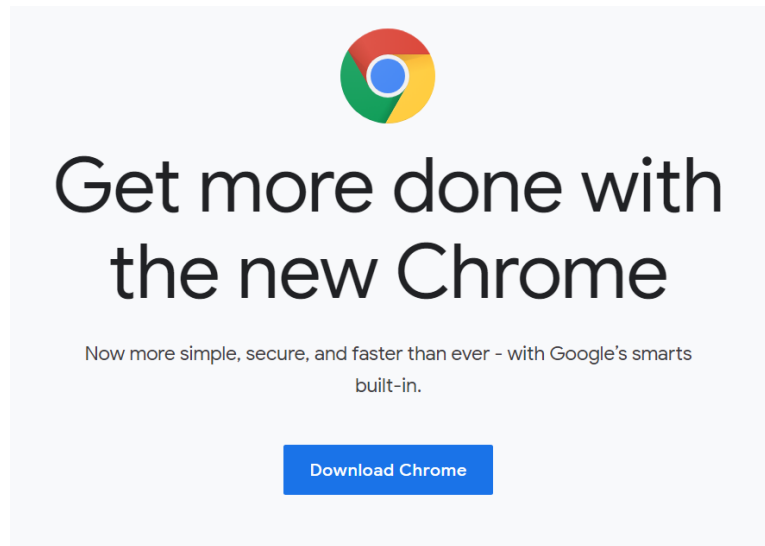
Figure 1. Google Chrome download link

2.3.2 Code Editor

A code editor is used to view and write codes in creating programs. It is recommended to use Visual Studio Code as it has a built-in terminal in its interface allowing users to enter commands easily.

You can download Visual Studio Code by clicking the download button on the website: code.visualstudio.com
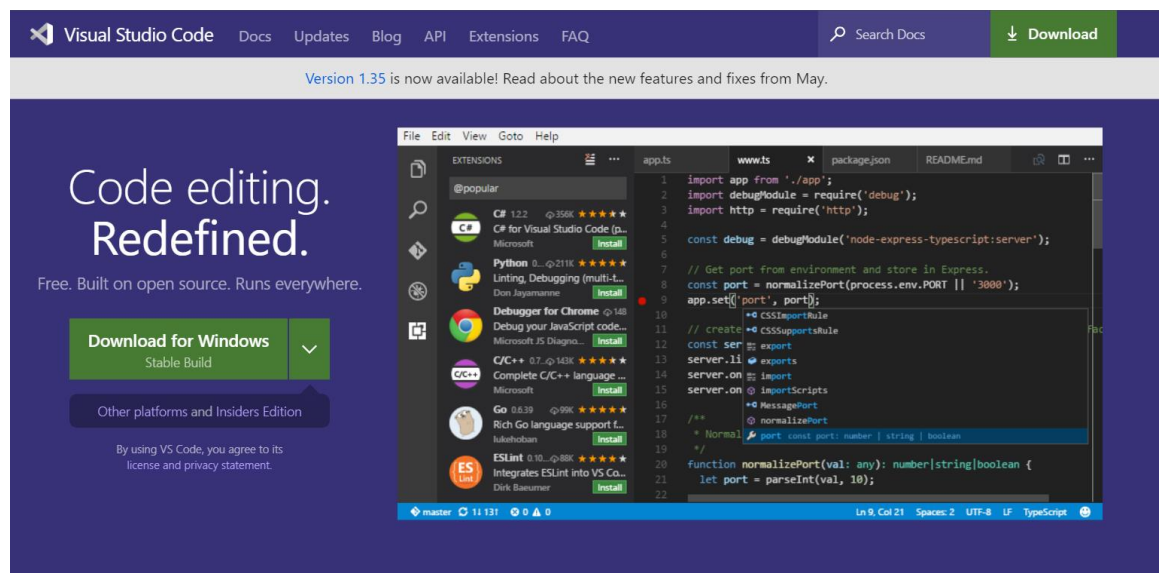

Figure 2. Visual Studio Code landing page

You can use other code editors such as Sublime Text if VSC is too bulky for your system as VSC uses up a lot of RAM space.

2.3.3 XAMPP

XAMPP is a cross-platform package for web servers. XAMPP also comes with PHP a vital component of the LIMS (written in PHP). Specifically, Apache and MySQL is required from XAMPP to enable local deployment of the application.

You can search and download XAMPP from any web browser:

Figure 3. XAMPP search result and landing page

You can click the download button with its corresponding operating system and version of PHP. XAMPP will typically be placed in drive C. However, you can decide to place it elsewhere in the installation wizard.

