

**AMBEKESHWAR INSTITUTE OF TECHNOLOGY AND
MANAGEMENT,LUCKNOW.**



Academic Year 2021 -22

Department: Computer Science And Engineering

SUBJECT: Database Management system

Full Name

A handwritten signature in red ink, appearing to read "Rishabh".

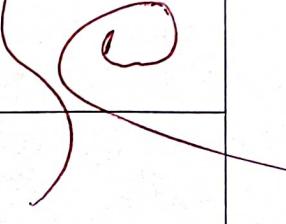
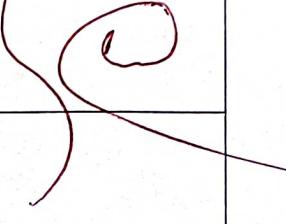
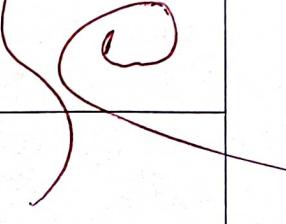
Roll No.

Submitted To:

A handwritten signature in blue ink, appearing to read "Dr. S. K. Singh".

Submitted By:

LIST OF PRACTICAL

S.NO	PRACTICAL NAME	DATE	PAGE NO	SIGNATURE
1.	CREATING DATABASE	13-05-2022 14-05-2022	2-3	
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4.	DESIGN OF DATABASE FOR ANY APPLICATION	3-06-2022 4-06-2022	17-33	

Write an email newsletter

LIST OF EXPERIMENT

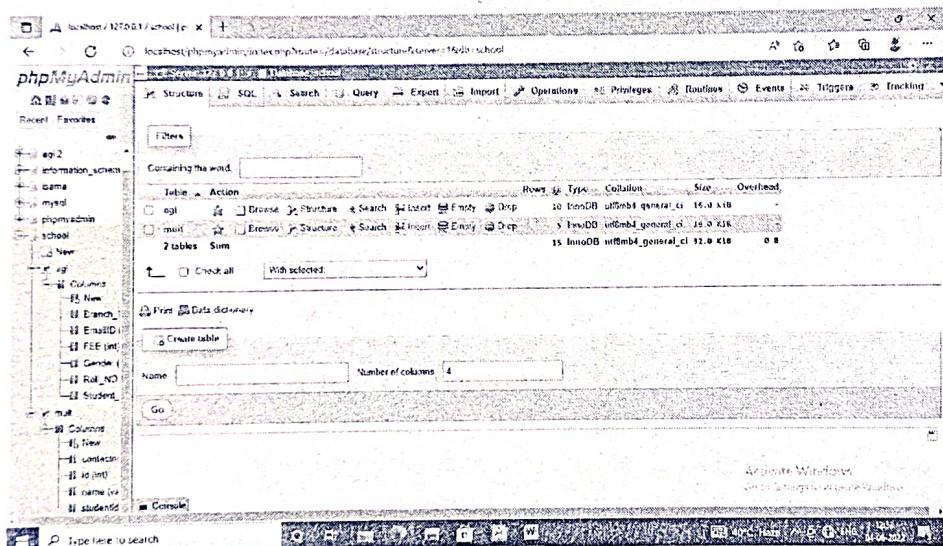
PRACTICAL NO 1

OBJECT: CREATING DATABASE

- I. CREATE TABLE DATA BASE NAME (SCHOOL).
- II. CREATING TABLE.
- III. SPECIFYING RELATIONAL DATA TYPES.
- IV. CREATING INDEX
- V. SPECIFYING CONSTRAINT.

CREATE TABLE DATA BASE NAME (SCHOOL).

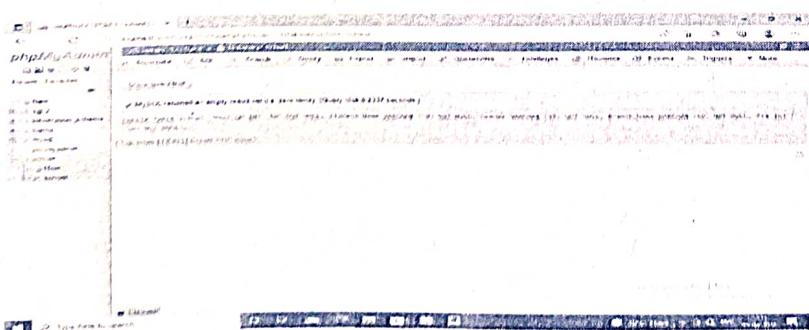
A database most often contains one or more tables. Each table is identified by a name (e.g. "Customers" or "Orders"). Tables contain records (rows) with data.



CREATE TABLE

```
CREATE TABLE agi( Roll_NO INT (50) NOT NULL, Student_Name VARCHAR (50) NOT NULL,  
Gender VARCHAR (50) NOT NULL, Branch_Name VARCHAR (50) NOT NULL, FEE INT (50) NOT  
NULL);
```

OUTPUT



SPECIFYING RELATIONAL DATA TYPES.

- **CREATING INDEX:** Used to create and retrieve data from the database very quickly

```
CREATE TABLE agi( Roll_NO INT (50) NOT NULL, Student_Name VARCHAR (50) NOT NULL,  
Gender VARCHAR (50) NOT NULL, Branch_Name VARCHAR (50) NOT NULL, FEE INT (50) NOT  
NULL );
```

OUTPUT

The screenshot shows the phpMyAdmin interface with the 'Structure' tab selected. A SQL query is entered in the main area:

```
CREATE TABLE agi( Roll_NO INT (50) NOT NULL, Student_Name VARCHAR (50) NOT NULL,  
Gender VARCHAR (50) NOT NULL, Branch_Name VARCHAR (50) NOT NULL, FEE INT (50) NOT  
NULL );
```

The results pane shows the message: "MySQL returned an empty result set (Query took 0.0337 seconds)".

SPECIFYING CONSTRAINT.

Constraints can be specified when the table is created with the CREATE TABLE statement, or after the table is created with the ALTER TABLE statement. SQL constraints are used to specify rules for the data in a table. Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the table. If there is any violation between the constraint and the data action, the action is aborted. Constraints can be column level or table level. Column level constraints apply to a column, and table level constraints apply to the whole table.

The following constraints are commonly used in SQL:

- NOT NULL - Ensures that a column cannot have a NULL value
- UNIQUE - Ensures that all values in a column are different
- PRIMARY KEY - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table
- FOREIGN KEY - Prevents actions that would destroy links between tables
- CHECK - Ensures that the values in a column satisfies a specific condition
- DEFAULT - Sets a default value for a column if no value is specified

PRACTICAL NO 2

OBJECT. TABLE AND RECORD HANDLING

- i. INSERT STATEMENT.
- ii. USING SELECT AND INSERT TOGETHER.
- iii. DELETE UPDATE TRUNCATE STATEMENT.
- iv. DROP, ALTER STATEMENT.

INSERT STATEMENTS

```
INSERT INTO `agi`(`Roll_NO`, `Student_Name`, `Gender`, `Branch_Name`, `FEE`) VALUES ('001','Anjali verma', 'Female', 'CSE', '35000');
```

```
INSERT INTO `agi`(`Roll_NO`, `Student_Name`, `Gender`, `Branch_Name`, `FEE`) VALUES ('002','Aakash kumar', 'Male', 'CSE', '35000');
```

```
INSERT INTO `agi`(`Roll_NO`, `Student_Name`, `Gender`, `Branch_Name`, `FEE`) VALUES ('003','Ankur Kumar', 'Male', 'CSE', '35000');
```

```
INSERT INTO `agi`(`Roll_NO`, `Student_Name`, `Gender`, `Branch_Name`, `FEE`) VALUES ('004','Manshi Verma', 'Female', 'CSE', '35000');
```

```
INSERT INTO `agi`(`Roll_NO`, `Student_Name`, `Gender`, `Branch_Name`, `FEE`) VALUES ('005','Vinay katiyar', 'Male', 'CSE', '35000');
```

OUTPUT

The screenshot shows the phpMyAdmin interface for a database named 'school'. The left sidebar lists databases like 'agi', 'information_schema', 'mysql', 'phpmyadmin', and 'school'. Under 'school', there are tables: 'agi' (selected), 'Columns', 'New', 'Rows', 'Branch_Name', 'FEE', 'Gender', 'Roll_NO', and 'Student_Name'. The main area shows the 'agi' table structure with columns: id, Roll_NO, Student_Name, Gender, Branch_Name, and FEE. Five rows have been inserted successfully:

- Row 1: Roll_NO '001', Student_Name 'Anjali verma', Gender 'Female', Branch_Name 'CSE', FEE '35000' (Query took 0.0551 seconds)
- Row 2: Roll_NO '002', Student_Name 'Aakash kumar', Gender 'Male', Branch_Name 'CSE', FEE '35000' (Query took 0.0074 seconds)
- Row 3: Roll_NO '003', Student_Name 'Ankur Kumar', Gender 'Male', Branch_Name 'CSE', FEE '35000' (Query took 0.0259 seconds)
- Row 4: Roll_NO '004', Student_Name 'Manshi Verma', Gender 'Female', Branch_Name 'CSE', FEE '35000' (Query took 0.0271 seconds)
- Row 5: Roll_NO '005', Student_Name 'Vinay katiyar', Gender 'Male', Branch_Name 'CSE', FEE '35000' (Query took 0.0291 seconds)

SELECT The SELECT statement is used to select data from a database. The data returned is stored in a result table, called the result-set.

• SELECT Syntax

```
SELECT *  
FROM table_name;
```

```
SELECT * FROM ag1;
```

OUTPUT

The screenshot shows the phpMyAdmin interface with the database 'ag1' selected. The 'Browse' tab is active, displaying the contents of the 'Student' table. The table has columns: Roll_NO, Student_Name, Gender, Branch_Name, and FEE. There are 10 rows of data. A search bar at the bottom right is set to 'Search this table'.

Roll_NO	Student_Name	Gender	Branch_Name	FEE
1	Anjali Verma	Female	CSE	35000
2	Aakash Kumar	Male	CSE	35000
3	Ankur Kumar	Male	GSE	35000
4	Mansi Verma	Female	CSE	35000
5	Vinay kalyan	Male	CSE	35000
6	Anjali verma	Female	CSE	35000
7	Aakash Kumar	Male	CSE	35000
8	Ankur Kumar	Male	GSE	35000
9	Mansi Verma	Female	CSE	35000
10	Vinay kalyan	Male	CSE	35000

UPDATE The UPDATE statement is used to modify the existing records in a table.

