



AJAX JSON setup with JavaScript start coding

AJAX JSON JavaScript Dynamic and Interactive Web Content

Learn how to use AJAX to send data to your web server and get response data back to output in your web application. Explore JavaScript code to connect to web APIs and retrieve JSON data back to your web pages outputting the data into your web page. Dyn

- what is JSON and how it works
- How your web browser can make server http requests using AJAX
- AJAX and what technologies make up AJAX
- How you can use JavaScript to update the DOM elements
- Manipulate Elements on your webpage creating, updating and styling page elements dynamically with code.
- Interactive web pages - adding event listeners and setting up page interactions
- JSON data and JavaScript Objects, arrays and datatypes
- Output and iteration of JSON data
- Using JavaScript Objects within web page content
- Creating interactive AJAX content
- Example of popular web APIs that you can connect to.

Code editor and development environment setup : Setup of Web development Environment Get Coding

- setup of code editor and live server <https://code.visualstudio.com/>
- Test to ensure you are using the http protocol and not the file protocol

Localhost



Hello World

File protocol - won't work on many AJAX requests



Hello World

What is JSON and AJAX Introduction to JSON and AJAX.

Explore how JSON data is created, the structure of JSON data. What AJAX is and how it works.

```
{
  "first" : "Laurence",
  "last" : "Svekis",
  "status" : true,
  "age" : 30,
  "courses" : [
    "JavaScript", "JSON", "AJAX"
  ],
  "friends" : {
    "first" : "Jack",
    "last" : "Smith"
  }
}
```

```
let data = {};
let data = {};
```

```
const url = 'data.json';
fetch(url)
  .then((response) => response.json())
  .then((data) =>{
    console.log(data);
  })
})
```

```
<!DOCTYPE html>
<html><head><title>AJAX</title></head>
<body>
<h1>AJAX asynchronous JavaScript and XML</h1>
<script src="app.js"></script>
</body>
</html>
```

JavaScript Objects

Objects can contain strings, integers, booleans, arrays, and other objects. Bracket notation vs dot notation to select object values.

```
const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
//const div1 = document.querySelector('div');
//div1.textContent = "hello div";
//output.textContent = "Hello";
const myObj = {
  "friends" : [
    {"first": "Laurence"},
    {"first": "Mike"},
    {"first": "John"}
  ],
  "myName" : "Laurence",
  "total" : 100,
  "status" : false,
}

const myObj1 = {
  "first" : "Laurence r",
  "last" : "Svekis"
```

```

}

const myObj2 = {
  "first name" : "Laurence r",
  "lastName" : "Svekis"
}

output1.textContent = myObj1["first"] + " " + myObj1["last"];
output2.textContent = myObj1.first + " " + myObj1.last;

console.log(myObj2["first name"]);
console.log(myObj2.lastName);

const val = "first name";

console.log(myObj2[val]);
console.log(myObj2.val);

output1.textContent = myObj["friends"][2]["first"];

```

JavaScript Objects and Arrays

Arrays and iterate through contents of an array. Objects within arrays to easily output the values of the items.

```

const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');

const myArr = ["first","two","three",0,100,true,{"first":"Laurence","first1":"Laurence Svekis"},[0,1,2]];

let val = "none";
val = myArr[0];
val = myArr[6]["first1"];
val = myArr[7][1];
//console.log(val);

for(x=0;x<myArr.length;x++){
  //console.log(myArr[x]);
}

```

```

}

myArr.forEach((val, index, totalArray) => {
    //console.log(val);
    //console.log(index);
    //console.log(totalArray);
    totalArray.push(index);
})

const myObj2 = {
    "people" : [{
        "firstName" : "Laurence",
        "lastName" : "Svekis",
        "age" : 40
    },
    {
        "firstName" : "Linda",
        "lastName" : "Vekis",
        "age" : 30
    },
    {
        "firstName" : "John",
        "lastName" : "Kis",
        "age" : 20
    }
    ]
}

myObj2["people"].forEach((val) => {
    console.log(val.firstName);
    output1.innerHTML += `${val.firstName} ${val.lastName} ${val.age} <br>`;
})

```

JSON methods in JavaScript

```

const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');

const myObj = {
    message : "Hello",

