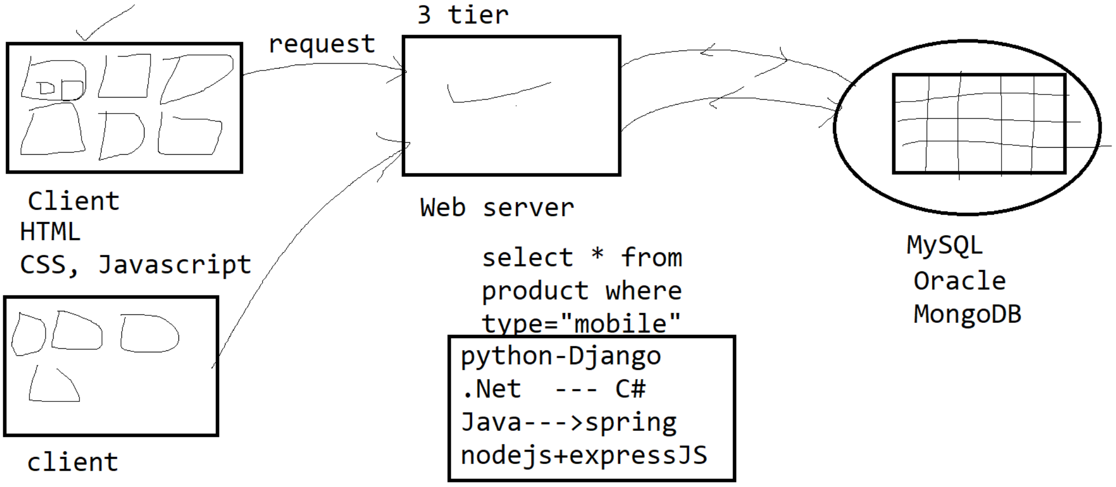
Types of applications

1. Single user
2. Web application
3. Mobile Application
4. Web Services

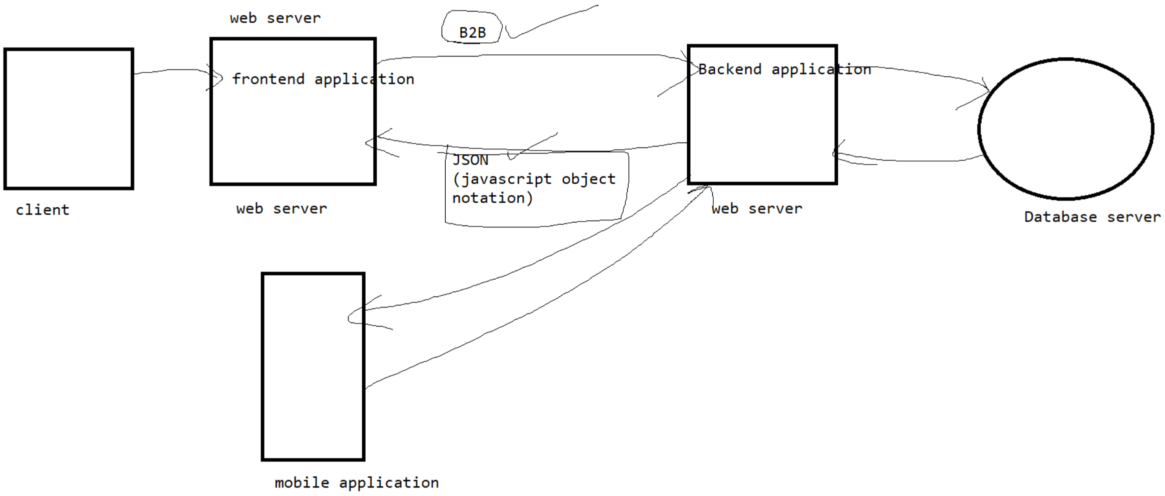
Web Application:

Any application which accepts data from database /web service and converts the data into customer understandable format, by adding presentation logic. (means converts it in to HTML page)



Web service:

The application which gets the data from database and transfers the data to frontend application in either JSON format, XML format, text format.



HTML (Hypertext markup language)

Pages are of two types

1. Static web page --- the page looks same on multiple client machines
   Example --- blogs, tutorial site, news paper
   Technology --→ html, CSS
2. Dynamic web page--- if the page look and feel, or contents are different for different users based on user's i/p
   Examples: flipcart.com,   bookmyshow.com
   Technology-→ html,css,javascript

   HTML
   1. Every begin tag should have end tag.
   2. Tags are predefined tags, and not case sensitive.
   3. The file extension has to either html or htm

Editor

Visual studio code

1. To download visual studio code
   https://code.visualstudio.com/download
   download user installer
2. Using exe/msi file install it
3. Got to windows start button--→ open visual studio code
4. File→open folder--→select the folder
5. View>extension> search for live server> install the extension
6. To run the html file -→ use go live option which is at the bottom of the screen
   Or right click in editor window > open with liver server

Header tags	6 header tags are there, these tags are called as semantic tags	h1, h2, h3, h4, h5, h6
Lists	There are 3 types of lists, in every list there are many list items <li>	Ol --- > type , start Ul -→ type dl
Anchor tag	It is used to display links on the page. Using this we can open a new file, or a url or section of the same page, or section of the other page, or blank email with email address written in To	A--→Href, name, target
Body	The contents in this tag will appear in browser window	Body-→ bgcolor, background, alink, vlink, link, text
table	To display data in tabular format, then use table tag	Table--→border, width, cellspacing, cellpadding, bgcolor Thead tbody Tr--→bgcolor, align Th→ colspan, rowspan, bgcolor, align, valign Td -→colspan, rowspan, bgcolor, align, valign
Br	To add a new line character, use br tag, It is empty tag	

Hr	To draw a horizontal line	Hr-align, width, size, color
Img	To display image on the screen	Img--→ border, vspace, hspace, width, height,alt

Product id	Product name	quantity	price
1	lays	40	40
2	nachos	50	150
<th colspan=”4”> Product details <th>			
Product id	Product name	quantity	price
<td rowspan=2> 1</td>	lays	40	40
nachos		50	

