Terna Engineering College
Computer Engineering Department

Program: Sem V

Course: Web Technology Laboratory (CSL504)

Faculty: Mrs Reshma Koli

LAB Manual

PART A

(PART A: TO BE REFERRED BY STUDENTS)

Experiment No.10

A.1 Aim:

Study and analyze different types of web applications and of Web development Frameworks

A.2 Prerequisite:

Knowledge web applications and WWW

A.3 Outcome:

After successful completion of this experiment students will be able to analyze end user requirements and identify and appropriate web development framework

A.4 Theory:

➢ Web Application Framework or simply "web framework":

- ➔ Is a software framework that is designed to support the development of web applications including web services, web resources, and web APIs.
- ➔ Frameworks are, in short, libraries that help you develop your application faster and smarter!
- ➔ Nowadays, the number of Web Frameworks has increased greatly. To help you pick up the most suitable one for your Web Application, we have compiled a list of 10 best frameworks available online, in your preferred language.

➢ Web Development Framework

1. Ruby On Rails (Ruby)
2. Django (Python)
3. Angular(Also, know as AngularJS) (Javascript)
4. ASP.NET (C#)
5. METEOR(Javascript)
6. Laravel (PHP)
7. Express(Java Script)
8. Spring(Java)
9. Play(Scala and Java)
10. CodeIgniter(PHP)

1. Ruby on Rails

Ruby on Rails is an extremely productive web application framework written by David Heinemeier Hansson. One can develop an application at least ten times faster with Rails than a typical Java framework. Moreover, Rails includes everything needed to create a database-driven web application, using the Model-View-Controller pattern.

- Language: Ruby
- Latest Version: Rails 5.0.0.beta2
- Framework Link: http://rubyonrails.org
- Github Link: https://github.com/rails/rails

Websites using Ruby on Rails are GroupOn, UrbanDictionary, AirBnb, Shopify, Github

2. Django

Django is another framework that helps in building quality web applications. It was invented to meet fast-moving newsroom deadlines while satisfying the tough

requirements of experienced Web developers. Django developers say the applications are ridiculously fast, secure, scalable, and versatile.

- Language: Python
- Latest Version: Django 1.9.2
- Framework Link: https://www.djangoproject.com
- Github Link: https://github.com/django/django

Websites using Django are Disqus, Pinterest, Instagram, Quora, etc.

3. Angular(Also, know as AngularJS)

Angular is a framework by Google (originally developed by Misko Hevery and Adam Abrons) which helps us in building powerful Web Apps. It is a framework to build large scale and high-performance web applications while keeping them as easy-to-maintain. There are a huge number of web apps that are built with Angular.

- Language: JavaScript
- Latest Version: Angular 7.1.5
- Framework Link: https://angular.io/
- Github Link: https://github.com/angular/angular

Websites using Angular are Youtube on PS3, Weather, Netflix, etc.

4. ASP.NET

ASP.NET is a framework developed by Microsoft, which helps us to build robust web applications for PC, as well as mobile devices. It is a high performance and lightweight framework for building Web Applications using .NET. All in all, a framework with Power, Productivity, and Speed.

- Language: C#
- Latest Version: ASP.NET 5 (ASP.NET Core 1.0)
- Framework Link: http://www.asp.net/

Websites using ASP.NET are GettyImages, TacoBell, StackOverflow, etc.

5. METEOR

Meteor or MeteorJS is another framework that gives one a radically simpler way to build real time mobile and web apps. It allows for rapid prototyping and produces cross-platform (Web, Android, iOS) code. Its cloud platform, Galaxy, greatly simplifies deployment, scaling, and monitoring.

- Language: JavaScript
- Latest Version: Meteor 1.2.1
- Framework Link: https://www.meteor.com/
- Github Link: https://github.com/meteor/meteor

Websites using Meteor are HaggleMate, WishPool, Telescope, etc.

6. Laravel

Laravel is a framework created by Taylor Otwell in 2011 and like all other modern frameworks; it also follows the MVC architectural pattern. Laravel values Elegance, Simplicity, and Readability. One can right away start learning and developing Laravel with Laracasts which has hundreds of tutorials in it.

- Language: PHP
- Latest Version: Laravel 5.2
- Framework Link: https://laravel.com/
- Github Link: https://github.com/laravel/laravel

Websites using Laravel are Deltanet Travel, Neighbourhood Lender, etc.

7. Express

Express or Express Js is a minimal and flexible framework that provides a robust set of features for web and mobile applications. It is relatively minimal meaning many features are available as plugins. Express facilitates the rapid development of Node.js based Web applications. Express is also one major component of the MEAN software bundle.

- Language: JavaScript

- Framework Link: http://expressjs.com/
- Github Link: https://github.com/strongloop/express

Websites using Express are Storify, Myspace, LearnBoost, etc.

8. Spring

Spring, developed by Pivotal Software, is the most popular application development framework for enterprise Java. Myriads of developers around the globe use Spring to create high performance and robust Web apps. Spring helps in creating simple, portable, fast, and flexible JVM-based systems and applications.

- Language: Java
- Latest Version: Spring 4.3.0
- Framework Link: http://projects.spring.io/spring-framework/
- Github Link: https://github.com/spring-projects/spring-framework

Websites using spring are Mascus, Allocine, etc.

9. PLAY

Play is one of the modern web application frameworks written in Java and Scala. It follows the MVC architecture and aims to optimize developer productivity by using convention over configuration, hot code reloading, and display of errors in the browser. Play quotes itself as “The High-Velocity Web Framework”.

- Language: Scala and Java
- Latest Version: Play 2.4.6
- Framework Link: https://www.playframework.com/
- Github Link: https://github.com/playframework/playframework

Websites using PLAY are LinkedIn, Coursera, LendUp, etc.

