Phase 4

28-10-2021

Front end technologies

http://[www.google.com](http://www.google.com) URL

req(http/https)-------🡪

Client Server

🡨-------res(http/https)------

HTML/HTML5

CSS/CSS3

JavaScript

JEE

Asp.net

Php

Python

CGI

Node JS

Etc

Html : Hyper text mark up language which help to create the web application. That application may be static or dynamic.

Basic html

Hyper link

Image tags

List

Table tag

Form tag

It is use to display the content.

CSS : Cascading Style sheet : it is use to apply formatting style for web page.

It is use to display the content in different styles.

JavaScript : JavaScript was object based interpreter scripting language which help to create the dynamic web page as well as to do validation on client side.

Now a days we can do validation in JavaScript using two ways

1. Using HTML5 features
2. Using JavaScript

MEAN Stack Mongo DB / MySQL Express JS Like spring Rest Angular Node JS

MERN stack Mongo DB / MySQL Express JS Like spring Rest React Node JS

Web Application

VSCode

Html is not a structure

We can run the program in html without writing any tags.

Html 4 version

<!DOCTYPE html public url=”path.dtd”/>

Document type definition : inside this file they written the rules to html tags. means root tag, child tag, mandatory or optional tags.

In html 5 they removed path

<!doctype html> : instruction to browser we are writing html 5 code.

P

Heading tags : h1 to h6

attribute : we can descries the properties of tags using attributes.

Every tags contains one or more attributes.

Attribute we have to use in opening tags in the form of key value pairs

<tagName attributeName=”value” attributeName=’value’>

</tagName>

Link tag

List tags

Unorder list

Order list

Table Tags

Forms

HTML4

<input type="text/password/radio/checkbox/button/reset/submit/file"/>

HTML5

<input type="email/number/url/search/date/color"/> etc

Application.html

First name

Last name

Gender

Email

Hobbies

City Drop Down

Address

Search

Submit Reset

<input type=”text”/>

<input type=”password”/>

<input type=”email”/>

<input type=”radio” name = “gg” value=”male”/>Male

Checkbox

Dropdown

CSS :

Cascading style sheet

Without CSS : if we want to apply any formatting style we have to depends upon the other tags or there is not others tags to apply formatting style.

We have to write our contents and formatting style in one place.

Using CSS we can make separation of concern( We can write separate contents and formatting style).

CSS provide lot of pre-defined properties we can apply good look and feel for the application.

Types of CSS

1. Inline CSS
2. Internal CSS or embedded CSS
3. External CSS

Inline CSS :

<tagName style=”property:value;property:value;”></tagName>

Div : Division tag : it contains more than one other tags.

Like p, b, i or h1 to h6 or other tags.

Internal CSS or Embedded CSS

We have to use style tag in between head tag.

Syntax

Selector { property : value}

Types of selector

1. Universal selector : \* all tags
2. Specific selector : tagName : p, div, h1 to h6 etc.
3. Multi specific selector : tagName,tagName,tagName etc
4. Class selector :
5. Local class selector : tagName.className{property:value}
6. Global class selector : .className {property:value,property:value}
7. Id selector : #idName{property:value;property:value;}

Class selector Vs Id selector

<p class=”abc” id=”p1”>First Tag</p>

<p class=”xyz” id=”p2”>Second Tag</p>

<p class=”abc” id=”p2”>Third Tag</p>

<p class=”xyz” id=”p4”>Fourth Tag</p>

Class : group of tags is known as class.

Id selector is use to make the unique ness between two tags if tag may be same type or different type.

External CSS :

02-11-2021

JavaScript : JavaScript was object based interpreter scripting language.

JavaScript using ES5 features

ECMA : European Computer manufacture association

ES is a concept and JavaScript is one of implementation of ES.

Object based Vs object oriented.

Till ES5 JavaScript there is not concept called as class. it contains lot of pre-defined object as well as we can create user-defined objects.

We can write JavaScript code

1. Using internal JavaScript inside html page
2. Using external JavaScript connecting html page.

Syntax

<script type=”text/JavaScript”> opening tag

</script> closing tag

This tag we can write in between head or body tag of web page.

We can write more than one script tag in between head or body tags.

Type attribute is optional.

To display simple welcome message through JavaScript we have to use document pre-defined object and write pre-defined function.

In JavaScript it is not mandatory every statement end with semi colon.

