Lab # 10: DBMS LAB Project – Normalized Relational Schema and SQL Database

OBJECTIVES OF THE LAB

This lab covers third part of DBMS Lab Project Submission that is Database Design consisting of the Normalized Relational Schema and Physical Schema consisting of SQL Implementation.

- *Normalized Relational Schema*
  - *Relational Schema*
  - *3NF Normalized Relations*
- *SQL Database*
  - *Tables*
  - *Metadata*
  - *Data*
  - *Constraints*
  - *Functions*
  - *Cursors*
  - *Stored Procedures*
  - *Triggers*

NORMALIZED RELATIONAL SCHEMA

Relational Schema is a mapping of Conceptual Schema in terms of relations. These relations are then used for the process of normalization in which various data dependencies are identified and removed step-by-step in different normal forms.

----------Task 10.1----------

Submit the Complete Relational/Logical Schema of your DBMS Project including:

1. Relational Schema: Transformation of ERD and EERD into Relations
2. Normalization: 3NF of Relational Schema

COMPLETE SQL DATABASE

Once the Relational/Logical Schema of Project is completed, the next step to implement it in SQL. This requires table creation & its metadata, constraints satisfaction, data population, query execution, views, functions, triggers, cursors, and stored procedures. All these are part of Physical Schema.

----------Task 10.2----------

Submit the Complete Physical Schema of your DBMS Project. Snapshots of following SQL Commands should be provided along with .sql database file in soft form.

1. **SHOW TABLES**
2. **DESCRIBE for each table**
3. **SHOW CREATE TABLE for each table**
4. **SELECT * for each table**
5. **VIEWS**
    a. **Write at least 1 view.**
    b. **Show snapshot of each view code using MYSQL CE.**
    c. **Show output snapshot of each view using MYSQL CLI.**
6. **STORED PROCEDURES**
    a. **Write at least 3 procedures.**
    b. **Show snapshot of each procedure code using MYSQL CE.**
    c. **Show output snapshot of each using MYSQL CLI.**
7. **STORED FUNCTIONS**
    a. **Write at least 1 function.**
    b. **Show snapshot of each function code using MYSQL CE.**
    c. **Show output snapshot of each using MYSQL CLI.**
8. **TRIGGERS**
    a. **Write at least 2 triggers.**
    b. **Show snapshot of each trigger code using MYSQL CE.**
    c. **Show output snapshot of each using MYSQL CLI.**
9. **CURSOR**
    a. **Write at least 1 cursor.**
    b. **Show snapshot of each cursor code using MYSQL CE.**
    c. **Show output snapshot of each using MYSQL CLI.**

----------Task 10.3----------

Write **at least 25 queries** for your database along with output snapshots. Note: queries must show use of following:

1. **Comparison Operators** **[Ref: Lecture 07a, Slide: 38]**
2. **LIKE and IN Operators** **[Ref: Lecture 07a, Slides: 44-45]**
3. **GROUP BY and HAVING** **[Ref: Lecture 07a, Slides: 48-49]**
4. **SQL Joins** **[Ref: Lecture 08, Slides: 14, 16-17, 20-21]**
5. **SQL Sub-Queries** **[Ref: Lecture 08, Slide: 9]**

6. **SQL Built-in Functions** **[Ref: Lecture 08, Slides: 25, 27, 29]**

SAMPLE SNAPSHOTS

This section provides a general sample of snapshots applicable for Task 10.2 part 5-9.

a. Sample snapshot of view code using MYSQL CE:

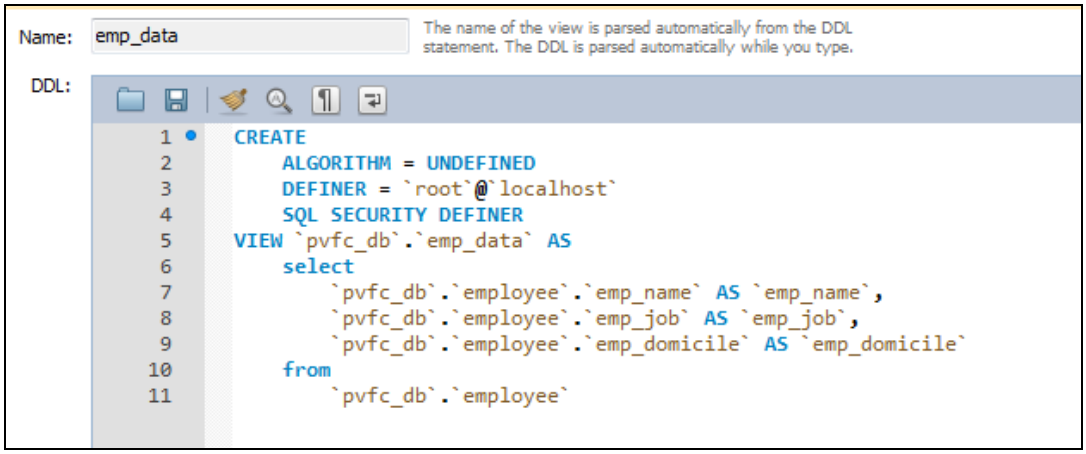


Figure 8.1 – Snapshot of View Code

b. Sample snapshot of view output using MYSQL CLI:

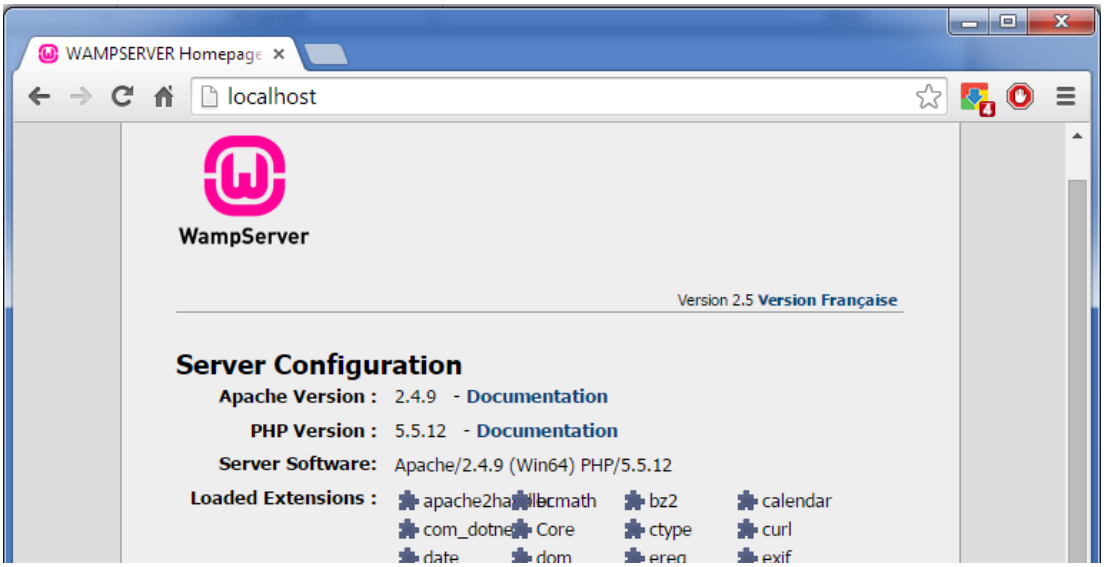
```
mysql> select * from emp_data;
+----------+---------------------+--------------+
| emp_name | emp_job             | emp_domicile |
+----------+---------------------+--------------+
| BCA      | Lab Engineer        | Peshawar     |
| ABD      | Lecturer            | Abbotabad    |
| CVA      | Lecturer            | Mardan       |
| VAC      | Assistant Professor | Swabi        |
| ACB      | Assistant Professor | Mardan       |
| XZY      | Assistant Professor | Mardan       |
| ABS      | Assistant Professor | Mardan       |
| FGJ      | Assistant Professor | Peshawar     |
| OOP      | Lecturer            | Abbotabad    |
| HHA      | Lecturer            | Peshawar     |
| HBV      | Lab Engineer        | Peshawar     |
| HCA      | Lab Engineer        | Peshawar     |
+----------+---------------------+--------------+
12 rows in set (0.00 sec)
```