10. CodeIgniter

CodeIgniter, developed by EllisLab, is a famous web application framework to build dynamic websites. It is loosely based on MVC architecture since Controller classes are necessary but models and views are optional. CodeIgnitor promises with exceptional performance, nearly zero-configuration, and no large-scale monolithic libraries.

- Language: PHP
- Latest Version: CodeIgnitor 3.0.4
- Framework Link: https://codeigniter.com/
- Github Link: https://github.com/EllisLab/CodeIgniter

Websites using CodeIgnitor are Bufferapp, The Mail and Guardian, etc. Apart from these 10 frameworks, others like Symphony , Ember.js, Sails.js, React.js are also worth mentioning.

➢ Types/Examples of Web Applications

Definition

A web application is a computer program that utilizes web browsers and web technology to perform tasks over the Internet.

Overview

Millions of businesses use the Internet as a cost-effective communications channel. It lets them exchange information with their target market and make fast, secure transactions.

However, effective engagement is only possible when the business is able to capture and store all the necessary data, and have a means of processing this information and presenting the results to the user.

Web applications use a combination of server-side scripts (PHP and ASP) to handle the storage and retrieval of the information, and client-side scripts (JavaScript and HTML) to present information to users. This allows users to interact with the company using online forms, content management systems, shopping carts and more. In addition, the applications allow employees to create documents, share information, collaborate on projects, and work on common documents regardless of location or device.

➢ How a web application works

Web applications are usually coded in browser-supported language such as JavaScript and HTML as these languages rely on the browser to render the program executable. Some of the applications are dynamic, requiring server-side processing. Others are completely static with no processing required at the server.

The web application requires a web server to manage requests from the client, an application server to perform the tasks requested, and, sometimes, a database to store the information. Application server technology ranges from ASP.NET, ASP and ColdFusion, to PHP and JSP.

Here's what a typical web application flow looks like:

1. User triggers a request to the web server over the Internet, either through a web browser or the application's user interface
2. Web server forwards this request to the appropriate web application server
3. Web application server performs the requested task – such as querying the database or processing the data – then generates the results of the requested data
4. Web application server sends results to the web server with the requested information or processed data
5. Web server responds back to the client with the requested information that then appears on the user's display

➢ Example of a web application

Web applications include online forms, shopping carts, word processors, spreadsheets, video and photo editing, file conversion, file scanning, and email programs such as Gmail, Yahoo and AOL. Popular applications include Google Apps and Microsoft 365.

Google Apps for Work has Gmail, Google Docs, Google Sheets, Google Slides, online storage and more. Other functionalities include online sharing of documents and calendars. This lets all team members access the same version of a document simultaneously.

➢ Benefits of a web application

1. Web applications run on multiple platforms regardless of OS or device as long as the browser is compatible
2. All users access the same version, eliminating any compatibility issues
3. They are not installed on the hard drive, thus eliminating space limitations
4. They reduce software piracy in subscription-based web applications (i.e. SaaS)
5. They reduce costs for both the business and end user as there is less support and maintenance required by the business and lower requirements for the end user's computer

➢ **Conclusion**

Increased Internet usage among companies and individuals has influenced the way businesses are run. This has led to the widespread adoption of web applications as companies shift from traditional models to cloud-based and grid models. Web applications give businesses the ability to streamline their operations, increase efficiency, and reduce costs.

These online apps such as email clients, word processors, spreadsheets, and other programs provide the same functionality as the desktop versions. However, they have an added advantage of working across multiple platforms, having a broader reach, and being easily accessible from anywhere.

PART B

(PART B: TO BE COMPLETED BY STUDENTS)

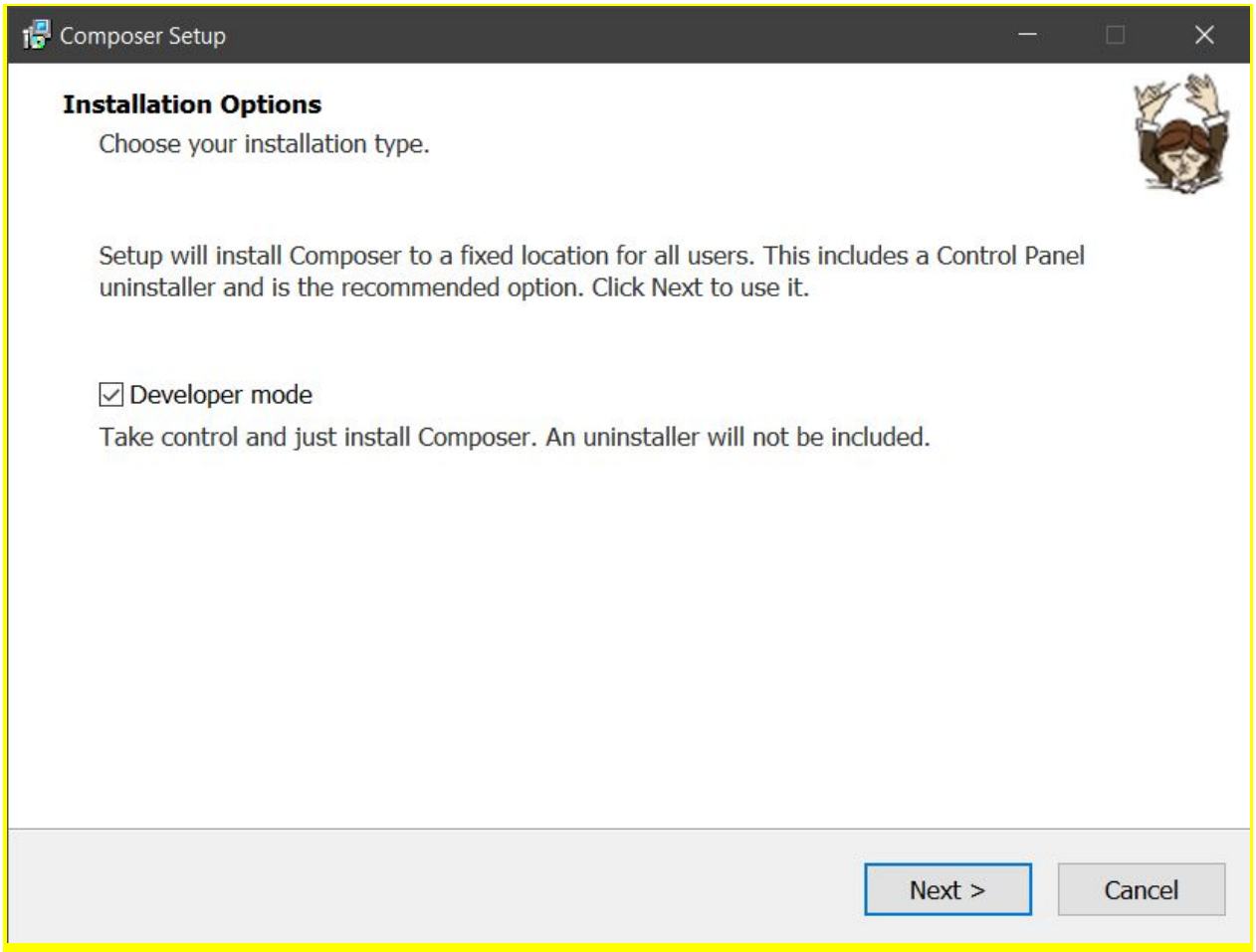
(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the Blackboard or emailed to the concerned lab in charge faculties at the end of the practical in case the there is no Blackboard access available)