UPDATE Syntax

```
UPDATE table_name
```

```
SET column1 = value1, column2 = value2, ...
```

```
WHERE condition;
```

```
UPDATE `ag1` SET `Roll_NO`='1', `Student_Name`='AnjaliVerma'  
, `Gender`='Female', `Branch_Name`='CSE', `FEE`='35000' WHERE Roll_NO=2;
```

OUTPUT

The screenshot shows the phpMyAdmin interface with the database 'ag1' selected. The 'Browse' tab is active, displaying the contents of the 'Student' table. The table has columns: Roll_NO, Student_Name, Gender, Branch_Name, and FEE. There are 10 rows of data. A search bar at the bottom right is set to 'Search this table'.

Roll_NO	Student_Name	Gender	Branch_Name	FEE
1	Zeeva Verma	Female	CSE	35000
2	AnjaliVerma	Female	CSE	35000
3	Ankur Kumar	Male	CSE	35000
4	Mansi Verma	Female	CSE	35000
5	Vinay kalyan	Male	CSE	35000
6	Anjali verma	Female	CSE	35000
7	Aakash Kumar	Male	CSE	35000
8	Ankur Kumar	Male	GSE	35000
9	Mansi Verma	Female	CSE	35000
10	Vinay kalyan	Male	CSE	35000

DELETE : The DELETE statement is used to delete existing records in a table.

DELETE FROM table_name WHERE condition;

DELETE FROM school;

OUTPUT

The screenshot shows the phpMyAdmin interface for a database named 'school'. In the left sidebar, under the 'school' database, there is a table named 'school'. The 'Columns' section of this table is visible, listing columns such as 'New', 'Branch', 'EmailID', 'FEE (int)', 'Gender', 'Roll_NO', and 'Student'. In the main query editor area, the SQL command `DELETE FROM school;` has been entered. Below the command, the result is shown: `✓ 0 rows affected (Query took 0.0143 seconds)`. The status bar at the bottom right of the window displays the message `Activate Windows`.

TRUNCATE : used to delete the data inside a table, but not the table itself.

Syntax

TRUNCATE TABLE table_name;

TRUNCATE Table school;

output

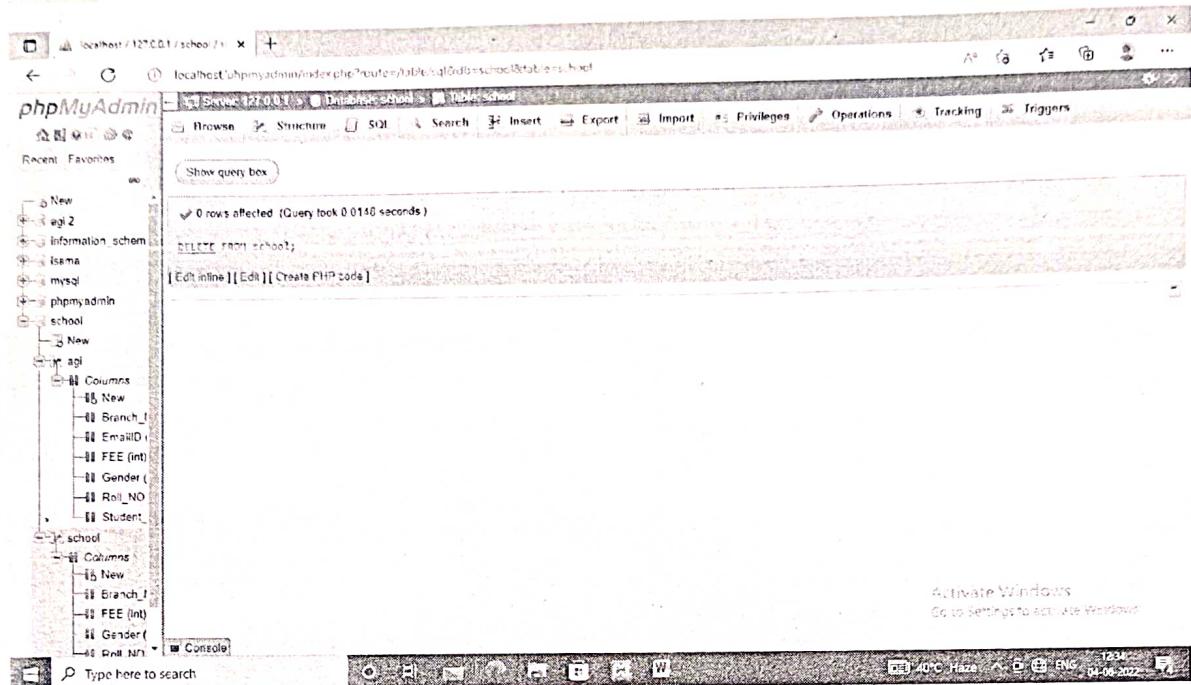
The screenshot shows the phpMyAdmin interface for the same 'school' database. The 'school' table is selected in the sidebar. In the main query editor area, the SQL command `TRUNCATE TABLE school;` has been entered. Below the command, the result is shown: `✓ 0 rows affected (Query took 0.0140 seconds)`. The status bar at the bottom right of the window displays the message `Escape School`.

DROP: drop the existing table "school";

DROP TABLE table_name;

DROP Table agi;

OUTPUT



A screenshot of the phpMyAdmin interface. The left sidebar shows a database tree with 'agi' and 'school' databases selected. The 'school' database contains tables 'New', 'Columns', and 'school'. The 'Columns' table has columns 'New', 'Branch', 'EmailID', 'FEE (int)', 'Gender', and 'Roll.NO'. The 'school' table has columns 'New', 'Branch', 'FEE (int)', 'Gender', and 'Roll NO'. The main query window displays the command 'DELETE FROM school;'. Below the command, it says '0 rows affected (Query took 0.0140 seconds)'. The status bar at the bottom right shows 'Activate Windows' and 'Go to Settings to activate Windows'.

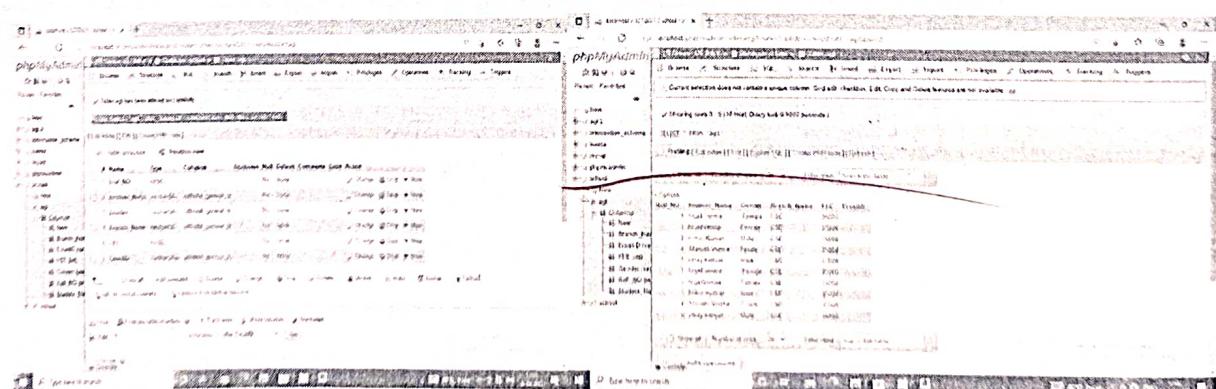
ALTER: The Alter Statement is used to add, delete or modify column in an existing table

Syntax

Alter Table table name Add column name datatype;

ALTER TABLE `agi` ADD `EmailID` VARCHAR(255) NOT NULL AFTER `FEE`;

OUTPUT



A screenshot of the phpMyAdmin interface. The left sidebar shows a database tree with 'agi' and 'school' databases selected. The 'agi' database is currently selected. The 'Columns' table has columns 'New', 'Branch', 'EmailID', 'FEE (int)', 'Gender', and 'Roll.NO'. The 'school' table has columns 'New', 'Branch', 'FEE (int)', 'Gender', and 'Roll NO'. The main query window displays the command 'ALTER TABLE `agi` ADD `EmailID` VARCHAR(255) NOT NULL AFTER `FEE`;'. Below the command, it says '0 rows affected (Query took 0.0140 seconds)'. The status bar at the bottom right shows 'Activate Windows' and 'Go to Settings to activate Windows'.

PRACTICAL NO 3

OBJECT: Retrieving Data from a Database

- i. Select statement.
- ii. Where.
- iii. Logical operator where.
- iv. Between, Orderby, like, Groupby, Having.
- v. Using aggregate.
- vi. Join.

WHERE

The WHERE clause is used to filter records. It is used to extract only those records that fulfill a specified condition.

WHERE Syntax

```
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

LOGICAL OPERATOR WHERE .

AND Syntax

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 AND condition2 AND condition3 ...;
```

OR Syntax

```
SELECT column1, column2, ...
FROM table_name
WHERE condition1 OR condition2 OR condition3 ...;
```

```
SELECT * FROM agi WHERE Student_Name="anjali verma" AND Branch_Name="cse";
```

Student_ID	Student_Name	Branch_Name	EmailID
25	Anjali Verma	CSE	25005

```
SELECT * FROM agi WHERE Student_Name="anjali verma" OR Roll_NO=3;
```

Roll_No	Student_Name	Grade	Banch_Name	FEE	EmailID
1	Anjali verma	Ten	CSE	10000	
2	Anvita Kumar	Nine	CSE	10000	
3	Anjali verma	Ten	CSE	10000	
4	Anvita Kumar	Nine	CSE	10000	

BETWEEN:

The BETWEEN operator selects values within a given range. The values can be numbers, text, or dates. The BETWEEN operator is inclusive: begin and end values are included.

BETWEEN Syntax

```
SELECT column_name(s)  
FROM table_name  
WHERE column_name BETWEEN value1 AND value2;
```

```
SELECT Roll_NO, Student_Name FROM agi WHERE Student_Name="anjali verma" BETWEEN 3 AND 4;
```

Roll_No	Student_Name
3	Anjali verma
4	Anvita Kumar

ORDERBY: The ORDER BY keyword is used to sort the result-set in ascending or descending order.

The ORDER BY keyword sorts the records in ascending order by default. To sort the records in descending order, use the DESC keyword.

