



Web Database Programming using PHP and MySQL

April 3, 2019

Prof. Jongwuk Lee

*Slide credit: This material is mainly made by **Hyeseon Ko**.*

Contents

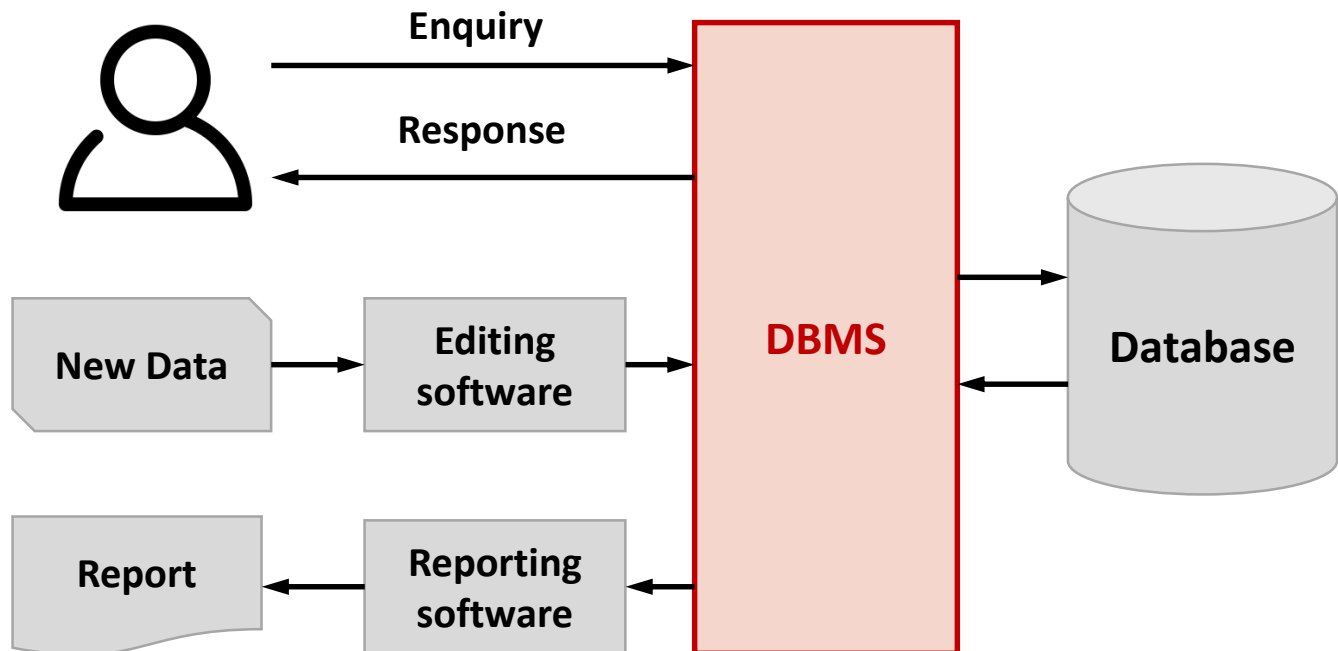


- **Web database system**
- **DB Modeling**
- **Database programming using PHP**
- **Appendix: Setting Development Environments**

What is a DBMS?

➤ **A database management system (DBMS) is a system application to store and analyze data.**

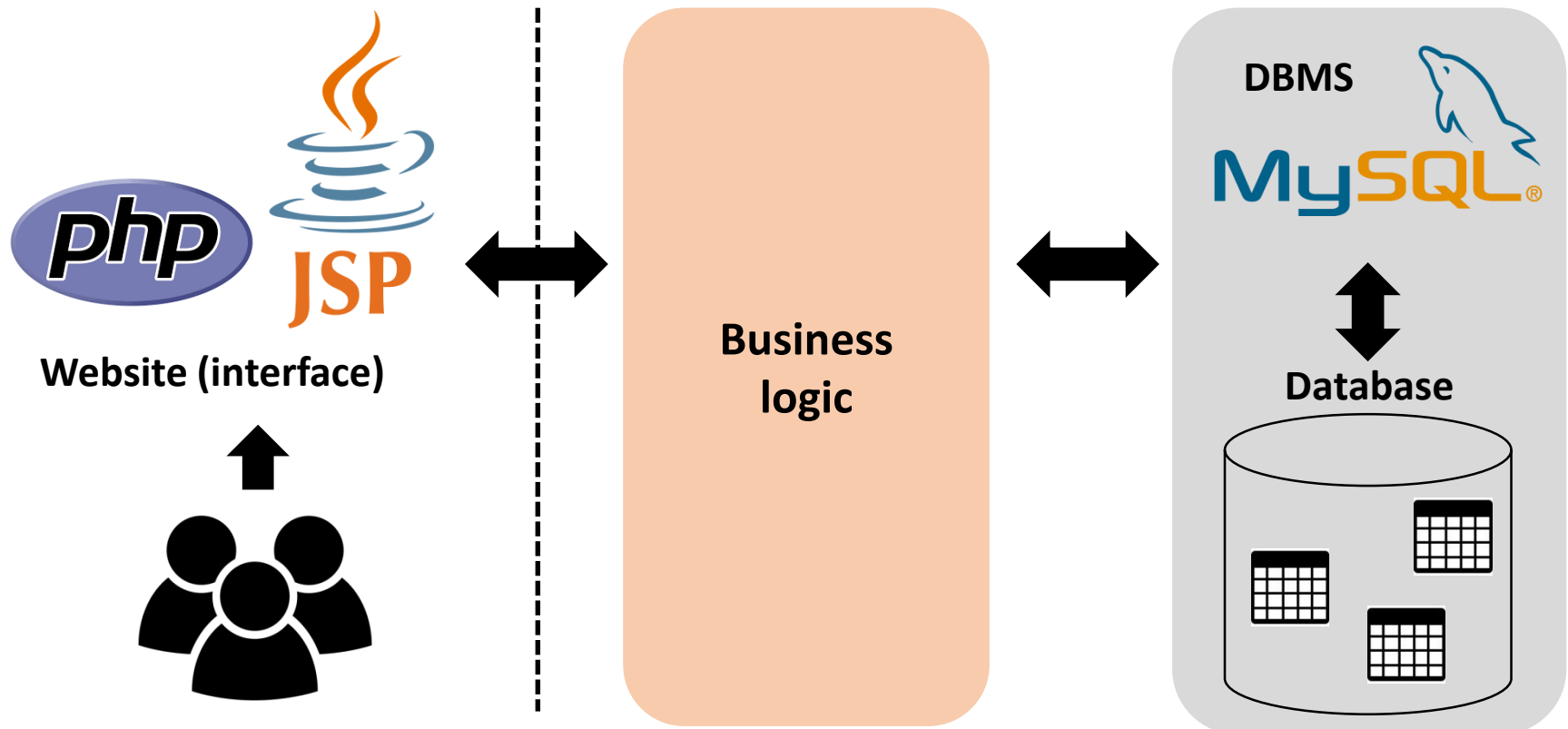
- ◆ E.g., MySQL, Postgre SQL, Oracle, IBM DB2, Microsoft SQL Sever, MongoDB, MariaDB, SAP HANA, SQLite, ...



How to Use DBMS?

➤ Three-tier architecture

- ◆ **Website:** Interface for end-users
- ◆ **Control:** implement business logic
- ◆ **DBMS:** managing and storing users' data





Web Database System

Example: SKKU Library System



성균관대학교 LIBRARY

English Log In
☆
🔔
인사캠
자과캠

자료

연구·학습지원

서비스 이용

알림·문의

도서관 안내

☰

이용시간

자료실

평일 08:00 ~ 21:40
토요일 10:00 ~ 17:00

PC

평일 08:00 ~ 21:40
토요일 10:00 ~ 17:00

열람실

일반 06:00 ~ 01:00
휴일 휴실

공지사항

제1열람실 칸막이좌석 설치작업에 따른 열람실 이용 안내

2017.09.22

[삼성학술정보관] 2017년 10월 시네마룸 상영영화 안내

2017.09.22

(수정 완료)아이폰 iOS11버전 업데이트 시 모바일열람...

2017.09.21

[중앙] 인문사회과학캠퍼스 정기소독(9/24)에 따른 열람...

2017.09.21

「건학기념일, 공부자탄강일, 추석연휴」 자료실 휴실 안내

2017.09.19

KNOW WISDOM

'내 손안의 지식' 수 / 중 / 혜

하루 1분 내 안의 지식 경쟁력을 키워자!

자주 찾는 질문

시설안내 및 예약

자료구입신청

원문복사

타기관 도서대출

이용자별 안내

RISS

NDSL

국가지식포털

국회도서관

ERIS

국립중앙도서관

국가전자도서관

Google Scholar

개인정보처리방침
COPYRIGHT(C) 2015. SKKU LIBRARY.ALL RIGHTS RESERVED

Family site

Example: SKKU Library System



➤ SKKU Library System

- ◆ 중앙학술정보관, 삼성학술정보관의 전산시스템

➤ Main services

- ◆ 도서 검색/대출/반납
 - 도서관에서 보유 중인 도서 목록 중 사용자가 입력한 keyword를 포함하는 도서의 목록을 뽑아 출력
 - 도서의 상태(대출가능/불가능)와 사용자의 상태(권한, 연체 여부, 대출 가능 권수 초과 여부)등을 고려하여 대출 허가
- ◆ 시설안내 및 예약
 - 열람실 좌석 발권
 - 스터디룸, 세미나룸 등 도서관 내 시설물 예약

Example: Student Intranet (GLS)



**성균관대학교**
SUNGKYUNKWAN UNIVERSITY

내 정보는 여기로
정보광장

학번선택 2013314650 (소프트웨어학과-대) | 로그아웃 |

학부-졸업


메뉴 즐겨찾기

메뉴펼치기 메뉴접기

- 학사일정
- 신청/자격관리
- 수업영역
- 학적/개인영역
- 학업영역
- 비교과영역
- 지식재산권

International Partners


Academic Exchange Programs with Overseas Institutions Agreement with 549 Universities in 47 countries including ISEP 33 affiliated members & SAF 40 members & CONAHEC 16 members



세계100대 연구중심대학

Global Challenge SKKU

- 01. Global Alliance확대
- 02. 국제화 교육/연구 역량강화
- 03. 국제화 리더십/조직역신
- 04. 인프라 업그레이드



Example: Student Intranet (GLS)

➤ SKKU Students Intranet (GLS)

- ◆ GLS(Gold Lawn Square 금잔디광장).
- ◆ 학생 및 동문의 학사지원을 위한 인트라넷 서비스

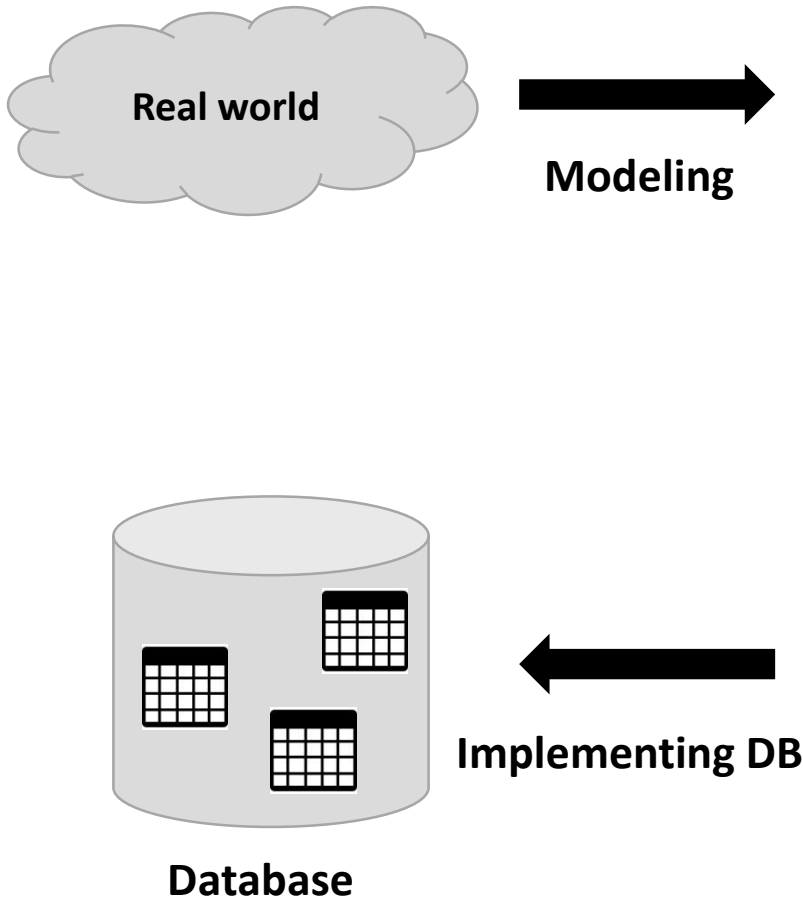
➤ Main services

- ◆ 학사일정안내
- ◆ 휴.복학, 장학금, 학생 생활 관련 신청
- ◆ 학적/신상정보, 등록금, 졸업자가진단
- ◆ 수강신청
- ◆ 학업성적 확인
- ◆ 온라인교육

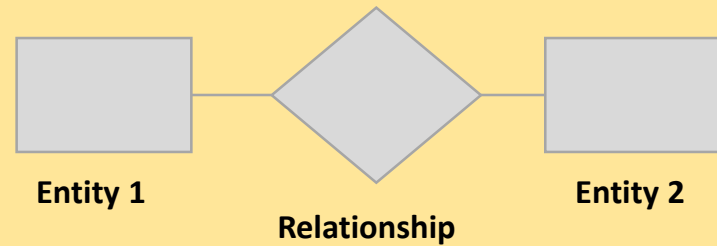


DB Modelling

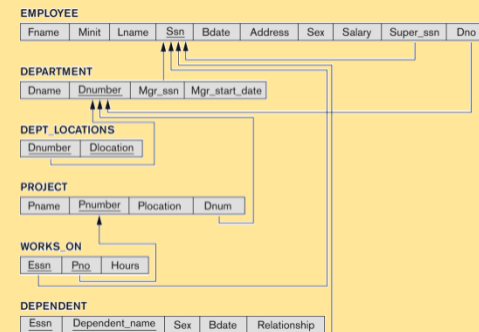
Relational Modeling for Web DB Systems



Conceptual Model: ER Diagram



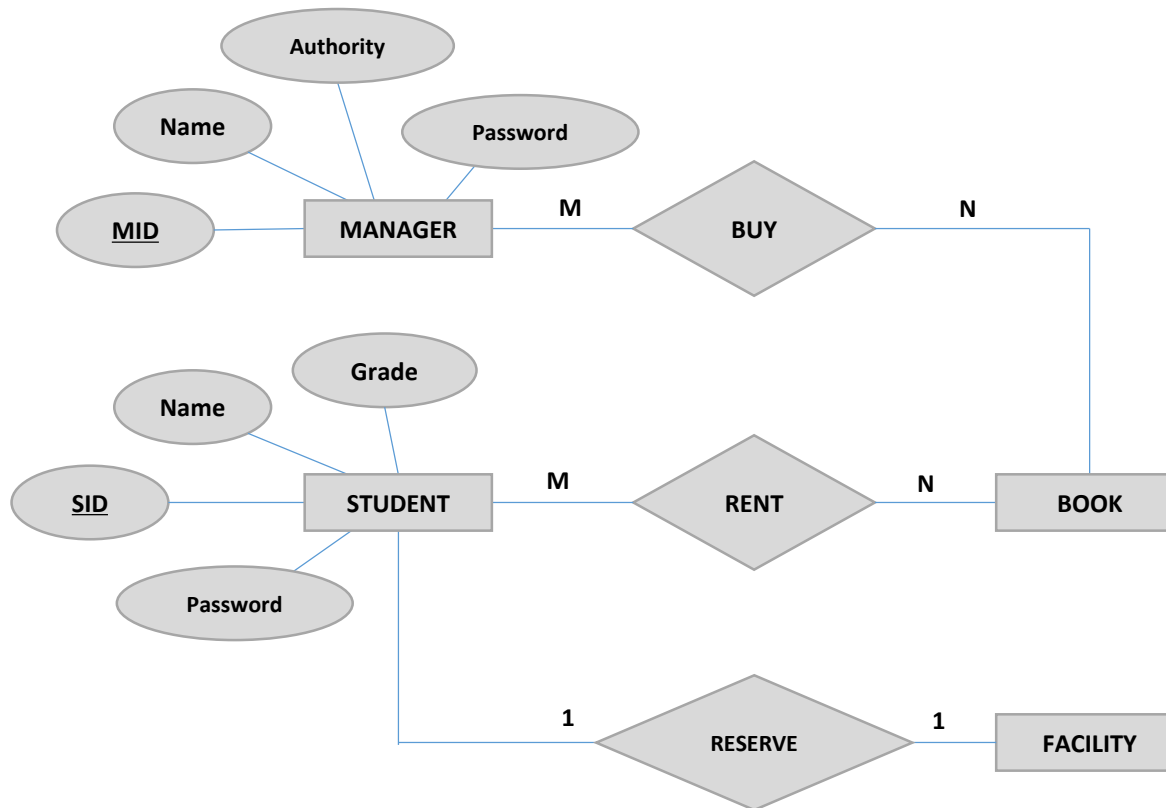
Logical Model: Relational Model



Relational Modeling for Web DB Systems

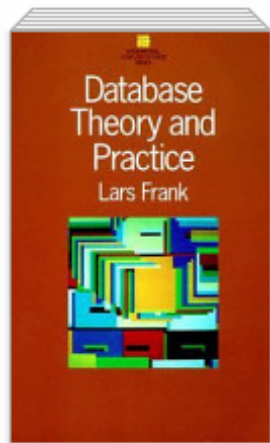


➤ ER diagram for SKKU Library System



🏠 > Resource > Detail view

Detail view



Resource type Western Book

Title Statement [Database : theory and practice / Lars Frank.](#)

Personal Name [Frank, Lars.](#)

Publication Statement Workingham, England ; Reading, Mass. : Addison-Wesley, c1988.

Physical Description ix, 374 p. : ill. ; 24 cm.

Uniform Title [Databaser.](#) English

ISBN 0201180413 (pbk.)

▼ View more

My Storage ▼

Store temporarily ▼

Export ▼

Stocked resources [Samsung Library](#)

[Register number](#) ⬆

[Item location](#) ⬆

[Call number](#) ⬆

Location

Status

Service !