Roll No. 50	Name: Amey Thakur
Class: TE-Comps B	Batch: B3
Date of Experiment: 08/10/2020	Date of Submission: 08/10/2020
Grade :	

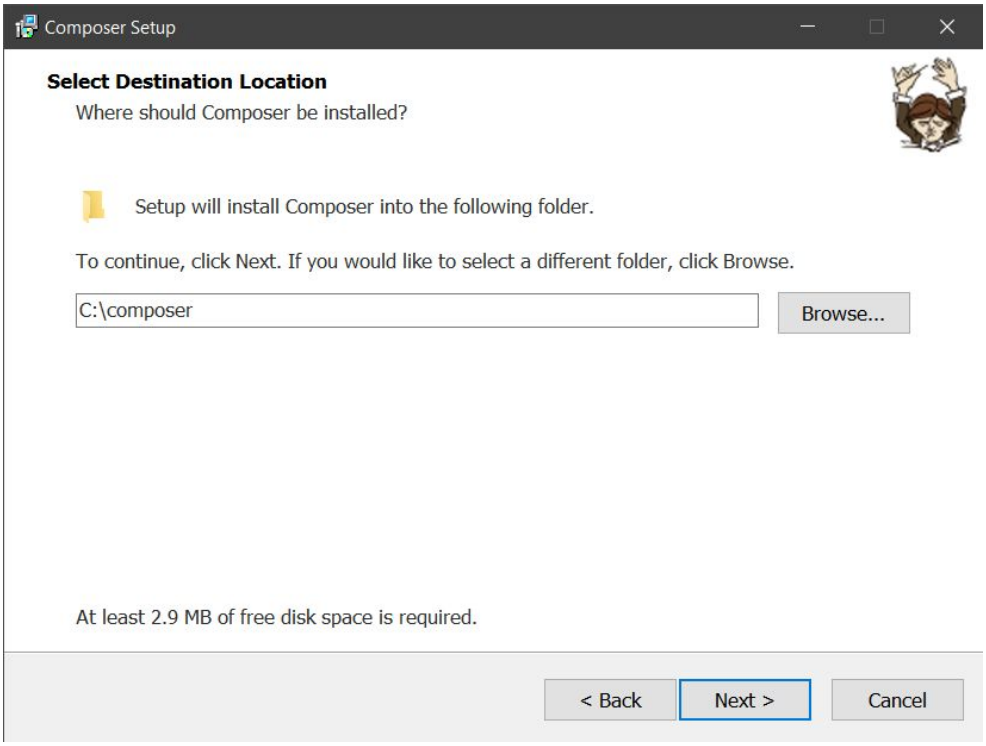
B.1 What is Laravel and add Installation Steps for Larval Framework:

(Write down the installation steps for Laravel Framework)