2.3.4 Git

Git is a version control system. It is primarily used to copy the LIMS source code from https://github.com/ where it is hosted. You can download Git from the web, as shown below.
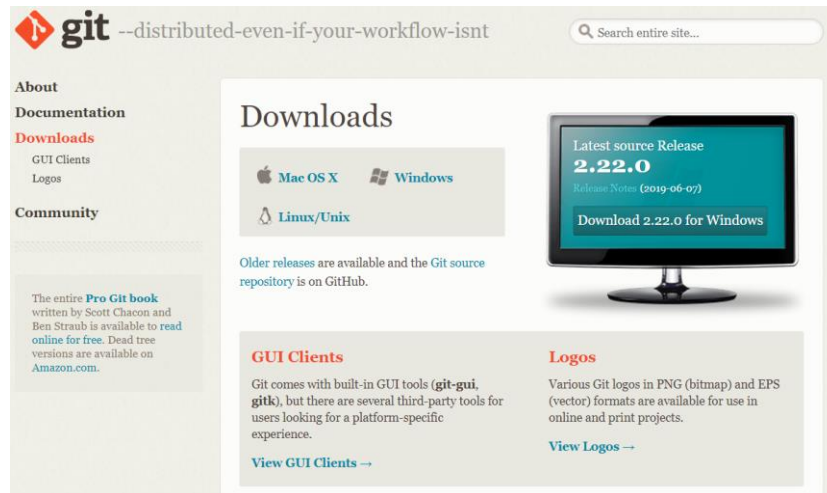
Figure 4. Git download page

After installing git you can open the bash terminal by using it in the xampp folder:

1. Locate your xampp directory:

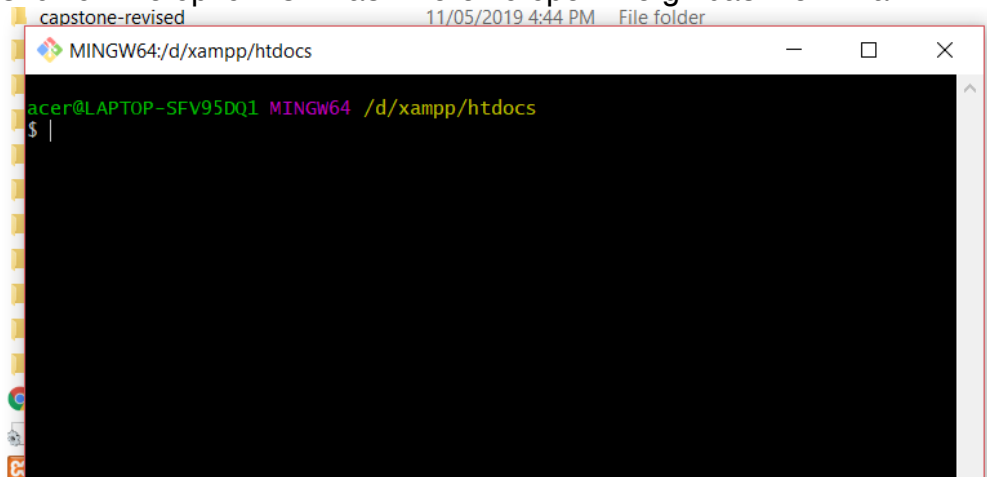

2. Go into the directory and find the htdocs folder:

3. Double-click into the folder. The htdocs folder is where the project folders will be placed in XAMPP. Here are examples of project folders:

4. To check the git bash terminal, right click anywhere within the htdocs folder. (Note: make sure no folder is selected. Selected folders will be highlighted with blue)

capstone-revised	11/05/2019 4:44 PM	File
dashboard	11/05/2019 4:40 PM	File
ict146	27/05/2019 2:05 PM	File

View >	11/05/2019 4:40 PM File
Sort by >	20/05/2019 11:59 ... File
Group by >	11/05/2019 4:52 PM File
Refresh	16/05/2019 1:34 A... File
	11/05/2019 4:44 PM File
Customize this folder...	21/06/2019 11:16 ... File
Paste	11/05/2019 4:40 PM File
Paste shortcut	11/05/2019 4:40 PM File
Undo Delete Ctrl+Z	06/05/2019 3:05 PM Chr
Open in Visual Studio	27/02/2017 5:36 PM Cas
Git GUI Here	16/07/2015 11:32 ... Icon
Git Bash Here	16/07/2015 11:32 ... PHF
Give access to >	
New >	

5. Click on the option 'Git Bash Here' to open the git bash terminal:

This terminal will allow you to enter git commands to copy/clone the LIMS project folder in your htdocs directory. This means you now have git installed in your system.

2.3.5 Composer

The LIMS software uses a PHP framework called Laravel. Composer is used to install Laravel. You can download the Composer-Setup.exe to install Composer in your system. You can also run the installation code inside a terminal like the bash terminal from above, to install Composer on a specific directory. You can find more details on the download page https://getcomposer.org/download/.

Download Composer   Latest: v1.8.6

Windows Installer

The installer will download composer for you and set up your PATH environment variable so you can simply call `composer` from any directory.

Download and run Composer-Setup.exe - it will install the latest composer version whenever it is executed.

