



Database I – SCS1103

Assignment – Scenario 02

4 students per group
(Groups are given in a separate Excel sheet)

**Assignment Deadline: On or before 4.00pm of
26th June, 2018**

Consider the following scenario given with respect to a private hospital.

Suwasetha Medical Associates (CMA) is a private hospital located in Kandy which has multiple owners. Currently it is owned by a group of medical corporations and individual physicians. For medical corporations with ownership interest in the hospital, the corporation name and headquarters are obtained. Corporation name uniquely identifies a medical corporation. The percentage ownership for each owner is also recorded.

The employees working at the hospital include physicians, surgeons, nurses, and support staff. All employees except the surgeons are on an annual salary. Surgeons do not receive a salary but works for Suwasetha Medical Associates on a contract basis. As stated above it is possible for a physician to have an ownership position in the hospital. All employees have an employee number, name, gender (male or female), address and telephone number and with the exception of surgeons, all employees also have a salary. Each person who works in the hospital can be identified by an employee number. For each physician, his or her specialty is captured whereas for each surgeon data pertaining to his or her specialty and contract are captured. Contract data for surgeons include the type of contract and the length of the contract (in years). Grade and years of experience represent the specific data requirement for nurses. Dependents details of each employee are also recorded for welfare/insurance purposes. These details include the name of the dependent, gender, relationship to the employee and the birth date.

A patient may have several illness and several patients may have the same illness. For each illness a code and description are recorded. In order to qualify as a patient, a patient must have at least one illness and Suwasetha keeps track of the patients those who are treated at the hospital. Data for patients consists of both personnel data and medical data. Personal data includes patient number (the unique identifier of a patient), name, gender (male or female), date of birth, address, and telephone number. Medical data includes the patient's blood type, cholesterol level, blood sugar, and the names of all patients' allergies. It should also be noted that a patient may have several allergies.

Surgeons perform surgery on patients as needed. It is required that a surgery schedule keeps track of the operation theatre where a surgeon performs a certain surgery type on a particular patient and when that surgery type is performed. Only some patients need surgeries and others don't. A surgery code is used to identify each specific type of surgery. In addition, the name, category and special needs are also captured for each surgery type. Moreover, there is the need to keep track of nurses who can be assigned to a specific surgery type since all nurses cannot

be assigned to assist in all type of surgeries. A nurse cannot be assigned to more than one surgery type. It is the policy of the hospital that all types of surgeries have number of nurses. Suwasetha maintains a list of surgery skills and each surgery skill is identified by its description and a unique skill code. A surgery type may require many surgery skills. Nurses possess one or more of these surgery skills. In order to assign a nurse to a surgery type, a nurse should possess one or more of the skills required for that surgery type.

Depending on the health condition, some patients may stay at the hospital for a few days. Additional data for each in-patient consists of a required date of admission along with the patient's location (nursing unit, room number, and bed number). A nurse attends to several in-patients. No more than one nurse attends to an in-patient; but some in-patients may not have any nurse attending to them.

Every physician serves as a primary care physician for number of patients. A patient is assigned one physician for primary care. Physicians prescribe medications to patients. Thus it is necessary to capture which physician(s) prescribes what medication(s) to which patient(s) along with dosage and frequency. Medications are identified by their unique medication code and also include name, quantity on hand, quantity on order and unit cost. As a medicine may interact with several other medicines, the severity of such interaction must be recorded in the system.

At least following sections must be covered in your implementation to achieve good grades for the assignment.

- 1) **A consistent database design** should be achieved for the system based on a good [ER \(or EER\) Diagram](#) followed by a [mapping process](#). If you make any assumptions clearly state those assumptions in the document.
- 2) **Implement the database** using your knowledge of [SQL Data Definition](#) with **appropriate constraints** where necessary.