WW0078838

Archive 2 (2nd basement floor)

* 621.381956 F828d



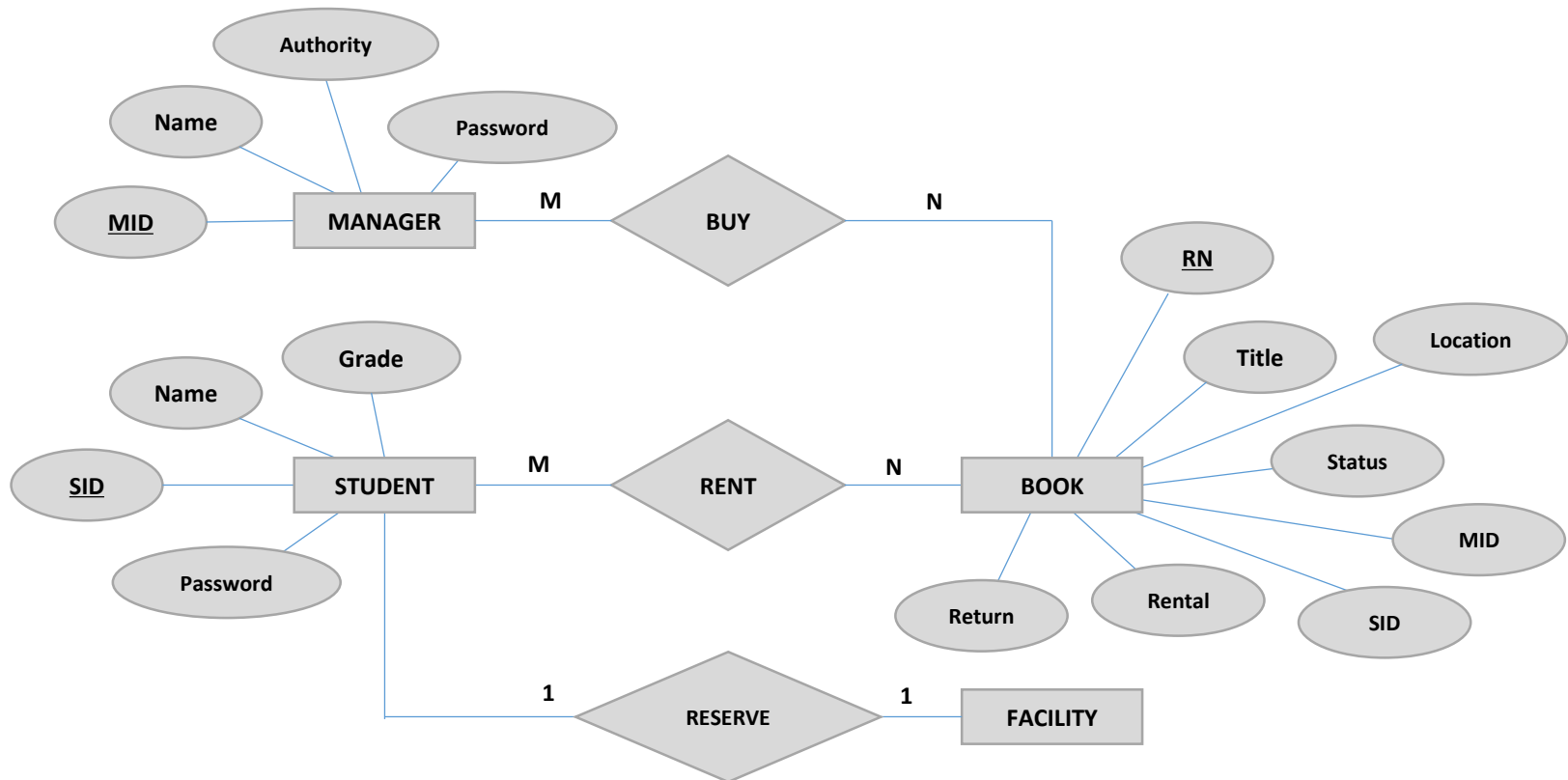
Available

sms

Relational Modeling for Web DB Systems



➤ ER diagram for SKKU Library System



그룹스터디룸

- 반드시 안내사항을 참조하여 이용에 착오 없으시기 바랍니다.
- 그룹스터디룸 이용예약은 4일전부터 예약가능 합니다.

이용안내

2층

3층

4층

4층



총 3 건 ☐ 사용가능 ☒ 사용중 ☒ 예약 ☐ 사용불가

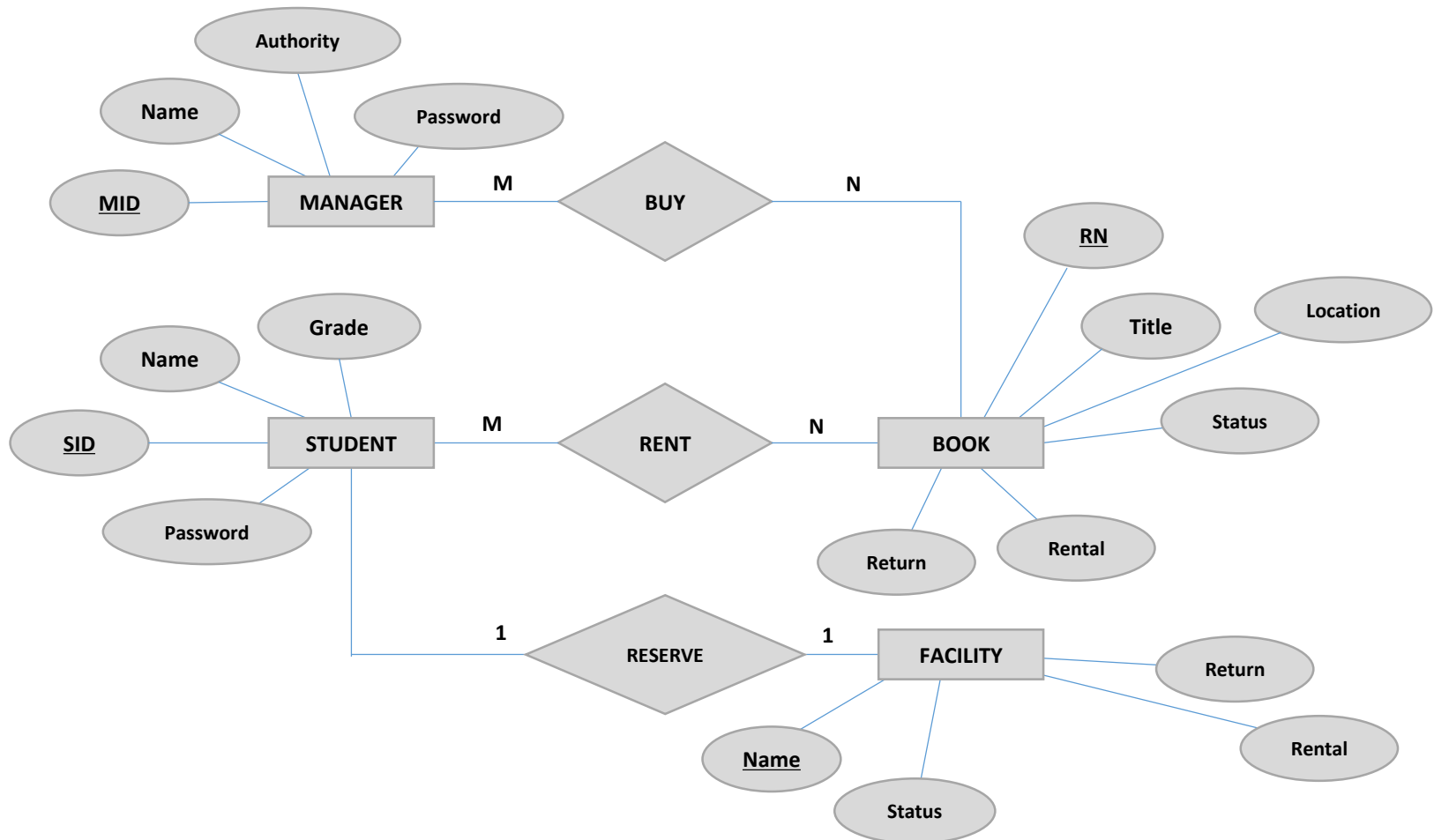
예약희망일자 2017-10-18

이름	수용인원	9	10	11	12	13	14	15	16	17	18	19	20	21	예약
스타디움 4-1	3 ~ 4														예약하기
스타디움 4-2	5 ~ 8														예약하기
스타디움 4-3	6 ~ 10														예약하기

Relational Modeling for Web DB Systems



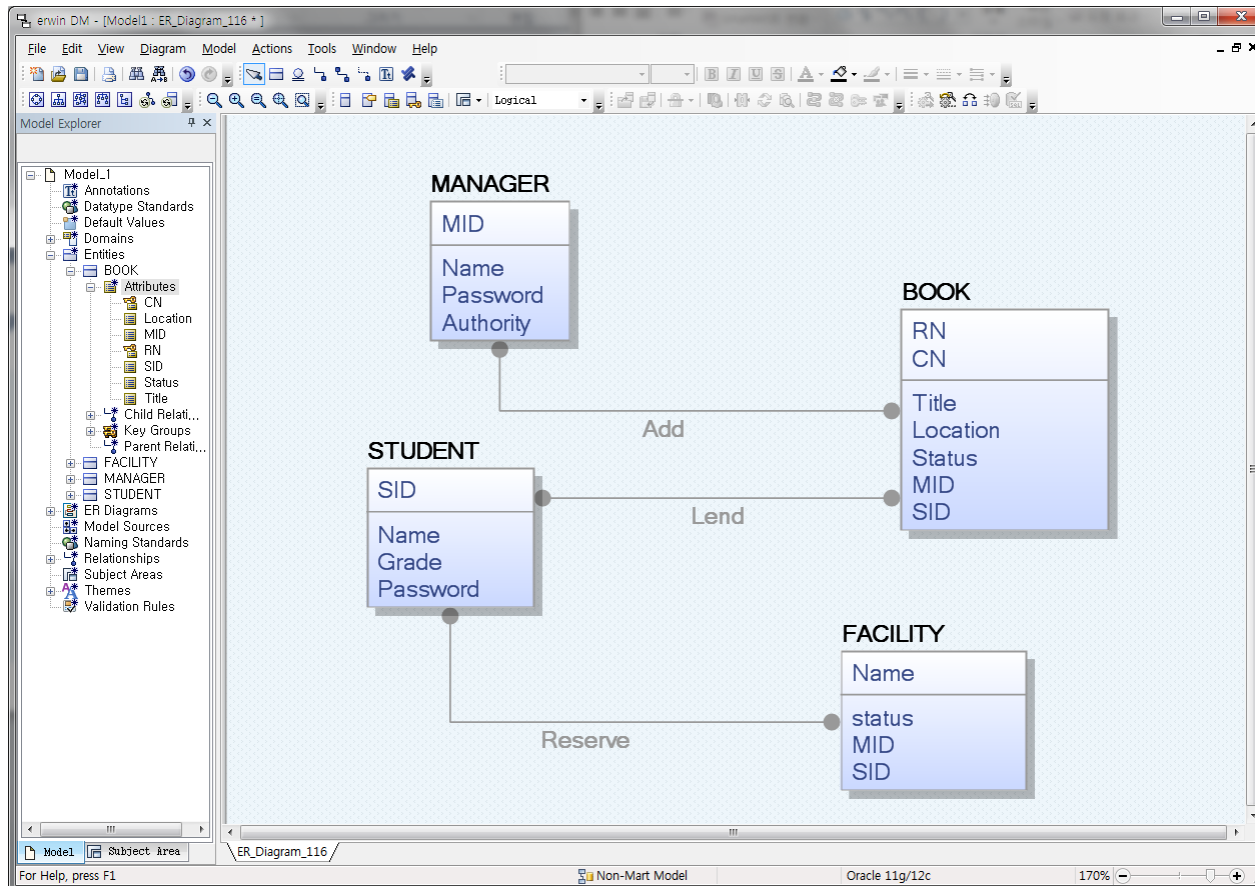
➤ ER diagram for SKKU Library System



Relational Modeling for Web DB Systems



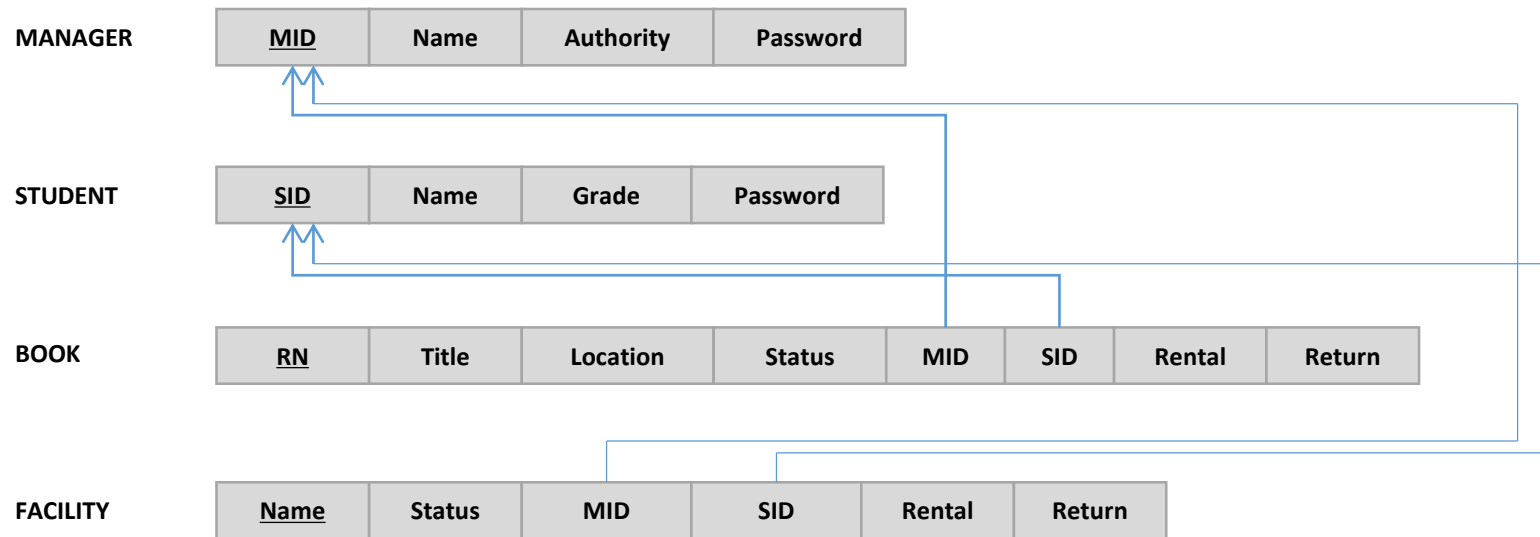
➤ ER diagram for SKKU Library System (ERWin)



Relational Modeling for Web DB Systems



➤ Relational Model for SKKU Library System



Relational Modeling for Web DB Systems



➤ Database for SKKU Library System (MySQL)

```
C:\Windows\system32\cmd.exe - mysql -u root -p
MariaDB [(none)]> use skklibrary
Database changed
MariaDB [skklibrary]> show fields from books;
```

Field	Type	Null	Key	Default	Extra
등록번호	char(9)	NO	PRI	NULL	
서명	varchar(40)	YES		NULL	
소장위치	varchar(20)	YES		NULL	
상태	varchar(10)	YES		NULL	
MID	char(10)	YES		NULL	
SID	char(10)	YES		NULL	
대여일	date	YES		NULL	
반납일	date	YES		NULL	

```
8 rows in set (0.00 sec)

MariaDB [skklibrary]> show fields from students;
```

Field	Type	Null	Key	Default	Extra
학번	char(10)	NO	PRI	NULL	
이름	varchar(20)	YES		NULL	
비밀번호	varchar(20)	YES		NULL	
성별	char(1)	YES		NULL	
대출가능도서수	tinyint(3) unsigned	YES		NULL	

```
5 rows in set (0.00 sec)

MariaDB [skklibrary]>
```



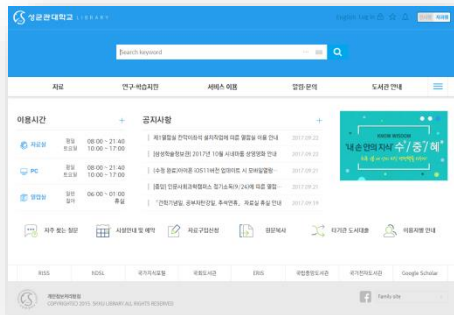
Database Programming with PHP

MVC Design Pattern



➤ Three main components of an application

- ◆ **Models:** Implement the logic for the application's data domain.
- ◆ **Views:** Display the application's user interface based on changes in the model.
- ◆ **Controllers:** Handle user interaction, work with the model, and ultimately select a view for the users.



View

**Business
logic**

Control

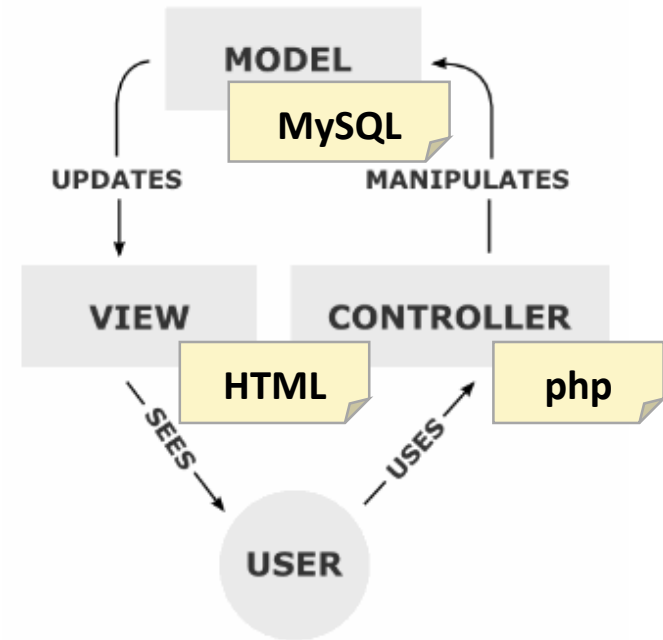


Model

MVC Design Pattern

➤ Web application and MVC

- ◆ 1. User accesses to an website (**Use**).
- ◆ 2. Controller calls the model to serve the page requested by user (**Manipulate**).
- ◆ 3. Model handles data and return the results.
- ◆ 4. Controller reflects the results from model to views (**Updates**).
- ◆ 5. User gets the chanced view (**Sees**).



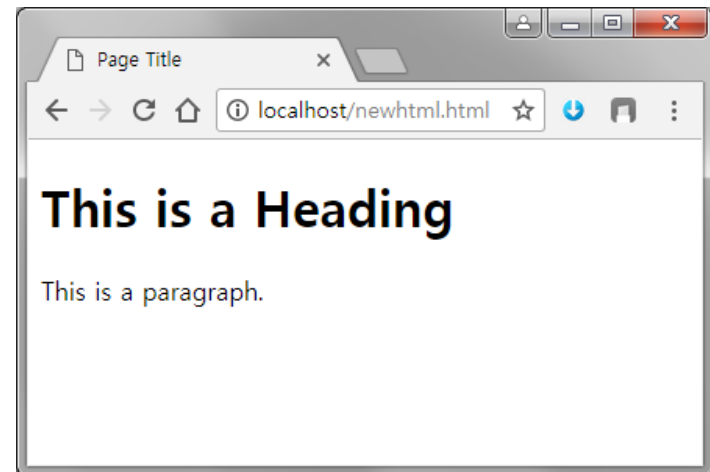
HTML: Web Interface



➤ HTML: HyperText Markup Language

- ◆ Standard markup language for creating web pages and web applications
- ◆ HTML elements are delineated by *tags*
 - e.g. , <input />, <p>...</p>
 - You can easily get how to use *tags* from Internet...

```
<!DOCTYPE html>
<html>
  <head>
    <title>Page Title</title>
  </head>
  <body>
    <h1>This is a Heading</h1>
    <p>This is a paragraph.</p>
  </body>
</html>
```



PHP: Controller



➤ PHP: Hypertext Preprocessor

- ◆ Open-source server side scripting language
- ◆ Available on most computer platforms
- ◆ Suits for creating dynamic Web pages that contain database access commands
- ◆ Supports various databases
 - e.g. MySQL, PostgreSQL, Mongo DB, etc.
- ◆ Acts as Controller in our project.