Variable : In JavaScript to declare the variable till ES5 we can use var keyword.

Syntax

var variableName;

In JavaScript data types are divided into four parts.

1. Number type
2. String type
3. Boolean type
4. Object reference type.

Operator

Arithmetic Operator : +, -, , \*, /, %

Logical operator : &&, ||, !

Conditional operator : >, >=, <, <=, ==, != ===

Assignment operator : =

Increment and decrement : ++, --

typeof operator or functions

if statement

switch statement

looping

while loop

do while loop

for loop

function : function is use to write the set of instruction to perform a specific task.

1. Pre-defined function
2. User-defined functions.

Pre-defined functions

1. alert(“msg”) : This function is use to display the alert message.
2. prompt() : This function is use to take the value through keyboards.
3. parseInt() : string to integer
4. parseFloat(): string to float
5. eval() : string to number
6. confirm() : this function display pop up message with 2 button ok and cancel. If user click on ok button it return true if click cancel it return false.

do {

1: Add 2 : Sub using alert display option

Take the value using prompt

switch() {

case 1: addition

conversation function

case 2: subtraction

default wrong choice

break

}

Confirm do you want to continue.

}while()

User-defined functions

Normal syntax

function functionName(parameterList) {

set of statements.

}

1. function no passing parameter and no return type.

function info() {

alert(“Welcome to user-defined function”);

}

1. function passing parameter but not return type.

function add(a,b) {

}

1. function passing parameter and return the value.

function (id,name,salary,desg) {

// coding

return value;

}

In JavaScript function can return any type of values or it may not return.

1. Function no passing parameter but return value.

Events : Event is a interaction between user and components.

Or Event provide bridge between html tags to JavaScript code.

Types of events

1. onClick
2. onDblClick button
3. onMouseOver
4. onMouseOut images
5. onKeyUp
6. onKeyDown textfields or password field.
7. onFocus enter inside text field
8. onBlur exit from text field
9. onSubmit form validation
10. onChange drop down if do any changes.
11. onLoad when page load
12. onUnload when page refresh.

etc

BOM : Browser Object Model

DOM : Document Object Model



JavaScript follow object hierarchy concept.

Object --🡪 properties or fields/state/variables

Behaviour or functions

Object ---🡪 properties

Behaviour

Object -🡪 property

Behaviour

Object

In BOM hierarchy top most object is window object.

In DOM hierarchy top most object is document object.

JavaScript using ES6 features

Index.html page

<html>

<head>

<title>This is simple message</title>

</head>

<body>

<p>Welcome to simple web application</p>

</body>

</html>

When we run this page in browser internally it will create DOM hierarchy

Html

Head body

Title p

textNode 🡪message textNode 🡪msg

DOM API Document Object Model Application Programming interface. Lot of programming language like java, C#, C,C++, Python as well as JavaScript provided DOM API which help to read, write and update dom (HTML page contents) dynamically.

03-11-2021

Using JavaScript read, write and update DOM very complex.

JavaScript library or framework came picture.

jQuery : jQuery is open source external JavaScript library which provide set of function and properties which help to read and write DOM very easily.

jQuery is not a standard.

Angular is a framework which provide set of API which help read and write DOM very easily with standard rules and regulation.

Angular JS :

Html, css and JavaScript using ES5 style.

Angular Framework :

HTML, CSS, JavaScript and Typescript.

Typescript is a super set of JavaScript which support all features ES6.

Angular or React JS or Vue JS

Node JS Node JS is not a library or framework. It is a run time environment for JavaScript library or framework.

Before Node JS JavaScript is known as Client side scripting language.

But after node JS JavaScript can use client side as well as server side scripting language.

MEAN Stack :

MERN Stack :

Mongo DB / My SQL Express Module Angular Node JS

Mongo DB / My SQL Express Module React JS Node JS

Download the node JS software

After installation

Open the command prompt

node -–version

With node JS we will get another one command that is npm

npm (node package manager).

npm is like a mvn in maven which help to downloads the external module or dependencies for node application.

npm --version

to create the angular project first we have to download ng module provided in google.

Angular : Angular is a open source web framework which help to develop SPA( Single Page Application). Angular is a part of google organization.