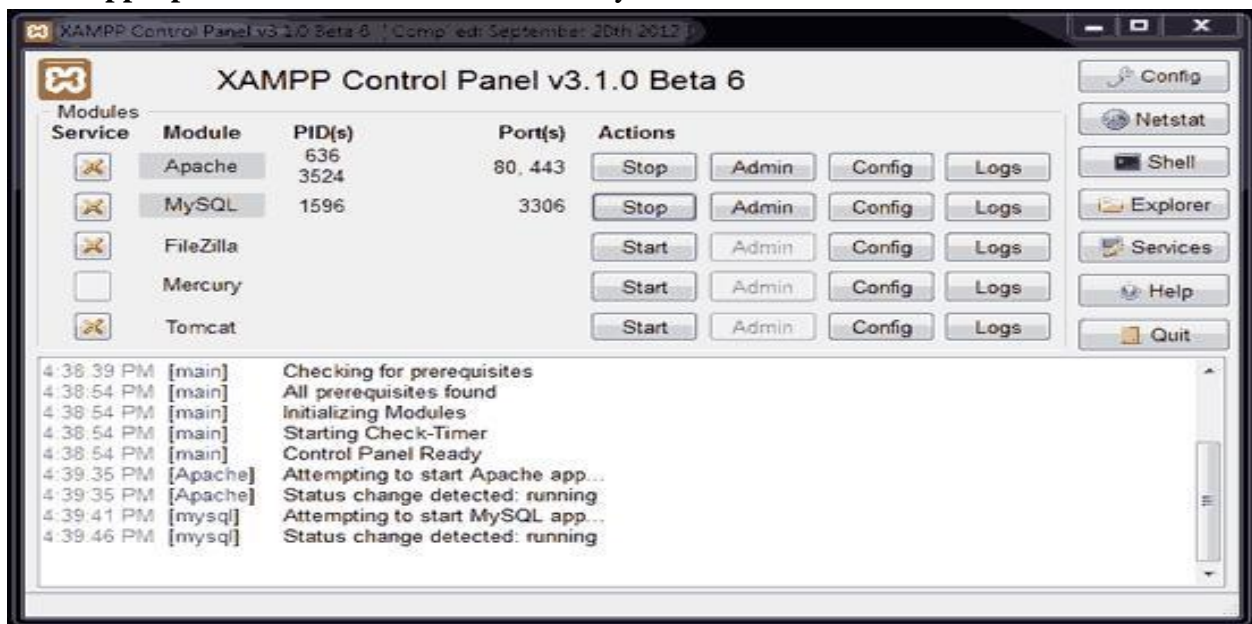


Figure 1: XAMPP Control Panel

Hint: Download and install XAMPP (<https://www.apachefriends.org/download.html>) in your machines to setup a local web server. Run XAMPP control panel as administrator. Start Apache and MySQL. This is the first step needed to create a database using XAMPP.

After that, visit “**localhost/xampp/index.php**” from a Browser. Click on “**phpMyAdmin**” under the “Tools” Section