Command-line installation

To quickly install Composer in the current directory, run the following script in your terminal. To automate the installation, use the guide on installing Composer programmatically.
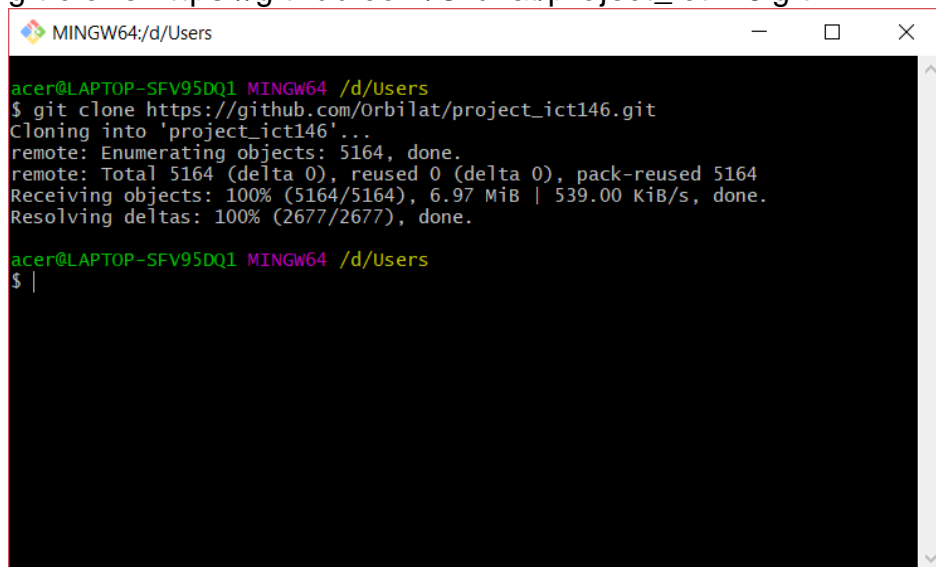
```
php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
php -r "if (hash_file('sha384', 'composer-setup.php') === '48e3236262b34d30969dca3c37281b3b4bbe3221bda826ac6a9a
php composer-setup.php
php -r "unlink('composer-setup.php');"
```

Figure 4. Composer downloads page

3 Installation

This section will provide an overview of the installation process of the LIMS software using git.

1. Follow the steps in section 2.3.4 to open the git bash terminal in the htdocs directory.

2. Enter the git clone command to copy the project folder from github:
   git clone https://github.com/Orbilat/project_ict146.git

3. Once the cloning is finished you will see the project_ict146 folder within your htdocs directory.

capstone-revised	11/05/2019 4:44 PM	File folde
dashboard	11/05/2019 4:40 PM	File folde
img	11/05/2019 4:40 PM	File folde
lite-accounting	20/05/2019 11:59 ...	File folde
lite-erp	11/05/2019 4:52 PM	File folde
newr	16/05/2019 1:34 A...	File folde
project_ict146	27/05/2019 2:05 PM	File folde
RohanAuth	11/05/2019 4:44 PM	File folde
solid-structure-new	21/06/2019 11:16 ...	File folde
webalizer	11/05/2019 4:40 PM	File folde