ORDER BY Syntax

```
SELECT column1, column2, ...
FROM table_name
ORDER BY column1, column2, ... ASC|DESC;
```

```
SELECT * FROM agi ORDER BY Roll_NO DESC;
```

The screenshot shows the phpMyAdmin interface with the following details:

- Database:** school
- Table:** agi
- Query:** SELECT * FROM agi ORDER BY Roll_NO DESC;
- Result:** 10 rows displayed
- Columns:** Roll_NO, Student_Name, Gender, Branch_Name, FEE, EmailID
- Data:** The results show 10 entries, each with a unique Roll_NO (1-10), Student_Name (e.g., Vinay kalyan, Manshi Verma), Gender (Male/Female), Branch_Name (CSE/IT), FEE (35000), and EmailID (e.g., vikas@gmail.com, manshi.verma@outlook.com).

LIKE : The LIKE operator is used in a WHERE clause to search for a specified pattern in a column. There are two wildcards often used in conjunction with the LIKE operator:

- The percent sign (%) represents zero, one, or multiple characters
- The underscore sign (_) represents one, single character

```
SELECT column1, column2, ...
FROM table_name
WHERE columnN LIKE pattern;
```

```
SELECT * FROM agi WHERE Student_Name LIKE '%a';
```

The screenshot shows the phpMyAdmin interface for a MySQL database. The left sidebar lists databases like 'New', 'agi', 'Information_schema', 'mysql', and 'phpmyadmin'. The main area shows a table named 'agi' with the following data:

Roll_NO	Student_Name	Gender	Branch	Name	FEE	EmailID
1	Anjali Verma	Female	CSE		15000	
2	Manish Verma	Female	CSE		35000	
3	Anjali Verma	Female	CSE		35000	
4	Manish Verma	Female	CSE		35000	

GROUPBY: The GROUP BY statement groups rows that have the same values into summary rows, like "find the number of customers in each country". The GROUP BY statement is often used with aggregate functions (COUNT(), MAX(), MIN(), SUM(), AVG()) to group the result-set by one or more columns.

GROUP BY Syntax

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
ORDER BY column_name(s);
```

```
SELECT COUNT(Roll_NO), Student_Name FROM agi GROUP BY Student_Name;
```

The screenshot shows the phpMyAdmin interface after executing the GROUP BY query. The results are displayed in a table:

Student_Name	COUNT(Roll_NO)
Manish Verma	2
Anjali Verma	2
Ankit Kumar	1
Viraj Kalijev	1

HAVING: The HAVING clause was added to SQL because the WHERE keyword cannot be used with aggregate functions.

HAVING Syntax

```
SELECT column_name(s)
FROM table_name
WHERE condition
GROUP BY column_name(s)
HAVING condition
ORDER BY column_name(s);
```

```
SELECT COUNT(Roll_NO), Student_Name FROM agi GROUP BY Student_Name HAVING COUNT(Roll_NO) < 5 ORDER BY COUNT(Roll_NO) DESC;
```

Count(Roll_NO)	Student_Name
2	Anjali Verma
2	Anjali verma
2	Vinay Kaliyar
2	Manasi Verma
2	Ankur Kumar

USING AGGREGATE . (COUNT) : The COUNT() function returns the number of rows that matches a specified criterion.

COUNT() Syntax

```
SELECT COUNT(column_name)
FROM table_name
WHERE condition;
```

```
SELECT COUNT(Roll_NO), Student_Name FROM agi GROUP BY Student_Name HAVING COUNT(Roll_NO) < 5 ORDER BY COUNT(Roll_NO) DESC;
```

```

localhost:127.0.0.1/school/x + localhost/phpmyadmin/index.php?route=table&tbl_name=student&sort=age
phpMyAdmin - Structure - SQL - Search - Insert - Export - Import - Privileges - Operations - Tracking - Triggers
Show query box
Current selection does not contain a unique column. Grid edit checkbox, Edit, Copy and Delete features are not available.
Showing rows 0 - 4 (5 total). Query took 0.0014 seconds.
SELECT COUNT(Roll_No) FROM agi WHERE COUNT(Roll_No) > 1 GROUP BY Student_Name HAVING COUNT(Roll_No) > 1 ORDER BY COUNT(Roll_No) DESC
Profiling | Explain SQL | Create RPT code | Refresh
Show all | Number of rows: 25 | Filter rows | Search this table
Orders
COUNT(Roll_No) > 1 Student_Name
1 Anjali Verma
2 Anjali Verma
2 Vinay Kulkarni
2 Manasi Verna
2 Arunkumar
Show all | Number of rows: 25 | Filter rows | Search this table
Query results operations
Print | Copy to clipboard | Export | Display chart | Create view
Activate Windows
Go to Settings to activate Windows
Type here to search

```

JOIN:

Inner Join: The INNER JOIN keyword selects records that have matching values in both tables.

INNER JOIN Syntax

```

SELECT column_name(s)
FROM table1
INNER JOIN table2
ON table1.column_name = table2.column_name;

```

SELECT muit.id, agi.Student_Name, muit.contactno, agi.Branch_Name FROM agi INNER JOIN muit ON muit.studentid= agi.Roll_NO;

The screenshot shows the phpMyAdmin interface with a database named 'school'. A query has been run:

```
SELECT * FROM agi JOIN muiit ON agi.Id = muiit.Id
```

The results show 10 rows from the 'agi' table joined with rows from the 'muiit' table where they share the same 'Id' value. The columns displayed are 'Id', 'Student_Name', 'contactno', and 'Branch_Name'.

Id	Student_Name	contactno	Branch_Name
11	Anjali Verma	123456	CSE
12	Anjali Verma	123455	CSE
11	Anjali Verma	123456	CSE
12	Anjali Verma	123455	CSE
11	Ankur Kumar	123459	CSE
11	Anjali Verma	123456	CSE
12	Anjali Verma	123456	CSE
11	Anjali Verma	123456	CSE
12	Anjali Verma	123455	CSE
11	Ankur Kumar	123459	CSE

Outer (Full) Join: The FULL OUTER JOIN keyword returns all records when there is a match in left (table1) or right (table2) table records.

Tip: FULL OUTER JOIN and FULL JOIN are the same.

FULL OUTER JOIN Syntax

```
SELECT column_name(s)
FROM table1
FULL OUTER JOIN table2
ON table1.column_name = table2.column_name
WHERE condition;
```

```
SELECT * FROM muiit JOIN agi;
```

localhost / 127.0.0.1 / school / +

localhost/phpmyadmin/index.php?route=tables/sql&tab=raw

phpMyAdmin

Recent Favorites

New agi2 Information_schema Isama mysql phpmyadmin school New agi

Columns New Branch_email EmailID FEE (int) Gender Roll_NO Student mut

Columns New contact Id (int) name (v) studentid

Console Type here to search

Show query box

Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.

Showing rows 0 - 24 (50 total. Query took 0.0007 seconds.)

SELECT * FROM agi

Profile Edit inline Edit Explain SQL Create PHP code Refresh

1 Show all Number of rows: 25 Filter rows Search this table

#	studentid	name	contactno	Roll_NO	Student_Name	Gender	Branch_Name	FEE	EmailID
11	1 sd	123456	1	Anjali verma	Female	CSE	35000		
12	1 anjali	123455	1	Anjali verma	Female	CSE	35000		
11	2 akash	1234576	1	Anjali verma	Female	CSE	35000		
11	2 ankur	123458	1	Anjali verma	Female	CSE	35000		
11	3 manashi	123459	1	Anjali verma	Female	CSE	35000		
11	1 sd	123456	1	Anjali verma	Female	CSE	35000		
12	1 anjali	123455	1	Anjali verma	Female	CSE	35000		
11	2 akash	1234576	1	Anjali verma	Female	CSE	35000		
11	2 ankur	123458	1	Anjali verma	Female	CSE	35000		
11	3 manashi	123459	1	Anjali verma	Female	CSE	35000		
11	1 sd	123456	3	Arikur Kumar	Male	CSE	35000		
11	1 anjali	123455	3	Arikur Kumar	Male	CSE	35000		

Activate Windows
Go to settings to activate Windows

Left: The LEFT JOIN keyword returns all records from the left table (table1), and the matching records from the right table (table2). The result is 0 records from the right side, if there is no match.

LEFT JOIN Syntax

```
SELECT column_name(s)
FROM table1
LEFT JOIN table2
ON table1.column_name = table2.column_name;
```

```
SELECT agi.Student_Name FROM agi LEFT JOIN mutit ON agi.Roll_NO= mutit.studentid ORDER BY agi.Student_Name;
```

localhost / 127.0.0.1 / school / +

localhost/phpmyadmin/index.php?route=tables/sql&tab=raw

phpMyAdmin

Recent Favorites

New agi2 Information_schema Isama mysql phpmyadmin school New agi

Columns New Branch_email EmailID FEE (int) Gender Roll_NO Student mut

Columns New contact Id (int) name (v) studentid

Console Type here to search

Show query box

Showing rows 0 - 15 (4 total. Query took 0.0149 seconds.) [Student_Name: MANSI VERMA ... VINAY KATIYAR ...]

Profile Edit inline Explain SQL Create PHP code Refresh

1 Show all Number of rows: 25 Filter rows Search this table

#	studentid	name	contactno	Roll_NO	Student_Name
1	Mansi Verma	123456	1	Mansi Verma	MANSI VERMA
2	Vinay Katiyar	1234576	1	Vinay Katiyar	VINAY KATIYAR
3	Shivam Singh	123458	1	Shivam Singh	SHIVAM SINGH
4	Pratik Patel	123459	1	Pratik Patel	PRATIK PATEL

Right The RIGHT JOIN keyword returns all records from the right table (table2), and the matching records from the left table (table1). The result is 0 records from the left side, if there is no match.

RIGHT JOIN Syntax

```
SELECT column_name(s)
FROM table1
RIGHT JOIN table2
ON table1.column_name = table2.column_name;
```