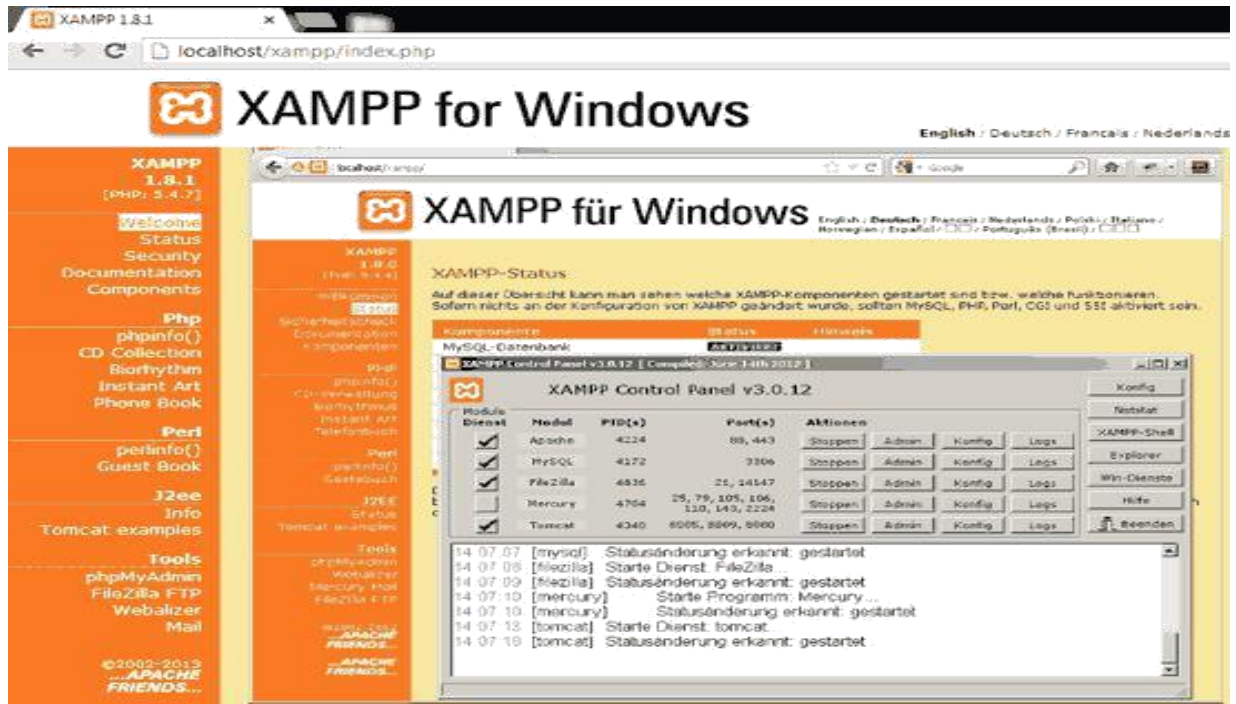


Figure 2: localhost/xampp/index.php Interface

You will see *phpMyAdmin* page as shown below. Click on Databases.

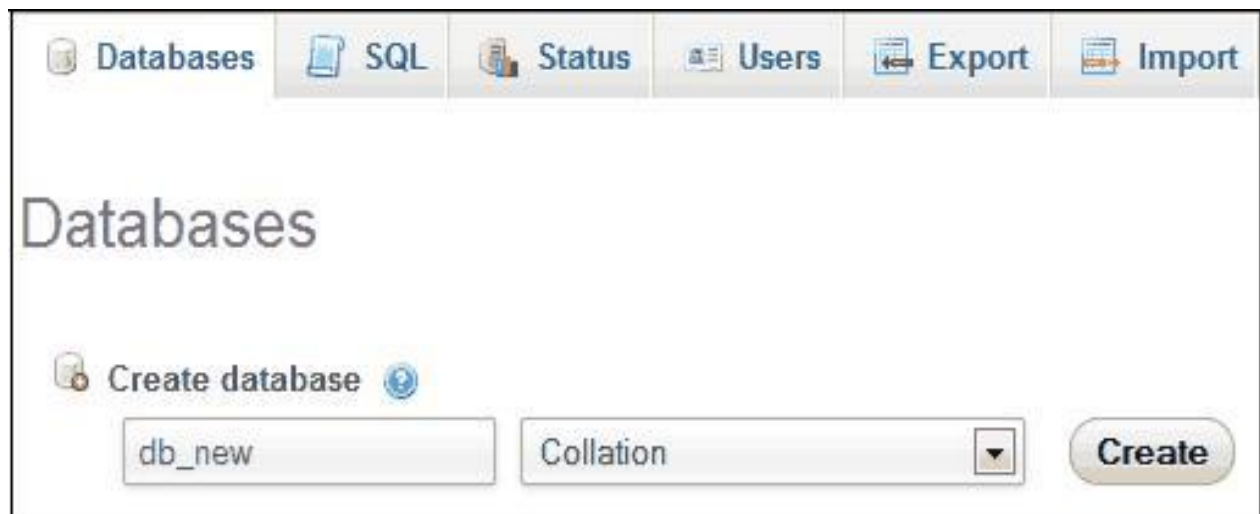


Figure 3: Sample Database Interface

Write a database name in the “Create database” textfield, and click on Create button. A database will be created.