Figure 8.2 – Snapshot of View Output

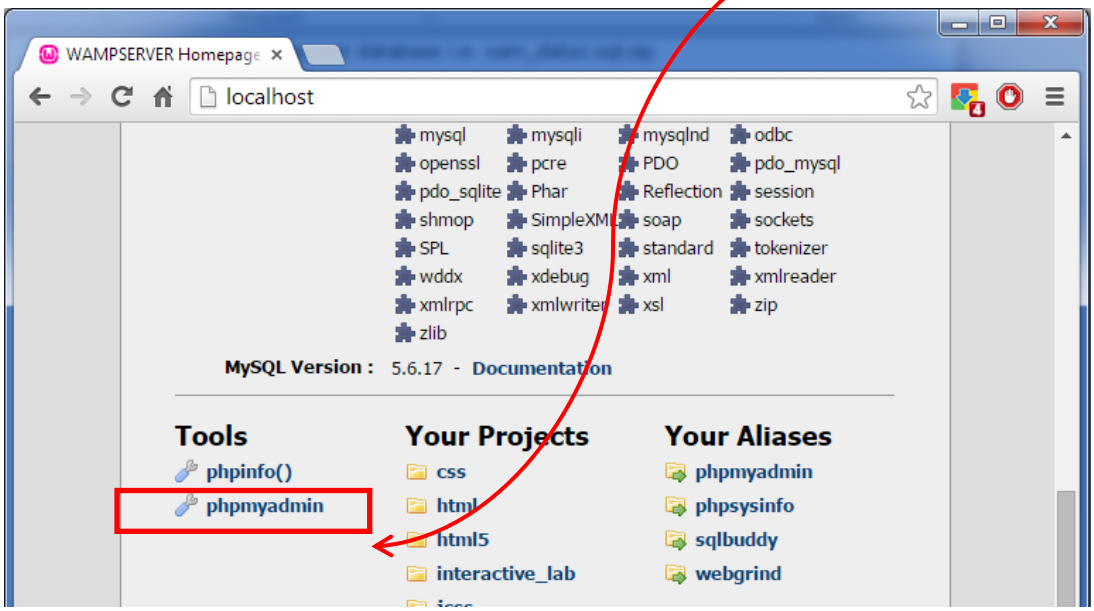
(HOW TO) EXPORT YOUR DATABASE FROM MYSQL

1) Start WAMP Server.

2) Open browser and type localhost in address bar. Press enter. "WampServer" page is loaded.

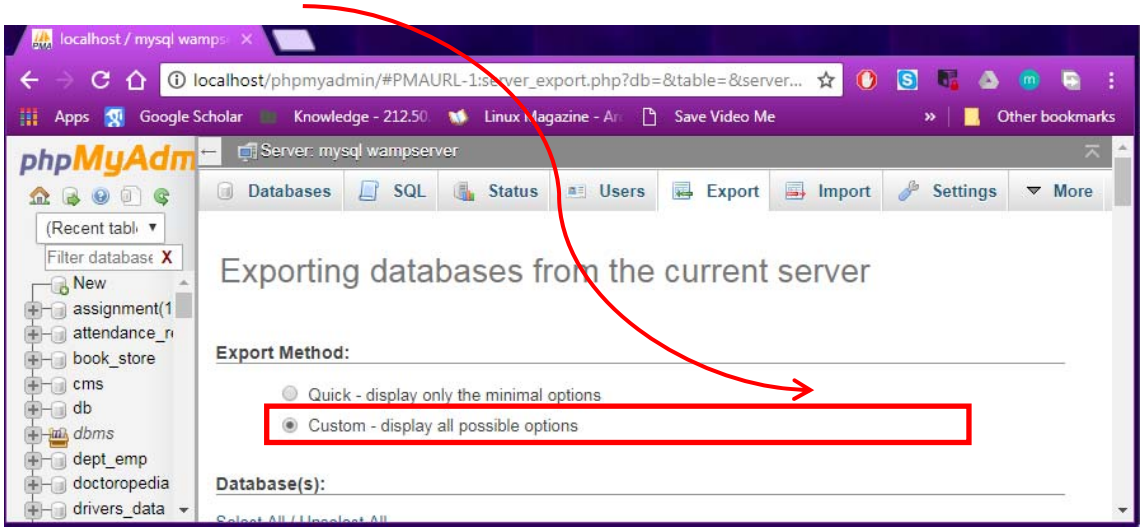


3) Scroll on bottom of WampServer page. Select phpmyadmin in Tools menu. "PhpMyAdmin" page is loaded.