```
SELECT muit.name FROM agi RIGHT JOIN muit ON agi.Roll_NO= muit.studentid ORDER BY
muit.name;
```

The screenshot shows the phpMyAdmin interface with the following details:

- Database:** school
- Table:** agi
- Query Result:** The results of the query `SELECT muit.name FROM agi RIGHT JOIN muit ON agi.Roll_NO= muit.studentid ORDER BY muilt.name;`. The results are:

name
akash
anjali
anjali
anjali
ankur
manashi
manashi
rd
rd
rd
sd

Left Panel (Structure): Shows the database structure with tables agi and muilt.

Top Bar: Includes tabs for Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, Tracking, and Triggers.

Bottom Bar: Includes links for Profiling, Edit inline, Explain SQL, Create PHP code, Refresh, Show all, Number of rows (set to 25), Filter rows, and Search this table.

PRACTICAL NO 3

OBJECT: Design of database for any application

XAMPP is one of the widely used cross-platform web servers, which helps developers to create and test their programs on a local webserver. It was developed by the **Apache Friends**, and its native source code can be revised or modified by the audience. It consists of **Apache HTTP Server**, **MariaDB**, and **interpreter** for the different programming languages like PHP and Perl. It is available in 11 languages and supported by different platforms such as the IA-32 package of Windows & x64 package of macOS and Linux.

What is XAMPP?

XAMPP is an abbreviation where **X stands for Cross-Platform**, **A stands for Apache**, **M stands for MySQL**, and the **Ps stand for PHP and Perl**, respectively. It is an open-source package of web solutions that includes Apache distribution for many servers and command-line executables along with modules such as Apache server, MariaDB, PHP, and Perl.

XAMPP helps a local.host or server to test its website and clients via computers and laptops before releasing it to the main server. It is a platform that furnishes a suitable environment to test and verify the working of projects based on Apache, Perl, MySQL database, and PHP through the system of the host itself. Among these technologies, Perl is a programming language used for web development, PHP is a backend scripting language, and MariaDB is the most vividly used database developed by MySQL. The detailed description of these components is given below.

Components of XAMPP

As defined earlier, XAMPP is used to symbolize the classification of solutions for different technologies. It provides a base for testing of projects based on different technologies through a personal server. XAMPP is an abbreviated form of each alphabet representing each of its major components. This collection of software contains a web server named **Apache**, a database management system named **MariaDB** and scripting/ programming languages such as **PHP** and **Perl**. **X** denotes Cross-platform, which means that it can work on different platforms such as Windows, Linux, and macOS.

Many other components are also part of this collection of software and are explained below.

1. **Cross-Platform:** Different local systems have different configurations of operating systems installed in it. The component of cross-platform has been included to increase the utility and audience for this package of Apache distributions. It supports various platforms such as packages of Windows, Linus, and MAC OS.
2. **Apache:** It is an HTTP a cross-platform web server. It is used worldwide for delivering web content. The server application has made free for installation and used for the community of developers under the aegis of Apache Software Foundation. The remote server of Apache delivers the requested files, images, and other documents to the user.