➤ Video

- ◆ https://www.youtube.com/watch?v=KUXO_swGPMk

➤ References

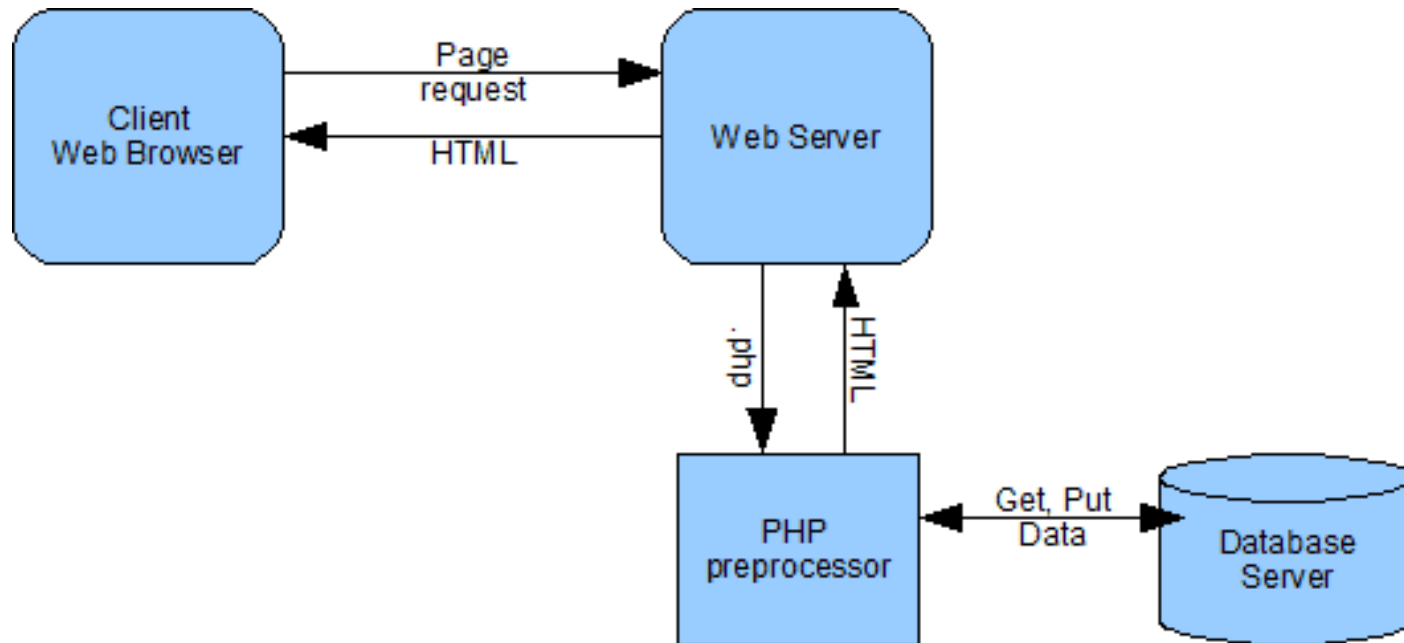
- ◆ <https://www.w3schools.com/php/>
- ◆ <http://php.net/manual/kr/tutorial.firstpage.php>

PHP: Controller



➤ Servers and Clients communication with PHP

- ◆ http://www.classicpageworks.com/articles/topic_PHP/PHP_Basics_Lesson_1.html



Basics of PHP

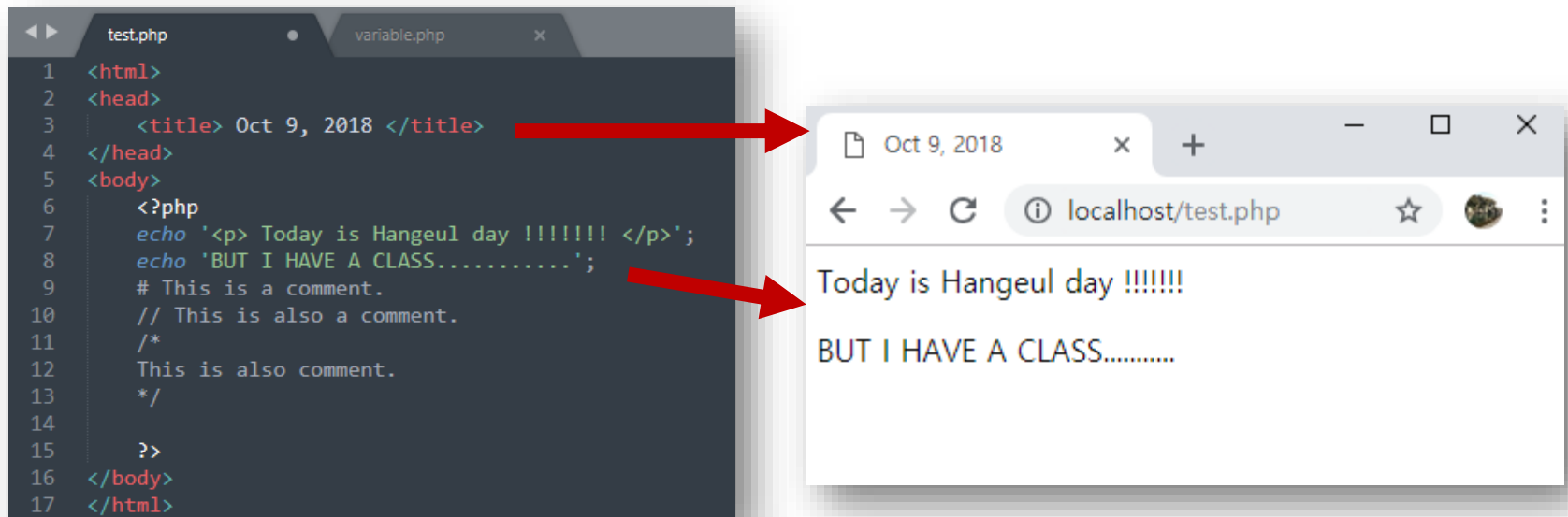
➤ The codes can be embedded in HTML document

➤ Tags

- ◆ `<?php` : PHP start tag
- ◆ `?>` : PHP end tag

➤ Comments

- ◆ `#` or `//` or `/* */`



The image shows a code editor on the left and a web browser on the right. The code editor displays the following PHP code:

```
1 <html>
2 <head>
3   <title> Oct 9, 2018 </title>
4 </head>
5 <body>
6   <?php
7     echo '<p> Today is Hangeul day !!!!!!! </p>';
8     echo 'BUT I HAVE A CLASS.....';
9     # This is a comment.
10    // This is also a comment.
11    /*
12     This is also comment.
13    */
14
15    ?>
16 </body>
17 </html>
```

Red arrows point from the code to the browser output. The first arrow points from the `<title> Oct 9, 2018 </title>` line to the browser's title bar, which shows "Oct 9, 2018". The second arrow points from the `echo` statements to the browser's main content area, which displays:

Today is Hangeul day !!!!!!!
BUT I HAVE A CLASS.....

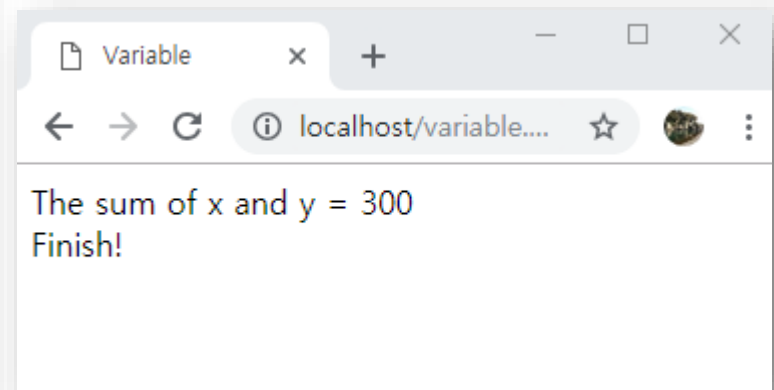
Basics of PHP



➤ PHP variables

- ◆ Start with \$ symbol
- ◆ Can include characters, letters, and underscore character (_)
- ◆ No intrinsic data type: PHP decides.

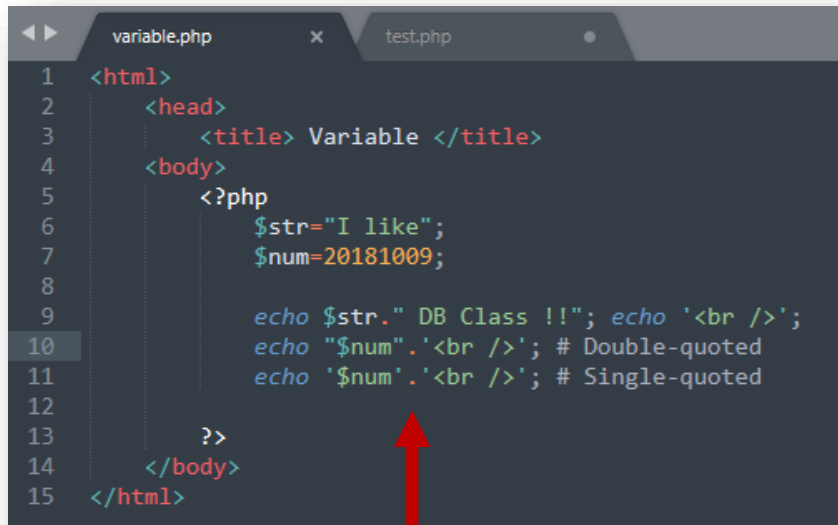
```
variable.php x test.php
1 <html>
2   <head>
3     <title> Variable </title>
4   <body>
5     <?php
6       $x = 100; # declare a variable x
7       $y = 200; # declare a variable y
8       echo 'The sum of x and y = ';
9       echo $x+$y;
10      echo '<br />'; # text wrapping
11      echo 'Finish!';
12    ?>
13  </body>
14 </html>
```



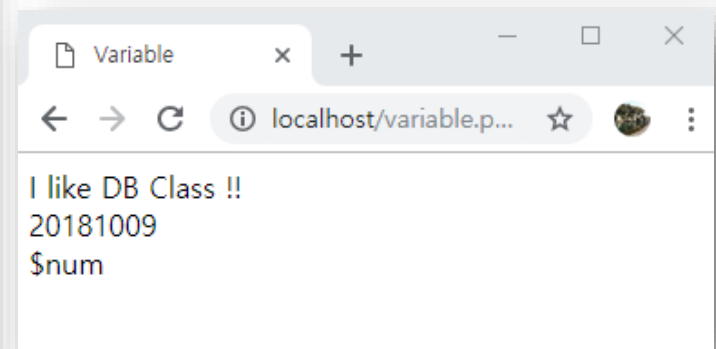
Basics of PHP

➤ Strings and text

- ◆ Single-quoted strings
 - Literal strings that contain no PHP program variables
- ◆ Double-quoted strings
 - Values from variables need to be interpolated into string
- ◆ **Period(.)** symbol
 - String concatenate operator



```
1 <html>
2   <head>
3     <title> Variable </title>
4   <body>
5     <?php
6       $str="I like";
7       $num=20181009;
8
9       echo $str." DB Class !!"; echo '<br />';
10      echo "$num". '<br />'; # Double-quoted
11      echo '$num'. '<br />'; # Single-quoted
12
13    ?>
14  </body>
15 </html>
```



Variable

localhost/variable.p...

I like DB Class !!
20181009
\$num

Period(.) symbol to concatenate operators

Basics of PHP



➤ Receiving data from HTML form

◆ HTML form

- The HTML <form> element defines a form that is used to collect user input
- https://www.w3schools.com/html/html_forms.asp

◆ Methods to submit form data

- GET
 - default method for submitting form data
 - submitted form data will be visible in the page address field
- POST
 - use POST when the form data contains sensitive or personal information.
 - POST method does not display the submitted form data in the page address field.

Receiving Data from Web Interface



➤ Receiving data from HTML form (Cont'd)

◆ Scenario

- (a) Initial form displayed by PHP program segment

A screenshot of a web browser window titled 'Login Page'. The address bar shows 'localhost/login...'. The page content includes a text input field labeled 'Enter your Student ID:' and a button labeled 'ENTER'.

- (b) User enters student ID 123456789

A screenshot of the same web browser window. The text input field now contains the value '123456789'.

- (c) Form prints welcome message for John Smith

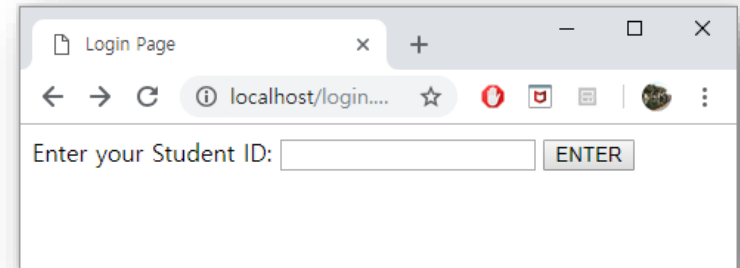
A screenshot of a web browser window titled 'WELCOME PAGE'. The address bar shows 'localhost/welco...'. The page content displays the message 'WELCOME, 123456789'.

Receiving Data from Web Interface



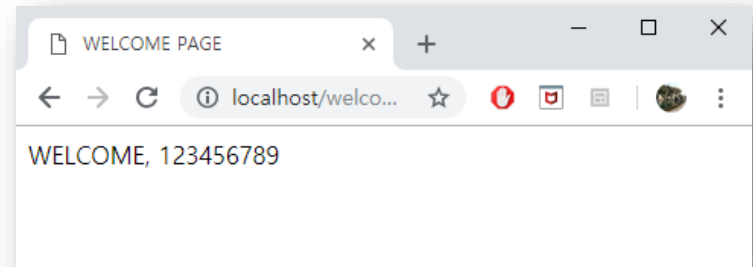
HTML file : login.html

```
login.html welcome.php x
1 <html>
2 <title> Login Page </title>
3 <FORM method="post" action="welcome.php">
4     Enter your Student ID:
5     <input type="text" name="user_id">
6     <input type="submit" value="ENTER">
7 </FORM>
8 </html>
9
```



PHP file : welcome.php

```
login.html welcome.php
1 <html>
2 <title> WELCOME PAGE </title>
3 <?php
4     print 'WELCOME, '.$_POST['user_id'];
5 ?>
6 </html>
7
```



Receiving Data from Web Interface



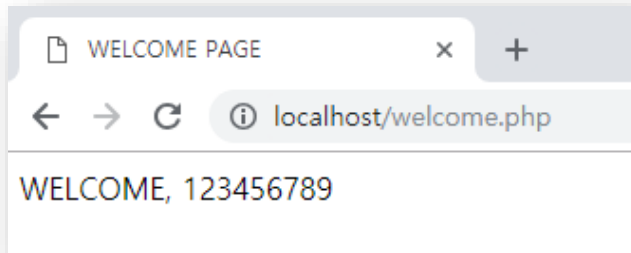
HTML file : login.html

```
login.html welcome.php x
1 <html>
2 <title> Login Page </title>
3 <FORM method="post" action="welcome.php">
4   Enter your Student ID:
5   <input type="text" name="user_id">
6   <input type="submit" value="ENTER">
7 </FORM>
8 </html>
9
```

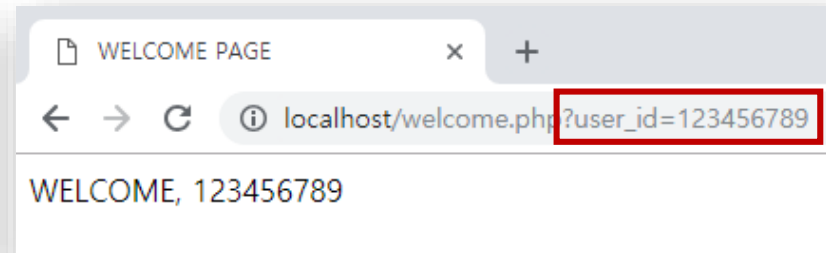
```
login.html welcome.php
1 <html>
2 <title> WELCOME PAGE </title>
3 <?php
4   print 'WELCOME, '.$_POST['user_id'];
5 ?>
6 </html>
7
```

➤ <FORM> tag

- ◆ <FORM METHOD= "how to send" ACTION="where to send">



METHOD = "POST"



METHOD = "GET"

Receiving Data from Web Interface



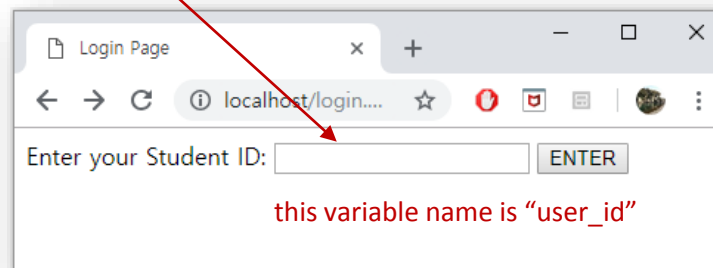
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4   Enter your Student ID:
5   <input type="text" name="user_id">
6   <input type="submit" value="ENTER">
7 </FORM>
8 </html>
9
```

```
login.html welcome.php
1 <html>
2 <title> WELCOME PAGE </title>
3 <?php
4   print 'WELCOME, '.$_POST['user_id'];
5 ?>
6 </html>
7
```

➤ <INPUT> tag

- ◆ <INPUT TYPE= "type of input" NAME="the name of variable" VALUE="values">
 - text / submit / button / radio / checkbox / hidden
 - (ex) <input type = "text" name = "user_id">, <input type="submit" value="enter">



Receiving Data from Web Interface



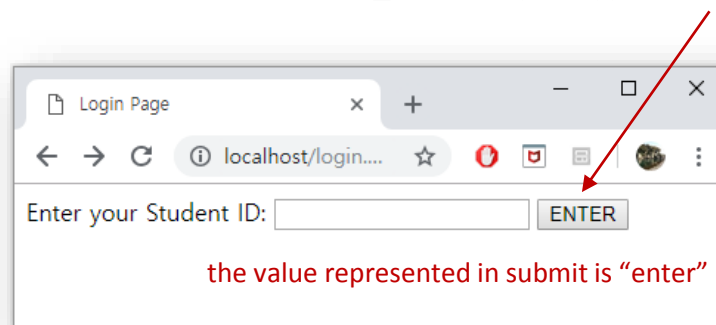
HTML file : login.html

```
login.html welcome.php x
1 <html>
2 <title> Login Page </title>
3 <FORM method="post" action="welcome.php">
4   Enter your Student ID:
5   <input type="text" name="user_id">
6   <input type="submit" value="ENTER">
7 </FORM>
8 </html>
9
```

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6 </html>
7
```

➤ <INPUT> tag

- ◆ <INPUT TYPE= "type of input" NAME="the name of variable" VALUE="values">
 - text / submit / button / radio / checkbox / hidden
 - (ex) <input type = "text" name = "user_id">, <input type="submit" value="enter">



Receiving Data from Web Interface



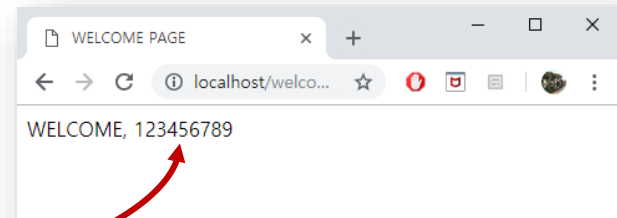
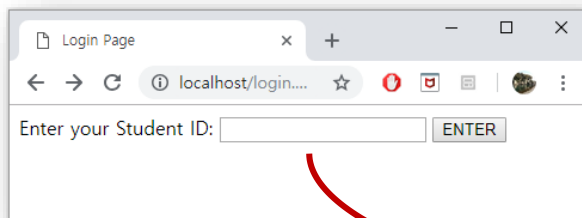
HTML file : login.html

```
login.html welcome.php x
1 <html>
2 <title> Login Page </title>
3 <FORM method="post" action="welcome.php">
4   Enter your Student ID:
5   <input type="text" name="user_id">
6   <input type="submit" value="ENTER">
7 </FORM>
8 </html>
9
```

```
login.html welcome.php
1 <html>
2 <title> WELCOME PAGE </title>
3 <?php
4   print 'WELCOME, ' . $_POST['user_id'];
5 ?>
6 </html>
7
```

