**Full Stack Web Development**

* Front End Development
* Back End Development
* We will build
  + Desktop Native
  + Web Applications
  + SPA [Single Page Applications]
  + Mobile Native Applications

**Web Application Architecture**

* Software applications architecture
  + One Tier
  + Two Tier
  + 3 Tier
  + N Tier

**FAQ: What is difference between Tier and Layer?**

* Applications are built in Layers.
* Applications run in Tier.

**FAQ: What is difference between UI developer and Full Stack Developer?**

* UI Developer: Building the UI, role UI Layer.
* Full Stack Developer: Building the UI, Business Logic, Create Database

**Front End Development: Building the UI**

**Back End Development: Business Logic and Database**

**Full Stack: Front End, Back End**

FAQ: **What is MEAN, MERN, Full Stack etc?**

**M - MongoDB - Database**

**E - Express - Middleware**

**A/R - Angular/React - Client Side**

**N - Node JS - Server Side**

**Angular / React**

**HTML, CSS, Bootstrap, LESS, SASS, jQuery, JavaScript - ES6 - UI**

**M - MongoDB - Database**

**E - Express - Middleware**

**A/R - Angular/React - Client Side – UX – SPA**

**N - Node JS - Server Side**

**UI Developer**

**MEAN**

**MERN**

**Full Stack**

**Front End Development**

* It is all about building the UI [User Interface]

**What are the basic software requirements for building the UI?**

|  |  |
| --- | --- |
| HTML | It is a presentation language used for presenting the contents on browser window. |
| CSS | It makes the presentation more interactive and responsive. |
| LESS & SASS | These are CSS pre-processors used to make CSS reusable, maintainable and extensible. |
| Bootstrap | It provides templates, which you can implement in your application. You build applications faster.  It is a library of HTML, CSS and JavaScript. |
| JavaScript | It is a language, used client-side, server-side, database.  Client-Side with HTML  Server-Side with Node JS  Database with MongoDB |
| jQuery | It is a JavaScript library.  Library comprises of set of functions, which you can implement in your application and handle functionality without writing much logic. |
| RxJS | It is a JavaScript Library.  It is used to handle asynchronous requests.  Asynchronous will improve the performance of application. |
| ReactJS | It is a JavaScript Library.  It is good in developing SPA. [Single Page Application].  You can build applications with good UX. |
| Ionic | It is a framework used to build cross platform mobile apps with JavaScript, HTML, ReactJS.  Other frameworks: Native Script, Cordova etc. |
| Angular [Intro] | Framework for building SPA. |
| Flash [Intro] | It is used for creating animations for web. |
| Photoshop [Intro] | It is for publishing images. |

**Back End Development**

* All about handling interactions server side.

|  |  |
| --- | --- |
| NodeJS | Server-Side Scripting  It is a technique used in web development, where scripts are employed on server, in order to generate a response customized to every client request. [CGI, JSP, PHP, ASP, Python] |
| MongoDB | Database |
| Express | It is a middleware, handle communication in multi-tier applications.  Middleware is a software framework. |
| Versioning | GIT |
| Testing | Jasmine-Karma |

**Toolchain Required for Front End Web Development**

**What is toolchain?**

* Toolchain refers to the tools required for building, debugging, compiling, testing and deploying.
  + Building – Designing
  + Debugging – Finding the bugs and fixing the bugs [technical issues].
  + Compiling – Translating
  + Testing – Asserting the client requirements.
  + Deploying – Publishing, ready to use.

|  |  |
| --- | --- |
| **Toolchain** | **Purpose / Description** |
| Package Manager | * It is a software tool used by developers to **install dependencies** required for project. * Dependencies are libraries required for building an application.   Ex: NPM, Yarn, Bower, NuGet, Ruby GEMS etc.  **Installing NPM [Node Package Manager]**   * Download Node JS on your PC  <https://nodejs.org/en/download/> * Install on your PC * Test its version from command prompt   C:\> node -v  C:\> npm -v |
| IDE / Editor | * Integrated Development Environment * It provides single platform from where we can build, debug, test and deploy applications. * There are various editor used across web development like, Web Strom, Sublime, Edit Plus, Eclipse, Visual Studio, Visual Studio Code etc.   **Installing Visual Studio Code**   * Visit the website  <https://code.visualstudio.com/> |
| Plugins for VS Code | **Install the following plugins for VS Code**   * Install Support for JavaScript [Customize] * Go to Extensions and Install the following **Live Server**   **Vscode-icons**  **IntelliSense for CSS class Names** |

**Creating a Project**

* Open any physical drive location on your PC
* Create a new folder for project  
  **C:\FrontEndProject**
* Go to Visual Studio Code
* File Menu -> Open Folder
* Select “C:\FrontEndProject”
* Click Select Folder
* Generate Meta Data for your project [Information about project]
  + Go to “Terminal Menu”
  + Select “New Terminal”
  + Run the following command  
    > npm init
  + This will generate “package.json” that contains meta data.

**Build UI for Web Applications**

**What is Web? What is difference between Internet and Web?**

* Internet is a Wide Area Network that connects computers across the world for sharing information and resources.
* Internet doesn’t have any restriction; any user can access any information from any location.
* In early 1990’s “**Tim Berners Lee”** introduced the concept of **Web.**
* Web is a portion of internet with restricted access.
* Web uses the mechanism of “Request and Response”.

**What is a Web Server?**

* Web Server resembles both hardware and software.
* It satisfies the client request by sending and receiving information.
* Sever role is hosting your resources, processing the requests and managing the response etc.
* Web Server Software
  + IIS [Internet Information Services Manager]
  + Tomcat
* Local Web Server
* Cloud Live Server

**Configuring Local Server for Web Development**

* **Apache Tomcat**
* **IIS [Internet Information Services]**
* **NGINX**
* **Lighthttpd**

**Local Web Server on Windows PC**

* Windows OS provides a built-in Web Server called IIS.

**Locating Local Web Server on Windows PC:**

* Open windows control panel
* Switch to “Large Icons” view
* Go to “Administrative Tools”
* Look for “Internet Information Services Manager”

**Adding Local Web Server on Windows PC:**

* Open Control Panel
* Go to “Programs and Features”
* Click on “Turn Windows Features ON or OFF”
* Select “Internet Information Services” check box
* Click OK

**Test your local Web Server:**

* Open any browser
* Type the following in address bar  
  <http://localhost>   
  or  
  <http://127.0.0.1>

**Web Site on Local Web Server**

**What is a web site?**

* Web site is a virtual directory on Web Server.
* It provides access to resources on Web Server.

**Creating a new Website on Local IIS [Web Server]:**

* Windows Run -> “inetmgr” [To open IIS]
* Expand “Local Computer: <http://localhost>”
* Expand “Sites” folder
* Right Click on “Default Web Site”
* Select “Add Virtual Directory”  
  Alias [Website Name]: Flipkart  
  Physical Path: C:\FlipkartResources

**Virtual Path:** [**http://localhost/flipkart**](http://localhost/flipkart) **Physical Path: C:\FlipkartResources**

**UI provided to clients for handling interaction with the resources.**

**UI is designed in a special document called “Web Page”.**

**What is a Web Page?**

* Web Page is a Hyper Text Document.
* It provides an UI from where user can interact with the resources of website.
* Web Page
  + Static Page
  + Dynamic Page