Web Application

It is a application which is deployed on web server, gets data either from database or from web service and converts data in user understandable format using HTML, CSS and JavaScript is Web Application. These type of applications are used for B2C(Business to client) communication

Web Service

It is a application which is deployed on web server, gets data from database and return data in either JSON/XML/text format is called as web service

If the web service uses SOAP(Simple Object Access Protocol) and return data always in XML format, then it is called as SOAP webservice

If the web service uses HTTP(Hyper text transfer protocol) protocol and return data either in JSON/ XML/ TEXT format then it is called as RESTful(Representational state transfer) Web service

These applications are used for B2B(business to business) communication

HTML,CSS and JavaScript are called as client side technology

But now a days JavaScript can be used at server side also, in NodeJs and ExpressJs, so JavaScript is server side technology also

HTML(Hypertext Markup Language)

It is used for designing webpages.

Every HTML page is divided into 2 parts , Head section , Body.

Whatever code you write in Body section is visible in Browser window.

The code in head section gives extra information about page to server

Web pages are of 2 types.

1. Static web page--- if the page appears same on every users machine then it is static web page
   Examples –>tutorial sites, blogs, news paper
   To design static web pages we use HTML
2. Dynamic web page---the pages appear different, on different users machine based on users i/p then it is called as dynamic web page
   Example→ bookmyshow.com, flipkart.com, amazon.in
   To design dynamic web pages we use HTML, CSS, JavaScript
   And Web services/web applications

Every web page is made up of forms, tables, bulleted lists, dropdown lists,

Images, links

In HTML lot of built in tags

To download Visual Studio Code

https://code.visualstudio.com/download

HTML has 6 header tags h1 to h6 --- these tags have built in formatting.

h1, h2, h3, h4, h5, h6

Li, ul, ol, dl -→ these tags are used for designing lists

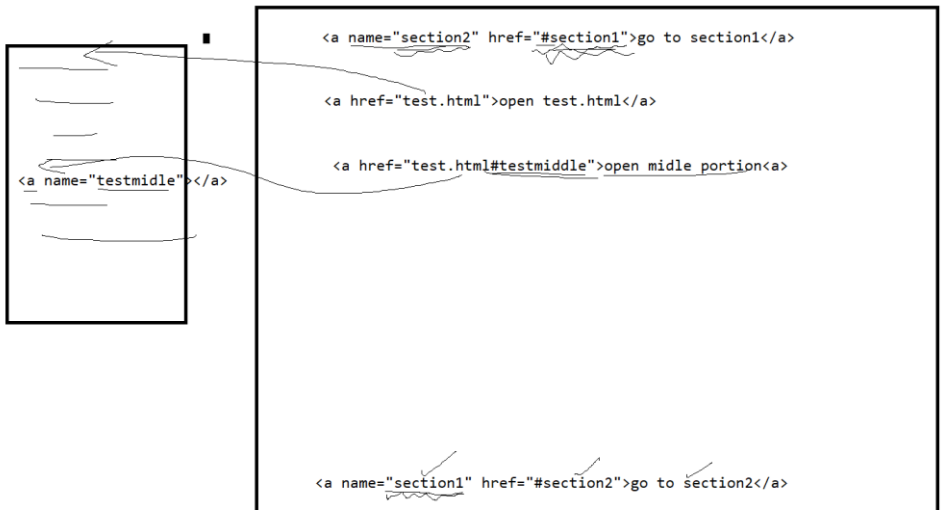
Ul	Unordered list	Type (circle, disc, square)
Ol	Ordered list	Type (A,a,I,i) start(any number)
Dl	Data list	
Li	List items	
Dd	Data definition	
Dt	Data term	

Types of tags

Auto closable tag	The tag which will end automatically examples li, tr
Empty tags	
Sematic tags	

To shoe links we use <a>text to display on the screen

href	It is url to open when user clicks on the link	http://google.com, #sectionname" , test.html#section1 test.html test/hello.html
name	It assigns the name to the page section	
target	To open the page in target window	_blank, _self, _parent, _top



Attributes of Body tag

background	To display image as background
bgcolor	To change background color of page
link	To assign color for all links
vlink	The link colour to appear after you visit the page
alink	The link colour to appear when the button is pressed on the link

Example

```
<body background="../images/flowers.png"  link="blue"
alink="green" vlink="orange">
```