➤ \$_POST

- ◆ **Auto-global** predefined PHP variable
- ◆ Dynamic array that holds all the values entered through form parameters
- ◆ `$_POST['the name of variable']`



user id

Connecting PHP to MySQL

➤ PDO (PHP Data Objects)

- ◆ Represents a connection between PHP and a database server.
- ◆ same function as mysql_connect (which was used in version before 5.5)

➤ Basic Functions/Methods

- ◆ Create PDO object in try-catch

```
try{  
    $pdo=new PDO($dsn, $db_user, $db_pass); // Access the database  
    $pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION); // Set error-mode  
    print "You successfully accessed database named ".$db_name;  
}catch(PDOException $Exception)
```

- ◆ Error Mode

- \$pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_SILENT); // 에러 출력 안함
- \$pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_WARNING); // 경고 출력
- \$pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION); // 에러 출력

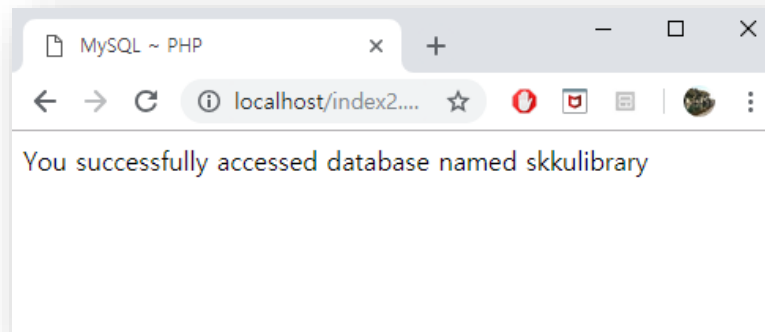
- ◆ Execute SQL query

- \$temp = \$pdo->prepare('sql query');
- \$temp -> execute();

Connecting PHP to MySQL



```
index2.php
1 <html>
2 <head>
3   <title>MySQL ~ PHP</title>
4 </head>
5 <body>
6   <?php
7       $db_user="root";
8       $db_pass='1234';
9       $db_type="mysql";
10      $db_host="localhost";
11      $db_name="skkulibrary";
12      $dsn    = "$db_type:host=$db_host; dbname=$db_name; charset=utf8";
13
14      try{
15          $pdo=new PDO($dsn, $db_user, $db_pass); // Access the database
16          $pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION); // Set error-mode
17          print "You successfully accessed database named ".$db_name;
18      }catch(PDOException $Exception)
19      {
20          die('Error: '.$Exception->getMessage());
21      }
22   ?>
23 </body>
24 </html>
25
```



Connecting PHP to MySQL



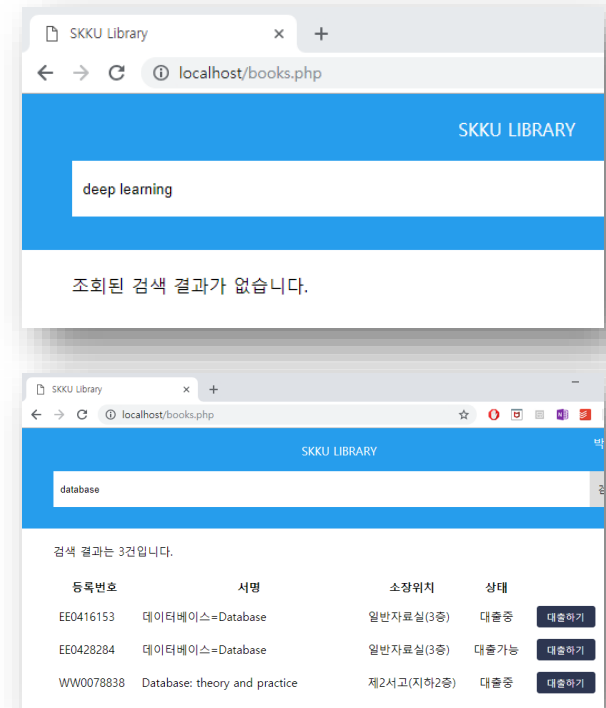
➤ Search rows with a keyword.

```
//검색 키워드 받아오기. (앞뒤로 %를 붙이면 중간 일치 검색 가능)
$bookname = $_POST["bookname"];
$search_key = '%'.$bookname.'%';

try{
    $sql = "SELECT * FROM books WHERE 서명 LIKE :book_name";

    $stmh = $pdo->prepare($sql);
    $stmh->bindValue(':book_name', $search_key, PDO::PARAM_STR);
    $stmh->execute();
    $count = $stmh->rowCount();

    if($count<1){
        print "<BR>조회된 검색 결과가 없습니다.<BR><BR>";
    }else{
        print "<BR>검색 결과는 ".$count."<BR><BR>";
    }
}
```



➤ PDO::prepare()

- ◆ prepares a statement for execution and returns a statement object.

➤ PDO::bindValue()

- ◆ binds a parameter to the specified variable name

Connecting PHP to MySQL



➤ Search rows with keyword and print them.

```
<TABLE width="900" border="1" cellspacing="0" cellpadding="8">
  <TBODY>
    <TR>
      <TH>등록번호</TH>
      <TH>서명</TH>
      <TH>소장위치</TH>
      <TH>상태</TH>
    </TR>

    <?php
    <?>
      while($row = $stmh->fetch(PDO::FETCH_ASSOC)){

        <TR>
          <TD align="left" width=100 style="word-break:break-all"><?=htmlspecialchars($row['등록번호'])?></TD>
          <TD width=300 style="word-break:break-all"><?=htmlspecialchars($row['서명'])?></TD>
          <TD><?=htmlspecialchars($row['소장위치'])?></TD>
          <TD align="center"width=80 style="word-break:break-all"><?=htmlspecialchars($row['상태'])?></TD>
          <TD>
            <form name="lend" method="post" action="lend_book.php" style="margin: 0 auto; ">
              <div style="text-align: center">
                <input type="hidden" name="rn" value=<?=htmlspecialchars($row['등록번호'])?>>
                <input type="hidden" name="sid" value=<?=htmlspecialchars($id)?>>
                <input type="hidden" name="search_key" value=<?=htmlspecialchars($bookname)?>>
                <input type="hidden" name="state" value=<?=htmlspecialchars($row['상태'])?>>
                <INPUT type="submit" value="대출하기" style=" background: #2d3651; width: 82px; height: 30px; margin:0; border:
                  0; padding:0; border-radius: .3em; color: #FFF;">
              </div>
            </form>
          </TD>
        </TR>

      </?php
      <?>
    }
  </TBODY>
</TABLE>
```

Connecting PHP to MySQL



➤ Search rows with keyword and print them.

The screenshot shows a web browser window with the address bar displaying 'localhost/books.php'. The page title is 'SKKU LIBRARY'. A search bar contains the text 'php' and a '검색' (Search) button. Below the search bar, it says '검색 결과는 3건입니다.' (There are 3 search results). A table displays the search results with columns: '등록번호' (Registration Number), '서명' (Title), '소장위치' (Collection Location), and '상태' (Status). Each row also has a '대출하기' (Borrow) button.

등록번호	서명	소장위치	상태
EE0262032	(New 알기쉬운)PHP	제2서고(지하2층)	대출중
EE0262033	(New 알기쉬운)PHP	제2서고(지하2층)	대출중
EE0478009	PHP+MySQL 웹 개발 마스터 북	일반자료실(3층)	대출중

Web_Database_Programming@Database[CSE3007-41]

Session Management in PHP



➤ Session

- ◆ A session is a way to store information (in variables) to be used across multiple pages.
- ◆ User information is stored in session variables and be used across multiple pages.
 - Unlike a cookie, information is not stored on the users computer.
 - By default, session variables last until the user closes the browser.

➤ Session in PHP

- ◆ Start session
 - `session_start();`
- ◆ Manipulate session variables
 - `$_SESSION['session_id'] = 'value';`
 - `unset($_SESSION['session_id']);`

Session Management in PHP

```
$id = $_POST["id"];
$pw = $_POST["pw"];

$sql = "select * from $tb_name where 학번 = :id and 비밀번호 = :pw";

$stmth = $pdo->prepare($sql);
$stmth->bindValue(':id', $id, PDO::PARAM_STR);
$stmth->bindValue(':pw', $pw, PDO::PARAM_STR);
$stmth->execute();
$count = $stmth->rowCount();

if($count<1){
    //로그인 실패. 로그인 페이지로 다시 돌아감.
    Header("Location:login.php?login=0");
}else{
    //로그인 성공. 로그인 정보를 세션에 저장.
    $row = $stmth->fetch(PDO::FETCH_ASSOC);
    $name = $row['이름'];

    session_start();
    $_SESSION['ses_id'] = $id;
    $_SESSION['ses_pw'] = $pw;
    $_SESSION['ses_name'] = $name;

    Header("Location:index.php?bookname='$id'");
}
```

서비스 이용을 위해 로그인하세요.

아이디

비밀번호

LOGIN



Setting Development Environments

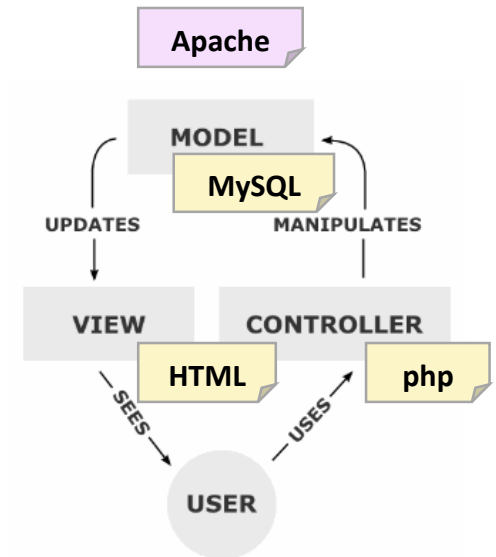
What is APM?

➤ Apache HTTP Server

- ◆ Free and open-source cross-platform web server software
- ◆ High scalability; interworks with server-side programming languages and DBMS

➤ APM

- ◆ A set of tools for web server programming
- ◆ Stands for:
 - **A**pache, as a web server program
 - **P**HP, as a server-side programming language
 - **M**ySQL, as DBMS





How to Install APM

➤ There are two possible ways to install APM.

- ◆ A. Download the three tools independently, and set up the environment by connecting them
 - Apache, from <http://apachelounge.com/download/>
 - PHP, from <http://windows.php.net/download>
 - and MySQL, from <http://dev.mysql.com/downloads/mysql/>
- ◆ B. Download an additional tool which install the three tools and set up them automatically
 - XAMPP from <https://www.apachefriends.org>

Downloading XAMPP



➤ Click XAMPP for Windows (7.2.10 version)

- ◆ **xampp-win32-7.2.10-0-VC15-installer.exe** file will be downloaded.
- ◆ Current version: 7.3.3 is also okay (27 Mar, 2019)

The screenshot shows the XAMPP Apache Friends website. The navigation bar includes links for Download, Add-ons, Hosting, Community, and About, along with a search bar and language selector (EN). The main heading is "XAMPP Apache + MariaDB + PHP + Perl". Below this, a section titled "What is XAMPP?" describes it as a popular PHP development environment. A video player shows the XAMPP logo. At the bottom, there are three download buttons: "Download" (with a link to other versions), "XAMPP for Windows 7.2.10 (PHP 7.2.10)" (highlighted with a red border), and "XAMPP for Linux 7.2.10 (PHP 7.2.10)". A separate button for "XAMPP for OS X" is also visible.

Apache Friends Download Add-ons Hosting Community About Search.. Search EN

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.

Download
Click here for other versions

XAMPP for Windows
7.2.10 (PHP 7.2.10)

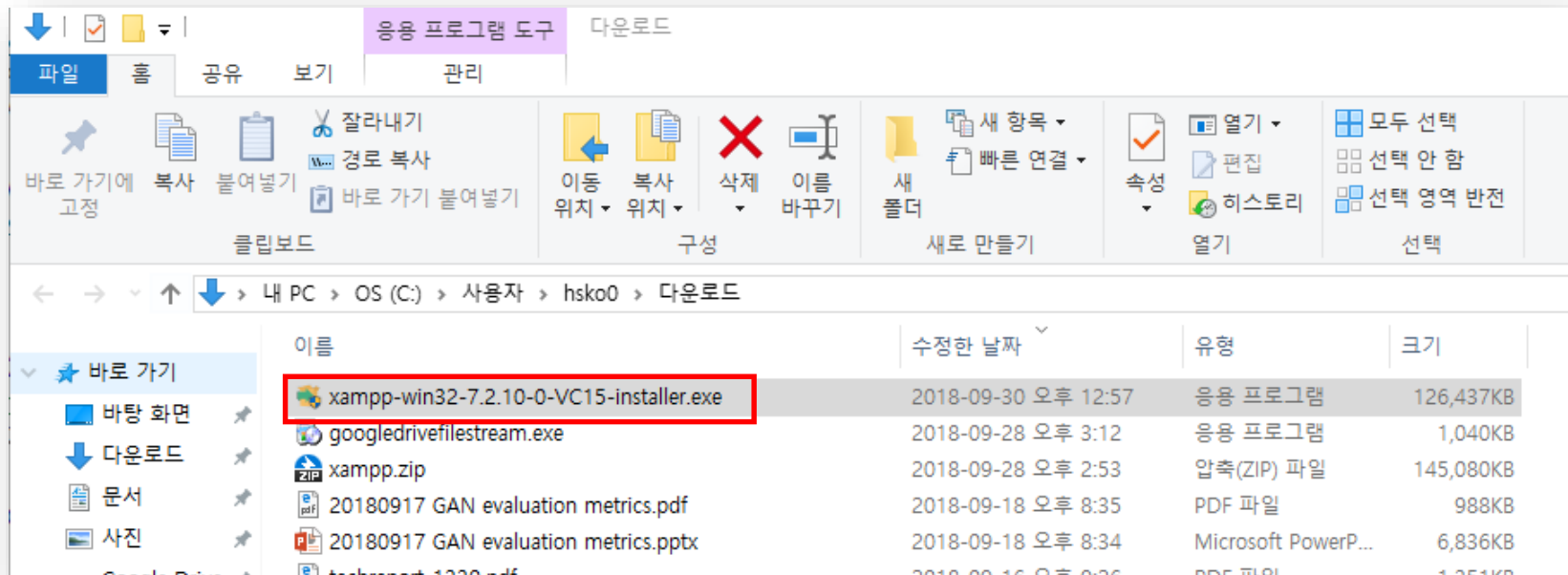
XAMPP for Linux
7.2.10 (PHP 7.2.10)

XAMPP for OS X
XAMPP-VM (PHP 7.2.10)

Downloading XAMPP

➤ Double-click installer.exe file

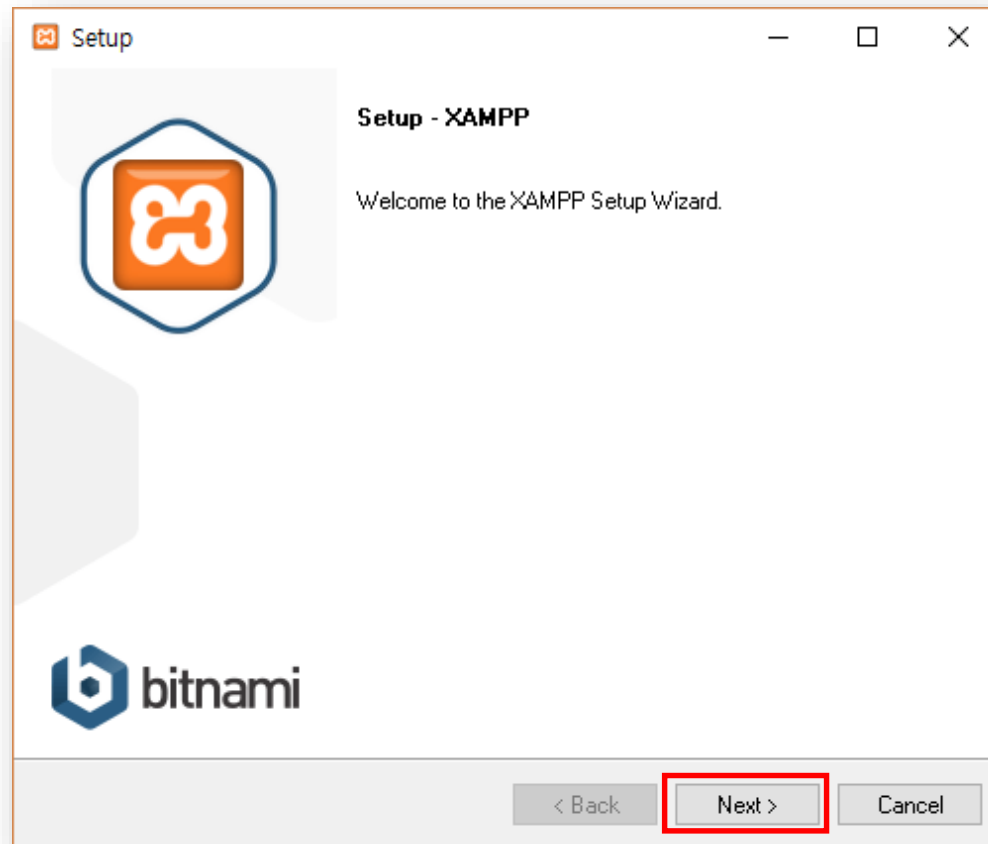
- ◆ xampp-win32-7.2.10-0-VC15-installer.exe



Installing XAMPP



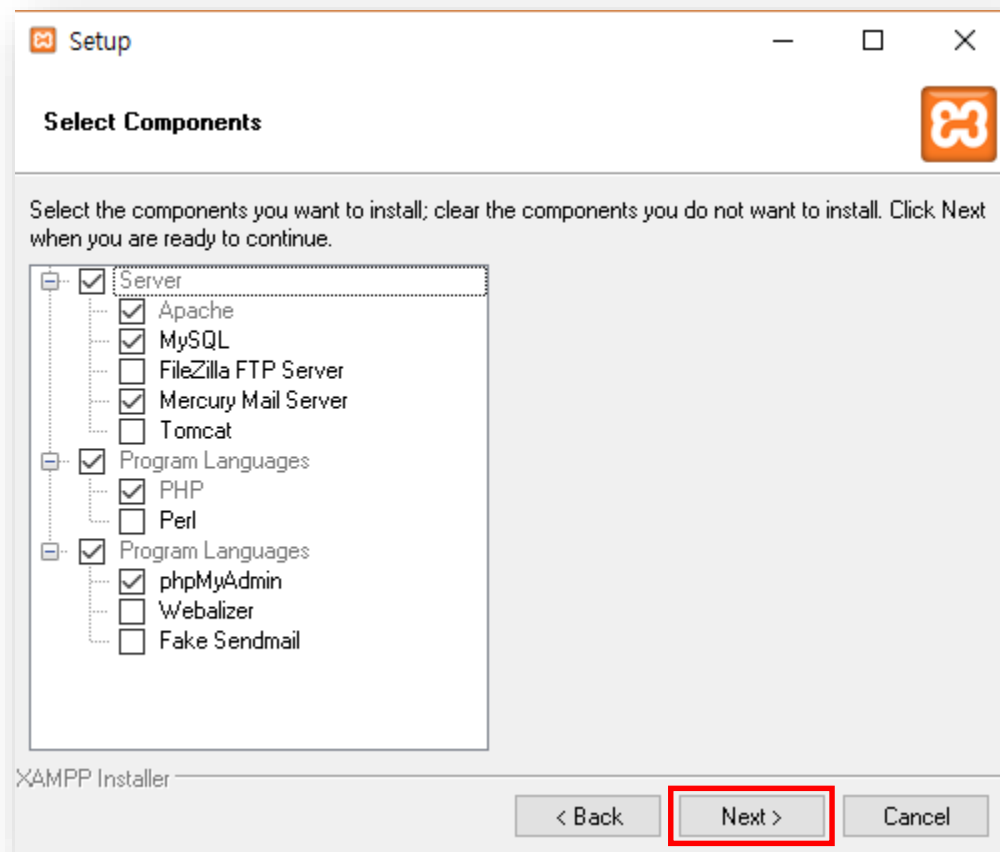
➤ Click [Next] Button.