3. **MariaDB:** Originally, MySQL DBMS was a part of XAMPP, but now it has been replaced by MariaDB. It is one of the most widely used relational DBMS, developed by MySQL. It offers online services of data storage, manipulation, retrieval, arrangement, and deletion.
4. **PHP:** It is the backend scripting language primarily used for web development. PHP allows users to create dynamic websites and applications. It can be installed on every platform and supports a variety of database management systems. It was implemented using C language. PHP stands for **Hypertext Processor**. It is said to be derived from Personal Home Page tools, which explains its simplicity and functionality.
5. **Perl:** It is a combination of two high-level dynamic languages, namely Perl 5 and Perl 6. Perl can be applied for finding solutions for problems based on system administration, web development, and networking. Perl allows its users to program dynamic web applications. It is very flexible and robust.
6. **phpMyAdmin:** It is a tool used for dealing with MariaDB. Its version 4.0.4 is currently being used in XAMPP. Administration of DBMS is its main role.
7. **OpenSSL:** It is the open-source implementation of the Secure Socket Layer Protocol and Transport Layer Protocol. Presently version 0.9.8 is a part of XAMPP.
8. **XAMPP Control Panel:** It is a panel that helps to operate and regulate upon other components of the XAMPP. Version 3.2.1 is the most recent update. A detailed description of the control panel will be done in the next section of the tutorial.
9. **Webalizer:** It is a Web Analytics software solution used for User logs and provide details about the usage.
10. **Mercury:** It is a mail transport system, and its latest version is 4.62. It is a mail server, which helps to manage the mails across the web.
11. **Tomcat:** Version 7.0.42 is currently being used in XAMPP. It is a servlet based on JAVA to provide JAVA functionalities.
12. **Filezilla:** It is a File Transfer Protocol Server, which supports and eases the transfer operations performed on files. Its recently updated version is 0.9.41.

XAMPP Format Support

XAMPP is supported in three file formats;

- o **.EXE-** It is an extension used to denote executable files making it accessible to install because an executable file can run on a computer as any normal program.
- o **.7z - 7zip file-** This extension is used to denote compressed files that support multiple data compression and encryption algorithms. It is more favored by a formalist, although it requires working with more complex files.

- o **.ZIP-** This extension supports lossless compression of files. A Zipped file may contain multiple compressed files. The **Deflate algorithm** is mainly used for compression of files supported by this format. The .ZIP files are quite tricky to install as compared to .EXE

Thus .EXE is the most straightforward format to install, while the other two formats are quite complicated and complex to install.

Prerequisites

Before going through XAMPP tutorial in-depth, you must have a fundamental knowledge of web development languages like HTML, and PHP.

Audience

Our XAMPP tutorial is designed for the aspirants who want to test their website or application on a localhost webserver. This tutorial will help those who want to build their career as a front end or web developer.

Problem

We assure you that it will resolve all your queries related to XAMPP, and you will not find any problem in this tutorial. Still, if there is any mistake or discrepancy, please post the problem in the contact form.

INSTALLATION PROCESS OF XAMPP