Table tag

Product id	name	qty
1	dfgdf	45
2	dfhgfgh	56
3	ghfghfgh	56

<table>

<caption align=”top”>this is table caption</caption>

<tr><th> Product id </th><th> name </th> <th> qty </th></tr>

<tr><td>1</td><td> dfgdf </td><td>45</td></tr>

</table>

Tags

tags	Values of attribute type	attributes
div		
p		
Span		
form		Action, method
input	Text, radio	Type, name, id, required, placeholder, autofocus, minlength, maxlength
button	Submit, reset, button	Type, name, id, value,
label		for

Style

margin	
Background-color	
border	
Border-radius	
Color	
padding	

Regular expression

*	O or more occurrences
+	1 or more occurrences
?	O or 1 time
{m}	Exactly m times
{m,n}	Minimum m times and maximum n times
\d	One digit character [0-9]
\w	One alphabet [a-zA-Z0-9_]
^	To check the pattern at the beginning of the string
$	To check the pattern at the end of the string

To practice regular expression

https://regex101.com/

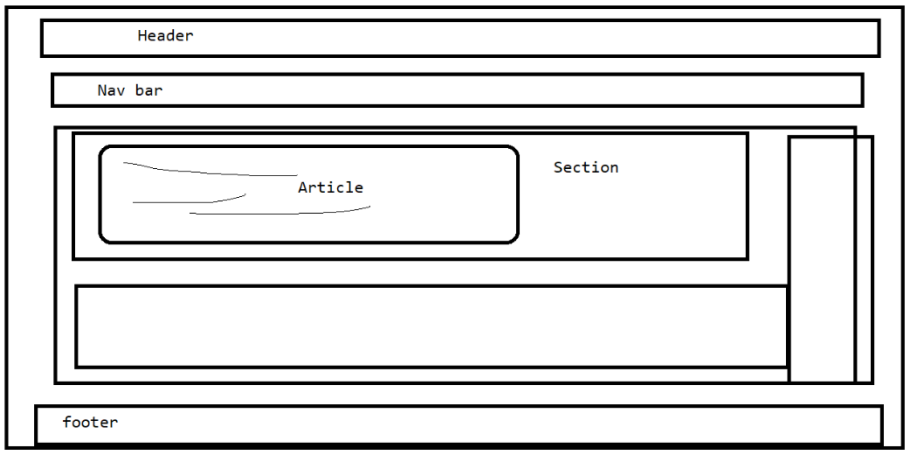
HTML 5

Semantic tag

If the tag name gives you extra information about the contents, then it is called as semantic tags.

<h1>Title</h1>

Haeder, footer, nav, article, section, aside



Media tags

Video, audio

Canvas

CSS

To give good look and feel to the page

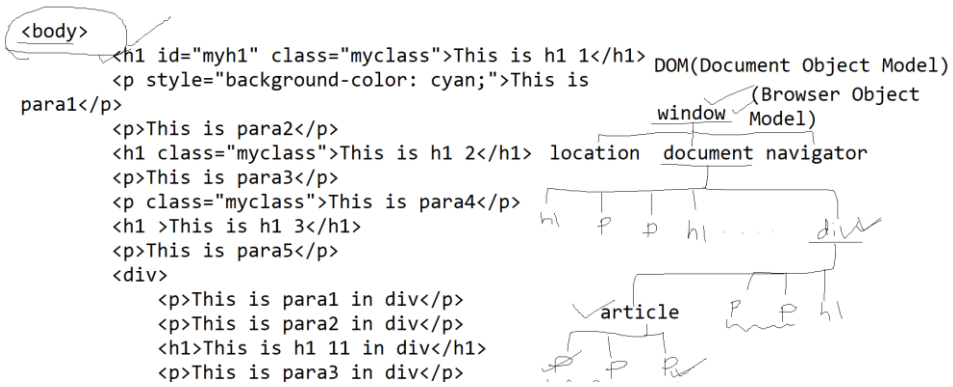
Selector{

Property:value;

Property: value;

}

selector	
Id selector #myid	To select one element in html page
Tag selector P, div, h1	To select all tags of one type
Universal selector *	To select all tags
Class selector .myclass	To select all elements with class attribute value is myclass
Div p	Ancestor descendent
div>p	Immediate child
P:hover	Apply style when the mouse is on the p
P:first-child	The 1st child of the tag should be p
P:last-child	The last child of the tag should be the p tag
P:nth-child(2)	The 2nd child of the tag should be p
Div[name]- attribute selector	Will select all div which has name attribute
Div[name="check"]	Will select all div which has name attribute set to check



Position

1. Static –
2. Relative-
3. Absolute
4. Sticky
5. Fixed

Animation effect:

You may apply animation effects to the page using keyframes,

In each keyframe add properties that you want to change

Demo:animationdemo.html

Media query:

To make you page responsive you may use media query, if the page look and feel is changing based on size of the screen, then it is called as responsive web page.

```
@media only screen and (min-width:401px) and (max-width:600px)
{
            body {
                background-color: blue;
                color: white;
                font-size: 30px;
            }
      Div{
         background-color: cyan;

      }
}
```

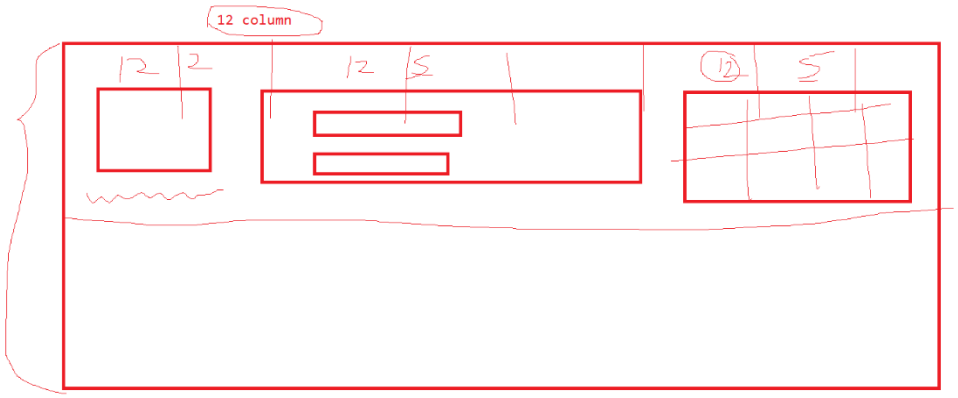
To make pages responsive and apply style using bootstrap js

1. Download bootstrap 4.6 on your machine
2. Unzip the file in one folder
   Note: This folder contains multiple files, bootstrap.css and bootstrap.min.css
   In minimized version of file, there will be no spaces, tabs, indentation , so not in readable format, these files are used in production environment
   Bootstrap.css file is in redable format, hence used in dvelopement/testing environment.
3. Add following entries in the head section of your html page
   <head>

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

In bootstrap the screen is divided in to 12 columns
Col-sm
Col-md
Col-lg

Col-xl



To use bootstrap without downloading

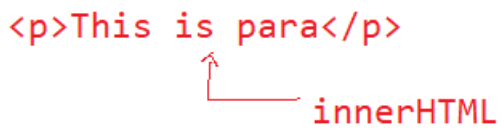
```
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/bootst
rap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYd0nLMwNLD69Npy4HI+N"
crossorigin="anonymous">
```

```
JavaScript
1.to make the page dynamic
2. do the client side validation
3. AJAX(Asynchronous javascript and XML) request can be used
        Ajax is useful to change the portion of the page, without
loading entire page
```

- To add javascript code in HTML page we will use <script> tag
- The code should enclosed in <script></script>
- We may add many script tags in html file
- We may add it in head, body tag

```
In javascript few objects are predefined objects
Window, document, location, navigator
```

```
<p>this is p</p>
```



The tags which are not used to accept data from user has innerHTML property

Example- h1, h2, …. H6, div, p, span, pre

Empty tags will not have innerHTML property

Example--- br, hr, input

The tags we use to accept data from user has value property

Example -- checkbox, radio, text, textarea, dropdown list

Data types available in javascript

Number -→ int, float

String ---→ enclosed in single or double quotes

Date----→ to store the date, new Date()-→to get todays date

Boolean-→ true, or false

Object---→

Null -→ value can be assigned to a variable

Var v=12 or let v=23 or const v=10

Var name=”kishori”;

Var flag=true;

Var ob={id:12,name:’rajan’,desg:’game designer’ ,dept:’gaming’}

Ob.email=rojrocks@gmail.com

To retrieve the name

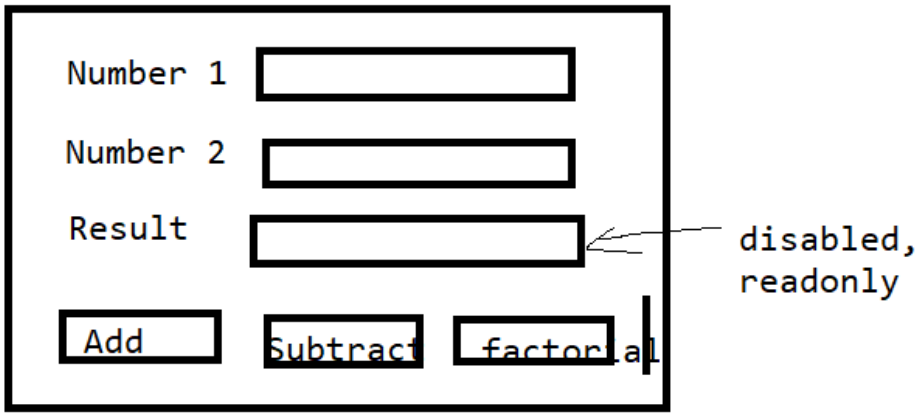
Ob.name or ob[“name”]