Types of tags

Empty tag	The tag which never contains any data between begin and end tag Examples: <br/> , <hr/> <input/>
Semantic tags	The tags which gives extra information about the contents, are called as semantic tag Examples: H1, h2,…h6, header, footer, nav, section, article,main.
tag	Example P, div, table
Auto closable tags	The begin is closed automatically when the next occurrence of the same tag is written. Examples -→ tr, li

Form tag attribute

method	Get-> sends the data to server via query string, the data will be transferred via header of request object. It is not secure data transfer because the data will be visible in the browser url bar (Querystring-→ it is is string which is concatenated to the url, separated by ?, it contains key ,value pairs separated by &) Post-→ to send data via body part of request object, it is secure way of data transfer because data will not be visible on the screen When the data you want to transfer to the server is sensitive or if size of data is very big then use post method By default value of method attribute is get
Action	It is a url of a program on the server, to which you want to send the data

To practice regular expression

https://regex101.com/

CSS3(Cascading styles sheet)

Rules for formatting

```
Selector{
Property:value;
Property:value;


    }
```

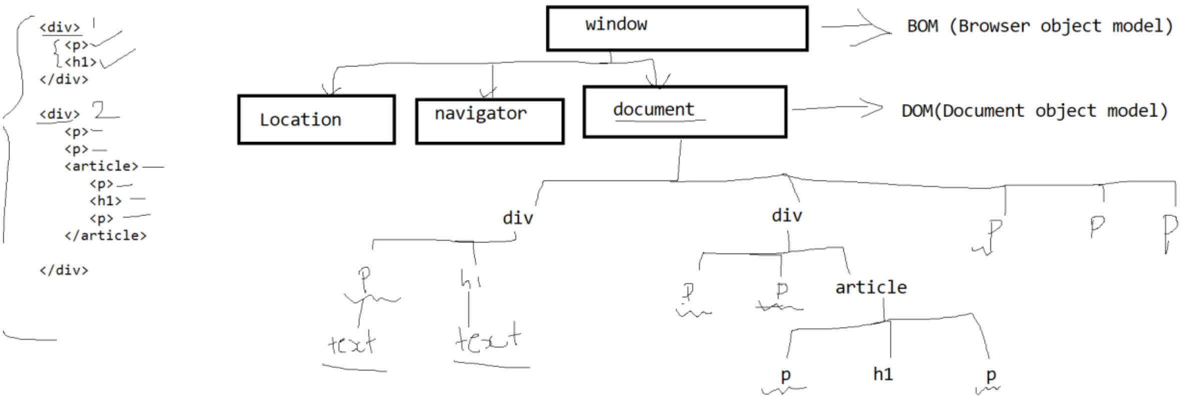
Adding style attribute in the tag

Css are of 3 types

1. Inline- if the rules of css are added in the begin tag, then it is called as inline css, It is useful if you want to apply the style only to one tag
2. Embedded- if the rules of css are added in the style tag, inside head tag, then it is called as embedded css, It is useful if you want to apply the style to multiple tags within same page
3. External css---if the formatting is written in a external file, and then the file is linked with the HTML page. Then it is called as external css.
    a. The extension of the file must be .css
    b. When you want to give same look and feel to multiple pages in the web application, then use external css
    c. To link external css in HTML page use <link rel=”stylesheet” href=”<cssfilename>”>

Types of selector

Tag selector	P, h1, div
Universal selector	*
Id selector	#myid
Class selector	.myclass
Ancestor descendent	Div p
Parent child	div>p
Attribute selector	Div[name]
Attribute value	Div[name=xxx]
Pseudo classes	:hover, :first-child :nth-child :last-child
a:link	To default color
a:visited	The color after visiting the link
a:active	The color when the link is active
P::first_line	The first line of p tag
P::first_letter	The first letter in p tag



```
<div> 1
  <p>
  <h1>
</div>

<div> 2
  <p>
  <p>
  <article>
    <p>
    <h1>
    <p>
  </article>

</div>
```

10 p tags -- 5 p tags

5 h1 tags --- 2 h1 tags

Position property

Values are ----static, relative, absolute, sticky, fixed

Left, right, top, bottom ---- these properties are applicable only when the position is not static

1. Static value ---left right top and bottom will not work
2. Relative ----left , right, top , bottom will work, it will follow natural ordering
3. Fixed-→ tis will keep the element always at the fixed position
4. Absolute-→ top, left, right, bottom will be calculated which respect to nearest positioned parent
5. Sticky--→ it toggles between relative and fixed, it is relative till the given top and bottom are false, otherwise it will change to fixed

To make the web responsive use media queries

```
@media (only) <device> and (min-width:<pixel>) and (max-width:<pixel>){

    Body{


  }

H1{

}


}
```

JavaScript

It is a scripting language.

To give dynamic effects to the page

AJAX requests can be used.

Validation of a data can be done

Types of javascript

1. External javascript
2. Internal javascript

<script> tag can be added in <head> section as well as <body> section
<script> tag can occur any number of times in the file;

If the code is written inside the function, the it is preferable to add in the head section
Otherwise put <script> tag in the body tag

Javascript uses DOM(Document Object Model)
DOM is in memory representation of HTML page, when HTML page gets loaded in browser, internally it gets converted into a tree structure, whose root is document object, it is called as DOM

Variables in javascripts

1. Variables are case sensitive
2. Variable should start with alphabet, and can be a combination of alphabet and numbers
3. Punctuation characters are not allowed, space is not allowed

To declare variables, we can use var, let and const

var	let	const
Duplicate declaration is allowed	Duplicate declaration is not allowed	Duplicate declaration is not allowed
Var v; initialization is not compulsory	let a; initialization is not compulsory	Const c=23; initialization is compulsory
These variables are global, or function scoped	These variables are always block scope	These variables are always block scope
Hoisting of variable is allowed	Hoisting of variable is not allowed	Hoisting of variable is not allowed

Data types in JavaScript
Number--→ int or float type numbers
String ---→ strings are enclosed in " " or ''
Boolean---→ true, false
Object

The variable is dynamically typed, the type of variable will be decided at runtime based on value assigned to it

Var v=23;

V=”sdjfjklds”

Operators

Arithmetic operators

+, -, * , /, %, ++, --

Logical operators

&& , || , !