4. Open Visual Studio Code from the Start menu or search for it.
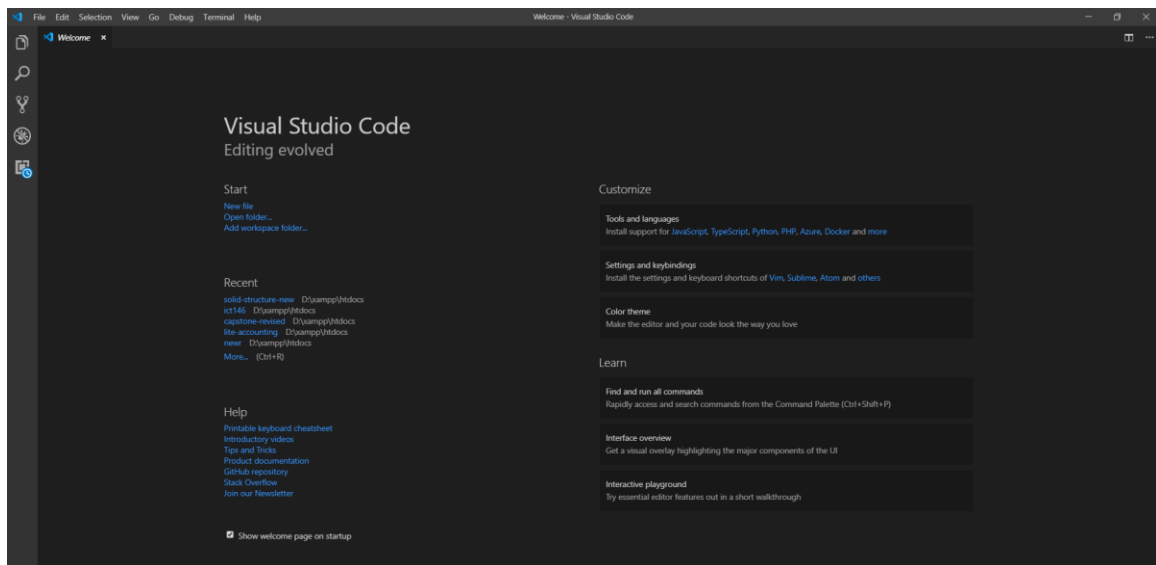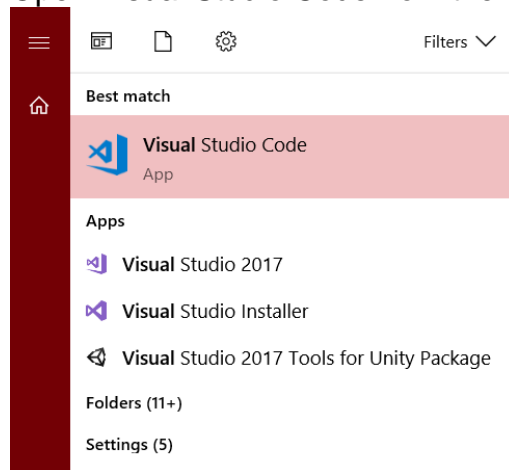
5. On the upper left side, under the File tab click Open Folder.
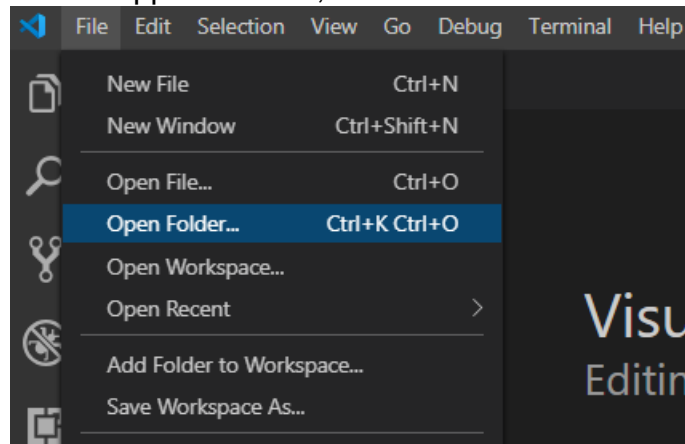
6. Navigate to the project_ict146 folder. Xampp > htdocs > project_ict146.
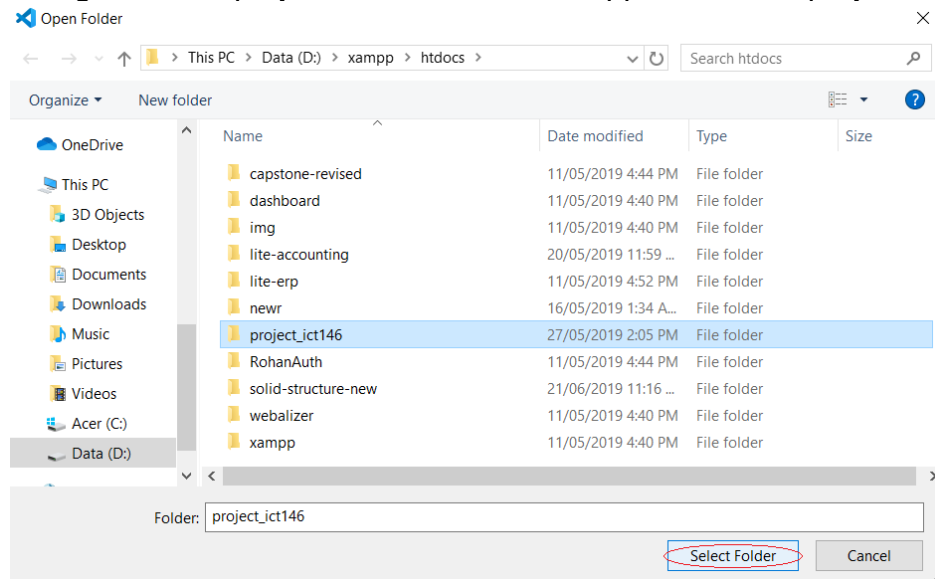
7. Click the Select Folder button and it will open the project folder in Visual Studio Code. At the left side you will see the contents of the folder.
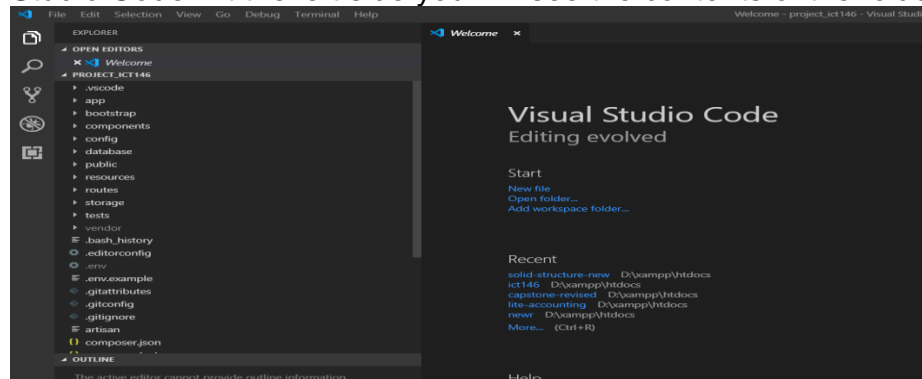