Var v; --→ v will get initialized to undefined

Difference between var vs let vs const

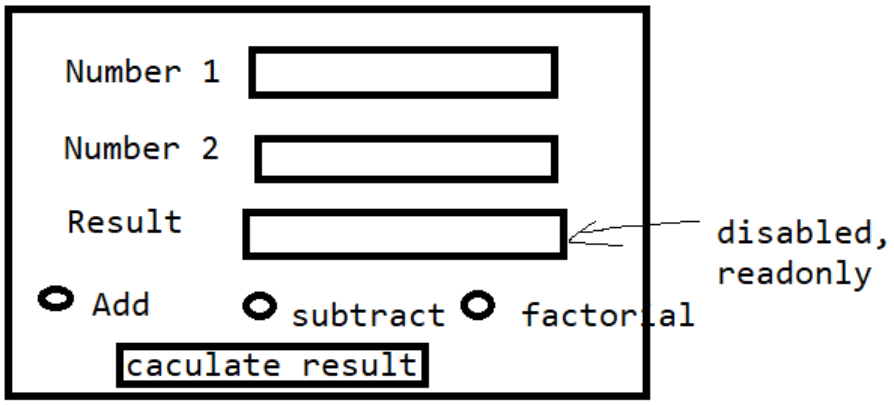
Var	Let	const
It is global variable or function scoped variable	It is blocked scope variable	It is blocked scope variable, and cannot be changed
Redeclaration is possible	Redeclaration not possible	Redeclaration not possible
Var v; Var d=23;	Let m; Let m=23;	Const c=30
Hoisting (moving up) of variable declaration is allowed	Hoisting of variable declaration is not possible	Hoisting of constant declaration is not possible

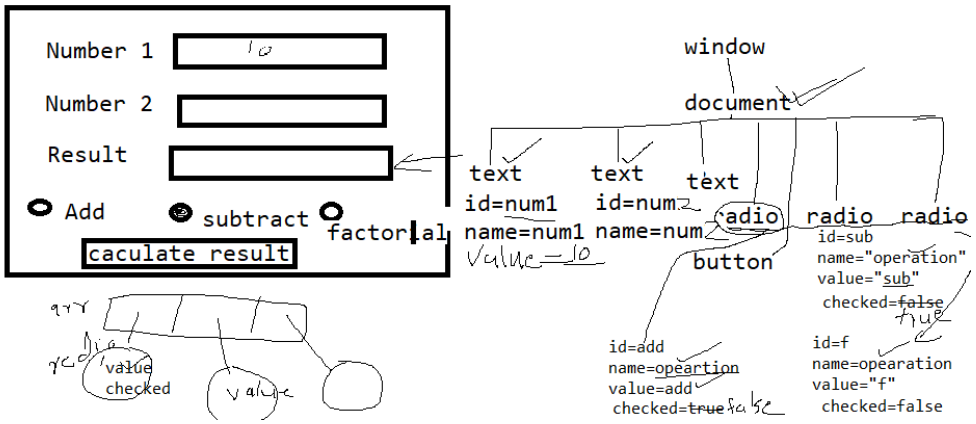
Examples:



Accept 2 numbers from user, and display addition if user clicks on add button, display subtraction if user clicks subtract button, display factorial if user clicks on factorial in result texbox (refer form1.html)

. display the form as shown below and calculate result once user click on the button, the appropriate operation will be performed based on the selected radio button(refer form2.html)





3. display the following form on the screen , once user clicks on the calculate result, check whether the text box contains numbers , otherwise show the error message beside the text box, also check whether one radio button is

checked or not otherwise show the error message, select minimum one radio button(refer form3.html)

4. display the following form, once user clicks on login , check whether password and confirm password matches, if not , then display error message beside confirm password text box, otherwise display popup box valid user.(refer loginvalidation.html)

Operators

Arithmetic

+, -, *, / , %

Relation operators

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

===	To do the strict checking we use === , it checks value as well as data type
!==	To do the strict checking we use !== for not equal to , it checks value as well as data type

If(12==”12”) -→ true if(12===”12”)-→ false because data type is not matching

Logical operators

&&, ||, !