Installing XAMPP



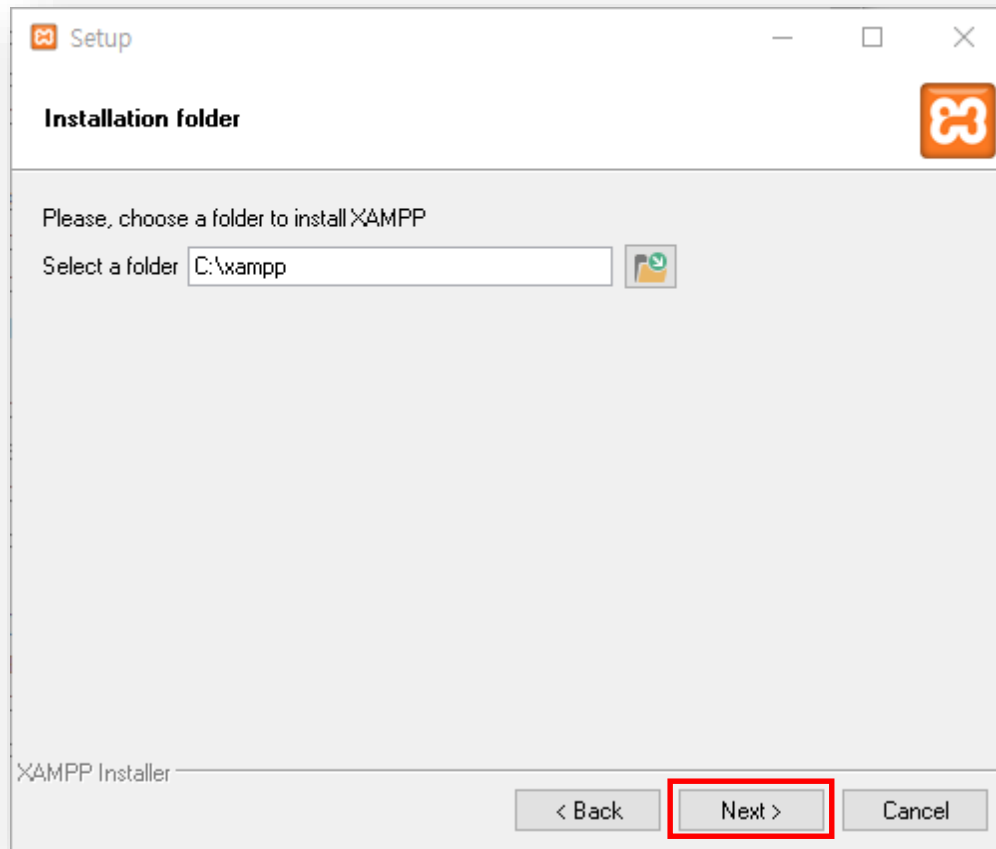
➤ At Setup stage, check needed tools only as follows:



Installing XAMPP



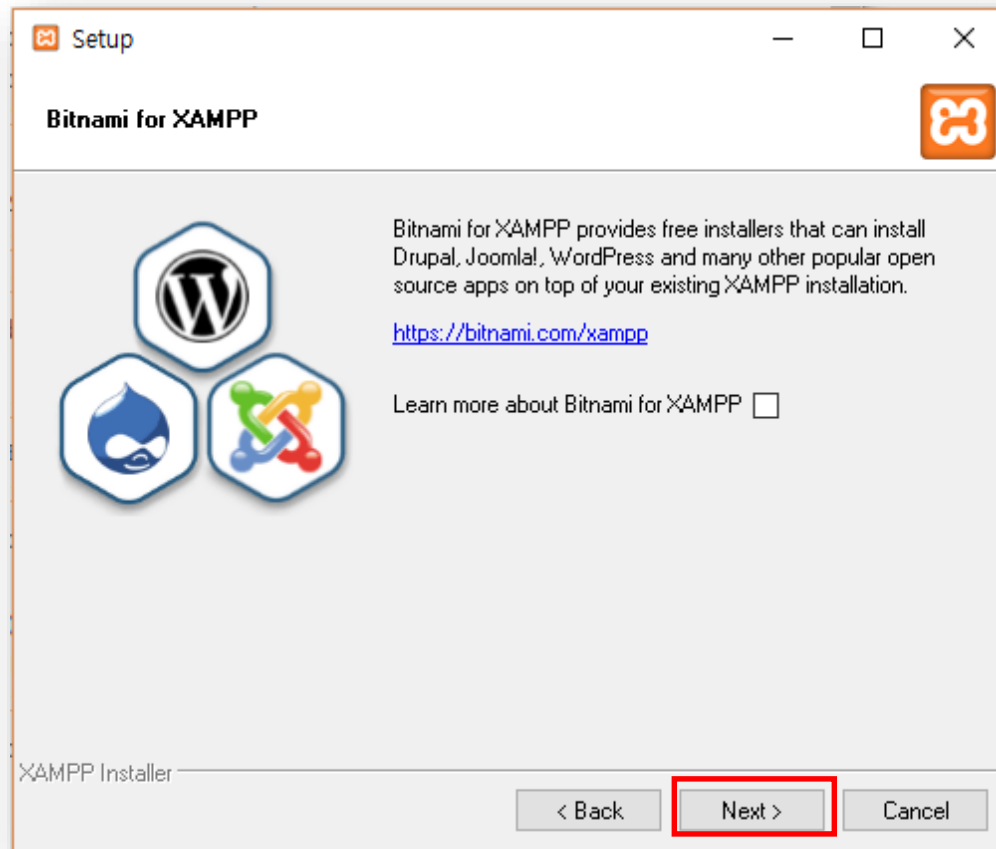
➤ Click [Next] Button.



Installing XAMPP



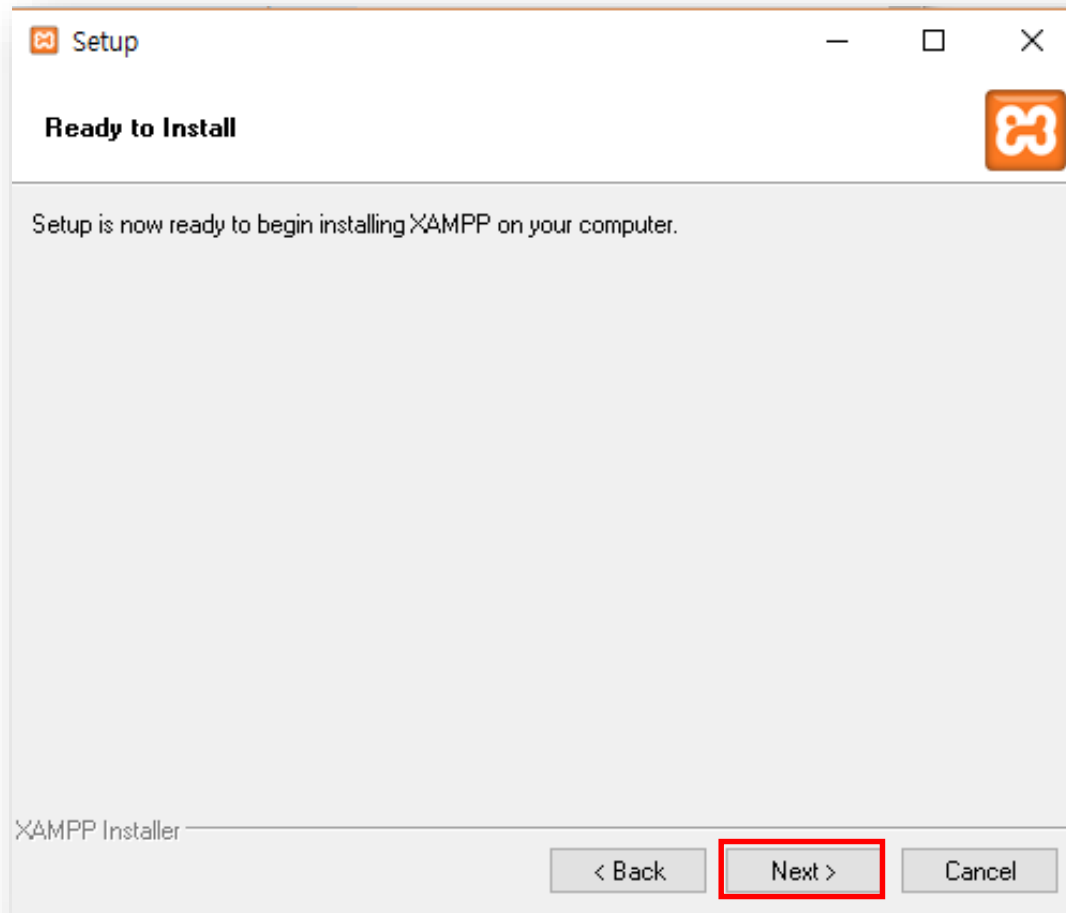
➤ Click [Next] Button.



Installing XAMPP



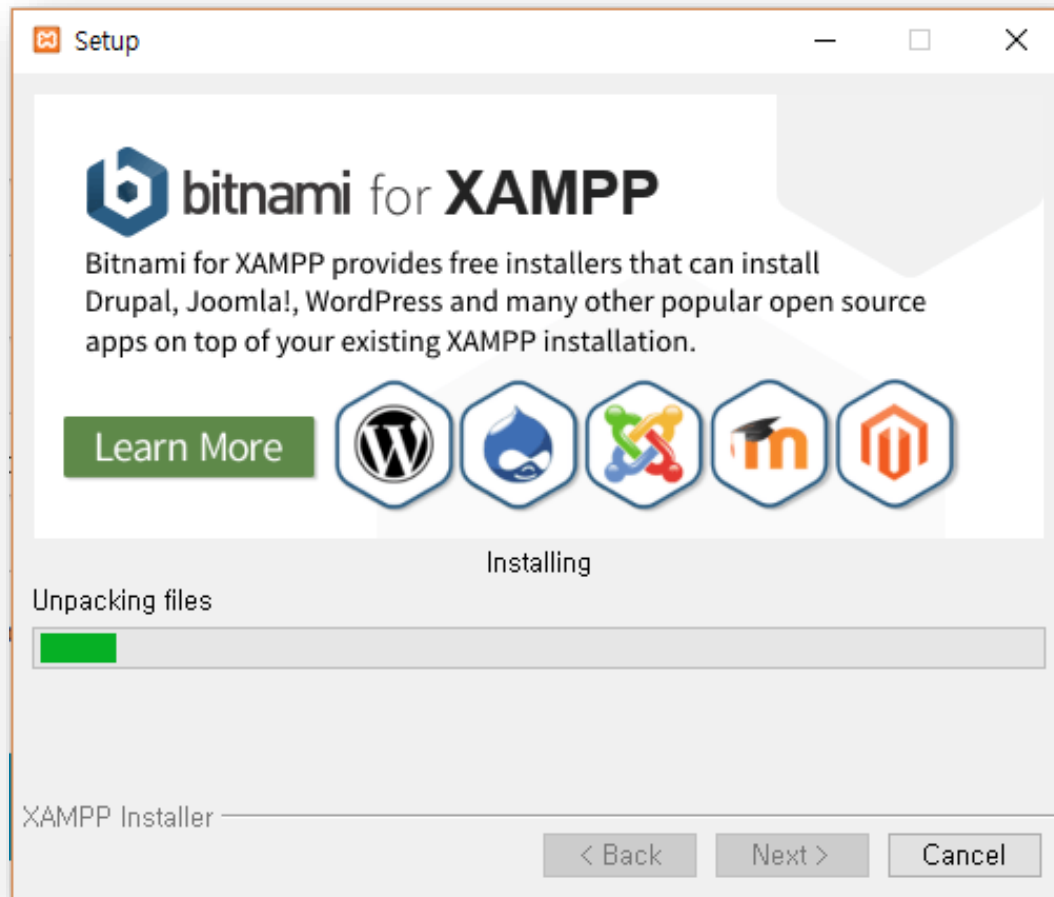
➤ Click [Next] Button.



Installing XAMPP



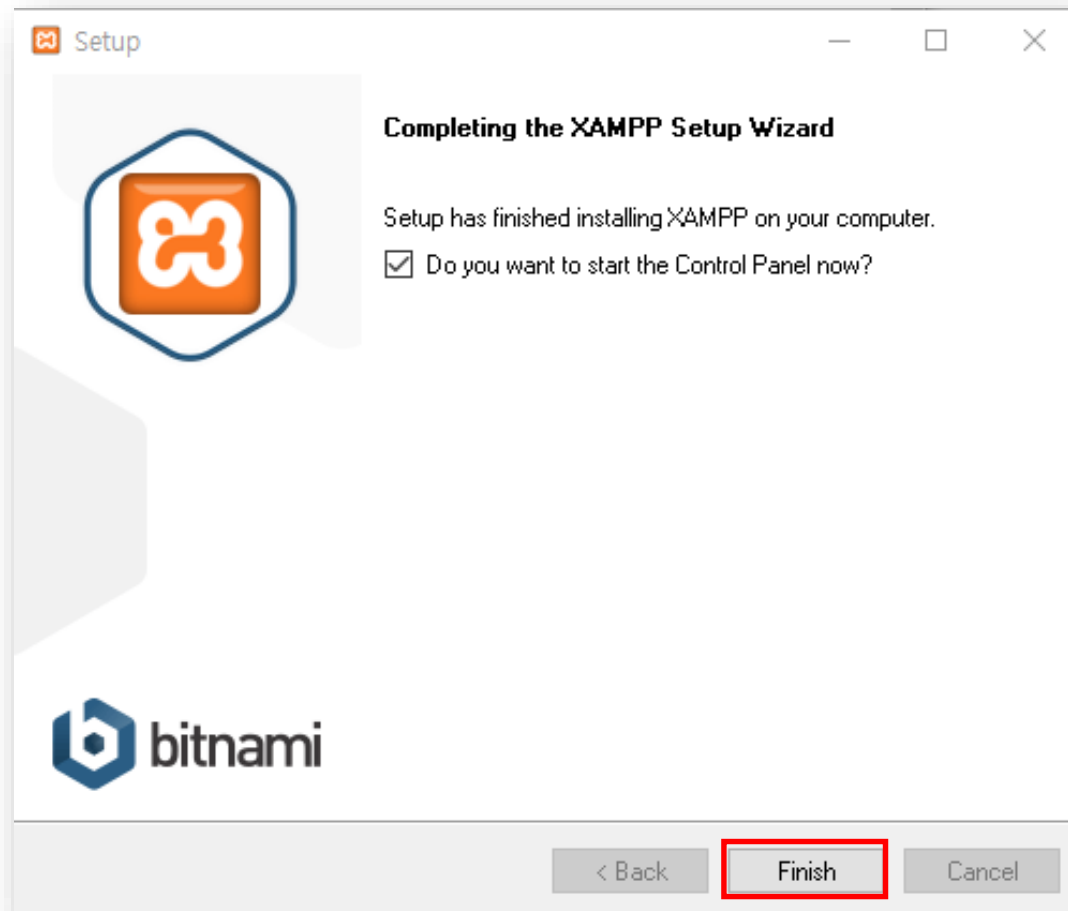
➤ On installation....



Installing XAMPP



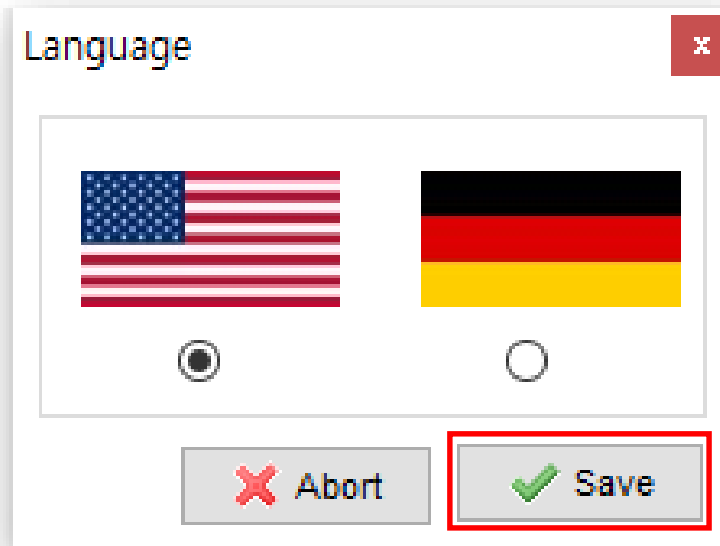
➤ Click [Finish] Button.



Installing XAMPP

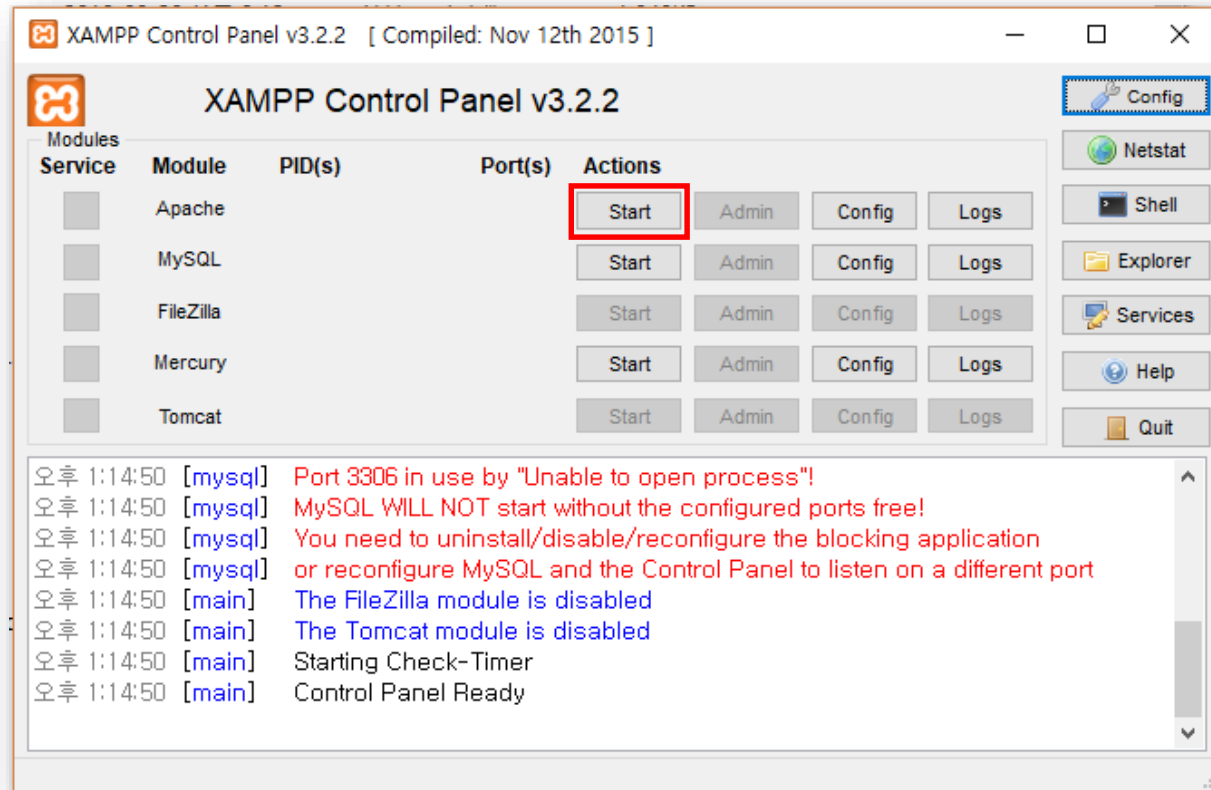


- Select Language [English] and Click [Save] Button.