Angular CLI (Command Line interface) which help to create angular projects.

ng (next generation)

npm install @angular/cli –g

ng –version

D:

C:

command to create the angular project

ng new project-name

ng new demo-app

do you want to routing 🡪 No

styling 🡪 CSS

after project created move inside project folder using command

cd project-name

cd demo-app

to run the project we have to use the command as

ng serve if it ask some policy y or no. you can give any option y or n. by default port number is 4200

ng serve --port 4201 : now it will run on port number 4201

after compile 100% project we have open the browser and hit the URL as

<http://localhost:4200>

please open the project in VS code

expand src folder

app folder

app.component.ts (typescript)

app.component.html

app.component.css

app.component.html page

here we can write static html code

app.component.ts page

app.component.css page

Angular is known as component base architecture framework.

Component control the view or control the part of the view in web page.

Every component work independently.

Angular provided set of pre-defined decorator like a annotation is java to make the class is type of special class.

@Component

In angular we use the component called modules. It is like a collection of files. Module is like a package in java.

@Component decorator contains property.

Selector : “app-root” : This property is use to create user-defined tags.

<p></p>

<div></div>

<form></form>

Using angular we are creating user-defined tags. that user-defined tags name provided through selector property.

templateUrl : this property is use to connect the html page.

styleUrls : This property is use to connect css page like link tag in html.

In angular we use export and import concept to connect more than one file.

app.module.ts

@NgModule : This decorator is use to make the class is a type of module class.

Properties

declaration : In this section we declare all component details.

import : in this section we have to import pre-defined or user-defined modules.

provider : in this section we will provide the details about angular service class.

bootstrap : This section provide parent component must load as a first component.

Creating new component using angular cli

ng generate component header

or

ng g c header

ng serve –o : after compiled 100% project it automatically open in default browser.

Angular Data binding

Data binding is use to share the data between component to template or html page. It provide the bride between component and view.

1. One way data binding
2. String interpolation : Component to View

Component ----------------🡪View

In html page

{{}}

{{variableName}}

{{5+4}}

{{display()}}

ng g c string-interpolation

1. Property binding : Component to View

In html page

[]

Name : <input type=”text” [value]=”variableName” />

<p [innerText]=”variableName”></p>

In String interpolation all data always consider as string only. But in property binding apart from string we can use other data types.

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1. Event binding : View to component

Angular using same event provided by JavaScript only different on pre-fixed remove and event name must wrap with parenthesis.

JavaScript event Angular Event

onClick (click)

onDblClick (dblclick)

onMouseOver (mouseOver)

onSubmit (ngSubmit)

In JavaScript we are calling normal Javascript function through event.

But in Angular we are calling component class function through events.

Template Reference :

In Angular using one of the way ie Template reference we can pass the value from view to components.

<input type=”text” #referenceName/>

It like a id in html and JavaScript.

Two way data binding :

1. Event binding and String interpolation or property binding is known as two binding.
2. Two data binding using ngModel attribute.

If we do any changes in view automatically update in component and vice-versa.

[(ngModel)]

<input type="text" [(ngModel)]="desg"/>

ngModel is pre-defined attribute part of FormsModule.

So in app.module.ts file we have to import FormsModule in import section.

Types of directive

ng new types-of-directives

routing –no

styling –css

Directive : directive is use to add extra behaviour or functionality to html or dom.

Types of directive

3 types of directives

1. Component directive : using this type of directive we can create the user-defined tags.

@Component({

Selector :”my-tag”,

templateUrl:”pageName.html”,

stylesUrl:[“pageName.css”]

})

export class AppComponent {

}

1. Structure directive: using structure directive we can add or remove dom elements from html page.

\*ngIf

\*ngFor

 <li \*ngFor="let variableName of arrayName">{{name}}</li>

Syntax to create the model class

Ng g class className

ng g class Employee

1. Attribute directive

Attribute directive mainly use to apply CSS rules.

ngStyle like a style (inline CSS file)

ngClass like a css class selector.

Bootstrap : Bootstrap is a open source CSS framework which provide set of pre-defined CSS classes respective tags.

Bootstrap is first framework which help to create the responsive web application base upon the device.

Bootstrap classes

Div tag related classes

container : it leave some space in left as well as right side.

contrainer-fluid : it use 100% width of the web page.

Create two separate project

ng new angular-forms

ng new angular-service

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Using angular forms we can pass the group of values in the form json.

2 types of forms

1. Template driven form
2. Model driven form or reactive form.

Template Driven form

1. The flow of the application from view (template) to component.
2. This type of forms easy to develop
3. It is good for small application.