Eval(“10+12”)= 22

isFinite ---to whether given value is number

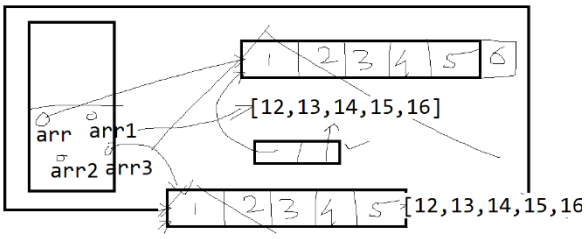
isNaN-→ to check whether the given value is string

array

push	To add element at the end

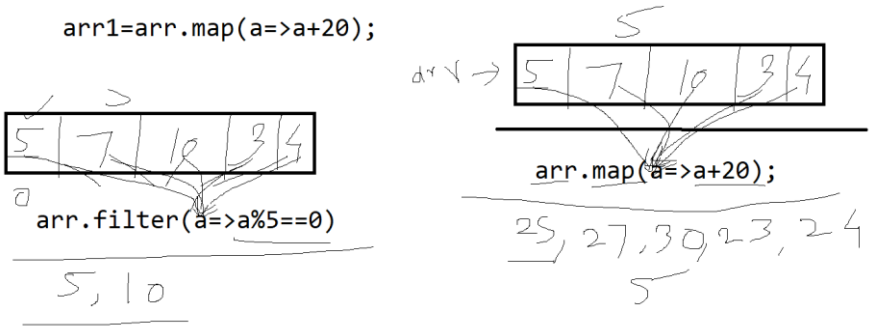
Pop	To delete one value from the end
Unshift	To add element at the beginning
shift	To delete one value from the beginning
indexOf	To find the position of the first occurrence of the value
splice	To delete from specific position, or to add at the specific position, or to find the old value and replace the data by given values
sort	To sort the array
reverse	To reverse the array
Find	To find the 1 st occurrence in the array based on condition
findIndex	To find the position of 1 st occurrence in the array based on condition
filter	To find all the values based on given condition
Map	To find new values based on given expression for every value in the array
reduce	To reduce multiple values to a single value

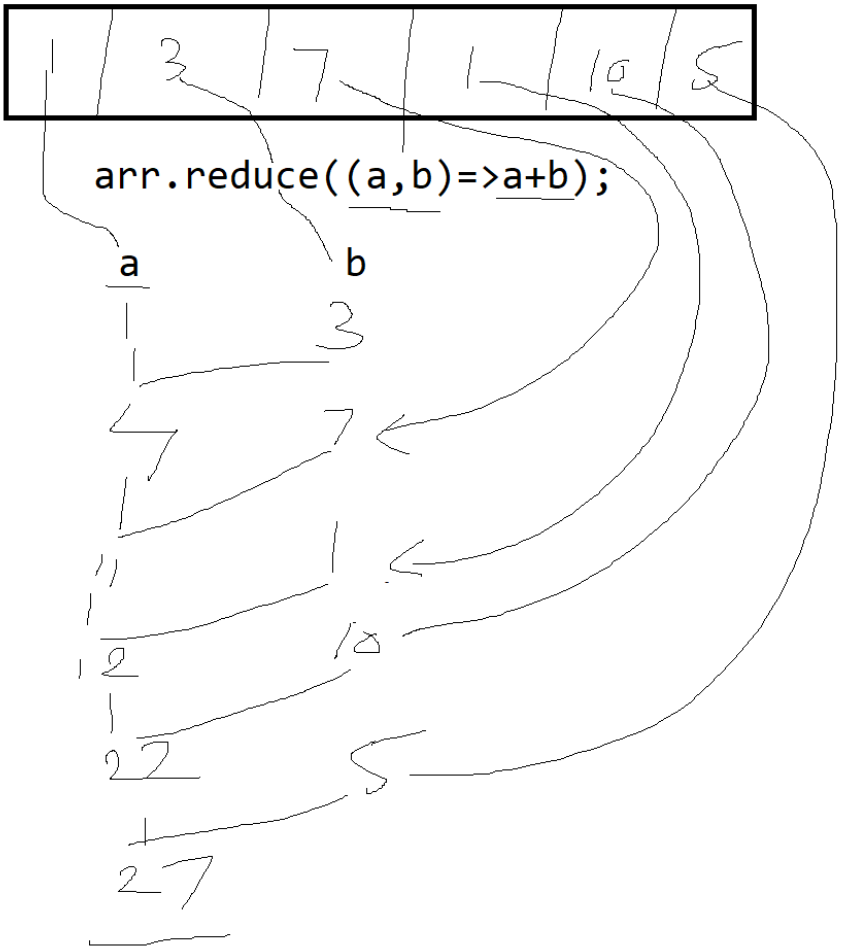
```
var arr=new Array(1,2,3,4,5);
          var arr1=[12,13,14,15,16]
          var arr2=[arr,arr1]
          var arr3=[...arr,...arr1]
```