As discussed in the earlier part of the tutorial, XAMPP is a cross-platform stack of software that provides web solutions based on technologies like MariaDB, Apache Server, Perl, and PHP. Further, it is supported by many file formats, such as .EXE, .ZIP and .7z- .7zip. Out of the three, the .EXE extension is the easiest to operate upon while installation. In this topic, we will discuss steps to be followed to download and install XAMPP software successfully on your desktops. Since it is a cross-platform software, it is supported by a number of operating systems, including Windows, Linux, and MAC OS. The process to be followed for installation of XAMPP will be explained for all three operating systems:

The installation process in Windows

STEP 1- Open any web browser and visit <https://www.apachefriends.org/index.html>. On the home page, you can find the option to download XAMPP for three platforms- Windows, MAC, and Linux. Click on **XAMPP for Windows**. The latest version available on the website is 7.4.5.

As soon as you click on it, a message displaying the automatic start of download appears on the screen.



XAMPP Apache + MariaDB + PHP + Perl

What is XAMPP?

XAMPP is the most popular PHP development environment

XAMPP is a completely free, easy to install Apache distribution containing MariaDB, PHP, and Perl. The XAMPP open source package has been set up to be incredibly easy to install and to use.

Introduction to XAMPP



Download

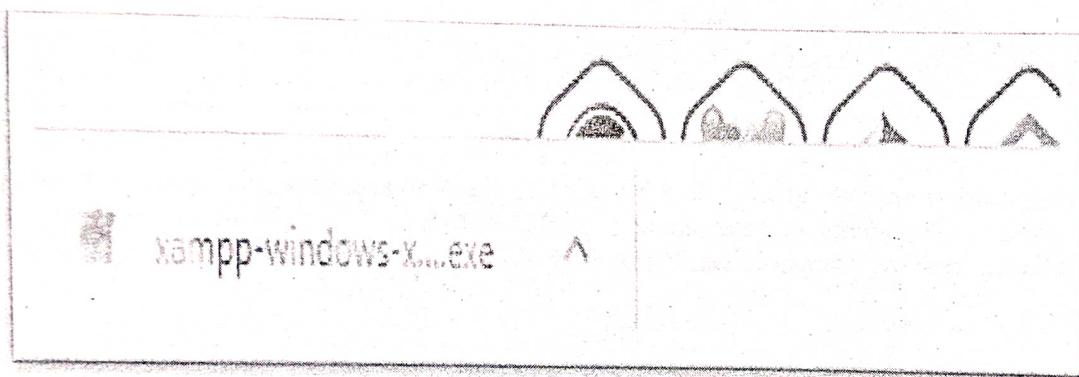
Click here for other versions

XAMPP for Windows
7.4.5 (PHP 7.4.5)

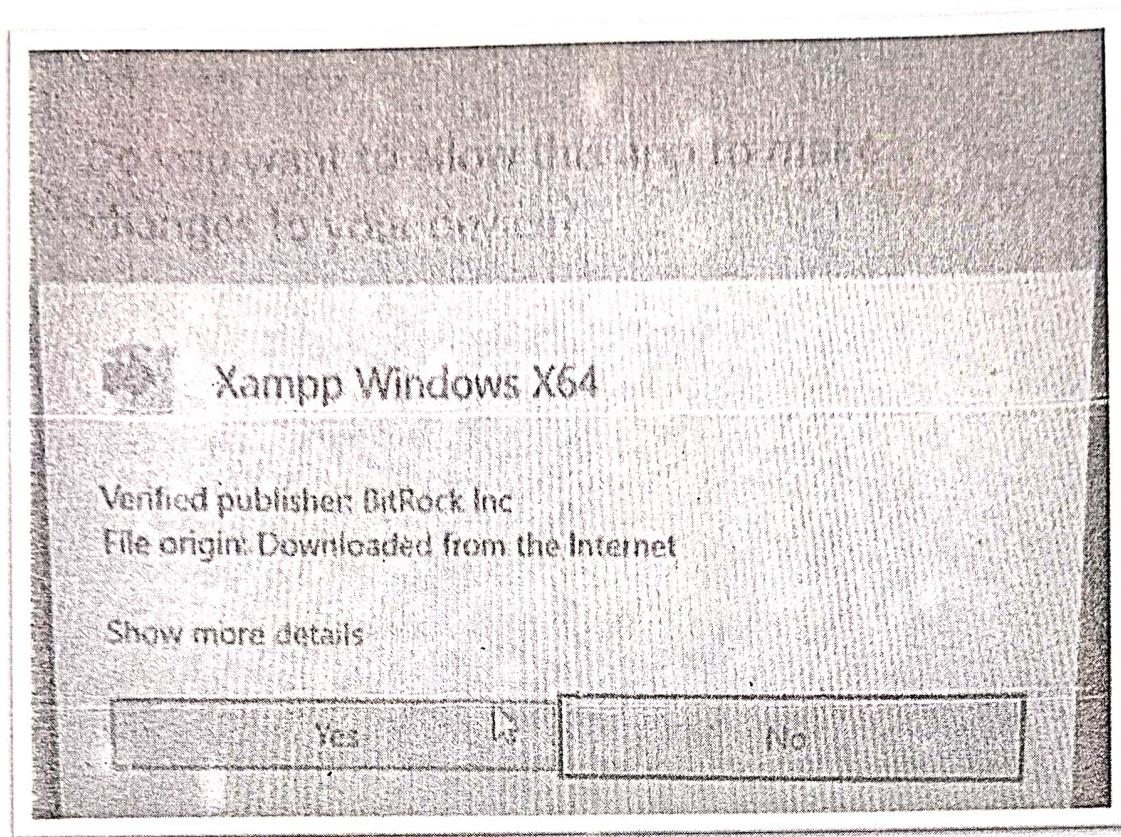
XAMPP for Linux
7.4.5 (PHP 7.4.5)

XAMPP for OS X
7.4.5 (PHP 7.4.5)

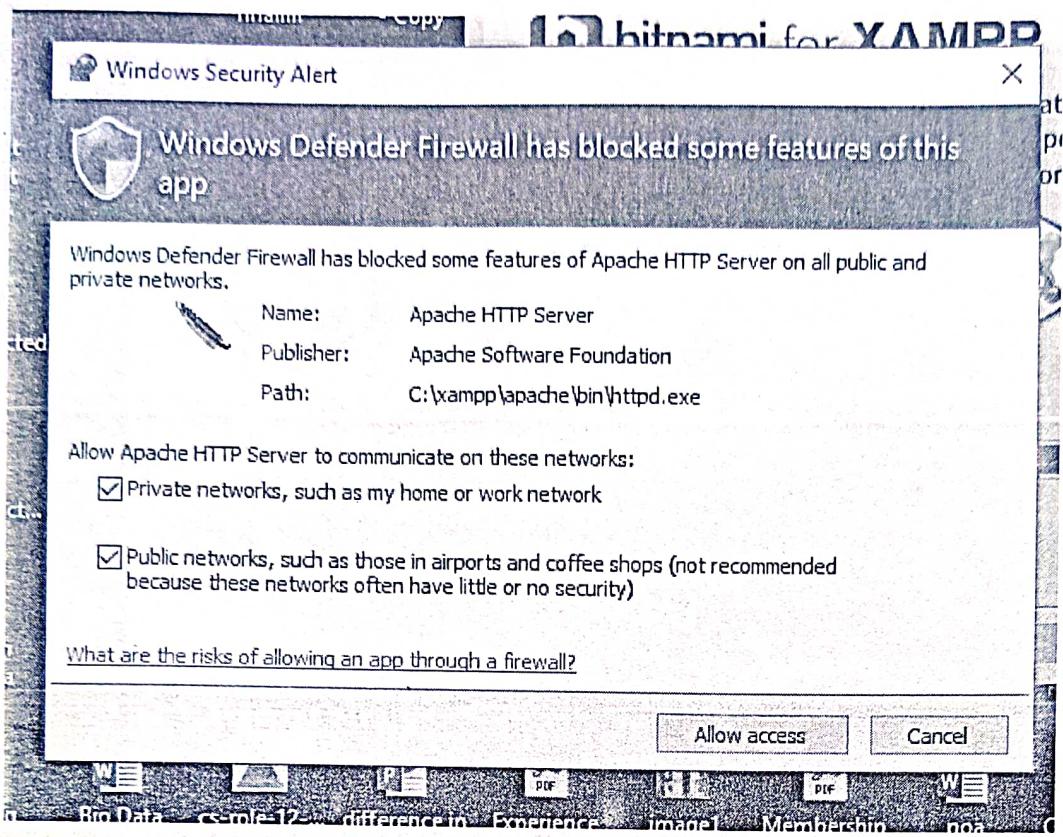
STEP 2- After the download is completed, double click the .exe extension file to start the process of installation.



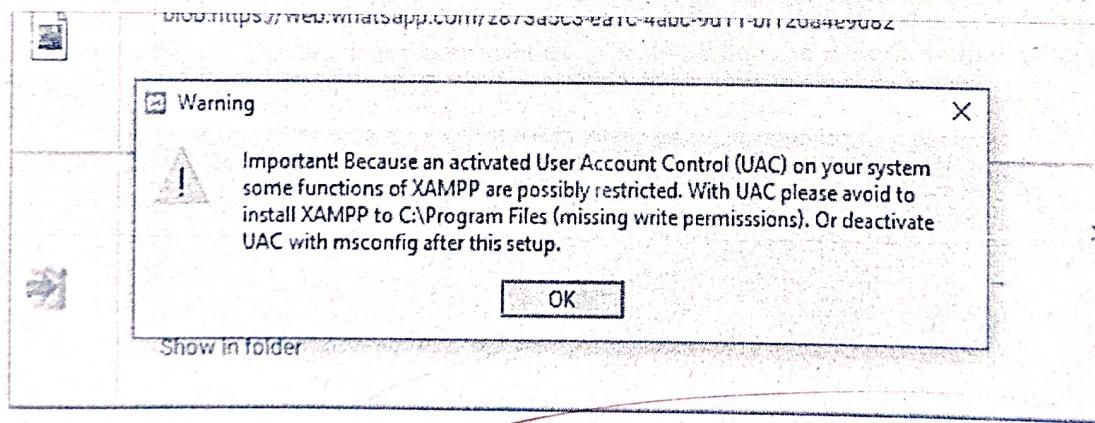
STEP 3- A pop-up screen with the message asking you to allow to make changes on your desktop appears. Click "YES" to continue the process.



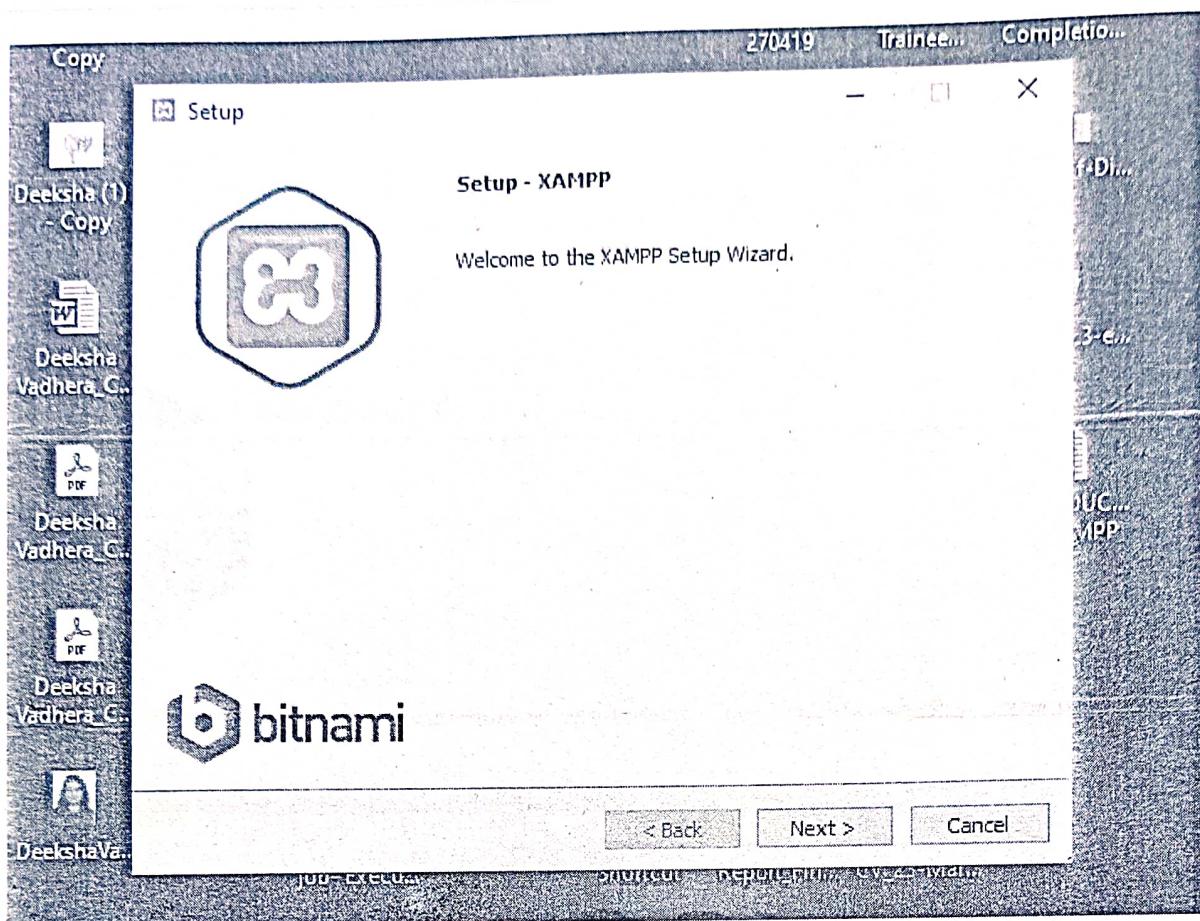
STEP 4- Click to Allow access or deactivate the firewall and any other antivirus software because it can hamper the process of installation. Thus, it is required to temporarily disable any antivirus software or security firewall till the time all the XAMPP components have been installed completely.



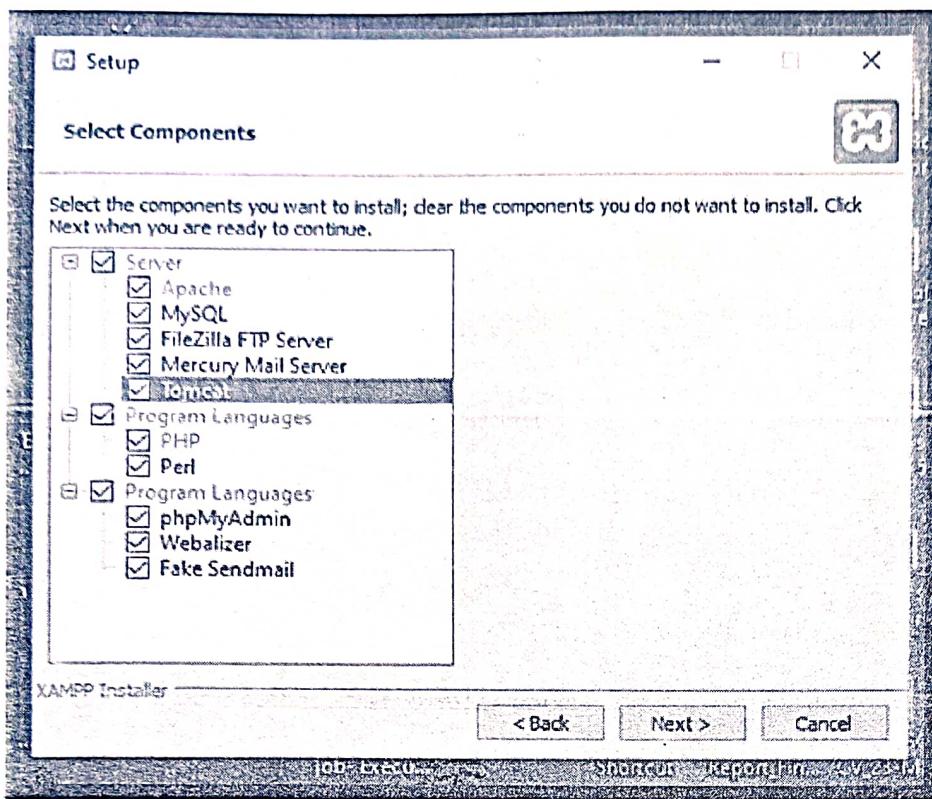
STEP 5- Just before the installation, a pop-up window appears with a warning to **disable UAC**. User Account Control (UAC) interrupts the XAMPP installation because it restricts the access to write to the C: drive. Therefore, it is suggested to disable it for the period of installation.



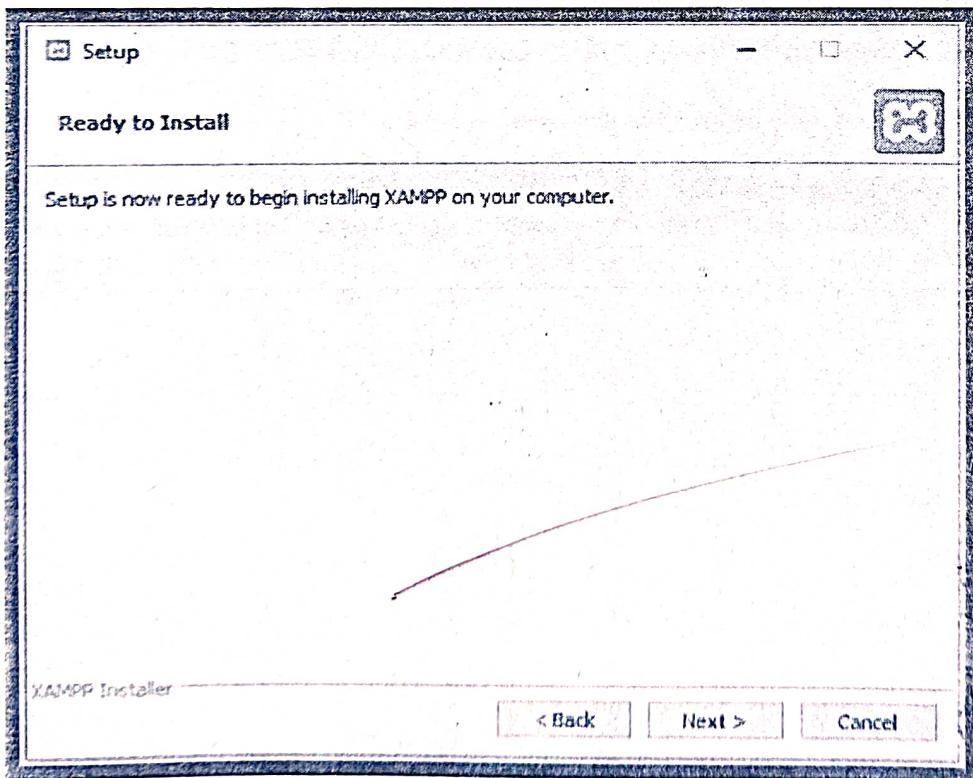
STEP 6- After clicking the .exe extension file, the XAMPP setup wizard opens spontaneously. Click on "NEXT" to start the configuration of the settings.



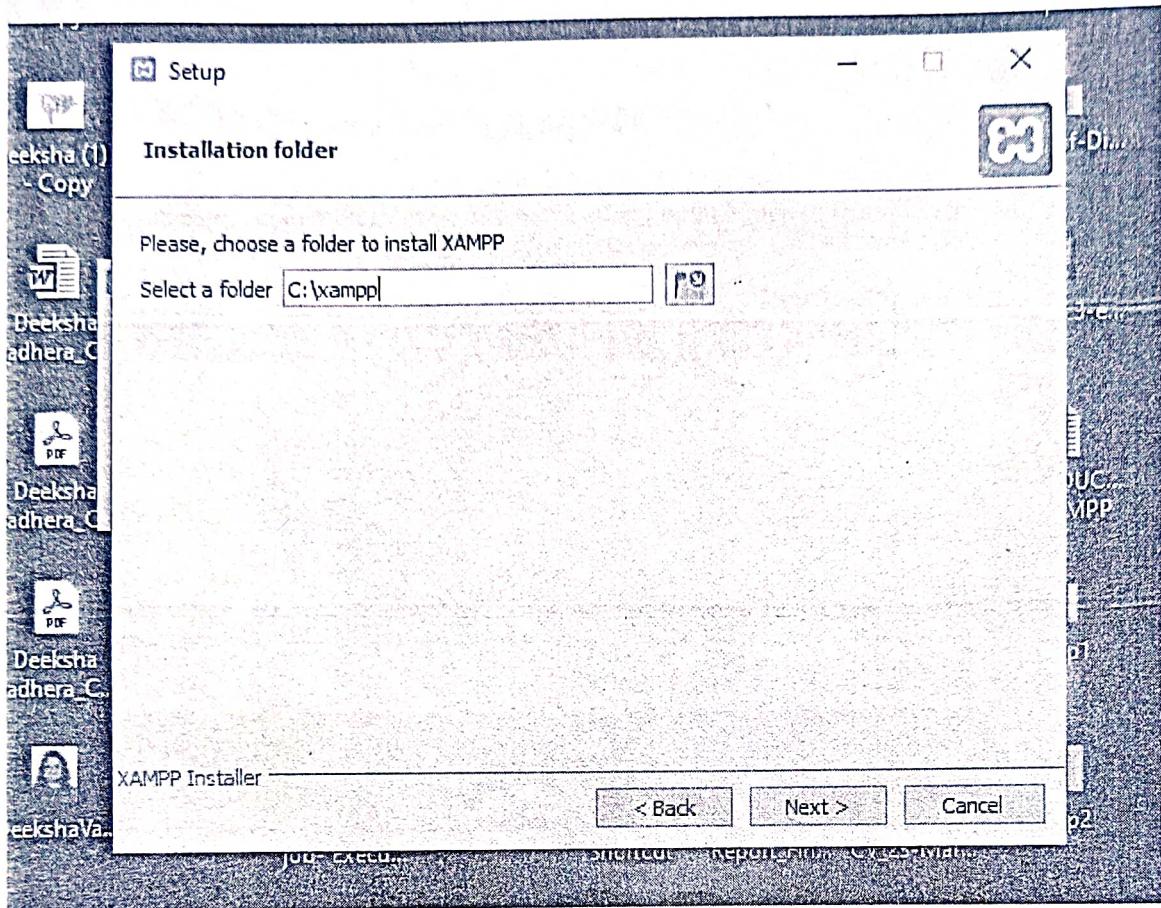
STEP 7- After that, a 'Select Components' panel appears, which gives you the liberty to choose amongst the separate components of the XAMPP software stack for the installation. To get a complete localhost server, it is recommended to install using the default options of containing all available components. Click "NEXT" to proceed further.



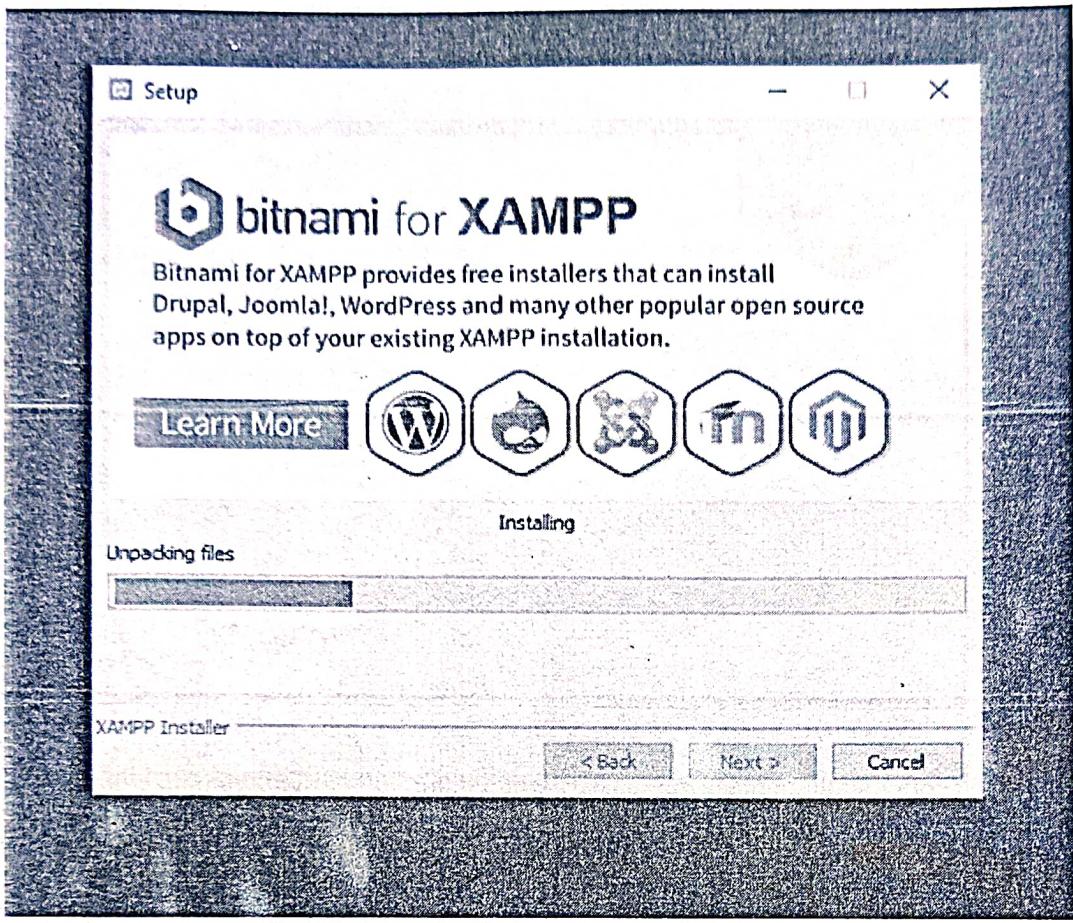
STEP 8- The setup is now ready to install, and a pop-up window showing the same appears on the screen. Click "NEXT" to take the process forward.



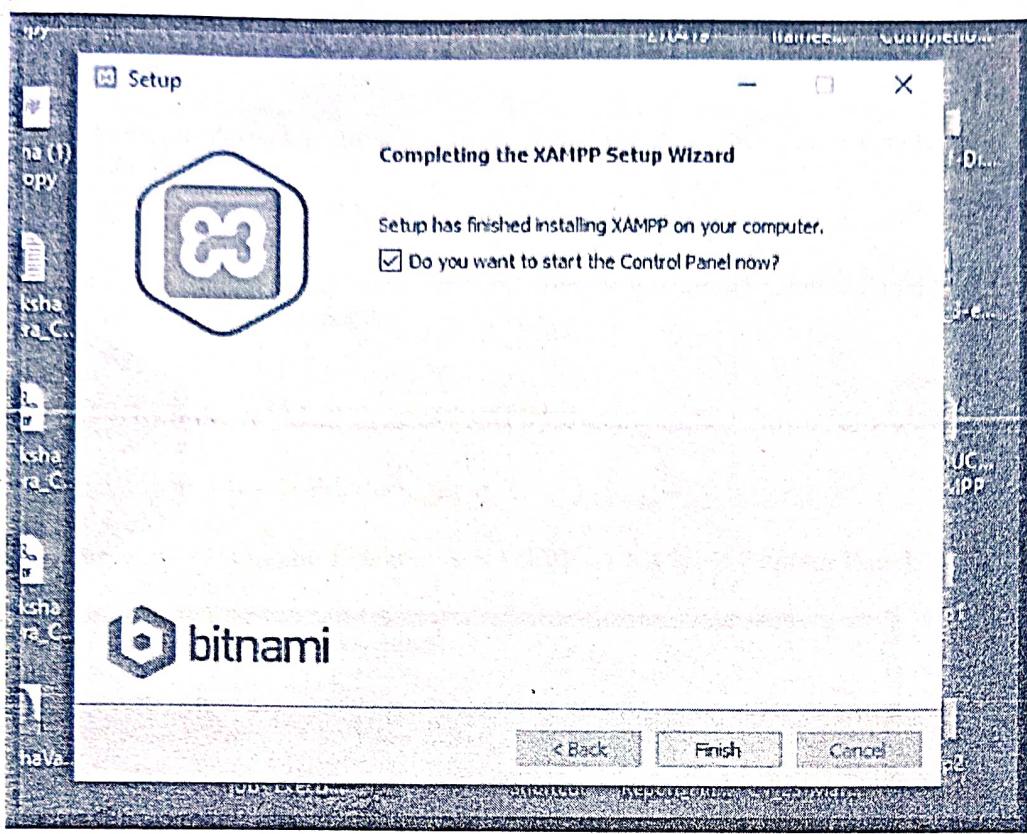
STEP 9- Select the location where the XAMPP software packet needs to be installed. The original setup creates a folder titled XAMPP under C:\ for you. After choosing a location, click "NEXT".