```

```
    greet : "welcome",
    who : "world"
  }
const myObj2 = `{"message":"Hello","greet":"welcome","who":"world"}`;

const str = JSON.stringify(myObj);

const myObj3 = JSON.parse(str);

console.log(myObj3);
```

How to connect to an API JavaScript AJAX Example

```
const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
const url = 'data6.json';
output1.textContent = "Click Me";
output1.style.border = "1px solid black";
output1.style.textAlign = "center";

output1.addEventListener("click",getData);

function getData(){
  fetch(url)
  .then(response => {
    if(response.ok){
      return response.json();
    } else {
      throw new Error('Not Connected');
    }
  })
  .then(data => {
    //console.log(data);
    outputData(data);
  })
  .catch((error)=>{
    console.log(error);
  })
}
```

```
function outputData(data) {
  output2.innerHTML = '';
  console.log(data);
  data.people.forEach((person)=>{
    const div = document.createElement('div');
    div.textContent = person.first;
    output2.append(div);
  })
}
```

```
{
  "people" : [
    {
      "first" : "Laurence"
    },
    {
      "first" : "Mike"
    },
    {
      "first" : "Jane"
    }
  ]
}
```

JavaScript Objects with code examples

```
<!DOCTYPE html>
<html><head><title>AJAX</title>
<style>
  .output1 {
    border:1px solid black;
    width:200px;
    margin:auto;
    text-align:center;
    cursor:pointer;
  }
  .output1:hover{
    border-color:red;
  }
</style>
```

```
</style>
</head>
<body>
<h1>JSON JavaScript Objects</h1>
<div class="output1">Click Me</div>
<div class="output2"></div>
<script src="app8.js"></script>
</body>
</html>
```

```
const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
const url = 'data8.json';
output1.addEventListener('click',getData);

function getData(){
  fetch(url).then(rep => rep.json())
  .then((data)=>{
    console.log(data);
    getInfo(data);
  })
}

function getInfo(data){
  for(const prop in data.person){
    //console.log(prop);
  }
  const keys = Object.keys(data.person);
  console.log(keys);
  keys.forEach((key)=>{
    //console.log(data.person[key]);
    const val = data.person[key];
    //console.log(typeof(val));
  })

  const vals = Object.values(data.person);
  //console.log(vals);

  const entries = Object.entries(data.person);
  console.log(entries);

  for(const arr of entries){
```



```
    console.log(arr[0]);
    console.log(arr[1]);
  }

  data.person["test"] = "New Value";
  console.log(data);
}
```

```
{
  "person" : {
    "first" : "Laurence",
    "last" : "Svekis",
    "interests" : ["JavaScript","HTML","CSS"],
    "courses" : [
      {
        "name" : "JavaScript",
        "length" : 15
      },
      {
        "name" : "HTML",
        "length" : 33
      },
      {
        "name" : "CSS",
        "length" : 43
      }
    ]
  }
}
```

JavaScript Array Methods with code examples

```
const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
const url = 'data9.json';

output1.addEventListener('click',getData);

function getData(){
  fetch(url).then(rep => rep.json())
```

```

.then((data)=>{
    //console.log(data);
    outputData(data.arr);
})
}

function outputData(arr) {
    console.log(arr);
    const removedVal = arr.pop();
    console.log(removedVal);
    const lenArr = arr.push("Four");
    //console.log(lenArr);
    const removeFirst = arr.shift();
    //console.log(removeFirst);
    const lenNewArr = arr.unshift("Five");//add to beginning
    //console.log(lenNewArr);
    console.log(arr);
    arr[1] = "Updated";
    arr.splice(1,0,"Six","Seven","Eight");
    arr.splice(0,1);

    const newArr = arr.slice(1,3);
    console.log(newArr);

    let myStr = arr.toString();
    myStr = arr.join(' -*- ');
    //console.log(myStr);
    output2.textContent = myStr;
}

```

```

{
    "arr" : ["one","two","three"]
}

```

JavaScript Array Methods with code examples Part 2

```

const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
const url = 'data9.json';

