

Getting ready for the course - BE Lesson Plan



Content Outline:

1. Introduction of tools and technologies used in the course.
2. Introduction to JavaScript
3. Node.js Introduction
4. Installation/usage of all the tools in different OS
5. How different technologies will be used in the different parts of the course and why have they been chosen?

Introduction (6 minutes):

1. In today's session, we are going to discuss the tools and technologies which we are going to use in the course. We will understand the installation process of these tools and their implementations. We will also learn about the technologies which we are going to be used in different parts of our course.

1. Introduction of tools and technologies used in the course: (50 mins)

In this section, we are going to understand the tools and technologies used in this course.

let's see technologies which we are going to use for the course :

- Node JS
- Javascript
- Express JS
- MySQL
- Miscellaneous (based on use cases)

Discussing them all in brief :

Javascript:

- JavaScript is a lightweight programming language, based on ECMAScript standard
- It is used in making websites and apps more dynamic
- Also, it can be used for other, non-web activities, like automatic form-filling and data validation or generating animations that play when the user hovers over an image.

Node JS

- Node.js is an open-source, cross-platform JavaScript run-time environment built on Chrome's V8 JavaScript engine.
- It is single-threaded (not exactly, it has a single-threaded event loop)
- It uses an event-driven, non-blocking asynchronous I/O model that makes node js lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices.
- Node.js allows the creation of Web servers and networking tools using JavaScript.
- Popular companies which use Node js are Microsoft, LinkedIn, IBM, Walmart, Yahoo, etc.

Express JS

- Express.js is a flexible and minimal node js web application framework that provides a set of features for web and mobile applications.
- It is built on top of the node's powerful HTTP module.
- Express JS enhances the functionality and fulfills various needs of the web application by providing ready-to-use solutions for common application routines, including templating, database connectivity, HTTP utilities, middleware, and many more.

MySQL

- MySQL is a Relational Database Management System (RDBMS) that uses Structured Query language (SQL) to interact with databases.
- It stores data in the form of tables that can be modified using Structured Query Language.
- Its adaptability with different computing systems like Windows, Linux, macOS, and Ubuntu has made it an easy-going RDBMS software option.

Tools which we are required for the course by our learners -

- VS code editor
- Git and Git Bash(only for Microsoft Windows users)
- NPM
- Postman
- MySQL Workbench

Now let's discuss each of them one by one (Brief introduction of each topic) :

VS Code :

- A code editor is basically a text editor but with some special features used by the developers to write and execute the code.
- VS code is the most famous code editor and comes with the support of debugging, task running, version control, etc.
- It is free to use.
- The course will be using VS code as our code editor

Git and Git Bash :

- Git is a free and open-source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.
- Version control system track the changes to the project files and revert changes if needed, it also helps in collaboration for the project
- Git Bash is an open-source, Unix shell, that enables an interactive shell experience on Windows. It comes with Git for Windows, configured to work natively while retaining the usability of the regular Git Bash shell.

NPM :

- NPM or “Node Package Manager” is the default package manager for the Node.js environment.
- Package manager makes it easier for a developer to publish and share the source code of Node.js packages
- It helps to install, uninstall and manage different versions of node programs.
- Its goal is to one day seamlessly handle the dependencies of any project written in Node.js or any other code capable of running within the Node environment.

Postman :

- Postman is a powerful multi-platform tool for API development to help you build, test, document, and monitor APIs more quickly and easily.

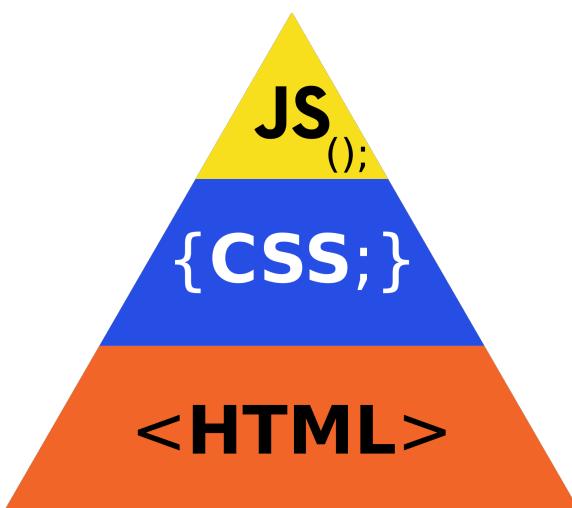
MySQL Workbench :

- MySQL Workbench is a cross-platform database design, development, and administration tool for MySQL.
- Written by the creators of MySQL to provide maximum comfort to fully take advantage of the power of the database.