Reactive forms

1. The flow the application component to view or template.
2. To develop this this type of form people must have good knowledge on typescript.
3. It is good for enterprise application.

Create new project

ng new angular-forms

move inside a project folder

now create two component

ng g c tdf-login-page

ng g c mdf-login-page

in template driven form we have to create the reference of form.

Syntax

<form #loginRef=”ngForm”>

</form>

Reference name start with # followed by reference name equal to ngForm. ngForm is a pre-defined attribute. Which help to create the reference. ngForm pre-defined attribute is a part of FormsModule. So we have to import this module in app.module.ts file mandatory.

If you want to bind textfield, password field to ngForm reference. We have to use ngModel attribute.

Reactive form or Model Driven Form

According to Reactive form in html textfield, password field, radio button, checkbox is known as FormControl. We can’t create FormControl without FormGroup. So FormGroup is a collection of more than one FormControl.

In Angular FormControl and FormGroup are API.

In Login Page we require one FormGroup which contains two FormControl.

formGroup and formControlName are pre-defined attribute part of ReactiveFormsModule. So We have to import ReactiveFormsModule in app.module.ts file.

Angular Service :

If we write any simple or complex business logic in component that logic or code become local to that component. Same logic we can’t access in another html or template page.

To overcome this problem Angular service came in a picture.

View

Or Component Service

Template

Html component ts file

Html component ts file Service ts file

Html component ts file

Angular Service mainly divided into two types

1. User-defined service
   1. Creating user defined service class object explicitly
   2. Creating user defined service class object using DI.

IOC : Inversion of control is a concept

DI : DI is a implementation of IOC.

Angular support only one type of DI ie constructor base DI.

If angular want to create the object for service class we have to follow few rules.

Points to remember

We have to make class with decorator @Injectable

Then we have to register this class details inside a module or component with property as provider.

Register in module level.

Open app.module.ts file and provide the service class name inside a provider attribute.

Then in a component file we have to pull the object using constructor.

1. Pre-defined service

First create the new angular-service project

Then inside this project create two component

ng g c first

ng g c second

Pre-defined Service :

Angular provided pre-defined API ie HttpClient which help to call backend technologies REST API.

Using HttpClient we can call Get, post, put and delete methods.

In angular project if want to keep any static images or json files we have to keep inside a assets folder.

Creating service class using ng command

ng g s employee

ng g c employee

ng g class employee

inside a user-defined service class we have to do DI for

HttpClient API

HttpClient all methods return type is Observable.

RxJS ( Reactive JavaScript).

If return type is Observable we have to use subscribe method to load the data.

Subscribe method takes 3 parameter

1. Next : This method is use to load the data one by one
2. Error : if any error generate at the beginning or middle or at last this method called.
3. Completed : if there is not error after loaded all data 3 parameter get called.

All these 3 parameter take callback function as parameter.

HttpClient is pre-defined API part of HttpClientModule. So we have to import HttpClientModule in app.module.ts file.

Client Server communication

2 types of communication

Synchronous communication :

It will execute the code line by line.

L1 Statement

L2 Statement

L3 Statement

L2 statement execute after L1 statement. L3 statement execute after L2 statement.

Asynchronous communication

If communication is asynchronous communication every statement execute independently

L1 Statement

L2 Statement

L3 Statement

L1, L2 and L3 statement execute independently.

Calling Fake REST API using Angular

Create the angular project using command as

ng new angular-product-api

routing -🡪 no

styling 🡪 css

ng g c product component

ng g s product service

ng g class product class

Angular routing and HttpClient Post methods

Node JS provided one of the type of module ie json-server which help to run the json file as server.

Using node command we have to install json-server module

npm install json-server –g

after install open command prompt in location where file stored.

json-server login.json

after running you can see the application running on port number 3000

<http://localhost:3000/login>

now create new angular project

ng new angular-login

routing -🡪 yes

styling 🡪 css

Routing : Routing is use to navigate from one component to another component depending upon the path provide in routing file.

To do the routing create few components

Ng g c aboutus

Ng g c contactus

Ng g c login

Ng g c signup

Ng g c dashboard

Ng g s login service class

Ng g class login model class

Angular provided pre-defined tag ie

<router-outlet></router-outlet>

This tag is behave like placeholder which help to load the content of component base upon the path provided in routing module file.