8. Open the XAMPP Control Panel by searching XAMPP at the Start menu.
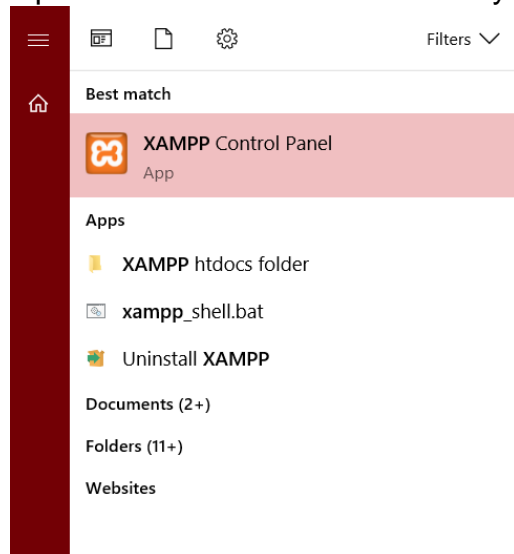
The Control Panel will look like the image below. As stated in section 2.3.3 we will be using Apache and MySQL. Click the Start buttons for both of them.
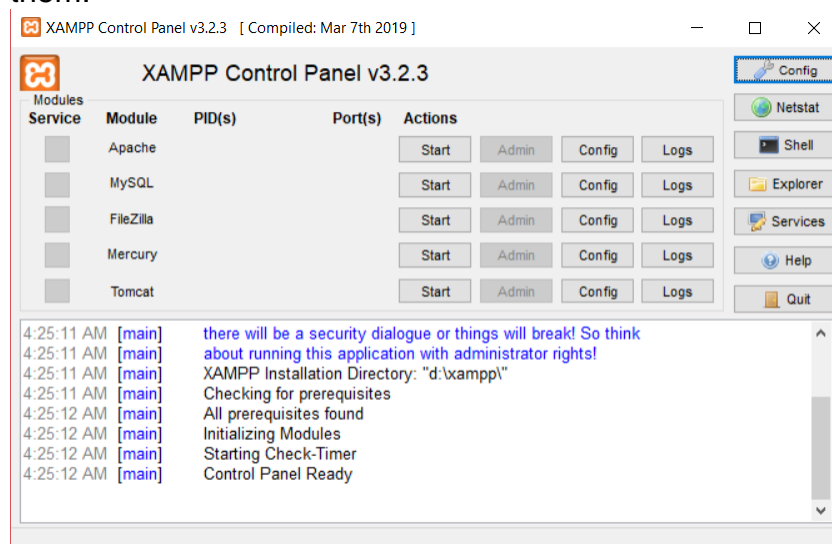
Once both Apache and MySQL are highlighted in green, it means they are both running.
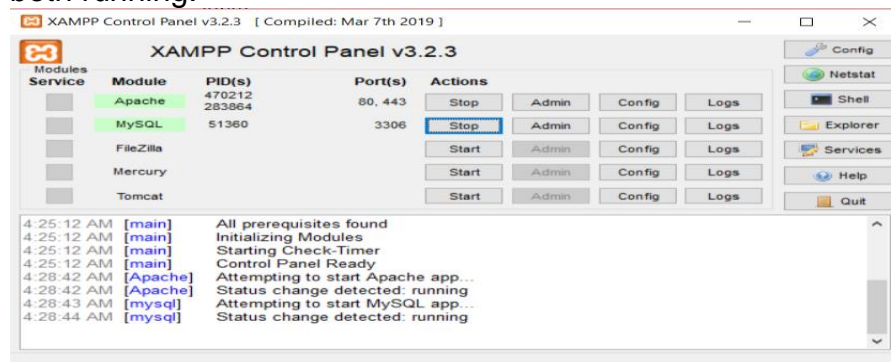
9. The next step is creating the local database to migrate data from the project. Open the web browser (Google Chrome) and in the search field enter 127.0.0.1 to open the XAMPP dashboard.