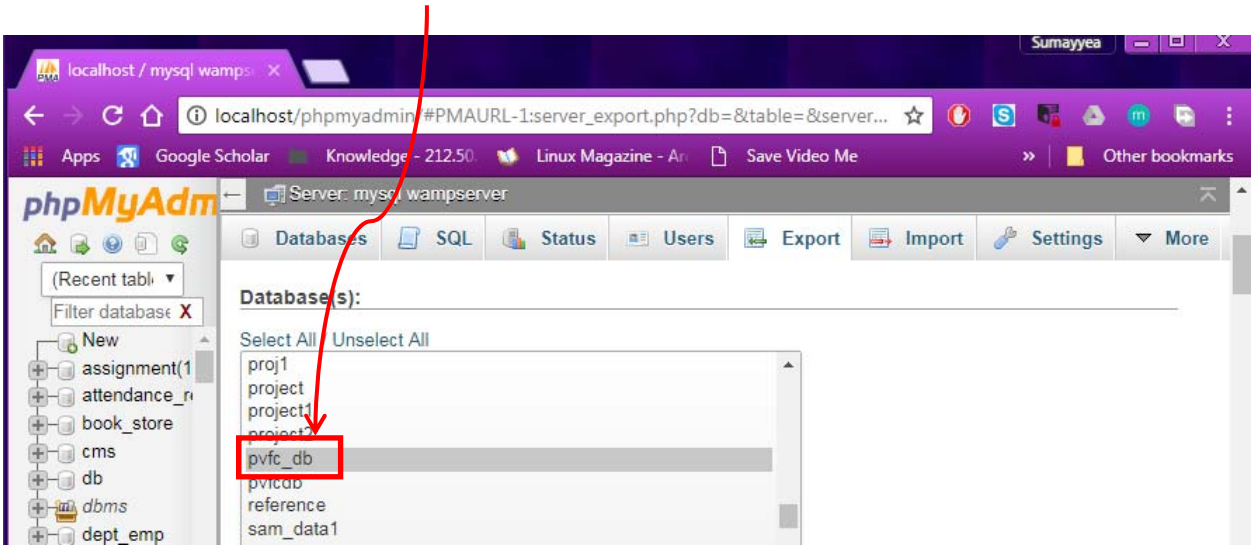


4) Select Export tab shown on right side of PhpMyAdmin page. "Exporting database from the current server" page is loaded.

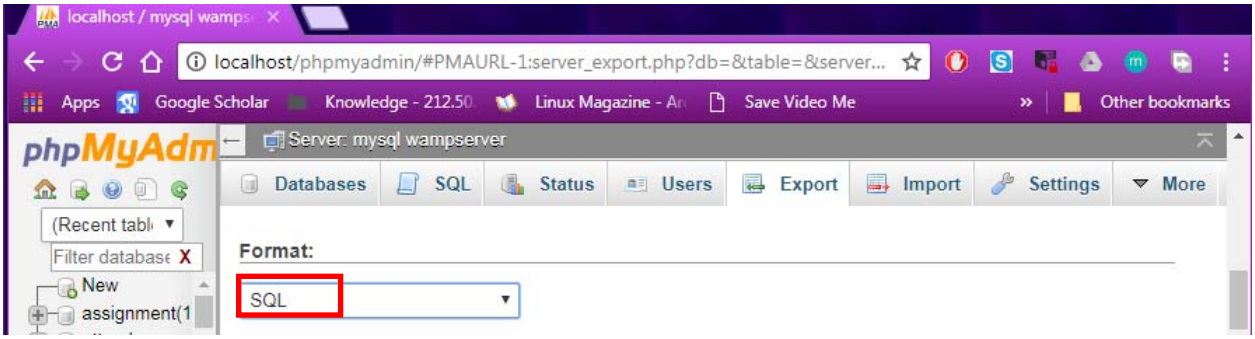
5) Select Custom option in Export Method.



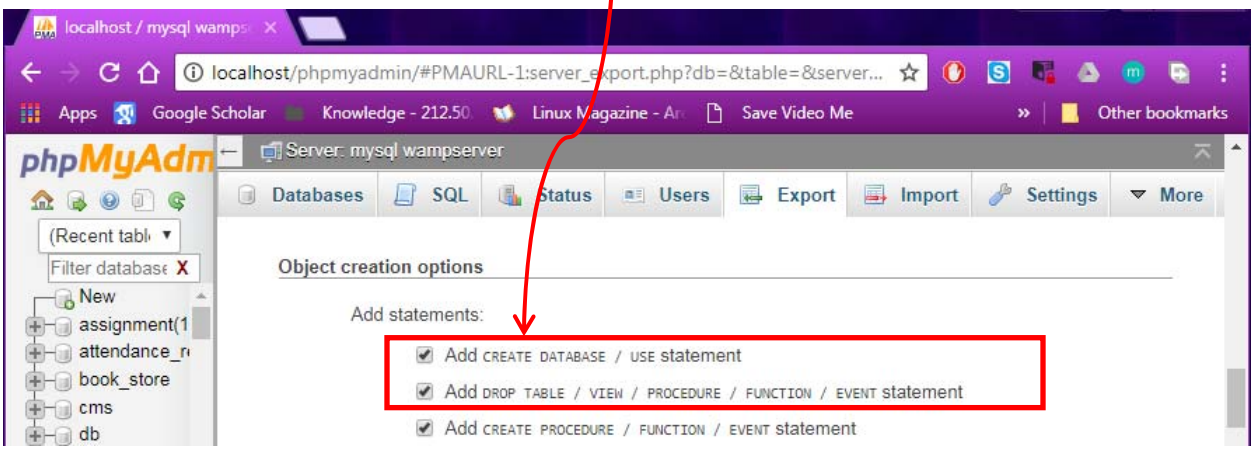
6) Next choose your database.