Relational operators

>, < , >=, <=, == , !=, ===, !==

=== and !== are strict checking, it checks value and data type both

A html element can be disabled or it can be readonly

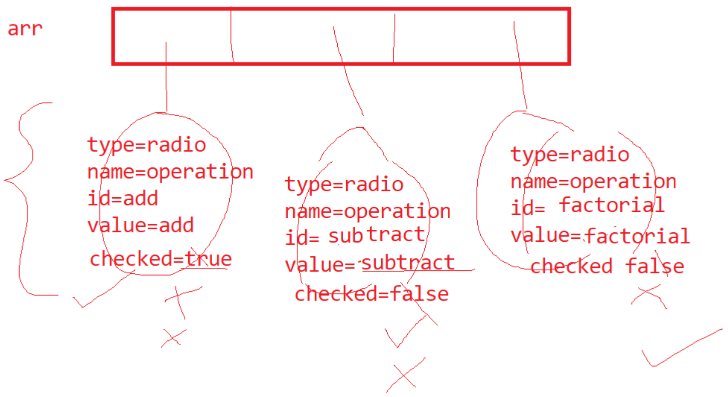
In both cases user will not be able to usethe element in html page

Disabled-→ then on submit event, data will not be send to the server

Readonly-→ then on submit event, data will be send to the server

Number function

isNaN()	To check whether data contains minimum one alphabet, then this function will return true, but if all are digits then it returns false
isFinite()	To check whether data contains all digits, then this function will return true, but if it contains minimum one alphabet , then it returns false
Math.floor()	It will remove all the digits after decimal point and keep the number as it is
Math.ceil()	It will remove all the digits after decimal point and shows the next number
Math.round()	It will keep the number of digits after decimal point based on precision and shows the next number if the digit> 5 otherwise keep it as it is
Math.truncate()	It will keep the number of digits after decimal point based on precision and shows the same number even if the digit> 5 or not
Math.random()	To generate random number between 0 and 1



```
var op;
for(var i=0;i<arr.length;i++){
   if(arr[i].checked){
     op=arr[i].value;
     break;
    }
}
```

1. Rest parameter (…) it is added in ECMA 6 version to use variable number of parameters in function.

String functions

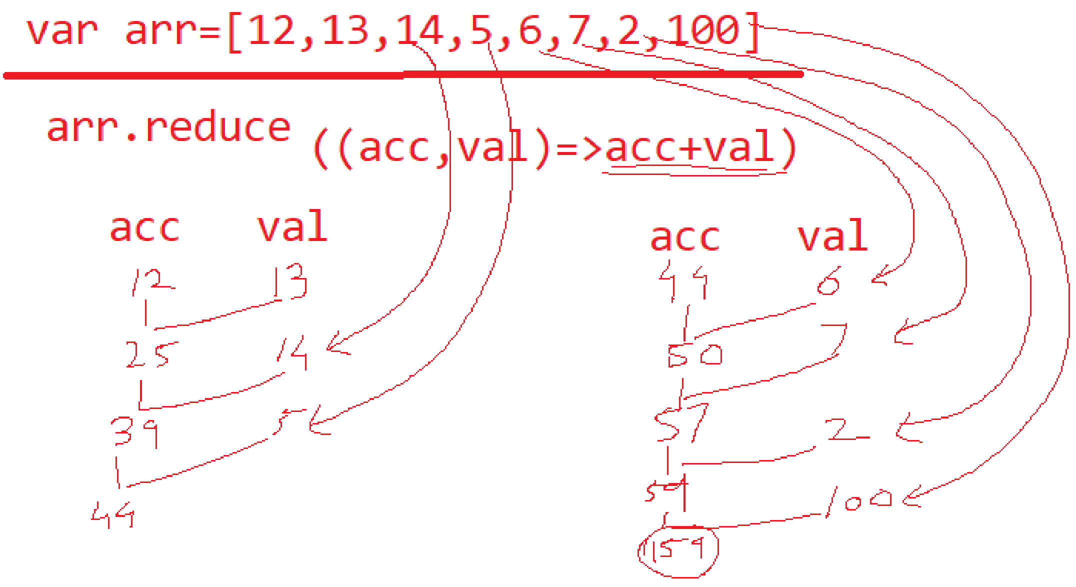
charAt	To retrieve the character at the given index position
toUpperCase	To convert String in uppercase
toLowerCase	To convert String in lowercase
split	To break the string in parts at some delimiter
replace	To find and replace, it finds the pattern and replace it with new string
match	To find the pattern, returns array of all occurrences
Search	To find the pattern, and display the position of first occurrence
slice	To get the portion of the string

2. Array functions

indexOf	It finds the index position of the first occurrence of the given value
Push	It adds the element at the end of array
Pop	It removes the element from the end of array
Shift	It removes the element at the begining of array
unshift	It adds the element at the begining of array
Splice	It is used for add element at the particular position, delete the element from the given position, replace the elements at the given position by new values
Sort	Sort the array in ascending/descending order, by default array gets sorted based on ascii values
Reverse	Reverse the array
findIndex	Find the index position of the first value which satisfies the given condition
find	Find the first value in the array which satisfies the given condition
Filter	Find all the values which satisfies the given condition
Map	It maps every value in the array to new value based on given expression
Reduce	It reduces all the values in the array to a single value