At the right side click on the phpMyAdmin link.
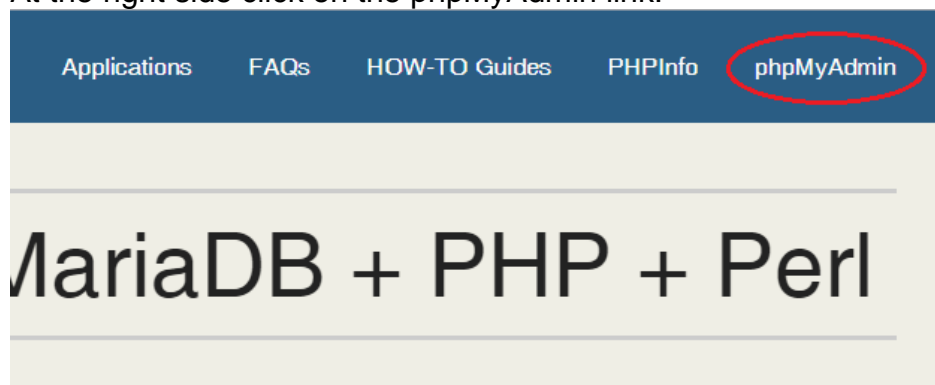
You will be taken to the phpMyAdmin dashboard as shown below.
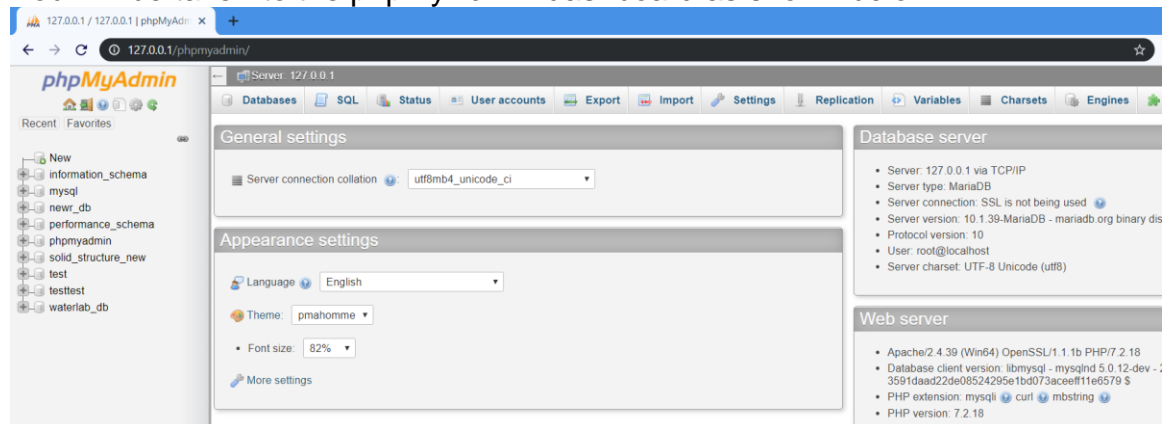
Click on new at the left side of the screen to create your own database.
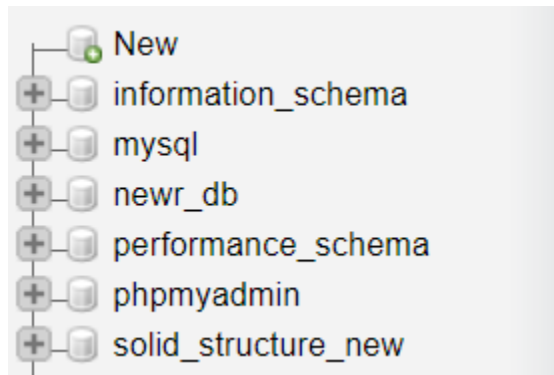
On the name field you can enter the name of your database, leave the second option as is. Below the database is named my_database. Click the Create button to create the new database.
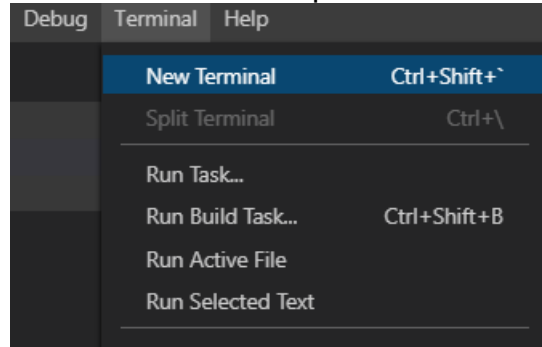