```

```

output1.addEventListener('click',getData);

function getData(){
  fetch(url).then(rep => rep.json())
  .then((data)=>{
    //console.log(data);
    outputData(data.arr);
  })
}

function outputData(arr){
  console.log(arr);
  let val = arr.indexOf('ttwo');
  if(val == -1){
    val = 'Not Found';
  }
  val = Array.isArray(arr);

  val = arr.find(ele => {
    //return ele == "otwo"
    console.log(ele.length);
    return ele.length >= 3
  })

  val = arr.includes("two0");

  const newArr2 = arr.map((ele,index)=>{
    // console.log(index);
    /*
    if(ele.length > 3){
      return ele;
    }
    */
    return `${index} ${ele}`;
  })
  arr.sort();
  arr.reverse();
  console.log(arr);
  //console.log(newArr2);
  output2.textContent = val;
  console.log(val);
}

```

```
}
```

JavaScript DOM for interactive and dynamic web pages

```
//console.dir(document);
//console.dir(window);
const output1 = document.querySelector('div');
const output2 = document.querySelectorAll('div');
const output3 = document.querySelector('.output3');

output2.forEach((ele, index)=>{
  console.log(ele);
  ele.textContent += "Click";
  ele.addEventListener('click', (e)=>{
    //ele.style.backgroundColor = 'red';
    ele.classList.toggle('btn');
    if(ele.classList.contains('output1')){
      console.log('output1');
      getData('data9.json');
    }
    if(ele.classList.contains('output2')){
      console.log('output2');
      getData('data6.json');
    }
  })
  ele.addEventListener('mouseover', (e)=>{
    ele.style.backgroundColor = 'red';
  })
  ele.addEventListener('mouseout', (e)=>{
    ele.style.backgroundColor = 'white';
  })
})

function getData(url){
  fetch(url).then(rep => rep.json())
  .then((data)=>{
    outputData(data);
  })
}
```

```
function outputData(data) {
    output3.textContent = JSON.stringify(data);
}

console.log(output1);
console.log(output2);

document.addEventListener('DOMContentLoaded', (e) => {
    console.log('ready');
})
```

JavaScript DOM Part 2

```
<!DOCTYPE html>
<html><head><title>AJAX</title>
<style>
    .output1 {
        border:1px solid black;
        width:200px;
        margin:auto;
        text-align:center;
        cursor:pointer;
    }
    .output1:hover{
        border-color:red;
    }
    .btn {
        background:chartreuse;
    }
</style>
</head>
<body>
<h1>JSON JavaScript Objects</h1>
<div class="output1">Click Me</div>
<div class="output2"></div>
<div class="output3"></div>
<script src="app12.js"></script>
```

```
</body>
</html>
```

```
const output1 = document.querySelector('.output1');
const output2 = document.querySelector('.output2');
const output3 = document.querySelector('.output3');
const output4 = document.createElement('div');
const btn = document.createElement('button');
btn.textContent = 'Fetch Data';

document.body.append(output4);
const ul = document.createElement('ul');
output4.append(ul);
//output2.textContent = "clicker";

const myInput = document.createElement('input');
myInput.style.margin = '5px';
myInput.style.marginTop = '20px';

console.log(myInput);
const txt1 = document.createTextNode(' Enter a Value : ');
const txt2 = document.createTextNode('Text 2');
output2.append(myInput);
output2.prepend(txt1);
output2.prepend(btn);
//const res = output2.appendChild(txt2);
//console.log(res);
myInput.setAttribute('placeholder', 'enter value');
output2.append(myInput);
//output2.append(output1);
myInput.setAttribute('type', 'text');
myInput.addEventListener('focusout', (e) =>{
  output3.textContent = myInput.value;
  //myInput.value = "";
})

output1.addEventListener('click', getClick);
//output2.addEventListener('click', getClick);

btn.addEventListener('click', () =>{
  fetch('data9.json').then(rep => rep.json())
  .then((data) =>{
```

```

    console.log(data.arr)
    data.arr.forEach((ele)=>{
        const el = maker('div',ele,output4);
        console.log(el);
    })
})

function maker(eleType,html,parent){
    const el = document.createElement(eleType);
    el.innerHTML = html;
    parent.append(el);
    return el;
}

function getClick(event){
    console.log(event.target);
    const li = document.createElement('li');
    ul.append(li);
    li.textContent = myInput.value;
    myInput.value = "";
}