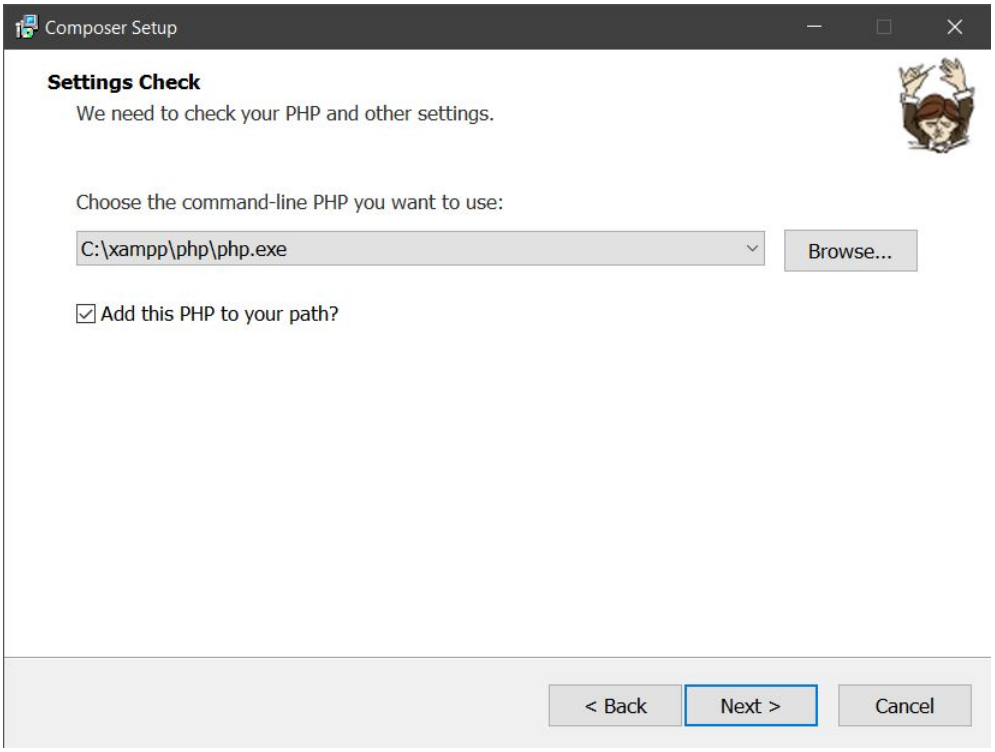
➔ Setup Composer Installation >> Next



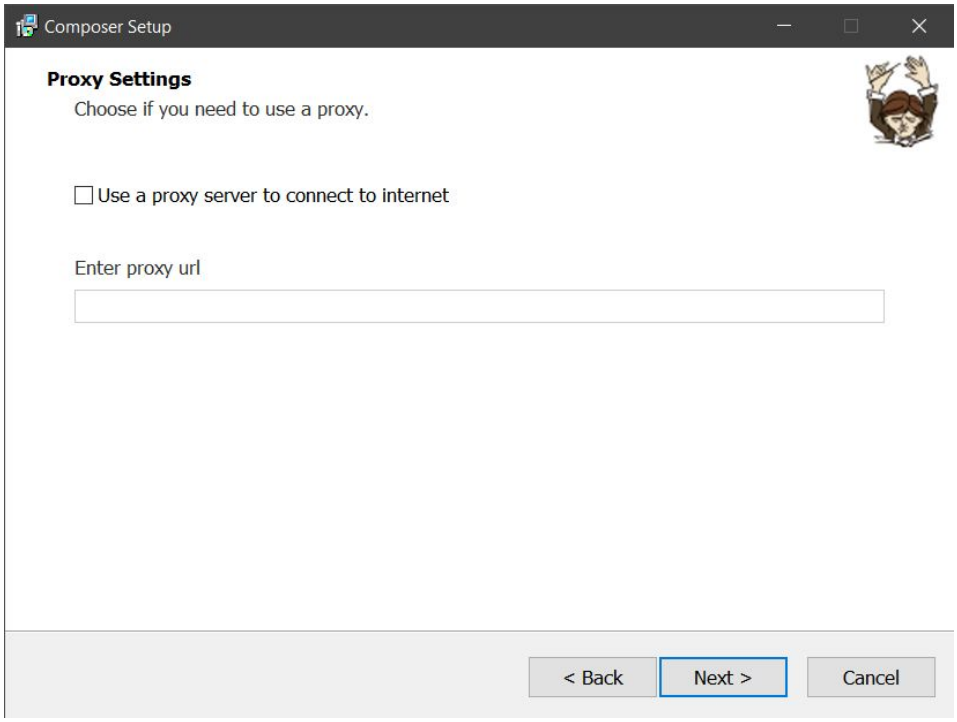
➔ Select Destination Folder >> Next



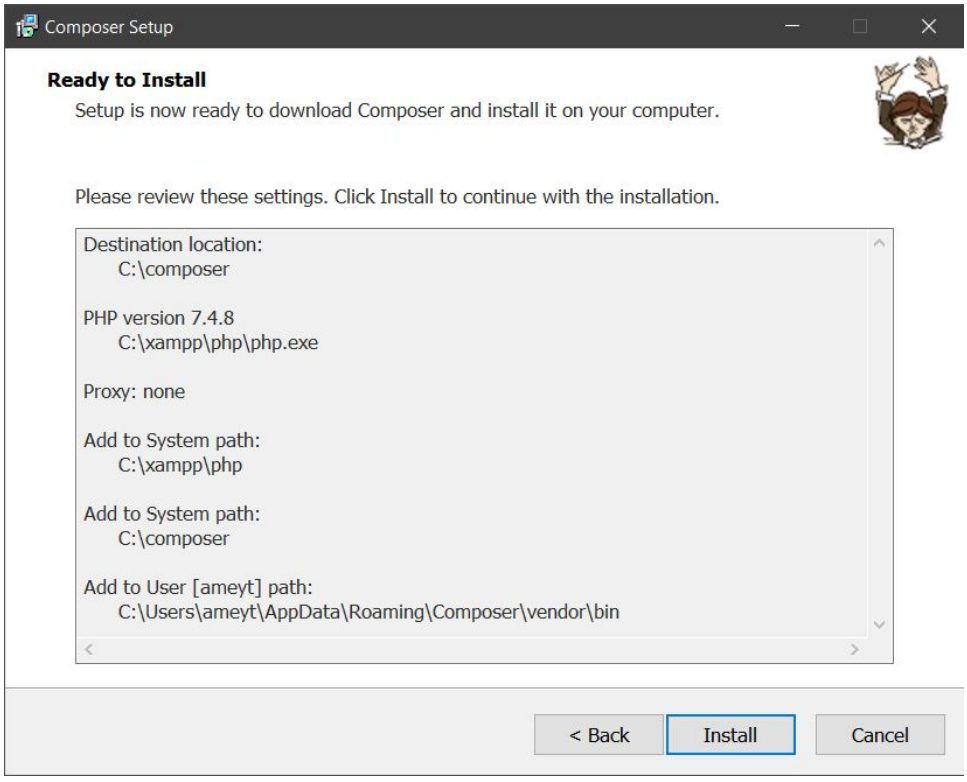