When the database is created you will see it shown at the left side of the dashboard and without any tables in the database.
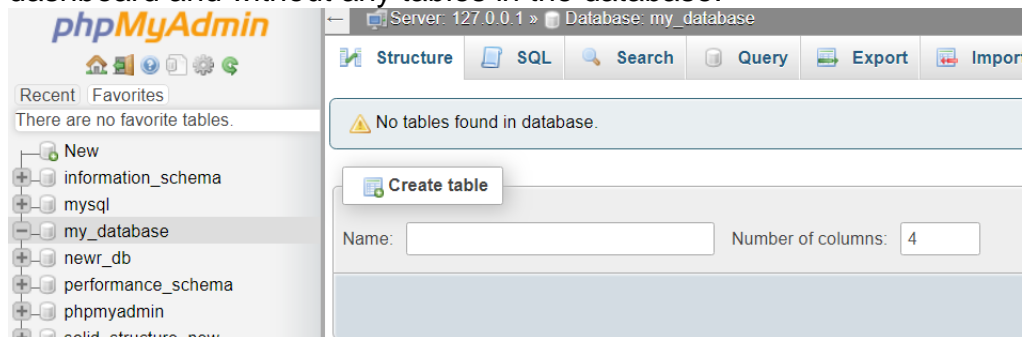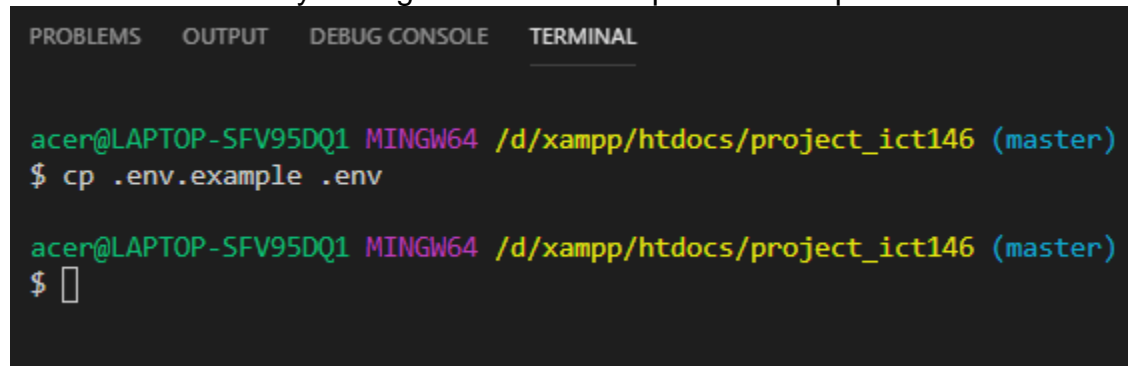
10. Return to your code editor (Visual Studio Code) and navigate to the Terminal tab at the top menu. Select on New Terminal.
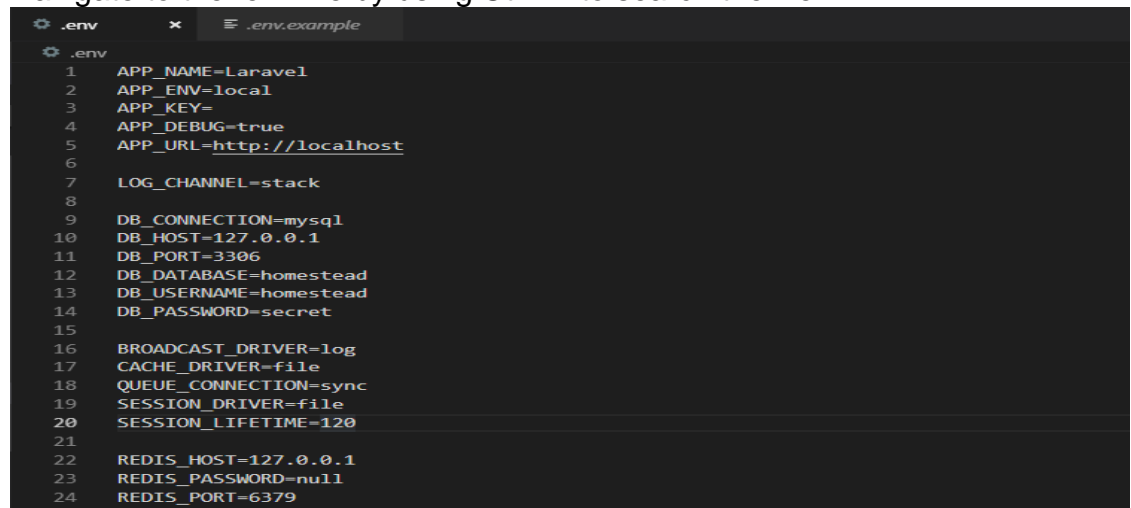