```

```

{
  "arr" : ["one","two","three","four"]
}

```

AJAX in Action

Web API JSON data with AJAX

```

<!DOCTYPE html>
<html><head><title>AJAX</title>
<style>
  .btn {

```

```

border:1px solid black;
width:200px;
text-align:center;
cursor:pointer;
display:inline-block;
}
.btn:hover{
border-color:red;
}
</style>
</head>
<body>
<h1>AJAX JavaScript</h1>
<div class="container">
<input type="text">
<div class="btn">Click Me</div>
</div>
<div class="output"></div>
<script src="apps1.js"></script>
</body>
</html>

```

```

const btn = document.querySelector('.btn');
const url = 'https://www.discoveryvip.com/shared/test1.json';
const localUrl = 'data20.json';
const output = document.querySelector('.output');
btn.addEventListener('click',getData);

function getData(e){
  //console.log(e);
  fetch(url).then(rep => rep.json())
    .then((data)=>{
      outputData(data);
    })
}

function outputData(data){
  let html = "";
  data.forEach((d)=>{
    console.log(d);
    html += `<p>`;

```



```
    html += `<div>${d.name.first} ${d.name.last}</div>`;
    html += `<small>${d.location.city} ${d.location.country}</small>`;
    html += `<div>${d.age}</div>`;
    html += `</p>`;
  })
  output.innerHTML = html;
}
```

```
[
  {
    "name": {
      "first": "Laurence",
      "last": "Svekis"
    },
    "age": 40,
    "location": {
      "city": "Toronto",
      "country": "Canada"
    }
  },
  {
    "name": {
      "first": "Lisa",
      "last": "Svekis"
    },
    "age": 30,
    "location": {
      "city": "New York",
      "country": "USA"
    }
  },
  {
    "name": {
      "first": "John",
      "last": "Sekis"
    },
    "age": 50,
    "location": {
      "city": "New York",
      "country": "USA"
    }
  }
]
```

]

Connect to Web API RandomUser

```
const btn = document.querySelector('.btn');
const output = document.querySelector('.output');
const myInput = document.querySelector('input');
myInput.setAttribute('type', 'number');
myInput.value = 1;
const url = 'https://randomuser.me/api/?results';
btn.addEventListener('click', getData);

function getData(e) {
  //console.log(e);
  const val = myInput.value;
  const urlResults = `${url}=${val}`;
  output.textContent = `fetching ${val} results.....`
  fetch(urlResults).then(rep => rep.json())
  .then((data) => {
    outputData(data.results);
  })
}

function outputData(data) {
  data.forEach((person) => {
    createRecord(person);
  })
}

function createRecord(person) {
  console.log(person);
  const container = maker('div', output, '');
  container.style.border = '1px solid black';
  container.style.padding = '5px';
  container.style.margin = '3px';
  const val1 = `${person.name.title} ${person.name.first} ${person.name.last}`;
  const namer = maker('div', container, val1);
  const img = maker('img', container, '');
  img.src = person.picture.thumbnail;
  const val2 = `${person.id.name} ${person.cell} ${person.email}`;
  const detailEle = maker('small', container, val2);
```

```

detailEle.style.display = 'block';
detailEle.style.fontSize = '9px';
container.style.backgroundColor = '#ddd';
namer.style.fontSize = '2em';
img.style.border = '5px solid white';
namer.addEventListener('click', (e)=>{
    namer.classList.toggle('red');
})
}

function maker(eleType,elParent,elHTML){
    const ele = document.createElement(eleType);
    elParent.append(ele);
    ele.innerHTML = elHTML;
    return ele;
}

```

StackExchange API

```

<!DOCTYPE html>
<html><head><title>AJAX</title>
<style>
    .btn {
        border:1px solid black;
        width:200px;
        text-align:center;
        cursor:pointer;
        display:inline-block;
    }
    .btn:hover{
        border-color:red;
    }
    .red{
        color:red;
    }
</style>
</head>
<body>

```

```

<h1>AJAX JavaScript</h1>
<div class="container">
<input type="text">
<div class="btn">Click Me</div>
</div>
<div class="output"></div>
<script src="apps3.js"></script>
</body>
</html>