➔ Check Settings >> Next



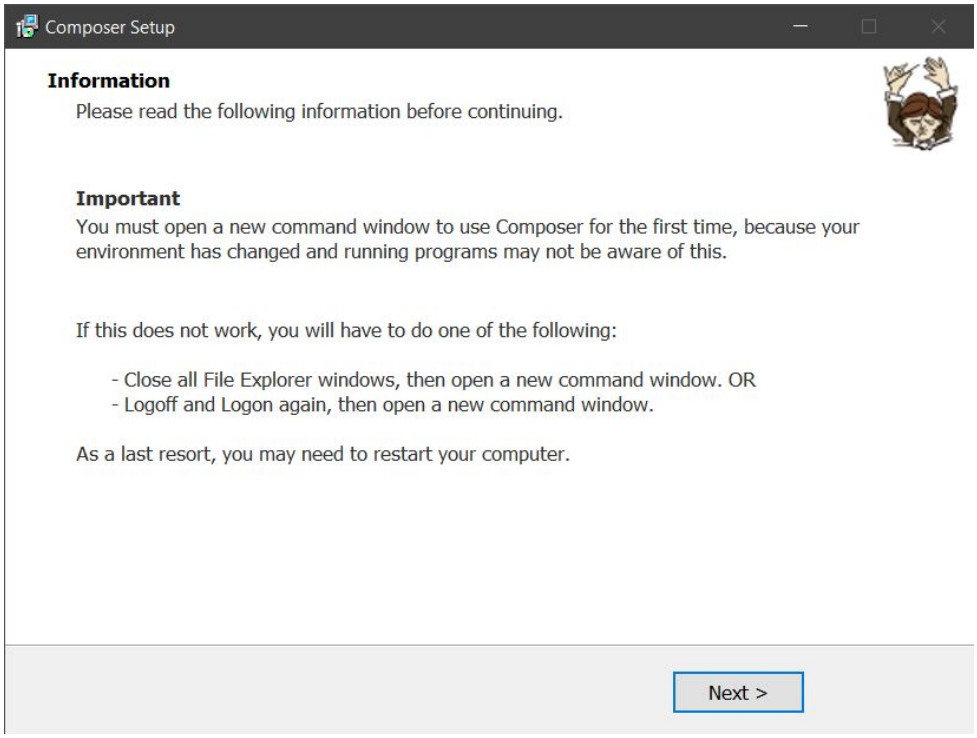
➔ Proxy Settings >> Next



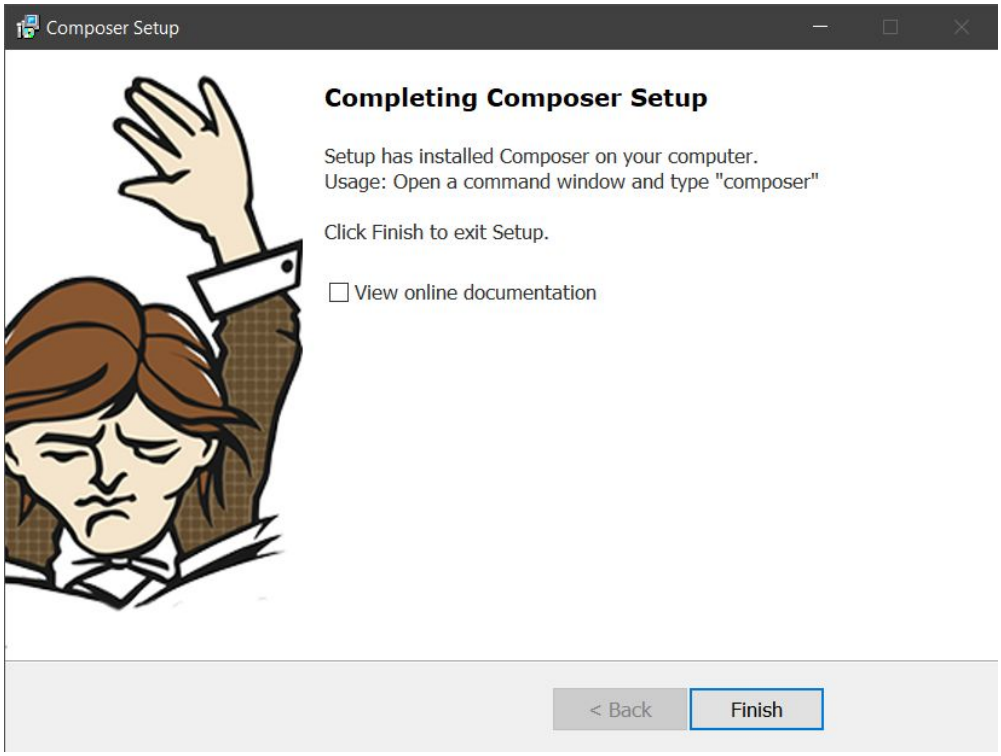
➔ Install Setup by Reviewing Settings >> Next