Spread operator

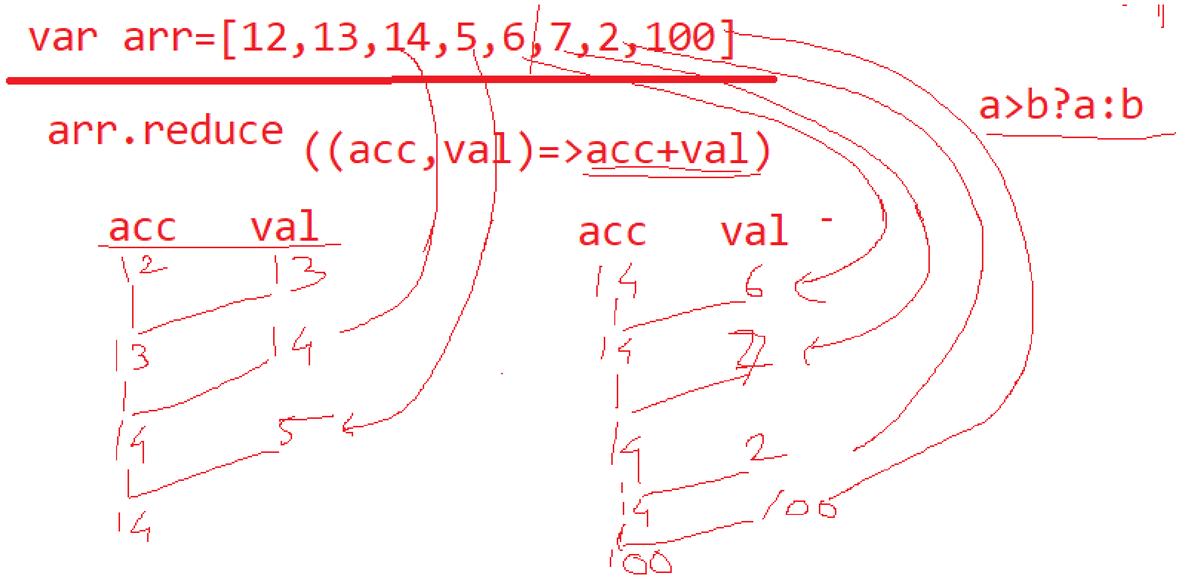
… --→ spread operator



```
var arr=[12,13,14,5,6,7,2,100]
arr.reduce ((acc,val)=>acc+val)
```

acc val

acc val



```
var arr=[12,13,14,5,6,7,2,100]
arr.reduce ((acc,val)=>acc+val)
```

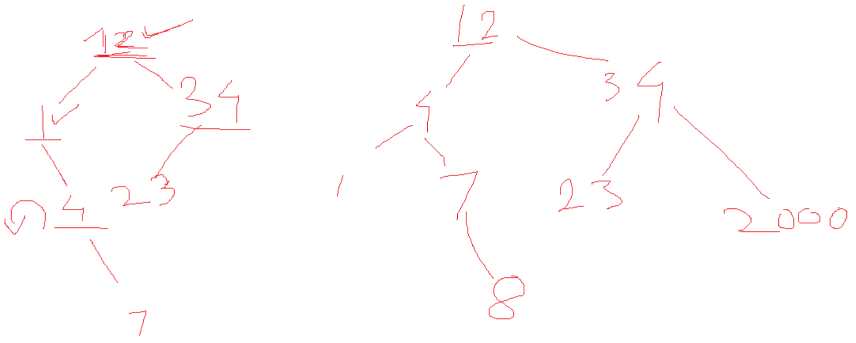
a>b?a:b

acc val

acc val

Sorting

[12,34,1,23,4,7,8,2000]



```
var arr=[12,13,14,5,6,7,2,100]
    arr.filter((a,index,ar)=>a%7==0)
```

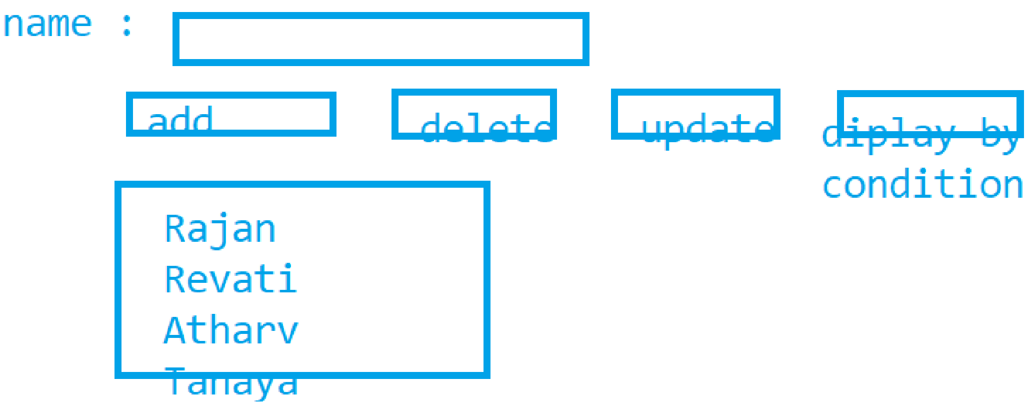
14,7

```
var arr=[12,13,14,5,6,7,2,100]
    arr.map(a=>a*a)
```

144,169,196,25,36,49,4,10000

Design the application to perform crud operation on names array

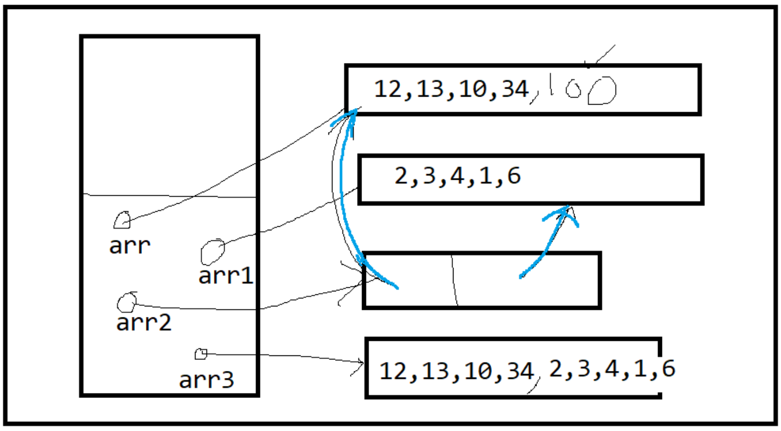
```
names=["Rajan","Revati","Atharv","Tanaya"]
```