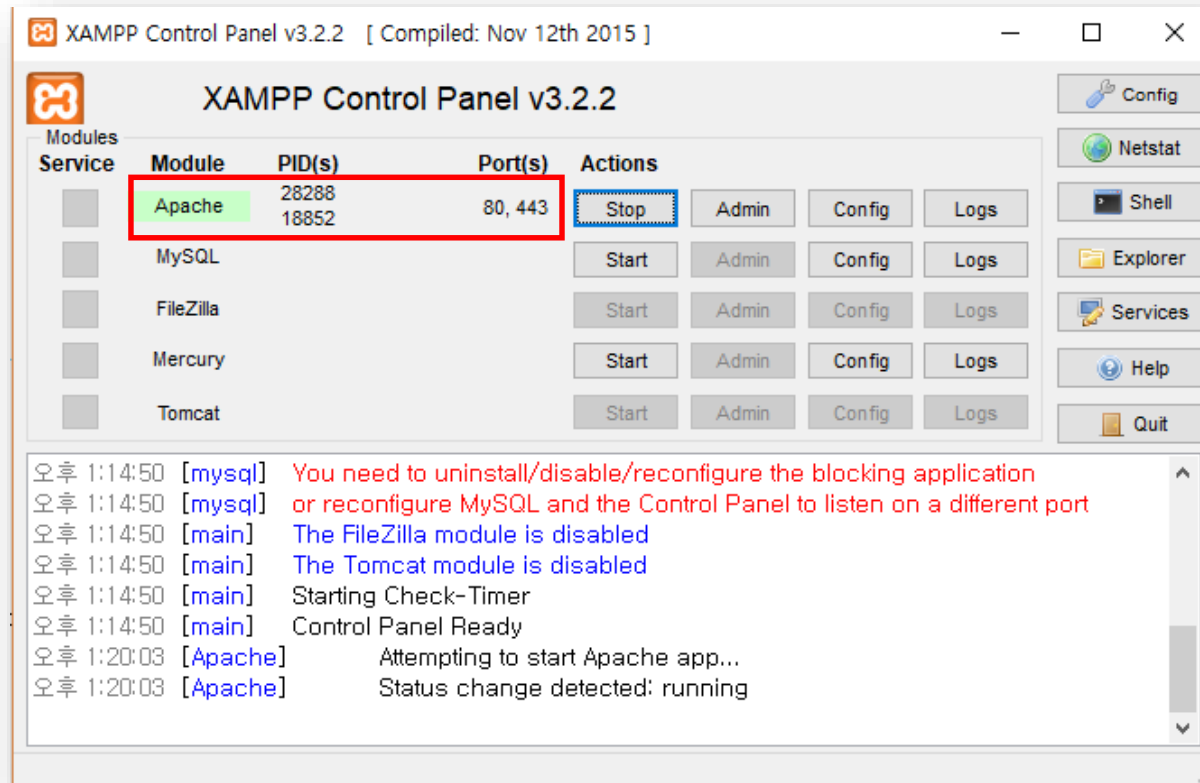
Running the Apache Server

- After you click [Finish], [XAMPP Control Panel] opens.
 - ◆ [Start] Apache and check Apache state, PID, and Port
 - ◆ If you get [Windows security warning], click [Cancel]



Running the Apache Server

- After you click [Finish], [XAMPP Control Panel] opens.
 - ◆ [Start] Apache and check Apache state, PID, and Port
 - ◆ If you get [Windows security warning], click [Cancel]

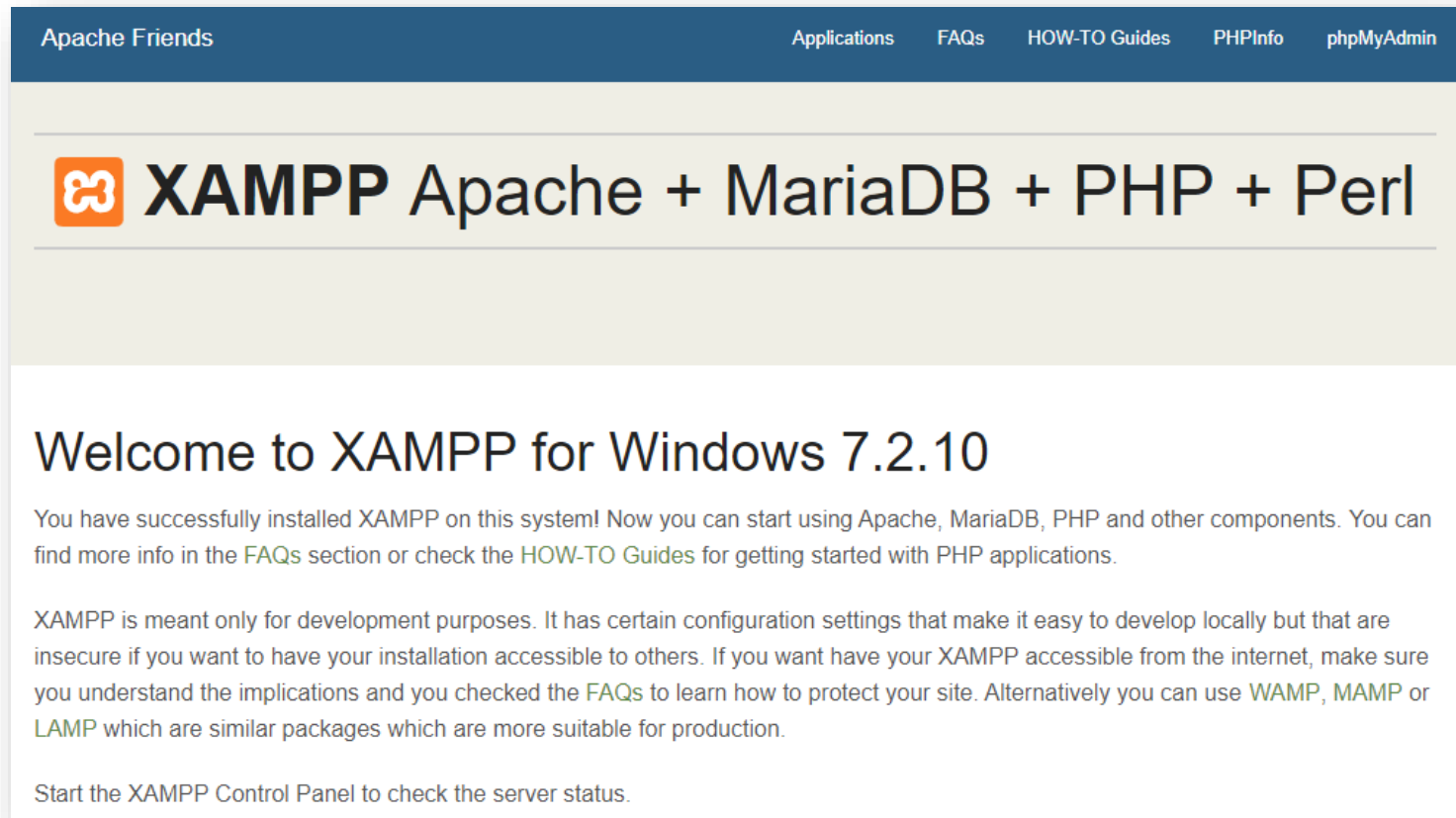


Running the Apache Server



➤ <http://localhost/dashboard/>

- ◆ If you can see the image as below, Click [Stop] Apache and [Quit].





Setting the Apache Server

➤ **Modify httpd.conf**

- ◆ Is under XAMPP install directory
 - `C:\xampp\apache\conf` if you did not change it.
- ◆ Tells how Apache behaves when sending to and receiving from web browser.

Setting the Apache Server

➤ Modify httpd.conf

- ◆ Check [ServerRoot] of Apache

```
39  ServerRoot "C:/xampp/apache"
```

- ◆ Check [Listen] for port number

- You may change the number if other applications are using the following port.

```
60  Listen 80
```

- ◆ Modify [DirectoryIndex]

- It tells which order Apache lookups index file.

```
284 <IfModule dir_module>
285     DirectoryIndex index.php index.pl index.cgi index.asp index.shtml index.html index.htm \
286     default.php default.pl default.cgi default.asp default.shtml default.html default.htm \
287     home.php home.pl home.cgi home.asp home.shtml home.html home.htm
288 </IfModule>
```



```
284 <IfModule dir_module>
285     DirectoryIndex index.php index.html
286 </IfModule>
```

Setting PHP

➤ Modify php.ini

- ◆ Is under
 - C:\xampp\php
- ◆ Check default_charset
 - It has to be “UTF-8”

```
684 default_charset="UTF-8"
```

- ◆ Modify date.timezone
 - From Europe/Berlin to Asia/Seoul

```
1934 [Date]  
1935 date.timezone=Europe/Berlin
```



```
1934 [Date]  
1935 date.timezone=Asia/Seoul
```

Setting PHP



➤ Modify php.ini

◆ Set mbstring

- It deals multibyte encoding, needed for Korean/Japanese/Chinese.
- mbstring.language = Korean

```
1637 [mbstring]
1638 ; language for internal character representation.
1639 ; This affects mb_send_mail() and mbstring.detect_order.
1640 ; http://php.net/mbstring.language
1641 ;mbstring.language = Japanese
```



```
1637 [mbstring]
1638 ; language for internal character representation.
1639 ; This affects mb_send_mail() and mbstring.detect_order.
1640 ; http://php.net/mbstring.language
1641 mbstring.language = Korean
```

- mbstring.internal_encoding = UTF-8

```
1648 mbstring.internal_encoding = UTF-8
```

- mbstring.http_input = UTF-8

```
1656 mbstring.http_input = UTF-8
```

- mbstring.http_output = pass

```
1666 mbstring.http_output = pass
```

Setting PHP



➤ Modify php.ini

◆ Set mbstring

- It deals multibyte encoding, needed for Korean/Japanese/Chinese.
- mbstring.encoding_translation = On

```
1674 mbstring.encoding_translation = On
```

- mbstring.detect_order = UTF-8

```
1679 mbstring.detect_order = UTF-8
```

- mbstring.substitute_character = none;

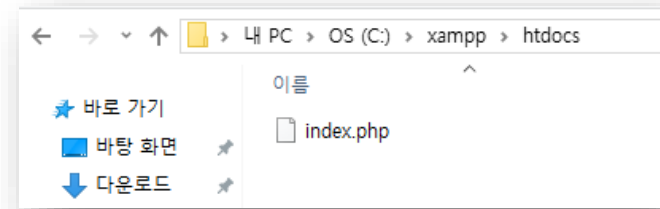
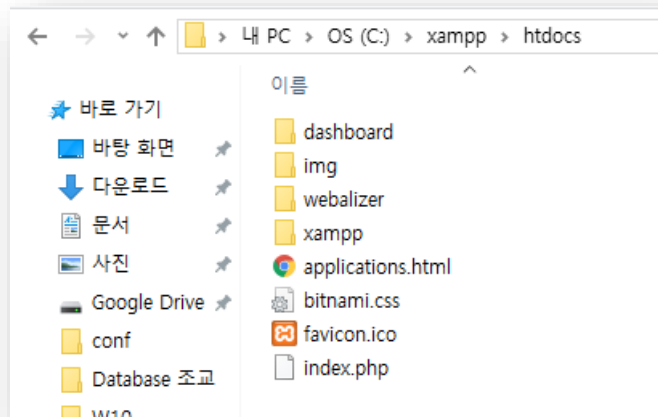
```
1684 mbstring.substitute_character = none
```

Running PHP



➤ Write index.php

- ◆ Create index.php in C:/xampp/htdocs
 - The directory is where you have set as [DocumentRoot]
 - Delete all existing files and leave index.php only.



- ◆ Write codes like below:

```
index.php
1 <?php
2     phpinfo();
3 ?>
4
```


Running PHP



- Check if PHP works by accessing <http://localhost> with your browser
 - ◆ You should start Apache first, with XAMPP Control Panel.

PHP Version 7.2.10

System	Windows NT DESKTOP-8KRP74D 10.0 build 17134 (Windows 10) i586
Build Date	Sep 13 2018 00:43:55
Compiler	MSVC15 (Visual C++ 2017)
Architecture	x86
Configure Command	cscript /nologo configure.js "--enable-snapshot-build" "--enable-debug-pack" "--with-pdo-oci=c:\php-snap-build\deps_aux\Oracle\x86\instantclient_12_1\wsdk\shared" "--with-oci8-12c=c:\php-snap-build\deps_aux\Oracle\x86\instantclient_12_1\wsdk\shared" "--enable-object-out-dir=../obj/" "--enable-com-dotnet=shared" "--without-analyzer" "--with-pgo"
Server API	Apache 2.0 Handler
Virtual Directory Support	enabled
Configuration File (php.ini) Path	C:\WINDOWS
Loaded Configuration File	C:\xampp\php\php.ini
Scan this dir for additional .ini files	(none)
Additional .ini files parsed	(none)
PHP API	20170718
PHP Extension	20170718
Zend Extension	320170718
Zend Extension Build	API320170718.TS.VC15
PHP Extension Build	API20170718.TS.VC15
Debug Build	no
Thread Safety	enabled
Zend Signal Handling	disabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	php, file, glob, data, http, ftp, zip, compress.zlib, compress.bzip2, https, ftps, phar
Registered Stream Socket Transports	tcp, udp, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2
Registered Stream Filters	convert.iconv.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, dechunk, zlib.*, bzip2.*

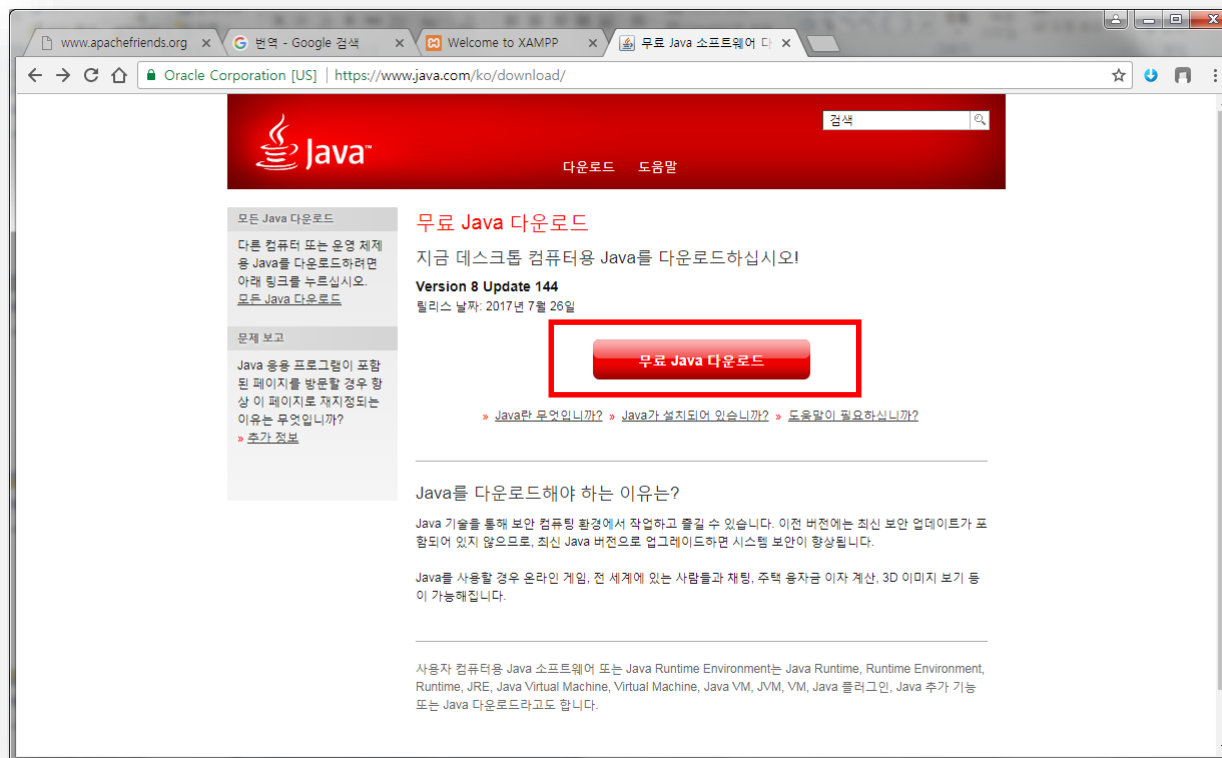
This program makes use of the Zend Scripting Language Engine:
Zend Engine v3.2.0. Copyright (c) 1998-2018 Zend Technologies

IDE for PHP



➤ Install Java

- ◆ (Only if Java is not installed to your computer)
- ◆ Download at <http://www.java.com/ko/download> and install.



IDE for PHP



➤ Install JDK SE Development Kit 8

◆ Download JDK 8 version.

- <https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>

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Thank you for downloading this release of the Java™ Platform, Standard Edition Development Kit (JDK™). The JDK is a development environment for building applications, applets, and components using the Java programming language.

The JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java platform.

See also:

- [Java Developer Newsletter](#): From your Oracle account, select **Subscriptions**, expand **Technology**, and subscribe to **Java**.
- [Java Developer Day](#) hands-on workshops (free) and other events
- [Java Magazine](#)

JDK 8u181 checksum

Java SE Development Kit 8u181

You must accept the [Oracle Binary Code License Agreement for Java SE](#) to download this software.

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Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	72.95 MB	jdk-8u181-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	69.89 MB	jdk-8u181-linux-arm64-vfp-hflt.tar.gz
Linux x86	165.06 MB	jdk-8u181-linux-i586.rpm
Linux x86	179.87 MB	jdk-8u181-linux-i586.tar.gz
Linux x64	162.15 MB	jdk-8u181-linux-x64.rpm
Linux x64	177.05 MB	jdk-8u181-linux-x64.tar.gz
Mac OS X x64	242.83 MB	jdk-8u181-macosx-x64.dmg
Solaris SPARC 64-bit (SVR4 package)	133.17 MB	jdk-8u181-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	94.34 MB	jdk-8u181-solaris-sparcv9.tar.gz
Solaris x64 (SVR4 package)	133.83 MB	jdk-8u181-solaris-x64.tar.Z
Solaris x64	92.11 MB	jdk-8u181-solaris-x64.tar.gz
Windows x86	194.41 MB	jdk-8u181-windows-i586.exe
Windows x64	202.73 MB	jdk-8u181-windows-x64.exe

IDE for PHP



➤ NetBeans 8.0.2

- ◆ <https://netbeans.org/downloads/8.0.2/index.html>

NetBeans IDE 8.0.2 Download

8.0.1 | 8.0.2 | 8.1 | Development | Archive

Email address (optional):

Subscribe to newsletters: ☒ Monthly ☐ Weekly

☒ NetBeans can contact me at this address

IDE Language: **English** Platform: **Windows**

Note: Greyed out technologies are not supported for this platform.