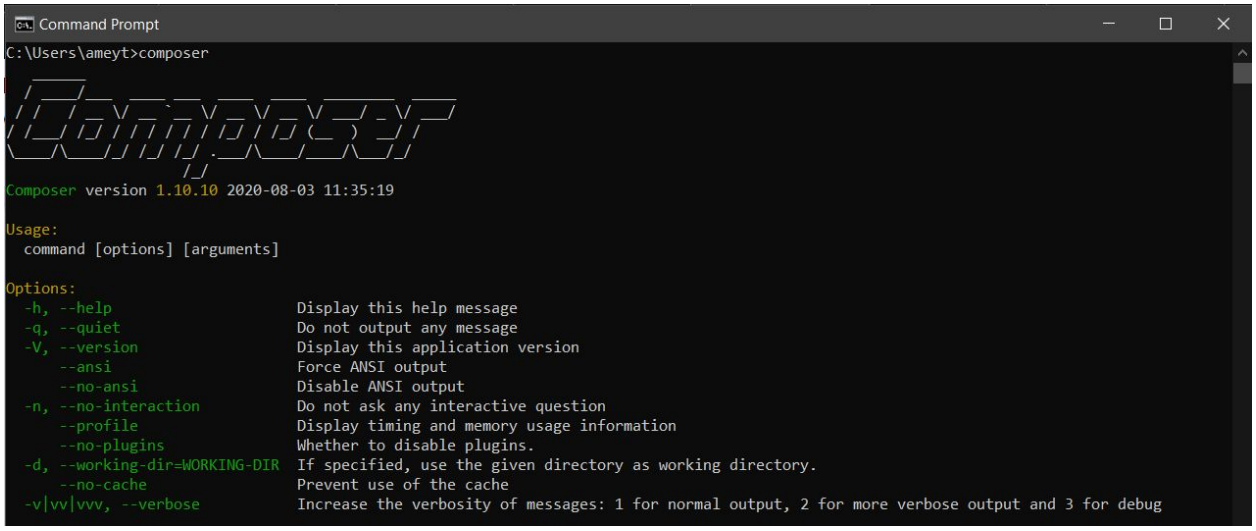
➔ Composer Setup Information >> Next



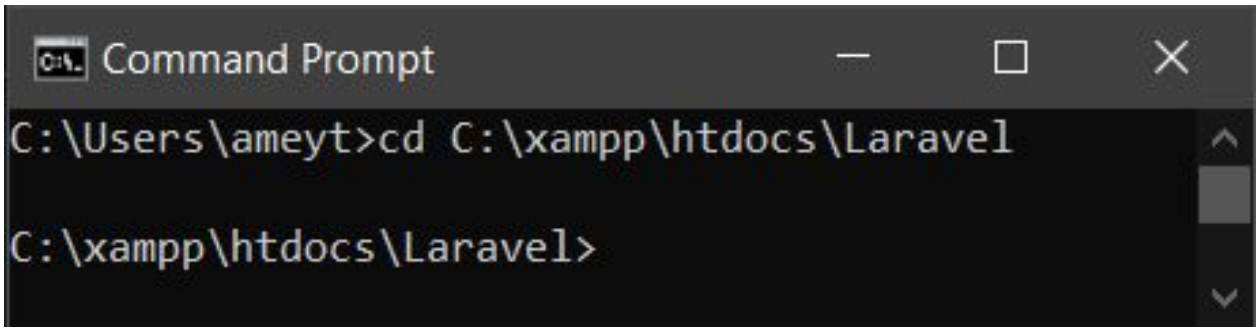
➔ Completing Composer Setup >> Finish



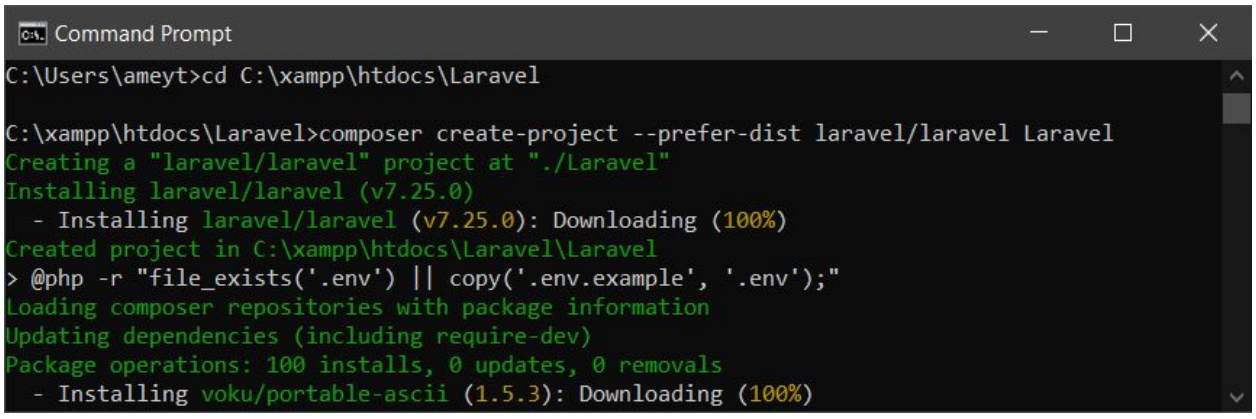
➔ Open Command Prompt >> Type Composer



➔ Laravel Installation >> In Command Prompt open Laravel Directory



➔ Type composer create-project --prefer-dist laravel/Laravel >> Enter



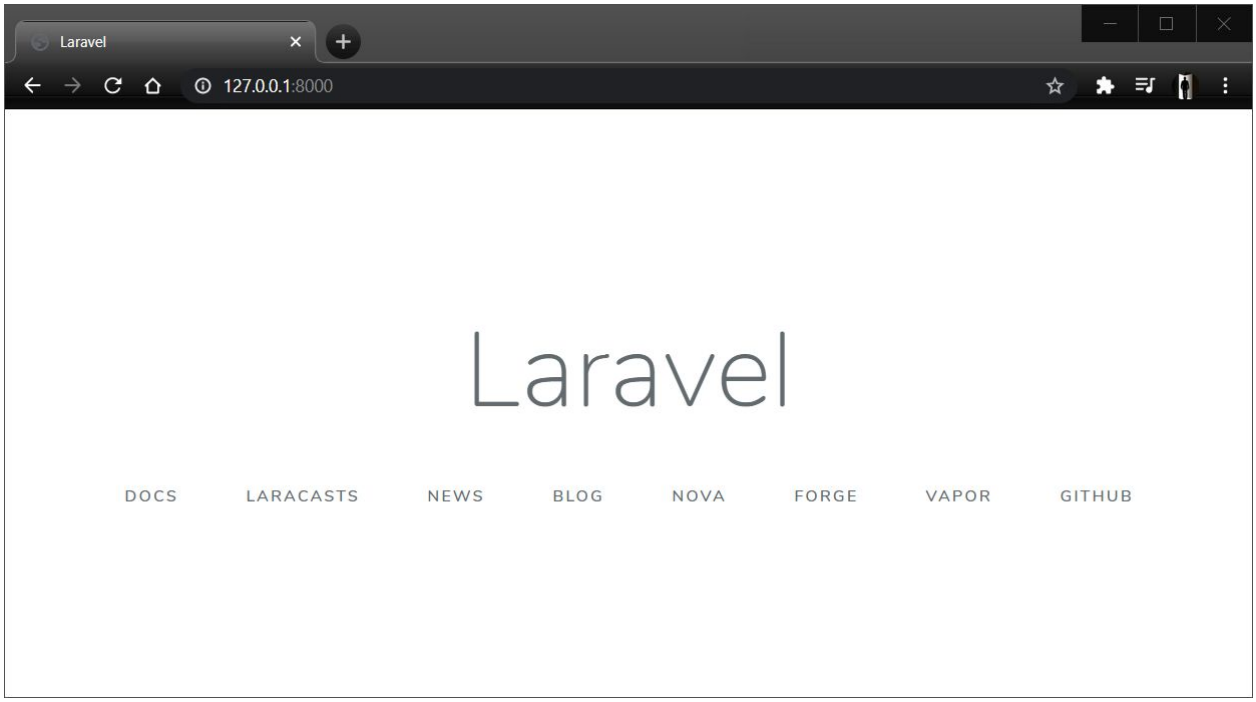
➔ Laravel Successfully Installed

```
Package manifest generated successfully.