Filter map

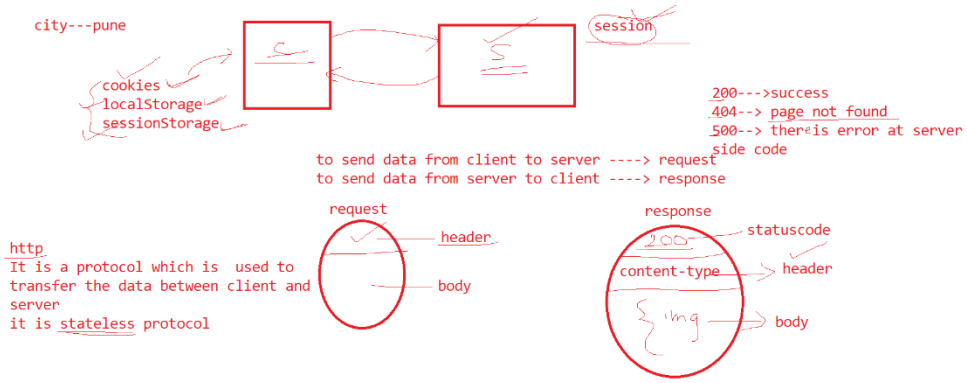
```
arr1=arr.map(a=>a+20);
```





localStorage and sessionStorage

these are predefined storage objects in javascript. If you want to retain the values till the browser window is open then use sessionStorage, and if you want to remember the values even after closing the browser window the use localStorage



Storage API

setItem ---- to assign or to change the value

getItem ---- to retrieve the value

removeItem--- to delete the property and the value

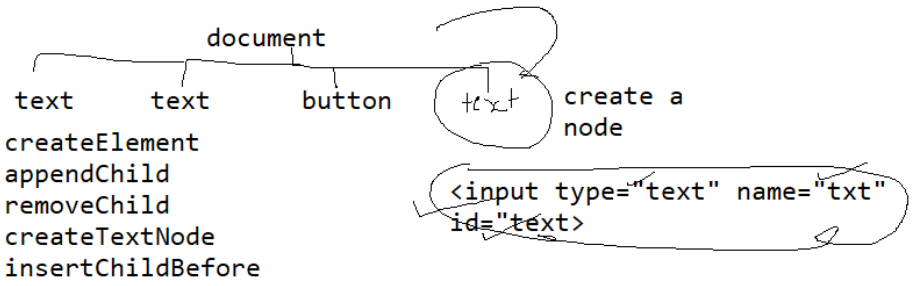
clear----- to delete all properties

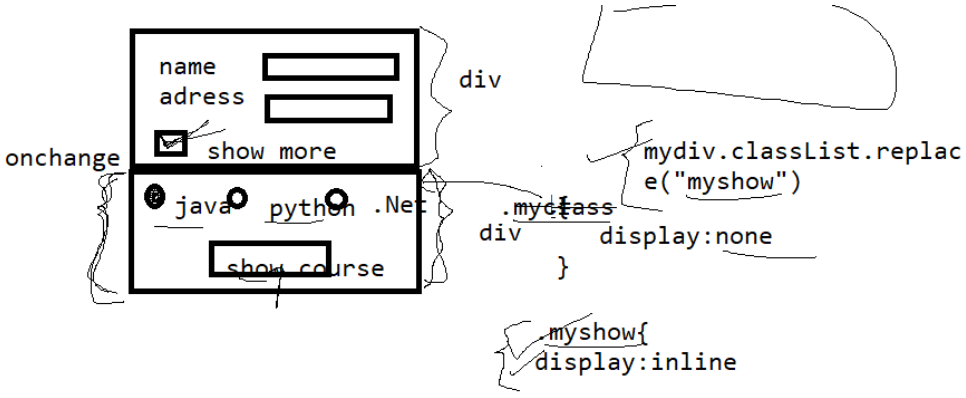
geolocation—this object is used to find latitude and longitude

getPosition --→ it communicates with gps system and gives you current location

watchPosition--→ it communicates with gps system and gives you live location

Dom manipulation





jQuery

It is a javascript library.

It is useful to reduce the size of code.

It makes your code cross platform, means the same code will work in all the browsers.

jQuery code will get executed only after the DOM is ready in the memory, the code has to be written inside ready event function.