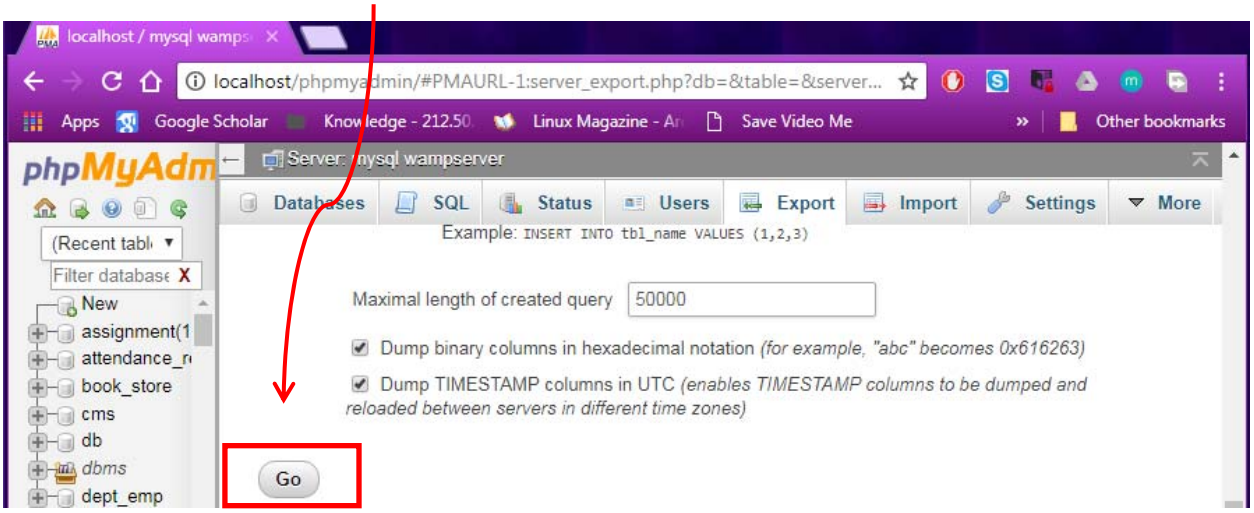
7) Select SQL as Format.



8) In Format –specific options: check Add create and Add drop radio buttons under Object creation options.



9) Press "Go" button in the end and save database as .sql file.



Registration #: _____ **Name:** _____ **Date:** _____

CSE 404L – Database Management Systems Lab

LAB ASSESSMENT RUBRICS

DBMS LAB 10 – DBMS LAB Project: Normalized Relational Schema and SQL Database

Dimension	Exemplary	Acceptable	Developing	Unsatisfactory	Student Score out of 10 Marks
	10	8	6	4	
Overall Impression of Lab Report	Report is complete, well written, and organized appropriately with additional elements that enhance it.	Report is complete, briefly written, and organized. Lacks additional elements.	Report is mostly complete, loosely written, and fairly organized.	Report is incomplete, sloppy, and/or disorganized.	
Submission	Report is submitted on time.	Report is submitted within 24 hours of due date.	Report is submitted within 72 hours of due date.	Report was more than 3 days overdue.	
Specification	Programs work and exceed specifications.	Programs work and meet all specifications.	Programs work and meet partial specifications.	Programs work but fail to meet any specification.	
Output Figures/Graphics	All the output figures and graphics are shown clearly and labeled.	Most output figures and graphics are shown clearly and labeled.	Few of the output figures and graphics are shown and labeled.	Output figures and graphics are not shown and not labeled.	
Verbal Communication and Understanding	Answered clearly and accurately with comprehensive knowledge of Normalized Relational Schema and SQL.	Answered clearly and accurately with average knowledge of Normalized Relational Schema and SQL.	Answered somewhat clearly and somewhat accurately with limited knowledge of Normalized Relational Schema and SQL.	Answered wrongly and inaccurately with no knowledge of Normalized Relational Schema and SQL.	

Marks: (_____+_____+_____+_____+_____)/5 = _____

Teacher Remarks and Signature: _____