48 packages you are using are looking for funding.
Use the `composer fund` command to find out more!
> @php artisan key:generate --ansi
Application key set successfully.

C:\xampp\htdocs\Laravel>
```

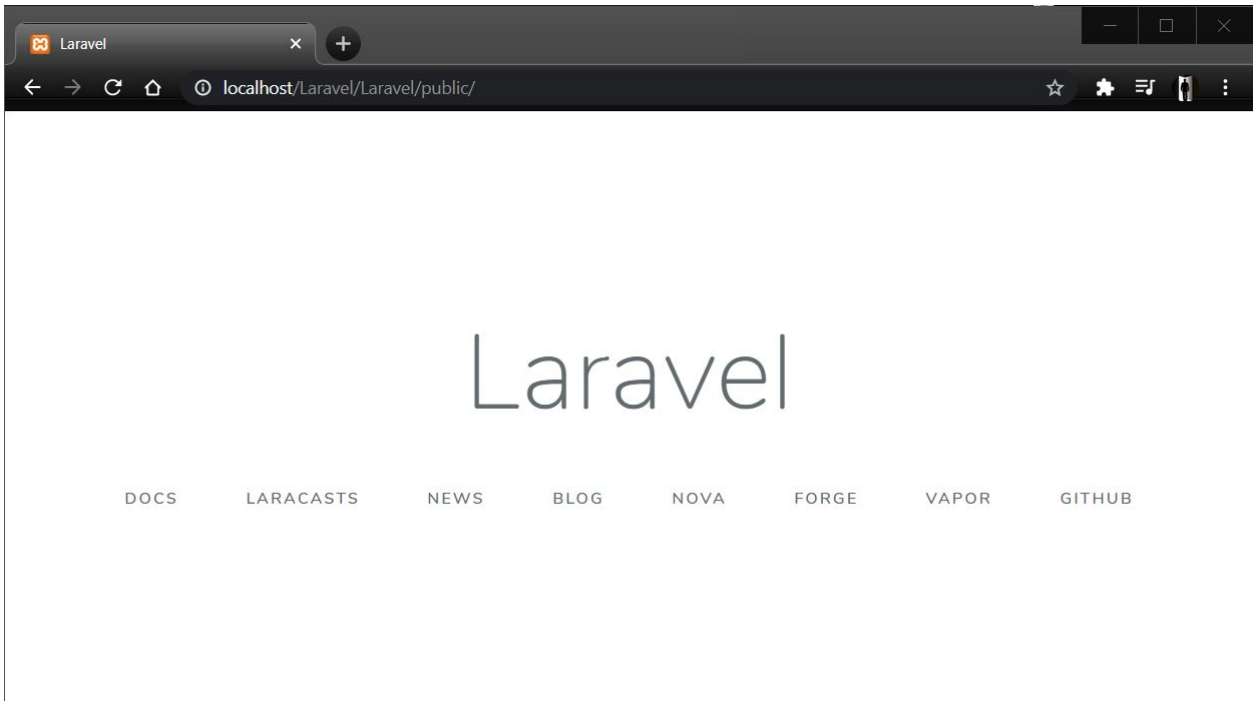
➔ Type php artisan serve >> Enter

```
Command Prompt - php  artisan serve
C:\xampp\htdocs\Laravel>cd laravel

C:\xampp\htdocs\Laravel\Laravel>php artisan serve
Laravel development server started: http://127.0.0.1:8000
[Tue Aug 18 10:57:09 2020] PHP 7.4.8 Development Server (http://127.0.0.1:8000) started
```