A new terminal will appear as a section at the bottom side of the screen.
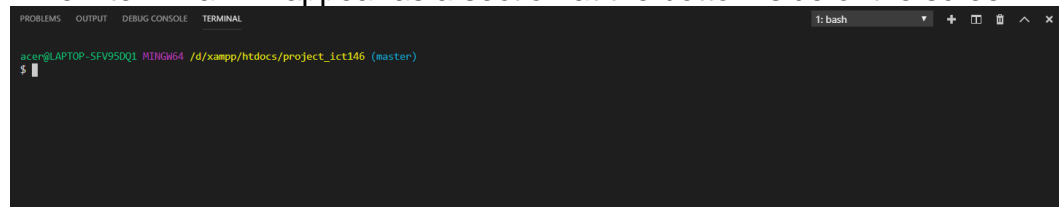
Create an .env file by writing the command: cp .env.example .env

Navigate to the .env file by using Ctrl+P to search the file.

Replace the values for DB_DATABASE to the database name you created at step 9, DB_USERNAME to root and the DB_PASSWORD will be left empty.

```
DB_CONNECTION=mysql
DB_HOST=127.0.0.1
DB_PORT=3306
DB_DATABASE=my_database
DB_USERNAME=root
DB_PASSWORD=
```

Save your changes by pressing Ctrl+S.

11. Update your dependencies by entering the command on the terminal:
composer update

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$ cp .env.example .env

acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$ composer update
Loading composer repositories with package information
Updating dependencies (including require-dev)
```

This will take a few minutes.

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL

Discovered Package: beyondcode/laravel-dump-server
Discovered Package: fideloper/proxy
Discovered Package: laravel/nexmo-notification-channel
Discovered Package: laravel/slack-notification-channel
Discovered Package: laravel/tinker
Discovered Package: laravelcollective/html
Discovered Package: maddhatter/laravel-fullcalendar
Discovered Package: nesbot/carbon
Discovered Package: nunomaduro/collision
Package manifest generated successfully.

acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$
```

12. Once all packages are installed successfully. Create a new application key by running the command: php artisan key:generate

```
acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$ php artisan key:generate
Application key set successfully.
```

13. Migrate the database information using the command: php artisan migrate:fresh –seed

```
acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$ php artisan migrate:fresh --seed
Dropped all tables successfully.
Migration table created successfully.
Migrating: 2019_04_07_101113_create_table_produits
Migrated:  2019_04_07_101113_create_table_produits
Migrating: 2019_04_07_101232_create_table_events
Migrated:  2019_04_07_101232_create_table_events
Migrating: 2019_04_07_101321_create_table_employees
Migrated:  2019_04_07_101321_create_table_employees
```

```
Migrated:  2019_05_20_095600_create_client_contacts
Migrating: 2019_05_20_102209_create_failed_jobs_table
Migrated:  2019_05_20_102209_create_failed_jobs_table
Seeding: EmployeesTableSeeder
Seeding: StationsTableSeeder
Seeding: ParametersTableSeeder
Database seeding completed successfully.

acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$
```

If an error occurs, you can try running the command composer dump-autoload, then repeating the migration command.

14. Lastly, once migrations and seeding are completed, you can serve the application through the command: php artisan serve

```
acer@LAPTOP-SFV95DQ1 MINGW64 /d/xampp/htdocs/project_ict146 (master)
$ php artisan serve
Laravel development server started: <http://127.0.0.1:8000>
```

15. Go to any web browser, preferably Google Chrome and enter on the search field: localhost:8000 or 127.0.0.1:8000 and you will be able to view the LIMS application. Go to localhost:8000/login for login details.
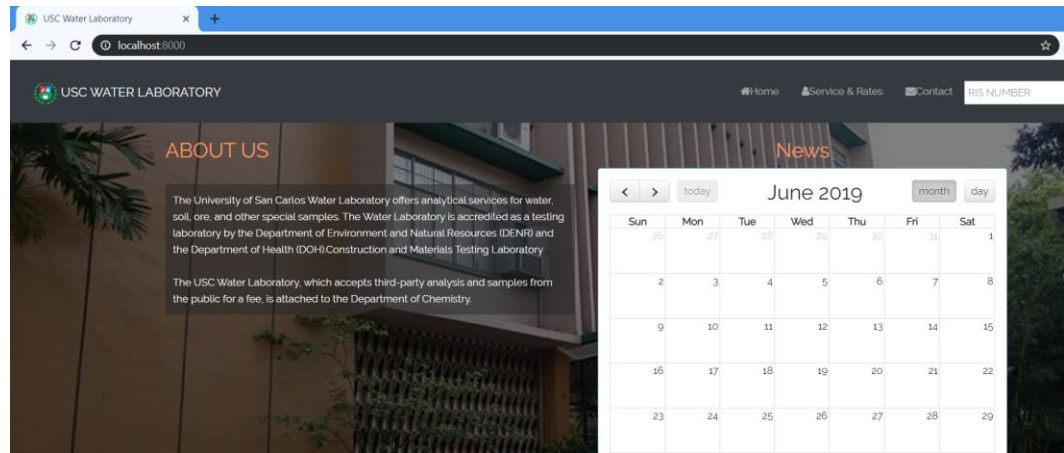
The LIMS application has been installed and the source code is found in the project_ict146 folder. You can check or control database information by going to 127.0.0.1/phpmyadmin and view the database you have created. The system is now ready for deployment on the Internet.