Selectors in jquery

Id selector	'#myid, #myid1'
Class selector	".myclass"
Tag selector	"p", "p,div,h1"
Ancestor descendants	"div p"
Child selector	"div>p"
attribute	P[name] to select all p's which has id as a attribute
Attribute value	'P[name="myp"]'
Specific child selector	P:first-child, p:last-child, p:nth-child(4)

```
<div name='catid'>
 Company is good                $('div[name^=cat]
</div>
<div name='idcat'>
  this is my Company        $('div[name$=cat])
</div>
<div name='mycatid'>
  where is you Company located?   $('div[name*='cat'])
</div>
```

In jquery to check whether the checkbox is checked

$('input[name=hobbies]').each(function(index,element){
If($(element).is(':checked'))
alert($(element).val());
 	
})
	To display values of selected checkboxes

$('input[name=hobbies]').each(function(index,element){
If($(element).prop('checked'))
alert($(element).val());
 	
})	

$('input[name="hobbies"]:checked').each(function() {
console.log(this.value);
});	

To assign and remove the event

Live die--→deprecates

Bind unbind

Delegate undelegated

On off---→ new style of event handling, on function will assign the event and off function will remove the event

One -→ it executes the event only once.

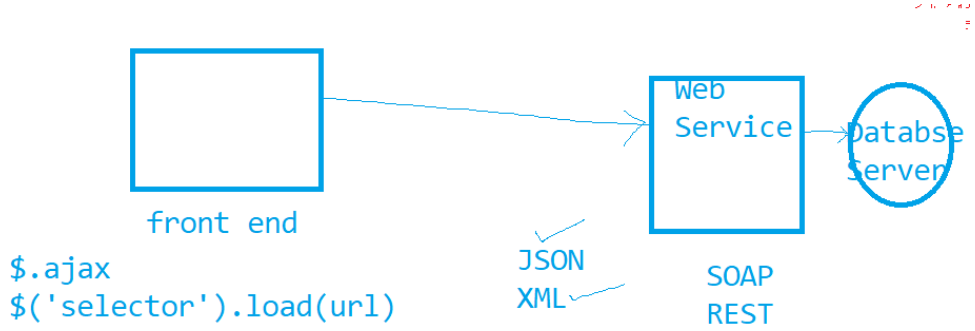
To handle class values

addClass, removeClass, toggleClass

```
.myclass{
  Background-color:blue;
Color:white;
}
.mytest{
  Background-color:white;
Color:black;
}
```

```
<p class=”mytest”> this is para</p>
```

Using web service



Web services are of 2 types

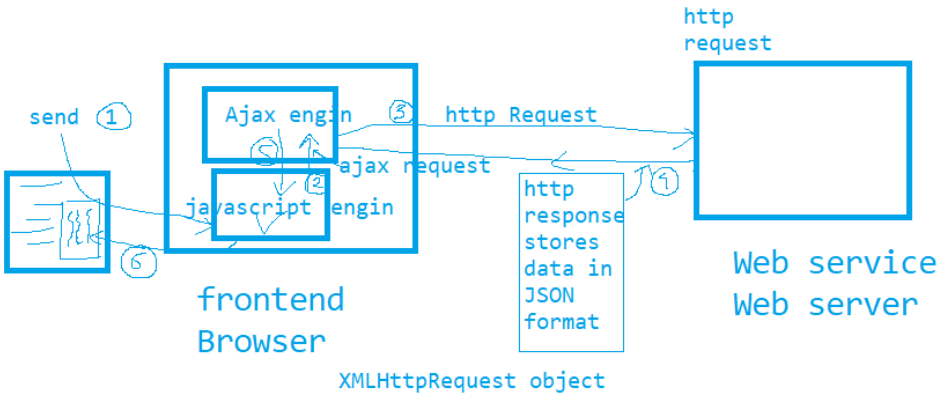
1. SOAP -→ (Simple Object Access Protocol) ,
   SOAP web services always transfer data in XML format.
   It uses SOAP protocol for exchange of data.
   These services uses WSDL(Web service definition language). These files are in XML format.