NetBeans IDE Download Bundles

Supported technologies *	Java SE	Java EE	C/C++	HTML5 & PHP	All
NetBeans Platform SDK	•	•			•
Java SE	•	•			•
Java FX	•	•			•
Java EE		•			•
Java ME		•			•
HTML5		•		•	•
Java Card™ 3 Connected				•	•
C/C++			•		•
Groovy					•
PHP				•	•
Bundled servers					
GlassFish Server Open Source Edition 4.1		•			•
Apache Tomcat 8.0.15		•			•

Download buttons: [Download] [Download] [Download] [Download] **[Download]**

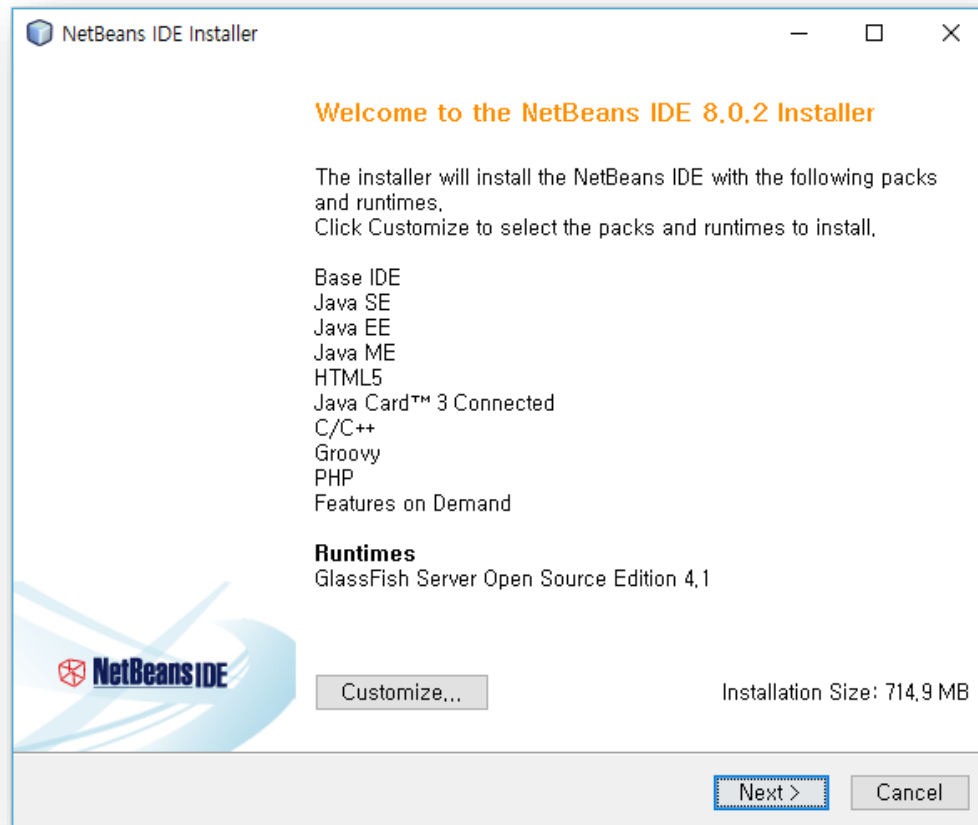
Free, 90 MB | Free, 186 MB | Free, 63 MB | Free, 63 MB | Free, 205 MB

IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Next] Button continuously.

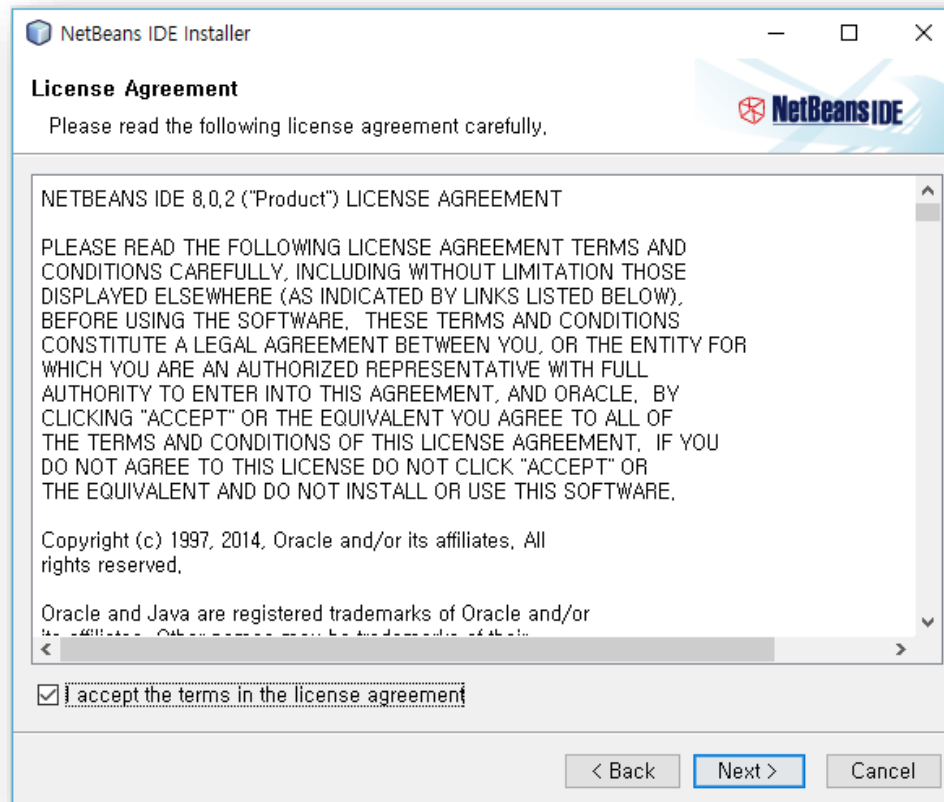


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Next] Button continuously.

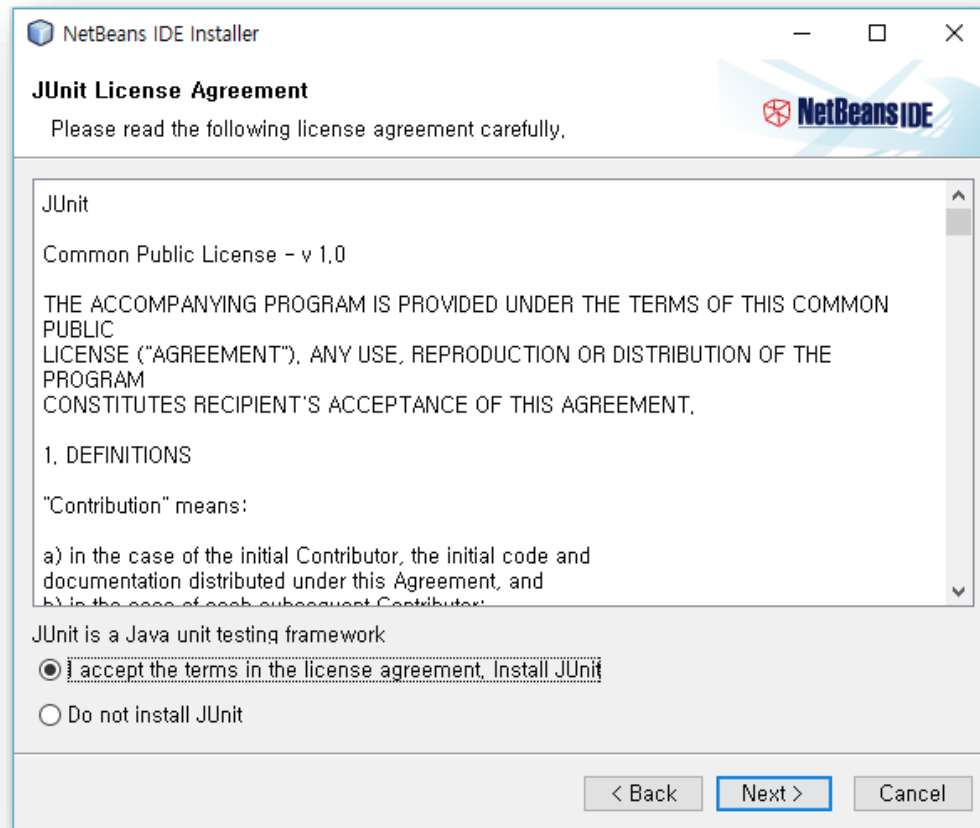


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Next] Button continuously.

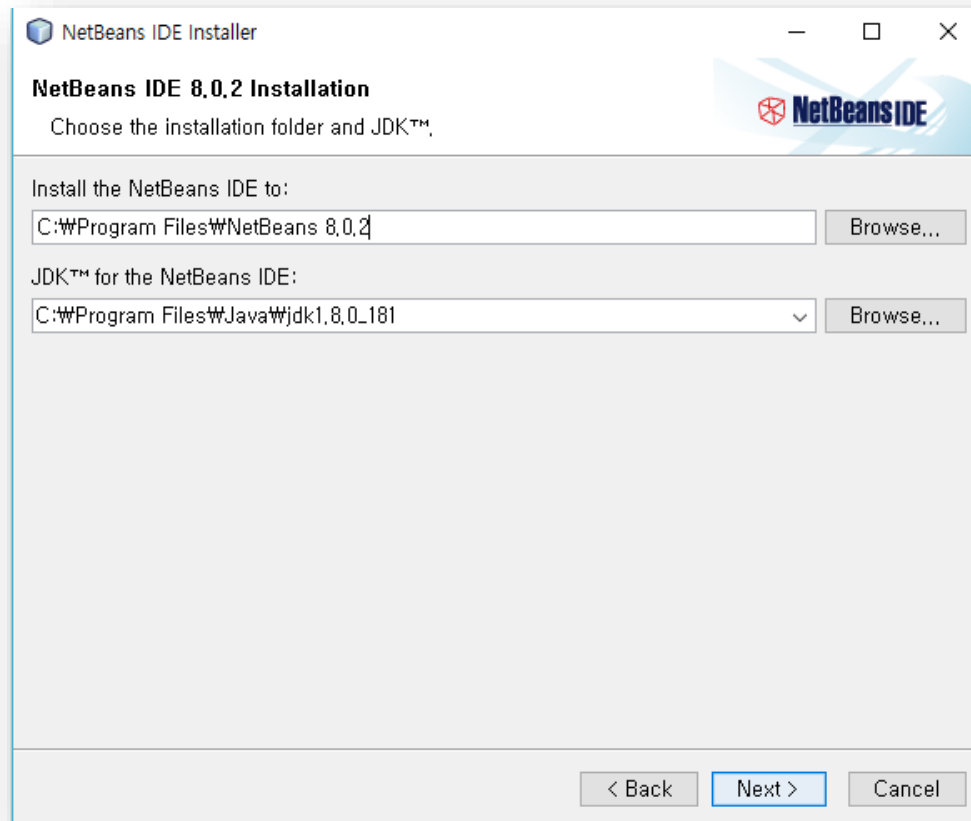


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Next] Button continuously.

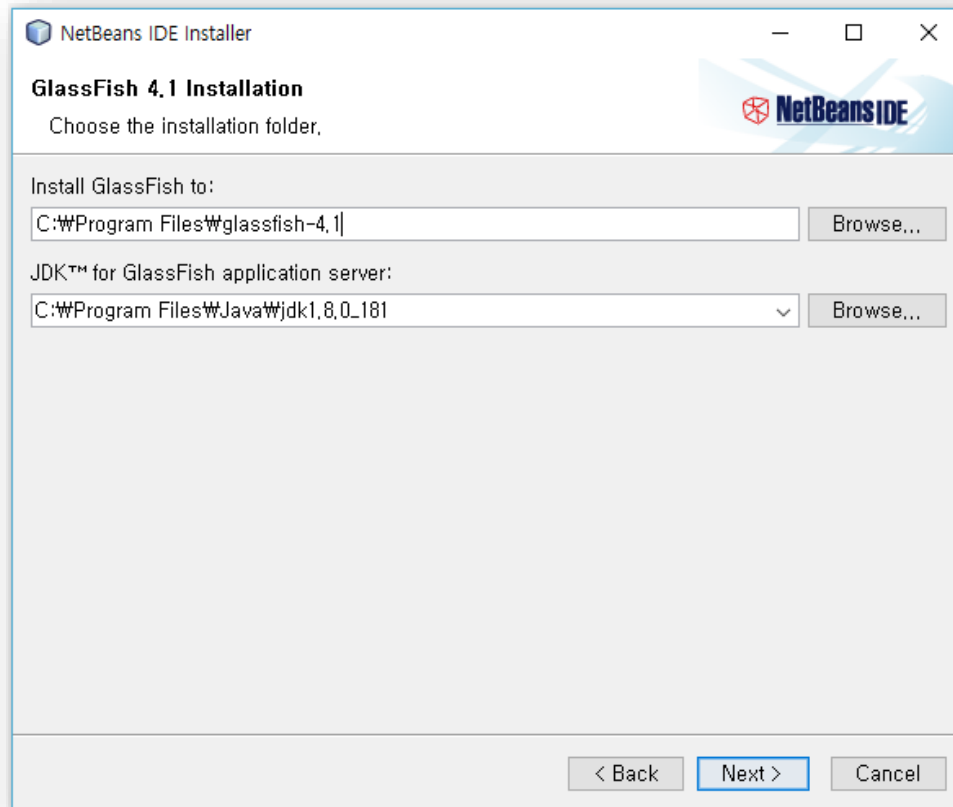


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Next] Button continuously.

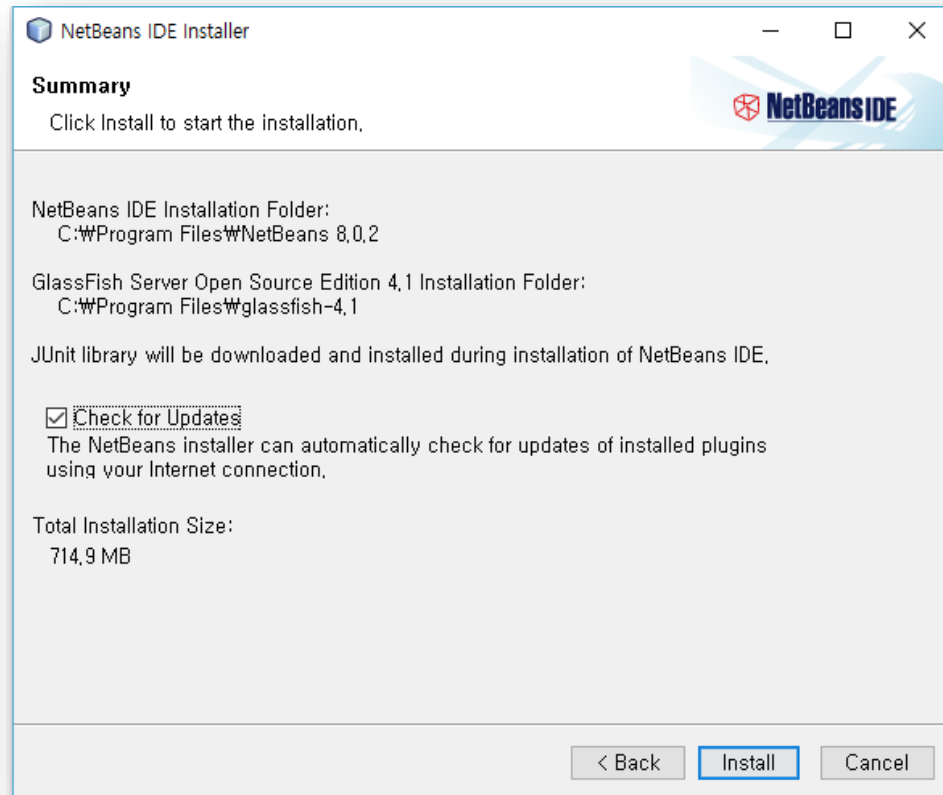


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Install] Button.

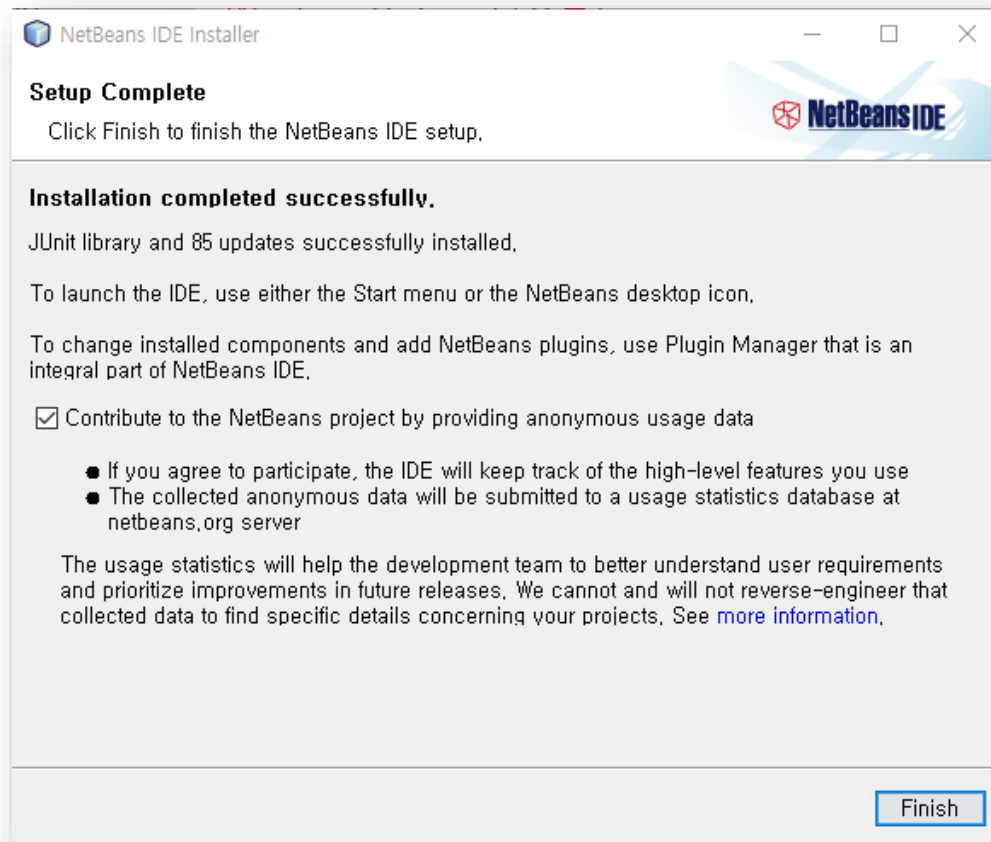


IDE for PHP



➤ NetBeans 8.0.2

- ◆ Click [Install] Button.