- 3) Having implemented the database, system should demonstrate its **ability or inability to manipulate** (select, insert, update and delete) specific records from the database ([SQL Data Manipulation](#)) **based on an appropriate privilege assignment scheme** assigned for **various user levels** ([SQL Data Security](#)). Use of an [Authorization Diagram](#) for your demonstration is highly recommended.

Hint: After identifying an appropriate set of user levels (not individual users, but user levels, i.e. for example: Doctor, Nurse, Attendant, Patient and Public if it is for a health care system) within your system domain, create separate user accounts for each, using the same SQL interface of *phpMyAdmin*. Use the same SQL interface for granting privileges as well.

Manipulation of database records: Implement a simple web interface (PHP+MySQL) to perform manipulation. You should be able to select a particular user level from your program and to demonstrate the execution of an example set of SELECT|INSERT|UPDATE and DELETE operations on request (See Figure 4).

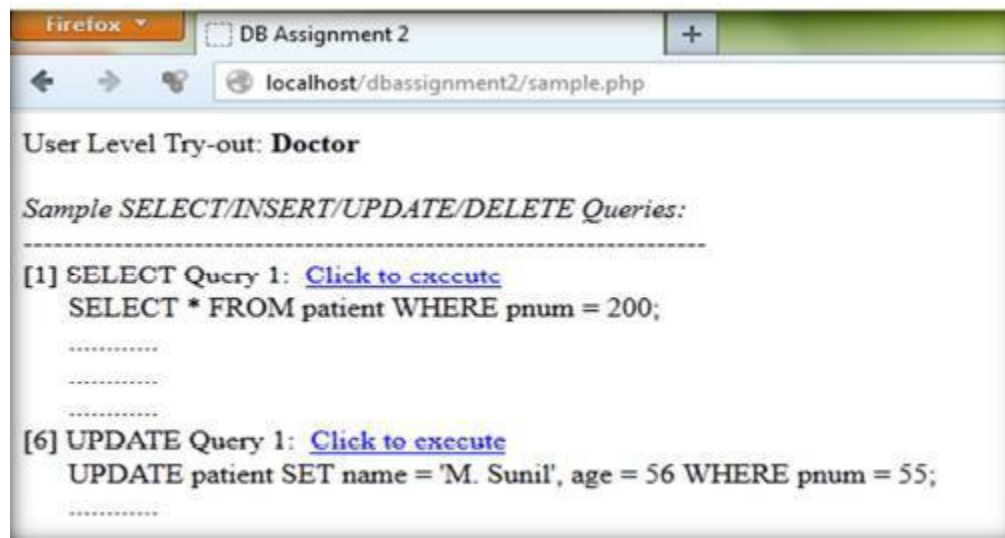


Figure 4: Sample Web Interface

Ability or inability to execute these queries should be based on the restrictions imposed by privileges assigned to a selected user level which should be **supported by an appropriate response** from the server side.

Reference materials for the development are as follows.

- Tutorial: <http://www.w3schools.com/sql/default.asp>
 - HTML Tutorial : <http://www.w3schools.com/html/default.asp>
 - PHP Tutorials : <http://www.w3schools.com/php/default.asp>
<http://php.net/manual/en/tutorial.php>
- 4) A reasonable number of **appropriate views (SQL Views)** to output valuable information from the system as reports **for various user levels** are also essential. Use the same approach described in section 3 to implement user views.
- 5) A suitable **project documentation** (i.e. a hard copy) **covering all your implementation details** must be provided with **a soft copy of your implementation on or before the following deadline**. Make sure you upload all the necessary files associated with your implementation as you are expected to sit for a **Viva** and a **Demonstration** based on that.

Dead Line 2018/ 06 / 26 on or before 4:00 p.m.