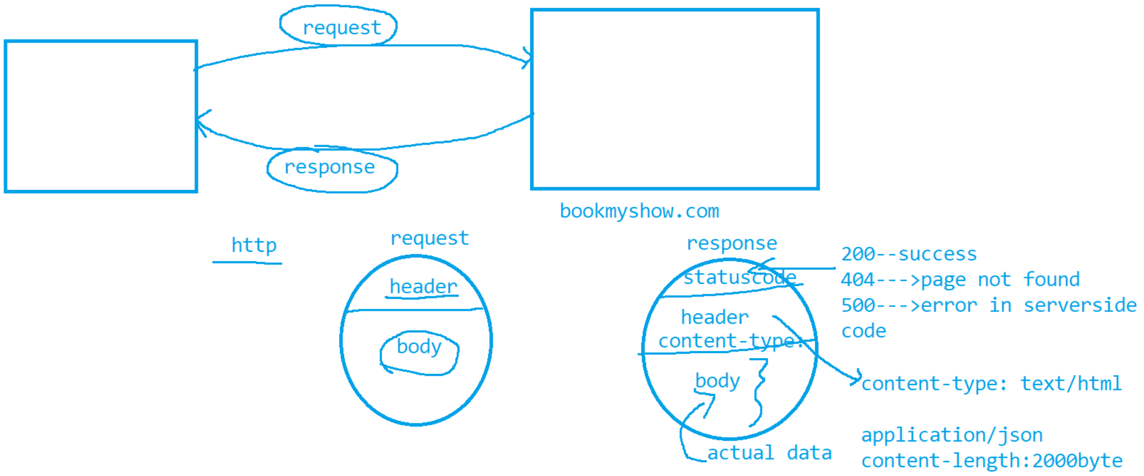


Spread operator

```
arr2=[arr,arr1]

arr3
=[...arr,...arr1]
```





- http protocol is used to transfer data between client and server.
- It is stateless protocol
- Client sends the data to server via request object
- Server sends o/p to client via response object
- When server receives request it reads data from request object and writes o/p in response object and sends to client. Data received via request object will be remembered by server, till it sends the response, hence http protocol is called as stateless protocol
- If you login to some site , and sends multiple requests to server, and the logs out or closes browser window, it will be considered as one session
- So if the data given by user, we need to remember till session ends then developer has to use techniques to retain the data.
- If you want to store the data on the server, then use session object
- If you want to store the data on client machine then use cookies/ localStorage/sessionStorage
- data stored in the sessionStorage will remain available, till you closes the browser window, once you close the window, the data from sessionStorage will be automatically deleted
- data stored in the locaStorage will remain available, till you explicitly delete it
- in developers tool, localStorage and sessionStorage values can be seen in application tab
- localStorage and session Storage objects are browser specific.
- Maximum size for cookies is 4kb, and for localStorage and sessionStorage it is 5 MB

JQuery
To download jQuery
https://jquery.com/download/

Tag slector	P, div, input
Id selector	#myid
Class selector	.myclass
Attribute selector	P[name]
Attribute value	P[name=myp]
Anscestor descendent	Div p
Parent child	div>p
pseudoclasses	The first child --→ p:first-child
	Last-child---→p:last-child
	Nth child---→p:nth-child(3)
	Even position p:even
	Odd position p:odd
	P[id^=my] --- will select all p tags with id attribute starts with my
	P[id$=t] --- will select all p tags with id attribute ends with t
	P:contains(“para”) will select all p tags which has para somewhere in innerHTML property

AJAX and JSON

The applications which retrieves data from database and transfers data along with presentation logic(HTML), is called as web Application, these are used for B2C communication

Examples-→ amazon, flipkart, makemytrip.com,bookmyshow.com

The application which sends data in the form of XML or JSON to other applications, then it is called as web service

It is used for B2B communication.

In B2B communication since heterogeneous applications communicate with each other, so we need some common format which is known to all the technologies, hence the data transfer happens in XML, JSON format.

XML stands for Extensible markup language

JSON stands for Javascript Object notation

Product data in XML format	Product data in json format

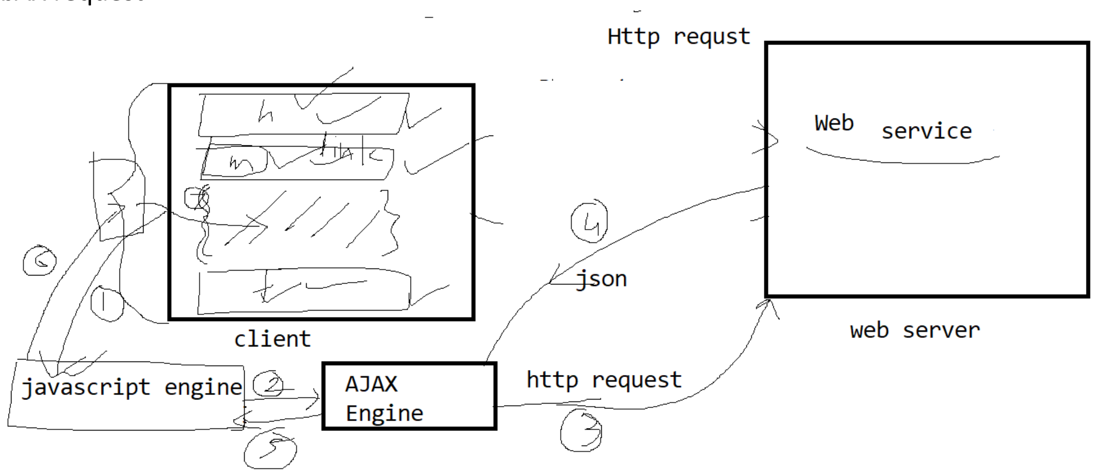
<products>
<product>
    <pid>11</pid>
    <pname>shoes</pname>
    <qty>11</qty>
<product>
<product>
    <pid>12</pid>
    <pname>bags</pname>
    <qty>234</qty>
<product>
 	
</products>
	[
	{
	“Pid”:11,pname:”shoes”,”qty”:11
	},
	{
	“Pid”:12,pname:”bags”,”qty”:234
	}
	]

Web Services are of 2 types

1. SOAP web services→
   These services were using WSDL(web service definition Language) files,
   The data transfer was only in XML format
   These applications uses SOAP(simple object access protocol) protocol