STEP 10- After choosing from all the previously mentioned preferences (like language and learn more bitnami dialogue box) click to start the installation. The setup wizard will unpack and install the components to your system. The components are saved to the assigned directory. This process may take a few minutes to complete. The progress of the installation in terms of percentage is visible on the screen.



STEP 11- After the successful installation of the XAMPP setup on your desktop, press the "FINISH" button.



On clicking the FINISH button, the software automatically launches, and the CONTROL PANEL is visible. The image below shows the appearance of the final result.

XAMPP CONTROL PANEL

This article defines the term XAMPP Control Panel and its utility.

XAMPP Control Panel is a management tool that offers to supervise the actions of individual components of XAMPP. It controls each component of the text server. The user can initiate or halt discrete modules by operating upon the buttons below the "Actions" column. Control panels efficiently manage all the components of the XAMPP package.

One can use the Control Panel to determine whether Apache, MySQL, Mercury, etc. are currently in function or not. The development environment can only be used when Apache and MySQL are in running state. The XAMPP Control Panel icon exists in the system tray. It is an orange-colored icon that is visible when Panel is in running state. If in case it is not visible, then, to launch the Control Panel follow the following steps:



As the name suggests, this button is used to leave the XAMPP Control Panel.

Operating XAMPP Control Panel

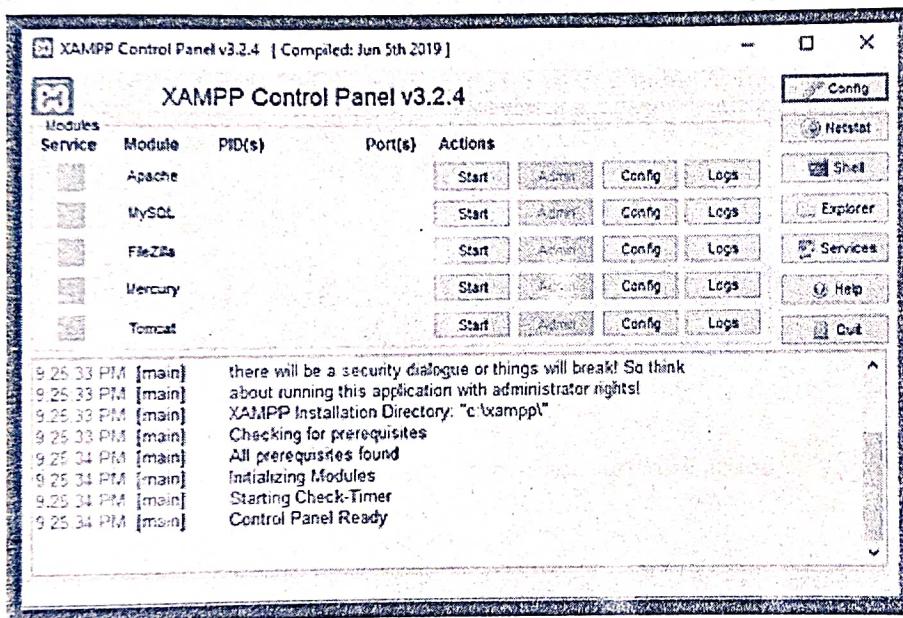
This part of the article deals with the steps used to operate the Control Panel to manage the start-stop actions for MySQL and Apache.

STEP 1- Open the XAMPP Control Panel by clicking on the shown icon



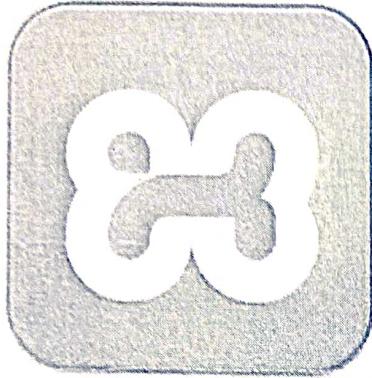
In case the icon is not visible then, go to:

All Programs → Apache Friends → XAMPP → XAMPP Control Panel.



STEP 2- Click Start button corresponding to Apache and MySQL. It is strongly advised to NOT MARK the Service checkboxes on the leftmost end because running these modules as a service may cause a clash with other applications or servers that share standard ports. Establishing and terminating services physically is considered better when one does not include the Apache and MySQL components to run for a considerable time.

STEP 3- Initially, while starting Apache or MySQL, Windows security will question you to Allow access to the servers on your local network in order to unblock the servers and grant access to the system.



Go to All Programs → Apache Friends → XAMPP → XAMPP Control Panel. In case it's already in running state, you will receive an Error! Message.

The functionality of the Control Panel

The XAMPP Control Panel accommodates several buttons, such as config, help, net stat, quit, shell, explorer, and services. Each button and its functionality is defined below:-



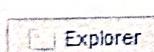
This button is used to configure the XAMPP as a whole, as well as its discrete components.



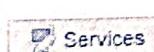
This button offers you to show all the processes currently active on your system.



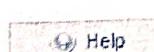
This button permits opening the UNIX shell.



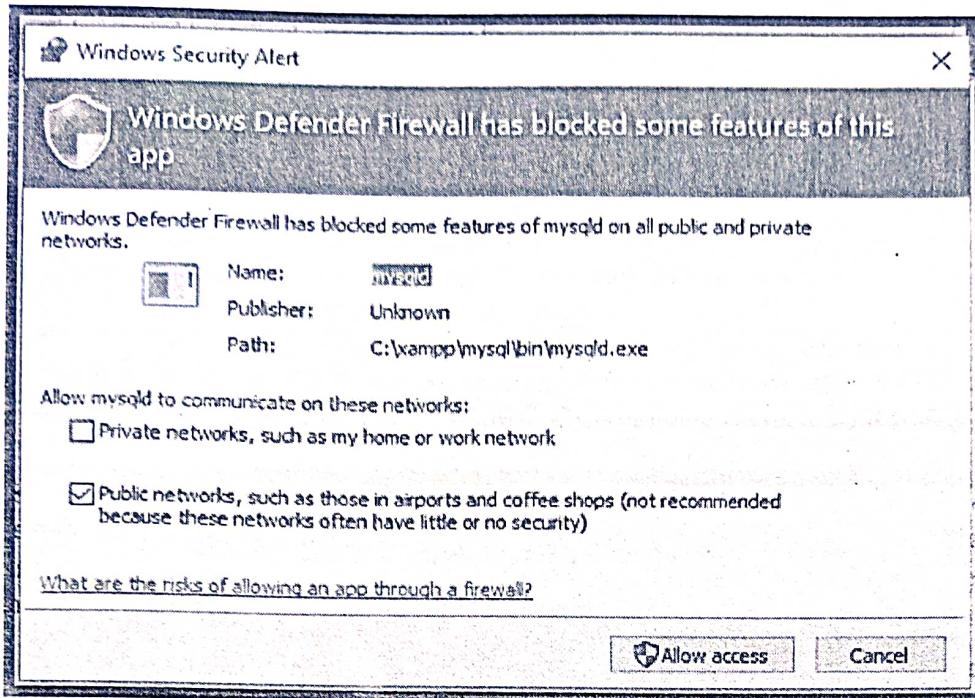
This button is used to open the XAMPP folder in Windows Explorer.



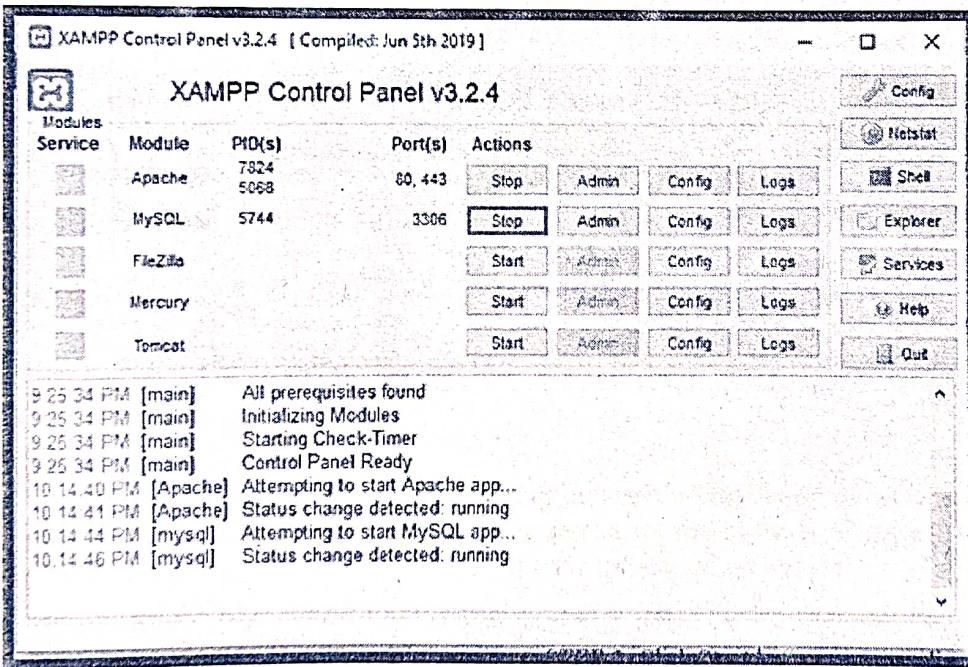
This button assists in showing all the services that are currently active in the back-end.



This button assists the user by providing links to the user forums.