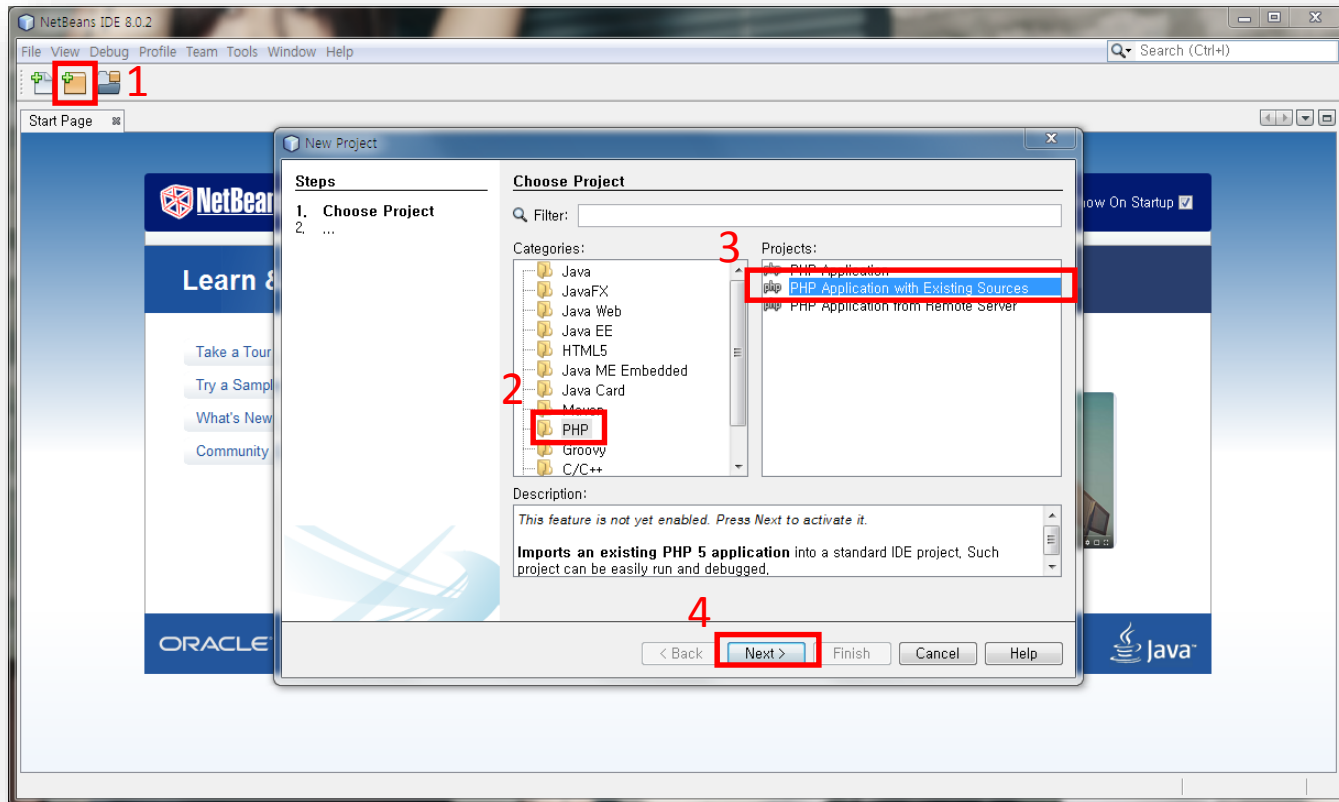


Make Project



➤ Run NetBeans and make project

- ◆ New Project > PHP > PHP Application with Existing Source

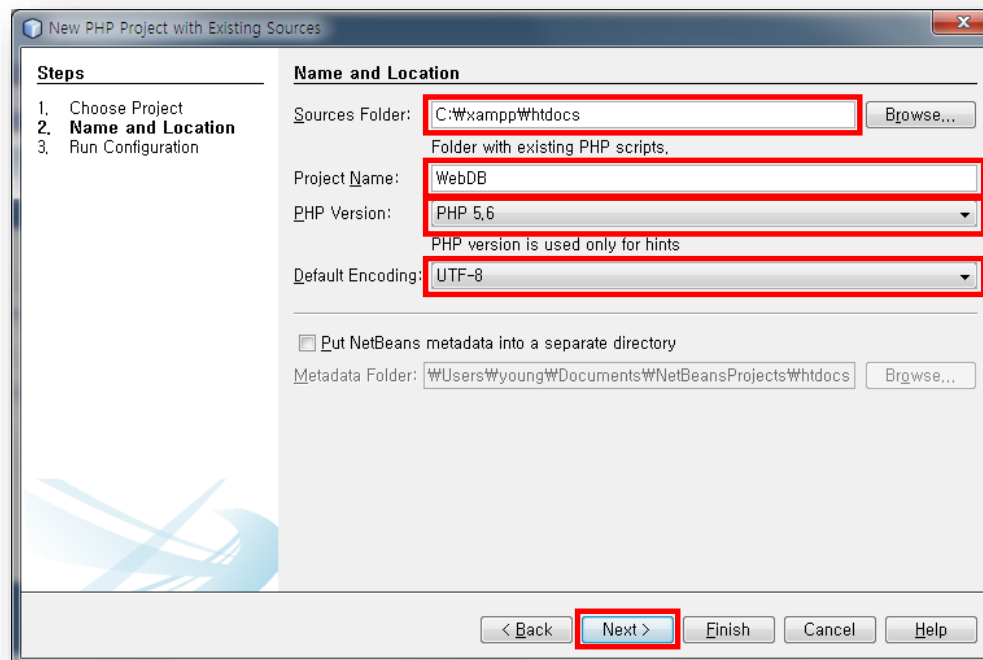


Make Project



➤ Run NetBeans and make project

- ◆ Source Folder: C:\xampp\htdocs
- ◆ ProjectName: WebDB
- ◆ PHP Version: 5.6
- ◆ Default Encoding: UTF-8

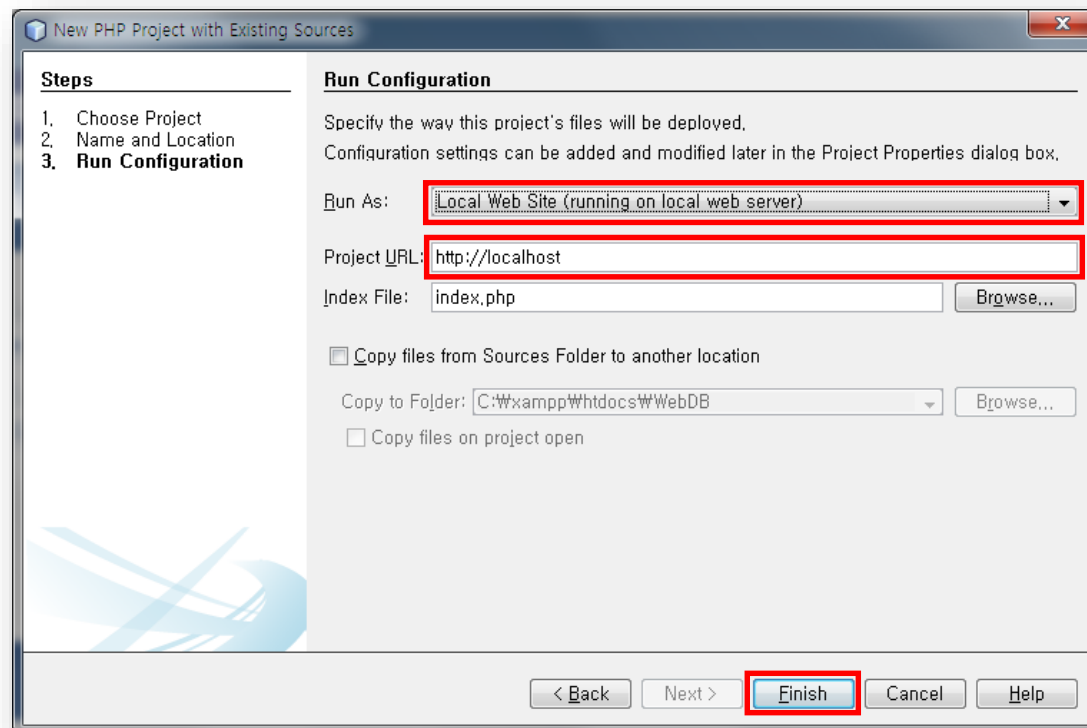


Make Project



➤ Run NetBeans and make project

- ◆ Run as: Local Web Site (running on local web server)
- ◆ Project URL: http://localhost

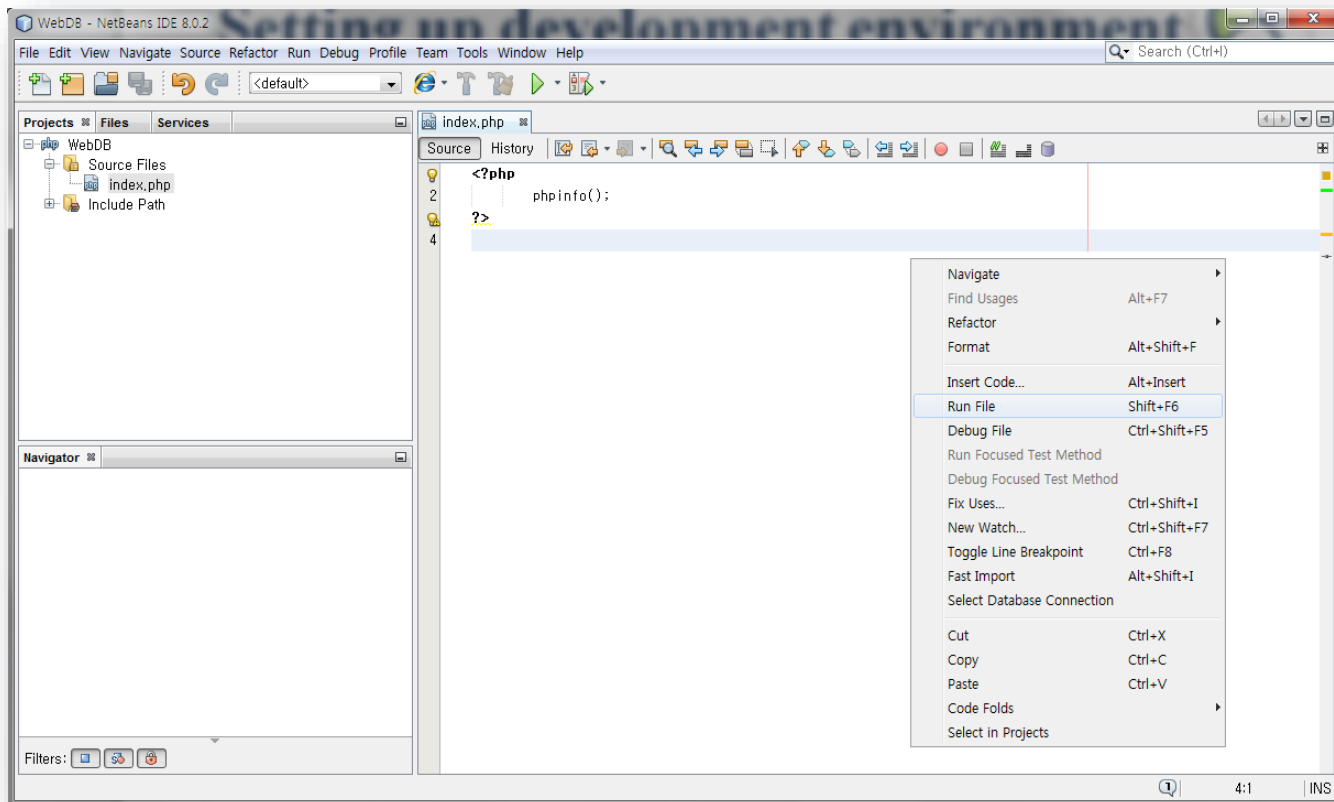


Make Project



➤ Run NetBeans and make project

- ◆ [Run File] executes the project on web browser



Make Project



➤ Run NetBeans and make project

- ◆ [Run File] executes the project on web browser

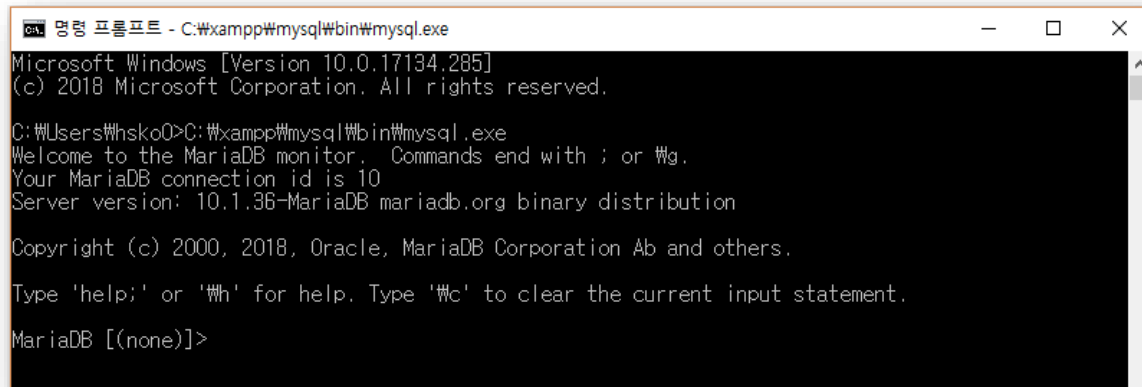
PHP Version 7.2.10

System	Windows NT DESKTOP-8KRP74D 10.0 build 17134 (Windows 10) i586
Build Date	Sep 13 2018 00:43:55
Compiler	MSVC15 (Visual C++ 2017)
Architecture	x86
Configure Command	cmd /c "nologoto configure.js --enable-snapshot-build --enable-debug-pack --with-pdo-oci=c:\php-snap-build\deps_aux\oracle\v86\instantclient_12_1\sdk\shared --with-oci8-12c=c:\php-snap-build\deps_aux\oracle\v86\instantclient_12_1\sdk\shared --enable-object-out-dir=.obj --enable-com-dotnet=shared --without-analyzer --with-pgo"
Server API	Apache 2.0 Handler
Virtual Directory Support	enabled
Configuration File (php.ini) Path	C:\WINDOWS
Loaded Configuration File	C:\xampp\php\php.ini
Scan this dir for additional .ini files	(none)
Additional .ini files parsed	(none)
PHP API	20170718
PHP Extension	20170718
Zend Extension	320170718
Zend Extension Build	API320170718,TS,VC15
PHP Extension Build	API20170718,TS,VC15
Debug Build	no
Thread Safety	enabled
Zend Signal Handling	disabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	php, file, glob, data, http, ftp, zip, compress.zlib, compress.bzip2, https, ftps, phar
Registered Stream Socket Transports	tcp, udp, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2
Registered Stream Filters	convert.iconv.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, dechunk, zlib.*, bzip2.*

Setting MySQL

➤ Access MySQL at Windows with cmd

- ◆ Execute MySQL
 - C:\xampp\mysql\bin\mysql.exe



```
명령 프롬프트 - C:\xampp\mysql\bin\mysql.exe
Microsoft Windows [Version 10.0.17134.285]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Whsko0>C:\xampp\mysql\bin\mysql.exe
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 10
Server version: 10.1.38-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

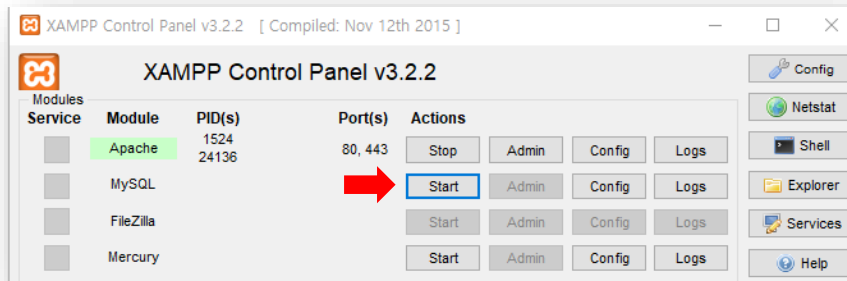
- ◆ Exit
 - mysql> exit
- ◆ If you see the error as below, then refer to the next page.
 - *ERROR 2059: Authentication plugin 'caching_sha2_password' cannot be loaded.*

Setting MySQL



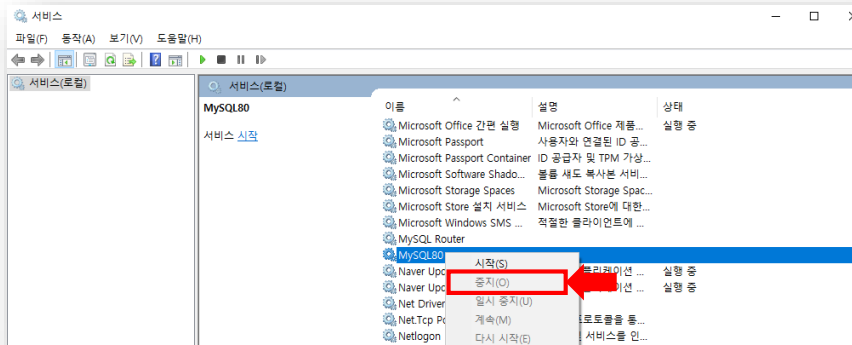
➤ How to solve the ERROR 2059

- ◆ Try this solution if MySQL doesn't work when you click [Start] Button.



- ◆ Solution suggested:

- Go to services.msc file on your windows.
- Stop the MySQL file.
- Now MySQL will start on the port 3306.



Setting MySQL



➤ Access as Administrator

◆ Case 1. If you already have password

- C:\xampp\mysql\bin> mysql -u root -p
- Enter password:

```
C:\xampp\mysql\bin>mysql -u root -p
Enter password:
```

◆ Case 2. If you don't have password

- mysqladmin -u root password 'your password goes here'
 - (ex. password = 1234) mysqladmin -u root password 1234
- mysql -h localhost -u root -p

```
C:\Users\Whsko0>mysqladmin -u root password 1234

C:\Users\Whsko0>mysql -h localhost -u root -p
Enter password: ****
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 4
Server version: 10.1.36-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

Setting MySQL



➤ Access MySQL at Windows with cmd

◆ Create Database

```
CREATE DATABASE [database name];  
CHARACTER SET [character code] COLLATE [collation];  
*collation: type of data arrangement
```

- Mairadb [mysql]> CREATE DATABASE sampledb
- CHARACTER SET utf8 COLLATE utf8_general_ci;

```
MariaDB [(none)]> CREATE DATABASE sampledb  
-> CHARACTER SET utf8 COLLATE utf8_general_ci;  
Query OK, 1 row affected (0.00 sec)
```

◆ Show/Drop Databases

- SHOW DATABASES; / DROP DATABASE [databasename];

```
MariaDB [(none)]> SHOW DATABASES;  
+-----+  
| Database |  
+-----+  
| information_schema |  
| mysql |  
| performance_schema |  
| phpmyadmin |  
| sampledb |  
| test |  
+-----+  
6 rows in set (0.00 sec)
```

References

➤ PHP 5 Tutorials

- ◆ <https://www.w3schools.com/php/>
- ◆ <http://php.net/manual/en/tutorial.php>
- ◆ <https://www.tutorialspoint.com/php/>

➤ MySQL Manual

- ◆ <http://dev.mysql.com/doc/>

➤ PHP + MySQL examples

- ◆ Provided by a book “PHP + MySQL MASTER BOOK”
- ◆ <https://bitbucket.org/abreqadhabra/php-mysql-master-book/downloads/>

Q&A