```

```

const btn = document.querySelector('.btn');
const output = document.querySelector('.output');
const myInput = document.querySelector('input');
myInput.value = '/2.3/posts?order=desc&sort=activity&site=stackoverflow';
myInput.style.width = '100%';
const baseURL = 'https://api.stackexchange.com';
btn.addEventListener('click',getData);

function getData(){
  console.log('ready');
  const val = myInput.value;
  const url = `${baseURL}${val}`;
  fetch(url)
    .then(res => res.json())
    .then((data)=>{
      outputData(data.items);
    })
}

function outputData(arr){
  output.innerHTML = "";
  arr.forEach((item)=>{
    console.log(item);
    const main = eleMaker('div',output,'');
    main.style.border = '1px solid black';
    if(item.post_type != null){
      const elHead = eleMaker('div',main,`<h4>${item.post_type}
${item.post_id}</h4>`);
    }
    if(item.title != null){
      const elHead = eleMaker('div',main,`<h4>${item.title}</h4>`);
    }
  })
}

```

```

    const myLink = eleMaker('a',main,`${item.link}`);
    myLink.setAttribute('href',item.link);
    myLink.setAttribute('target','_blank');
  })
}

function eleMaker(elType,elParent,elHTML){
  const ele = document.createElement(elType);
  ele.innerHTML = elHTML;
  return elParent.appendChild(ele);
}

```

GitHub API

```

<!DOCTYPE html>
<html><head><title>AJAX</title>
<style>
  .btn {
    border:1px solid black;
    width:200px;
    text-align:center;
    cursor:pointer;
    display:inline-block;
  }
  .btn:hover{
    border-color:red;
  }
  .red{
    color:red;
  }
</style>
</head>
<body>
<h1>AJAX JavaScript</h1>
<div class="container">
<input type="text">

```

```
<div class="btn">Click Me</div>
</div>
<div class="output"></div>
<script src="apps4.js"></script>
</body>
</html>
```

```
const headEle = document.querySelector('h1');
const btn = document.querySelector('.btn');
const sear = document.querySelector('input');
const output = document.querySelector('.output');
sear.value = 'ajax';
btn.textContent = 'Search GitHub';
btn.addEventListener('click',getData);
document.addEventListener('DOMContentLoaded', (e)=>{
  fetch('https://api.github.com/zen')
    .then(rep => rep.text())
    .then(html => headEle.textContent = html)
})

function getData(){
  const base = 'https://api.github.com/search/repositories';
  const q = `?q=${sear.value}`;
  fetch(base+q)
    .then(res => res.json())
    .then((data) =>{
      output.innerHTML = '';
      maker('div',output,data.total_count);
      makeOutput(data.items);
    })
}

function maker(typ,par,html){
  const ele = document.createElement(typ);
  ele.innerHTML = html;
  return par.appendChild(ele);
}

function makeOutput(arr){
  arr.forEach((el)=>{
    const main = maker('div',output,'');
    main.style.border = '1px solid #ddd';
```

```

main.style.padding = '5px';
main.style.margin = '5px';
console.log(el);
const ele = maker('div',main,el.description);
ele.addEventListener('click', (e)=>{
    ele.style.color = 'red';
    addDetails(ele,el.url);
})
const downlo = maker('div',main,'');
const aLink = maker('a',downlo,el.downloads_url);
aLink.setAttribute('href',el.downloads_url);
aLink.setAttribute('target','_blank');
const aURL = maker('a',main,el.url);
aURL.setAttribute('href',el.url);

})
}

function addDetails(par,url){
    par.innerHTML = '';
    fetch(url)
        .then(res=>res.json())
        .then((data)=>{
            console.log(data);
            const newEle = maker('div',par,'');
            const owner = data.owner;
            let html = `<div>${data.description}</div>`;
            html += `<div>${owner.login}</div>`;
            html += `<div>${owner.id} </div>`;
            const e11 = maker('div',newEle,html);
            e11.style.padding = '10px';
            e11.style.fontSize = '0.8em';
            e11.style.backgroundColor = '#eee';
        })
}

```