STEP 4- The "Actions" button is a toggle button that switches between Start/Stop. The Port information is also available corresponding to the modules once they are active.



STEP 5- Click the Close **x** button in at the upper right end, which will enable XAMPP to run in the background. It will now be accessible through the Notification area.

STEP 6- To manage the XAMPP Control Panel while running in the background, you can simply right-click the **XAMPP** icon in the **notification area** and start/stop components without opening it.

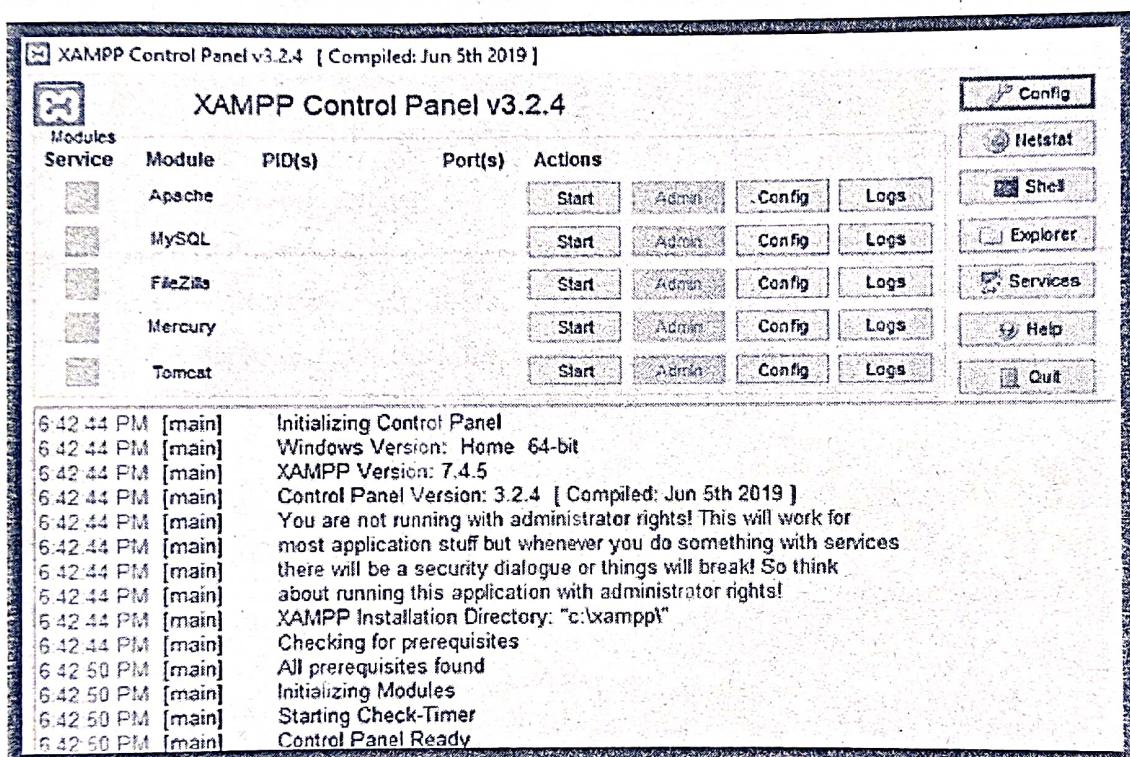
STEP 7- Admin and Config buttons for Modules-

Admin: In the case of Apache, it opens XAMPP for Windows Admin page in the default browser, and for MySQL, it redirects to PHPMyAdmin in the default browser.

Config: In the case of Apache, it provides access to apache folders and configuration files, like httpd.conf, and for MySQL, it grants access to MySQL database folders.

STEP 8- In order to suspend the running of any of the components like Apache or MySQL, click the "Stop" button corresponding to the module you wish to stop.

STEP 9- To stop the Control Panel from running as a background application, click on the "Quit" button at the lower right end. This will remove the XAMPP Launcher from the Notification Bar. To operate again, XAMPP Control Panel needs to be Re-launched.



Testing XAMPP Installation

Xampp allows us to work on a local server and test a local copy of websites using PHP code and mysql database. Any local copy can be accessed on the browser using a URL if xampp is active. XAMPP is a cross-platform software so that it can be used on any operating system.

XAMPP Control Panel:

XAMPP Control Panel provides us with complete control over all xampp-components. This panel can be used to start and stop various modules. Modules available on xampp control panel are:-

- o Apache
- o MySQL
- o FileZilla

- o Mercury
- o Tomcat

Testing XAMPP Installation:

In the control panel, click on the start action for the Apache module. This will instruct XAMPP to initiate the Apache webserver. Now open any web browser and type: <http://localhost> or 127.0.0.1, you should see the XAMPP screen. It means you have XAMPP installed properly on your system.

Follow these steps to check whether the XAMPP server is configured correctly or not, and we can create a PHP test page. This page can be stored under XAMPP's localhost and can run on the browser.

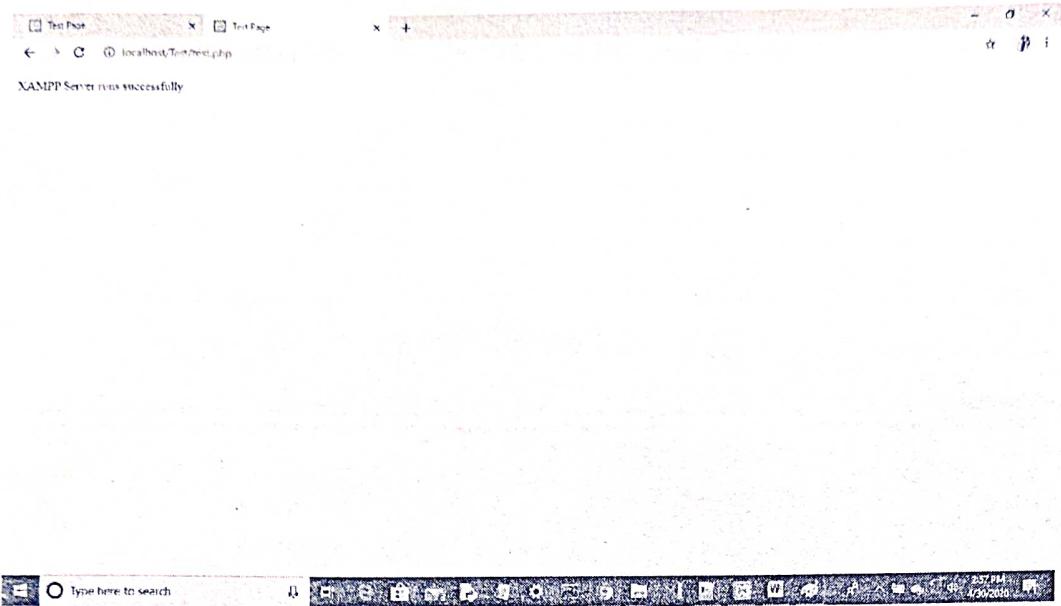
Steps to create a PHP page:-

1. Open the XAMPP directory present in C Drive and choose the htdocs folder (C:\xampp\htdocs for standard installations). This directory contains all the data required to run a web page.
2. Please create a new folder Test for the test page in htdocs.
3. Open notepad and type the following code and save the file in the Test folder.
4. Make sure you have saved the file with .php extension.

1. <!doctype html>
2. <html>
3. <head>
4. <title> Test Page</title>
5. </head>
6. <body>
7. <p> XAMPP Server runs successfully</p>
8. </body>
9. </html>

6. Open the XAMPP control panel and start the apache module.
7. Open your browser and type localhost/Test/test.php in the URL tab. If your browser prints 'XAMPP Server runs successfully', it means XAMPP is successfully installed and correctly configured.

The output of localhost:



From the output screen, you can see that the XAMPP server is successfully installed, and you have also successfully written your first PHP program. Now you can use it to create and test your PHP web apps and even learn how web servers work with OpenSSL, Tomcat, and others. We started only the apache module for testing, but you can also begin other modules like MySQL, FileZila, Mercury, Tomcat to create web apps.