2. REST-(Representational State transfer)
   It uses http protocol for transfer of data
   It can exchange data in JSON, XML, text format

javascript	XML	JSON
{pid:123, pname:'chair', qty:34, price:2000}	<products> <product> <pid>123</pid> <pname>chair</pname> <price>2000</price> <qty>34</qty> </product> <product> <pid>124</pid> <pname>table</pname> <price>3000</price> <qty>35</qty> </product> </products>	'{"pid":123, "pname":'chair', "qty":34, "price":2000}'

Ob={empid:123,
ename:"Kishori"
Dept:{deptno:10,dname:"HR"},
Hobbies:["reading","biking"],
Experience:[{name:'techM', years:5},{name:'igate',years:7}],
Married:true}
Ob.experience[1].name--→ igate

JSON



1. User will send AJAX request
2. JavaScript engine will generate XMLHttpRequest object, and send the request AJAX engine
3. This XMLHttpRequest object will help ajax engine to convert request into http request format and send it to web service.
4. Web service will process the request and sends the data in JSON format.
5. Once the data is received by AJAX engine, it will convert the data in JavaScript object format, and sends it to JavaScript engine.
6. Javascript engine will send the data to our code.

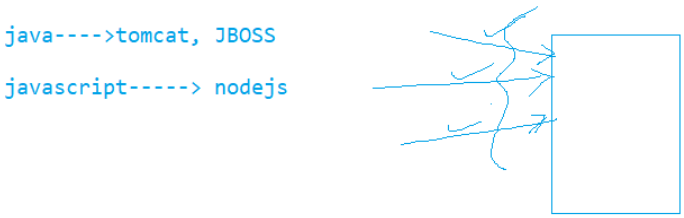
XMLHttpRequest(xhr) Object

1. Data, status, statusCode,

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

      })
```

NodeJs and expressjs
It is server side code, it uses javascript, it is helpful to use synchronous and asynchronous requests handling.
Nodejs helps us to design the server.



nodejs
express

web application--- to design front end, we need some template engine(pug,jade,ejs)

web service

1. Download nodejs

https://nodejs.org/en/download

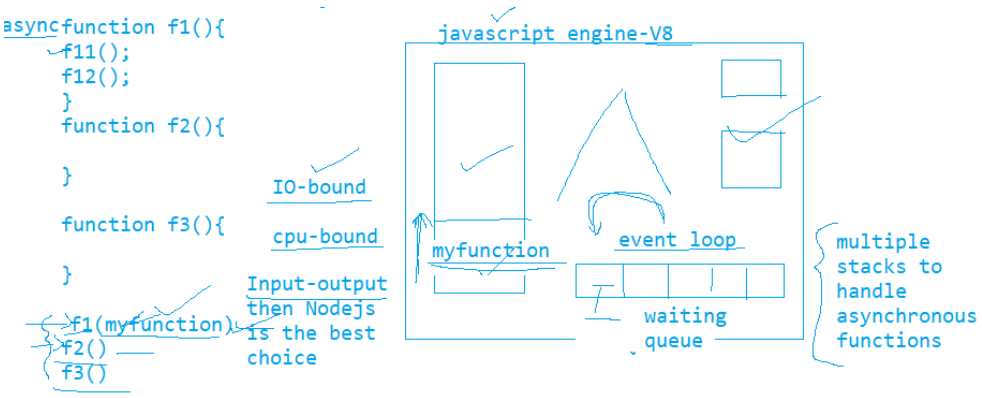
2. Install it by using msi file

3. To check whether installation is done
   Open cmd
   C:\user\system32>node –version

4. To open REPL(Read evaluate print loop)
   It helps you to do trail error for checking how one of the command works
   C:\user\system32>node
   >a=23
   >b=45
   If(a>b)
     Console.log(a)
   Else
     Console.log(b)

Multithreading--- deadlocks, race condition, critical section

User will write single threaded program, and javascript server will internally convert it into multithreaded program



Global functions	
setTimeout	It executes the given function after specified time
clearTimeout	It removes the settimeout setting
clearInterval	It will remove the setting of setInterval
setInterval	It will call the callback function after given time interval continuously, till clearInterval gets called

Nodejs lot of built in modules are available and we can write user defined modules also.

Buffer	It has multiple functions to allocate buffer, read data from buffer, write data to buffer
Fs	It has many functions available to perform file handling related tasks
Html	This module helps to create server, and handle user requests
url	This module helps to find user data, received vis request object

Write a program to accept details from user and store it in a file.
Accept login details from user and check whether given user is valid user or not

/register-----→ display the form for registration

/submit-data--→ then retrieve the data from the form and store it

/login ------→ display login form

/validate---→ then accept login details and check whether given user is valid or not

To design express application

1. Create a folder by name expressdemo1
2. Create package.json file
   npm init
3. Install express and body-parser in local folder
   npm install express --save
   npm install body-parse –save
4. If you want to install libraries globally, -g stands for global installation
   npm install -g express --save
   npm install -g body-parse –save

or

5. Type dependencies in package.json
   npm install