2. Introduction to JavaScript (15mins):

Javascript is used whenever you see a website that does more than merely display static data, such as an eCommerce website, a video streaming website, interactive maps, and so on.

- JavaScript is a computer language that is largely utilized by Web browsers to provide users with a dynamic and interactive experience
- It is lightweight and can be interpreted in an object-oriented manner
- Although JavaScript is the most well-known scripting language for Web pages, it is also used in a variety of non-browser applications, including Node.js, Apache.
- It is primarily known as the language of most modern web browsers.
- It is a case-sensitive language.
- It follows the syntax and structure of the C programming language. Thus, it is a structured programming language.
- It's a dynamic language this is prototype-based, single-threaded, multi-paradigm, and supports object-oriented and declarative styles.



- HTML is the markup language that enables us to structure and give meaning to the web content which is enhanced and modified by other technologies like CSS and JavaScript.
- CSS is a language that we use to set the styling rules for our HTML content.
- JavaScript is used to control the behavior of different elements.

3. Introduction to NodeJS (15mins):

- Node.js is an open-source, cross-platform JavaScript run-time environment built on Chrome's V8 JavaScript engine.
- It allows the creation of Web servers and networking tools using JavaScript
- It is being used in developing desktop applications as well with a popular framework called electron.
- Since we use Javascript in both the frontend and backend the development will be much faster.
- It uses async processing on a single thread.

Example of “Hello World” program in Node JS.

```
var http = require("http");
http.createServer(function (request, response) {
  response.writeHead(200, {'Content-Type': 'text/plain'});
  response.end('Hello World\n');
}).listen(3000);
```

- It's a dynamic language this is prototype-based, single-threaded, multi-paradigm, and supports object-oriented and declarative styles.

4. Installation of Tools (45 mins) :

i> VS code: (For reference - <https://code.visualstudio.com/download>)

- 1>Download the installation file.
- 2> Depending on the operating system and system setup, different installation files are available.
- 3> Download the file based on your requirement.

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.



Windows
Windows 7, 8, 10, 11



.deb
Debian, Ubuntu
.rpm
Red Hat, Fedora, SUSE



Mac
macOS 10.11+

User Installer
System Installer
.zip

.deb
.rpm
.tar.gz

.zip

Universal
Intel Chip
Apple Silicon

Snap Store

ii> Installation of Git/GitBash (windows) : (For reference - <https://git-scm.com/downloads>)**Installation guide for windows :**

- 1> Download the latest Git for window installer
- 2> The Git Setup wizard screen will appear after the installer has completed successfully. Complete the installation by following the Next and Finish prompts. For most people, the default options are visible
- 3> Open a Command Prompt (or Git Bash if during installation you elected not to use Git from the Windows Command Prompt).
- 4> Run the following commands to configure your Git username and email, substituting Tanay's user name with your own, and the following details will be associated with any commits you make:

```
$ git config --global user.name "TANAYTAPANSHU" $ git config --global  
user.email "tanaytapanshu@gmail.com"
```

Installation guide for Linux (Debian / Ubuntu) :

- 1> From your shell, install Git using apt-get:

```
$ sudo apt-get install git
```

- 2> Verify the installation using the command

```
$ git --version  
  
git version 2.9.2
```

- 3> Configure your Git username and email using the following commands

Replace the user.name with your username and email with your email.

```
$ git config --global user.name "TANAYTAPANSHU"  
  
$ git config --global user.email "tanaytapanshu@gmail.com"
```

Installation guide for Mac OS X:

Check if the git is already installed (if XCode is already Installed)

```
$ git --version git version 2.7.0 (Apple Git-66)
```

The easiest way to install Git on a Mac is via the stand-alone installer:

- 1> Download the latest version of the installer.

- 2> To install Git, follow the prompts.