➔ Open Laravel Server via Command Prompt >> 127.0.0.1.8000



➔ Open Laravel Server via XAMPP Server >> localhost/Laravel/Laravel/Public

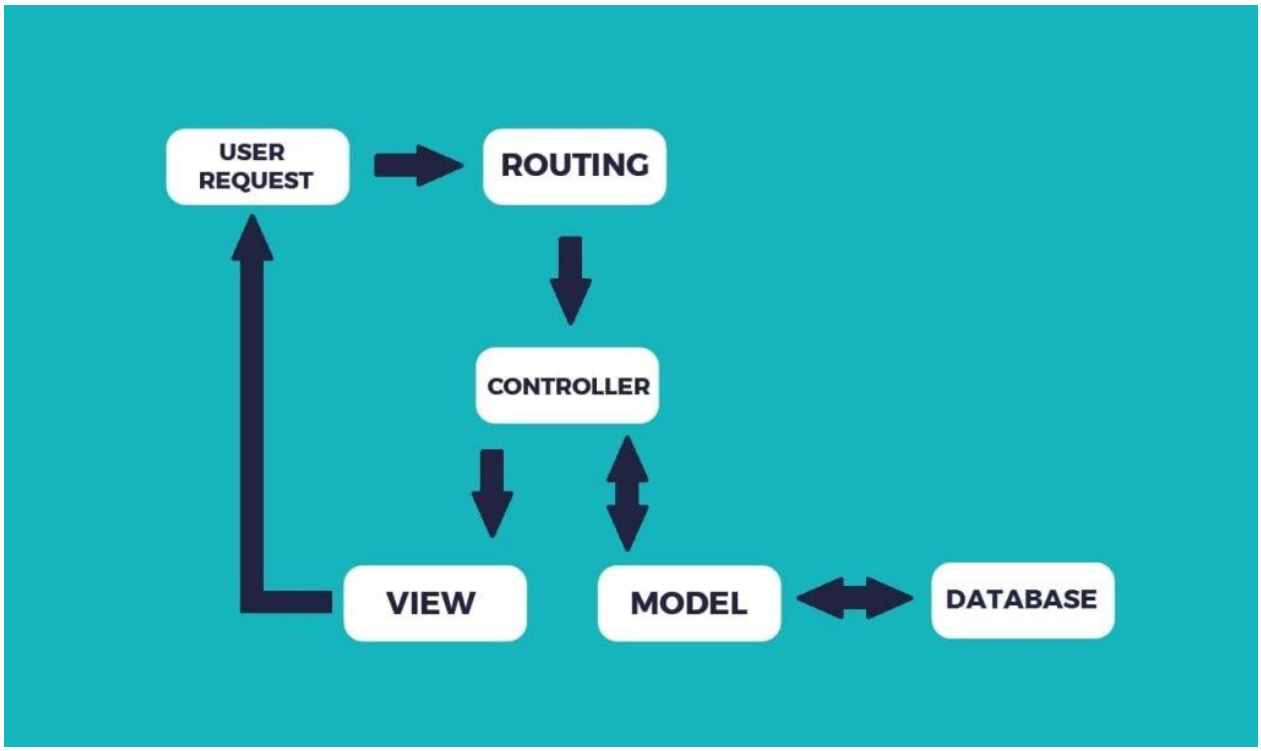


B2. Architecture of Laravel Framework:

(Explain and Draw the architecture of Laravel Framework)

LARAVEL ARCHITECTURE

➔ Laravel Architecture follows MVC Pattern. MVC stands for Model View Controller. The Architecture of Laravel changes as per the version of Laravel. Here we see MVC implementation in Laravel.



Model

➔ As we all know about Model in MVC, it manages the data in the database or any storage of the application. In the Laravel app, Model is a class with properties. In short, if you develop any project Student in Laravel and you create some class with a unique name then it will be the model of your tables and columns are properties in the database.

Student Properties

➔ Name
➔ Department
➔ Enroll No

To create a model in Laravel, run the command

$ php artisan make:model Student

Using this command, Laravel will create a Student.php file in the directory. This will be a PHP class with the name Student. It will be the model for our table Student in the database.

View

In the MVC Pattern view is used to display data. If we discuss Views of Laravel then all the views are stored in the directory resources/views. For example, you create a student.blade.php file then it is stored in a resources/views directory of our project. That file contains code and View displays the page.

Controller

In the MVC Pattern Controller is used to handle the request. With a single line of code, Laravel resource routing assigns the typical "CRUD" routes to a controller. It works as a directing traffic between Views and Models. If you wish to create a resource controller then run this command.

$ php artisan make:controller StudentController -r

Laravel will create a new file in the app/Http/Controllers directory called StudentController.php. The controller includes a method for each of the available resource operations. Resource Controller handles many actions like Get, Post, Delete, Put, Patch etc.

FEATURES OF LARAVEL

- ➔ Routing
- ➔ Schema Builder
- ➔ Include mail class
- ➔ Modularity
- ➔ Testability

If you want to create any web application in PHP then Laravel is the scope for you because it is easy to use and design is more structured. In Laravel, you can reuse existing components from other frameworks and develop an application. If you know the basic fundamentals of PHP and Core PHP then it is very easy to develop an application in Laravel.

B.3 Differentiate between Static and dynamic web applications, give suitable examples of each.

BASIS FOR COMPARISON	STATIC WEB PAGES	DYNAMIC WEB PAGES
Basic	Static web pages will remain the same for the time until and unless someone changes it manually.	Dynamic web pages are behavioral and have the capacity to produce distinctive content for different visitors.
Complexity	Simple to design.	Complicated to construct.
Application and web languages used to create web pages	HTML, JavaScript, CSS, etc.	CGI, AJAX, ASP, ASP.NET, etc.
Information change	Occurs rarely	Frequently
Page loading time	Less comparatively	More
Use of Database	Doesn't use databases	A database is used.

B.4 Conclusion:

(Write appropriate conclusion.)

- ➔ Hence we learnt how to install laravel framework.
- ➔ Also we Studied and analyzed different types of web applications and of Web development Frameworks.