2. REST(Representational state transfer) webservices
   The data can be transferred in either XML,JSON or text format
   It uses http protocol
   It accepts 5 types of requests.
   1. GET----Read data
   2. POST-→Create data
   3. PUT--→ update data
   4. DELETE--→ delete data
   5. PATCH-→ for partial update

AJAX request



Step by step for AJAX

1. Javascript XMLHttpRequest(XHR) object will get created
2. Configure the object
   a. Save the url to send the request.
   b. Decide the method for sending the request.
   c. Set the headers if any are needed.
3. Handle the event onReadyStateChange
   readyState-→ 1 -→ XHR object is ready
   -→ 2 → request is send to the server
   -→3 -→ server started sending data
   -→ 4 -→ the data received

JQUERY function

```
$.ajax({
async:true,
type:'GET',
url: 'https://jsonplaceholder.typicode.com/posts/',
success: function(result){
}
error:function(err,xhr,status){
}



})
```

Node js

1. Install nodejs on your machine
   https://nodejs.org/en/download
2. Once download msi file , follow step by step process to install it
3. Open cmd prompt and give following command.
   `node -v`

Nodejs is used for serverside javascript programming. Using nodejs you can write web application or web services.

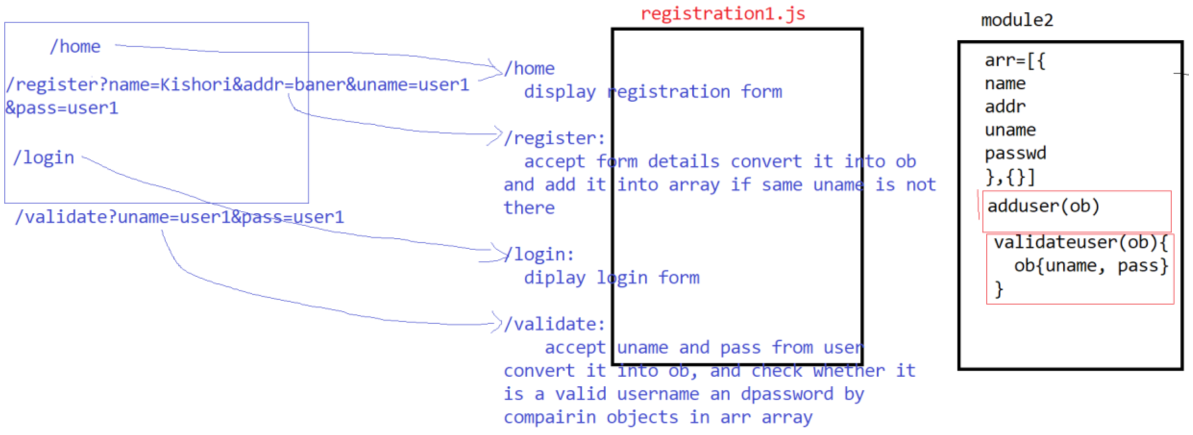
Nodejs uses asynchronous programming, so that request for multiple users can be processed parallelly.

It uses Google chrome's V8 javascript engine

Nodejs provides REPL (Read Evaluate print loop), to open REPL use command

```
C:\system>node
```

Registration application



```
    /home
/register?name=Kishori&addr=baner&uname=user1
&pass=user1

 /login
 /validate?uname=user1&pass=user1
```

registration1.js

```
/home
  display registration form

/register:
  accept form details convert it into ob
and add it into array if same uname is not
there

/login:
  diplay login form

/validate:
    accept uname and pass from user
convert it into ob, and check whether it
is a valid username an dpassword by
compairin objects in arr array
```

module2

```
arr=[{
name
addr
uname
passwd
},{}]
adduser(ob)
 validateuser(ob){
   ob{uname, pass}
 }
```

To use express js

1. Download expressjs on your machine.
2. Download body-parser
3. Download mysql driver to connect to mysql database
4. If you want to connect to mongodb, then use mongoose

Step1: create package.json

npm init

Step 2:

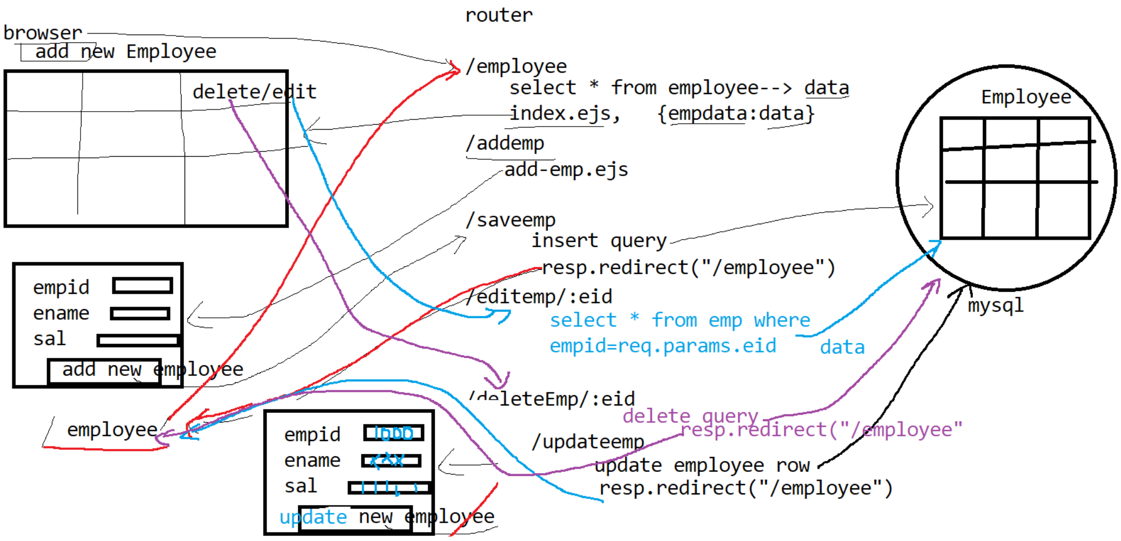
Install expressjs and body-parser locally

npm install express --save

npm install body-parser –save

npm install mysql –save

Web application using nodejs and expressJS



To connect to nodejs=mysql authentication 1251 error, change the password to your password

ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'root123';

To test the webservice the tool we can use is postman, download it from the given link https://www.postman.com/downloads/

Using Bootstrap

1. Download zip file version 4.6

https://getbootstrap.com/docs/4.6/getting-started/download/

2. Unzip the file
3. In html page add jquery.js, bootstrap.js and bootstrap.css file

```
<head>
    <script src="../../jquery.js"></script>
   <script src="../bootstrap-4.6.2-dist/js/bootstrap.js"></script>
   <link rel="stylesheet" href="../bootstrap-4.6.2-dist/css/bootstrap.css"
</head>
```

Reactnotes

To Install create-react-app

```
npm install -g create-react-app
```

To create new React Application

Note : do not use capital letter in projectname

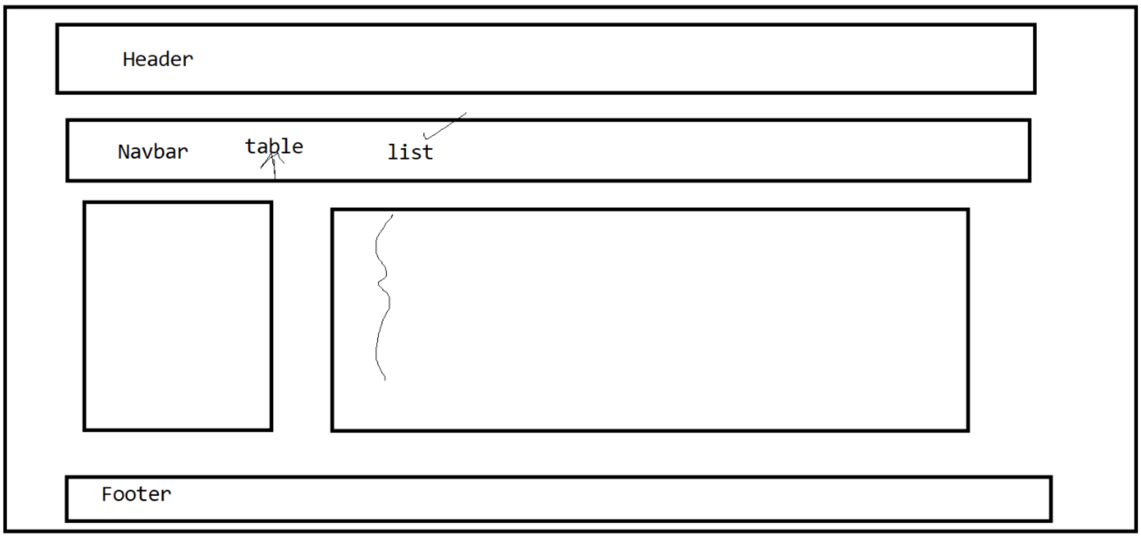
```
create-react-app myfirstapp
```

To run the application

```
cd myfirstapp
npm start
```

to test babel compiler

https://babeljs.io/repl#?browsers=defaults%2C%20not%20ie%2011%2C%20not%20ie_mob%2011&build=&builtIns=false&corejs=3.21&spec=false&loose=false&code_lz=DwEwlgbgBAdghgWwKYF4BEAPNUwnQgT1zQD4AoKSqYACwEYSAJJAGxYHtKB1dgJxZABCQcAD09cpWABXFpKrAWYEgBckGFWKXyp2gEbt2Aay3KK1UbPJjwEEkA&debug=false&forceAllTransforms=false&modules=false&shippedProposals=false&circleciRepo=&evaluate=false&fileSize=false&timeTravel=false&sourceType=module&lineWrap=true&presets=env%2Creact%2Cstage-2&prettier=false&targets=&version=7.21.8&externalPlugins=&assumptions=%7B%7D



Functional Component	

function App() {
  let f1=()=>{
    return "hello from f1"
  }
  let name="Kishori";
  let desg="Manager"
  return (
    <div>
        <h1>Hello World!!</h1>
        <h2>welcome {name} to react application</h2>
        <h3>Desg : {desg} </h3>
        <h4>{f1()}</h4>
  </div>
)
 	
}
 	
export default App;
	Import React,{Component} from 'react'
	
	class Header extends React.Component{
	render(){
	return(
	<h1>hello from Header class component</h1>
	)
	}
	}

These are stateless components	Stateful component

1. To create a component
   Create a folder by name components
   Write Header.js file
   Add following code in the file

```
const Header=()=>{
    return (
        <div>
            <h1>This is header component</h1>
        </div>
    )
}
```

```
export default Header;
```

then add entry in app.js, also add import statement in app.js file

```
let desg="Manager"
 return (
   <div>
     <Header></Header>
     <h1>Hello World!!</h1>
     <h2>welcome {name} to react application</h2>
     <h3>Desg : {desg} </h3>
     <h4>{f1()}</h4>
```

SN	Props	State
1.	Props are read-only.	State changes can be asynchronous.
2.	Props are immutable.	State is mutable.
3.	Props allow you to pass data from one component to other components as an argument.	State holds information about the components.
4.	Props can be accessed by the child component.	State cannot be accessed by child components.
5.	Props are used to communicate between components.	States can be used for rendering dynamic changes with
6.	Stateless component can have Props.	Stateless components cannot have State.
7.	Props make components reusable.	State cannot make components reusable.
8.	Props are external and controlled by whatever renders the component.	The State is internal and controlled by the React Compo