- 3> Use these git commands to check the version

```
$ git --version
```

4> Configure your Git username and email

```
$ git config --global user.name "TANAYTAPANSHU"
```

```
$ git config --global user.email "tanaytapanshu@gmail.com"
```

Installation terminal directly using homebrew in Mac OS X:

Open the terminal and run the command (make sure that brew is already installed)

```
$ brew install git
```

iii> Installation of NodeJS and NPM : (For reference - <https://git-scm.com/downloads>)

Installation guide for Linux (Debian / Ubuntu) :

- 1> Open the terminal (press Ctrl + Alt + T)
- 2> Download the node using the following command

```
sudo apt install nodejs
```

3> Once installed check the version of node

```
node -v or node -version
```

4> Now, install the npm using the command below

```
sudo apt install npm  
npm -v or npm -version
```

Installation guide for Windows :

1> Download the Windows installer from Nodejs.org. (<http://nodejs.org/download/>)

2> Run the installer

3> **Follow the prompts in the installer** (Accept the license agreement, click the NEXT button a bunch of times, and accept the default installation settings).

4. Restart the computer once and check the version

```
node -v or node -version
```

Installation guide for Mac using brew :

1> Check if the brew is installed in your computer.

2> Run the brew command to install node

```
brew install node
```

3> Once installed check the version of the node

```
node -v or node -version
```

4> Npm will also be automatically installed using the above command.

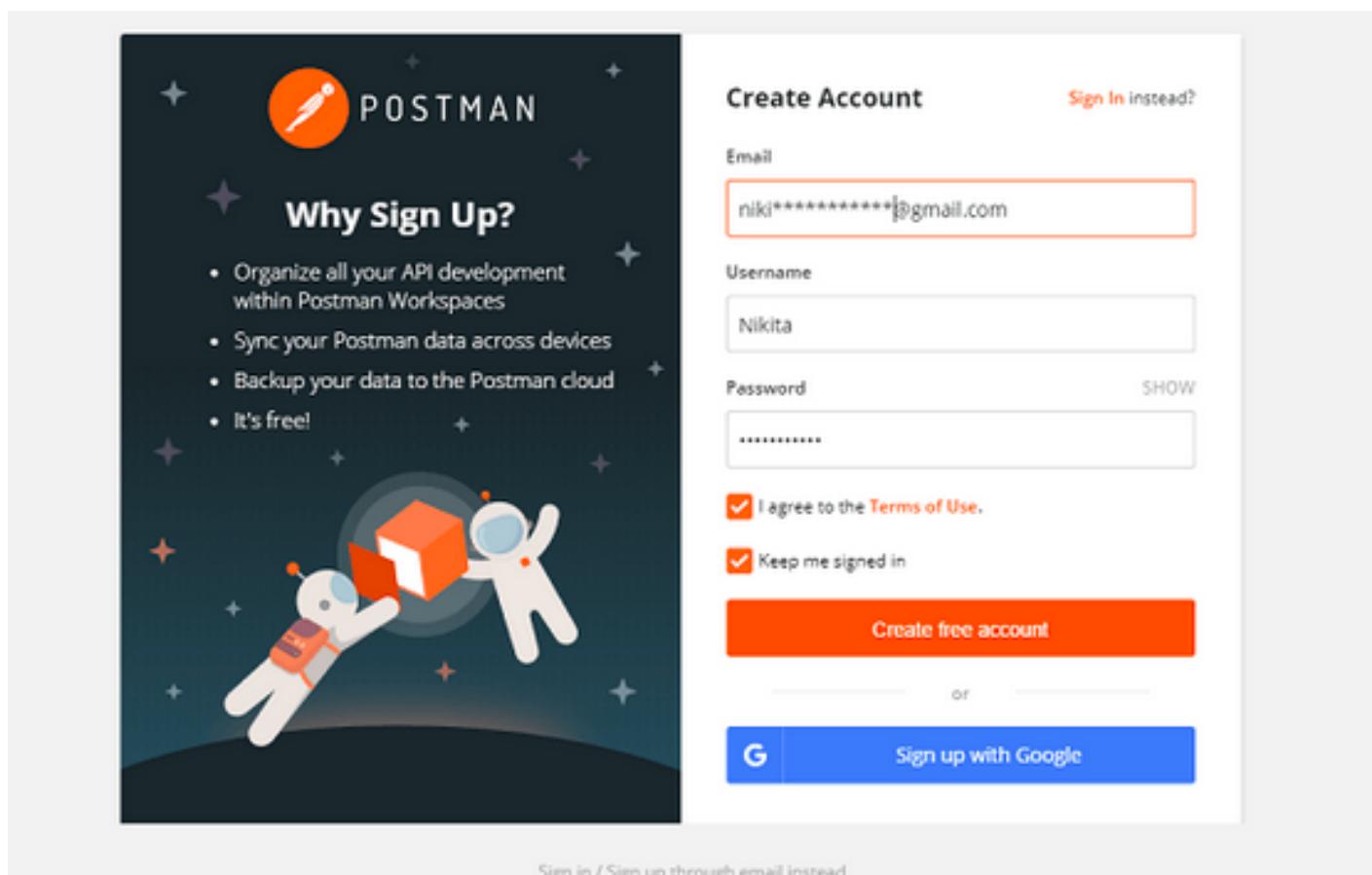
IV> Installation of Postman:

1> Go to the link <https://www.postman.com/downloads/>

Click download for Mac or Windows or Linux based on your operating system.

2> Check the download options and download the version which is suitable to your System configuration.

3> Once the download is complete, create your account with all the required details, or you can also signup with Google, as shown in the image.



Sign in / Sign up through email instead

V> Installation of MySQL Workbench:

Software Requirements :

The following operating systems are officially supported: Windows 7 (64-bit, Professional level or higher) Mac OS X 10.6.1+ Ubuntu 9.10 (64bit) Ubuntu 8.04 (32bit/64bit)

1.> Refer to the docs for the installation guide - <https://docs.oracle.com/cd/E19078-01/mysql/mysql-workbench/wb-installing.html#wb-installing-windows>

2.>

3.3. Starting MySQL Workbench

- [3.3.1. Installing MySQL Workbench on Windows](#)
- [3.3.2. Launching MySQL Workbench on Windows](#)
- [3.3.3. Uninstalling MySQL Workbench on Windows](#)
- [3.3.4. Installing MySQL Workbench on Linux](#)
- [3.3.5. Launching MySQL Workbench on Linux](#)
- [3.3.6. Uninstalling MySQL Workbench on Linux](#)
- [3.3.7. Installing MySQL Workbench on Mac OS X](#)
- [3.3.8. Launching MySQL Workbench on Mac OS X](#)
- [3.3.9. Uninstalling MySQL Workbench on Mac OS X](#)

The procedure for launching MySQL Workbench depends on the platform. Generally, there are two ways to launch MySQL Workbench from the command line and from the graphical user interface of the host operating system. Using the command-line launching facility is useful when you want to customize some aspects of the way MySQL Workbench operates. Launching MySQL Workbench for each of the supported platforms is described in the following sections.

In addition to platform-specific command line options, MySQL Workbench has the following command line options:

- `--admin instance` - Launch MySQL Workbench and load the server instance specified.
- `--query connection` - Launch MySQL Workbench and load the connection specified.
- `--model modelfile` - Launch MySQL Workbench and load the model specified.
- `--script script` - Launch MySQL Workbench and run the script specified.
- `--run code` - Launch MySQL Workbench and run the code snippet specified.
- `--quit-when-done` - quits MySQL Workbench after --script or --run finishes.

5. How different technologies will be used in the different parts of the course and why have chosen them? (15 mins) :

1> Web development part can be broadly into two parts -

- i> Frontend Part
- ii> Backend Part

2> Frontend of the website is what a user sees, backend of the website includes the server and the database

3> For creating the servers and backend database we will be using the Node JS and MySQL database.

4> Node.js provides simplicity in development because of its non-blocking I/O and event-based model results in short response time and concurrent processing, unlike other frameworks where developers have to use thread management.

Since we use Javascript in both the frontend and backend the development will be much faster.

5> MySQL is a web-based and server-based open-source relational database management system that is quick, dependable, and simple to use.

There are three main ways you can interact with MySQL:

- using a command line
- via a web interface
- through a programming language