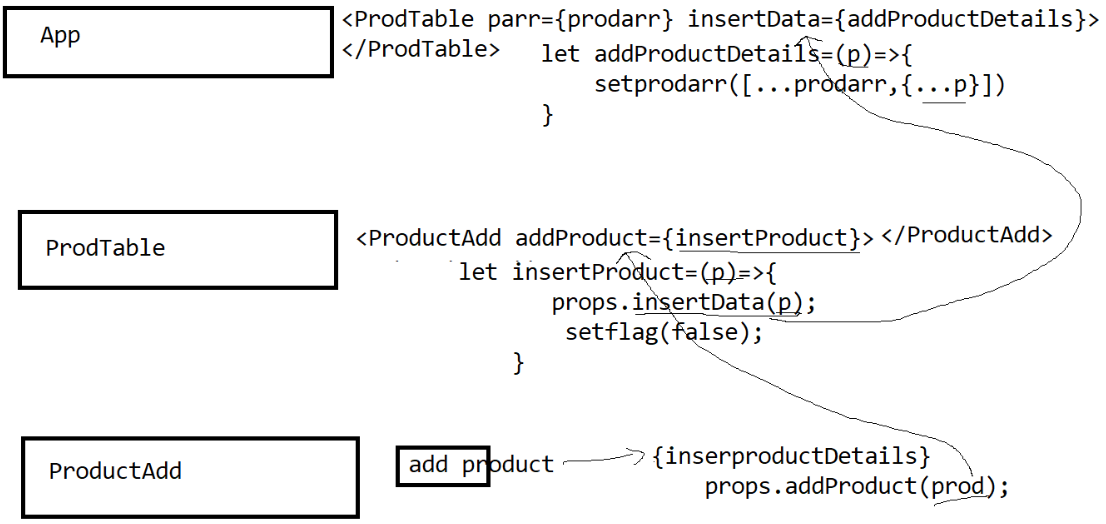
To add bootstrap

1. Install bootstrap on your machine
   npm install react-bootstrap@next bootstrap@4.6 –save

2. To use bootstrap icons
   npm install react-bootstrap-icons –save

in react when you use map function to identify every element uniquely it is necessary to add key property, so that only required portion will be modified, and it will make your code efficient.

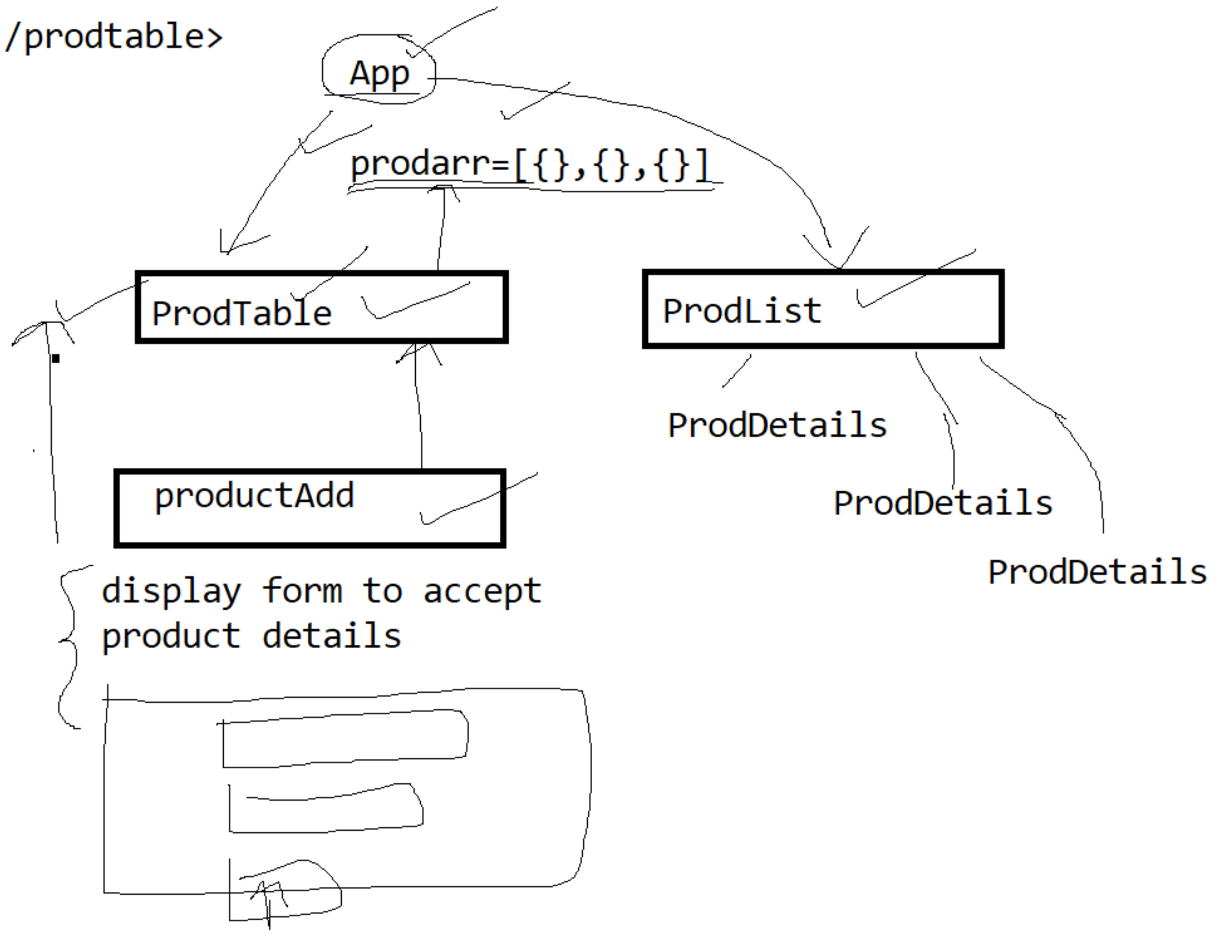
In functional component if you want to use variable as a state, the use useState hook,
It assigns a variable to initial value and return 2 values 1. State of variable , 2. Reference to setter method.
Value of this variable can be changes only by using setter method



```
<ProdTable parr={prodarr} insertData={addProductDetails}>
</ProdTable>    let addProductDetails=(p)=>{
                    setprodarr([...prodarr,{...p}])
                }
```

```
<ProductAdd addProduct={insertProduct}> </ProductAdd>
        let insertProduct=(p)=>{
              props.insertData(p);
               setflag(false);
        }
```

```
{inserproductDetails}
      props.addProduct(prod);
```



/prodtable>

App

prodarr=[{},{},{}]

ProdTable

ProdList

ProdDetails

ProdDetails

ProdDetails

productAdd

display form to accept
product details