



CURS Master

Tehnologii moderne de proiectare a aplicatiilor multimedia



Curs: TEHNOLOGII MODERNE DE PROIECTARE A APLICATIILOR MULTIMEDIA

CAP.8. LIMBAJUL JavaScript

CUPRINS

- 8.1. Introducere**
- 8.2. Elemente Limbaj JavaScript**
- 8.3. Instructiuni**
- 8.4. Functii**
- 8.5. Tablouri**
- 8.6. Obiecte**



8.1. Introducere

<https://www.w3schools.com/js>

Why Study JavaScript?

JavaScript is one of the **3 languages** all web developers **must** learn:

1. **HTML** to define the content of web pages
2. **CSS** to specify the layout of web pages
3. **JavaScript** to program the behavior of web pages



8.1. Introducere

JavaScript: limbaj de scripting client-side (ruleaza la nivelul browser-ului)

Avantaje :

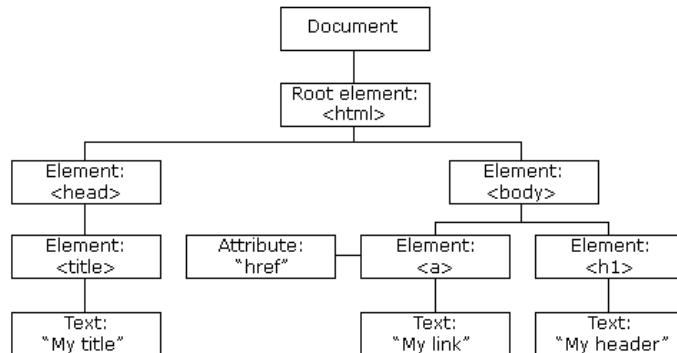
- ❑ dezvoltat pentru a prelucra informatiile din formulare si a adauga dinamism paginilor web
- ❑ este interpretat de browser si este incorporat in paginile HTML
- ❑ dezvoltat de Netscape , denumire initiala : LiveScript
- ❑ nu e Java , sintaxa similara cu limbajului C/Java
- ❑ ruleaza pe orice browser: Firefox, Opera, Netscape Navigator, Internet Explorer, Safari, etc.



8.1. Introducere

DOM: la incarcarea in browser a unei pagini web se creeaza automat un arbore de obiecte

The HTML DOM Tree of Objects



8.1. Introducere

Utilizand DOM, JavaScript: poate crea dynamic HTML(DHTML):

- ❑ Poate schimba orice element HTML din pagina
- ❑ Poate schimba orice atribut HTML din pagina
- ❑ Poate schimba orice stil CSS din pagina
- ❑ Poate adauga noi elemente si atribute HTML
- ❑ Poate reacționa la orice eveniment HTML din pagina
- ❑ Poate crea noi evenimente HTML in pagina



Caracteristici JScript

Javascript permite:

- executia scripturilor la nivelul browserului
- reactie la evenimente – (ex. Mouse click pe un element HTML)
- poate fi utilizat pentru a valida datele din formulare inainte de a fi trimise catre server
- poate fi utilizat pentru a detecta tipul browserului - in functie de acesta putem incarca o pagina sau alta
- etc



Inserarea codului JavaScript in pagina

- Prin tag-ul <script>

```
<script type="text/javascript">
    ...
    instructiuni
    ...
</script>
```

unde: Atributul type stabeleste limbajul de scripting utilizat



Inserarea codului JavaScript in pagina web

Exemplu:

```
1. <html>
2. <head>
3.   <title>Hello</title>
4. </head>
5. <body>
6.   <script type="text/javascript">
7.     document.write("<h1>Hello World! </h1>");
8.   </script>
9. </body>
10. </html>
```



Inserarea codului JavaScript in pagina web

Adding and Deleting Elements

Method	Description
document.createElement(element)	Create an HTML element
document.removeChild(element)	Remove an HTML element
document.appendChild(element)	Add an HTML element
document.replaceChild(element)	Replace an HTML element
document.write(text)	Write into the HTML output stream



Inserarea codului JavaScript în pagina

Exemplu: browser-ul nu poate interpreta Javascript

```
1. <html>
2.   <head>
3.     <title>Hello</title>
4.   </head>
5.   <body>
6.     <script type="text/javascript">
7.       <!--
8.         document.write("<h1>Hello World!</h1>");
9.       //-->
10.    </script>
11.    <noscript>Limbajul JavaScript nu e disponibil</noscript>
12.  </body>
13. </html>
```



Inserarea codului JavaScript în pagina

JavaScript se poate inseră:

a) **Intern** în documentul HTML

- Atât în `<head>` cât și în `<body>`
- funcțiile JavaScript se definesc de regulă în `<head>`
- Codul JavaScript din `<body>` se va executa în momentul în care este încarcată pagina în browser

b) **Extern** într-un fișier cu extensia .js

Avantaj: fișierul poate fi inclus în mai multe pagini HTML

Ex. Includere în document HTML în secțiunea `<head>`:

```
<script type="text/javascript" src="/cale/numefisier.js"></script>
```



8.2. Elemente Limbaj JavaScript

Variabile

Sintaxa :

```
var idVar;  
var idVar = val_initiala;  
idVar = val_initiala;
```

- Numele variabilelor sunt case-sensitive si trebuie sa inceapa cu o litera
- Variabilele nu au tip (ele pot retine orice valoare)
- Cuvantul var este optional (daca nu se specifica automat variabila e considerata globala)
- Variabilele declarate intr-o functie sunt locale acelei functii
- La declararea variabilelor locale trebuie specificat obligatoriu var
- Variabilele declarate in afara oricarei functii sunt globale (sunt accesibile oriunde in pagina)



Tipuri de baza

JavaScript are 3 **tipuri de baza**: number, string, si boolean
(Orice alt tip de date este considerat obiect)

- Numerele** sunt memorate intodeauna in virgula flotanta
 - Numerele **hexazecimale** incep cu 0x
 - Numerele in **baza 8** incep cu 0 (nu toate browserele suporta)
- Sirurile (string)** :secvente de caractere cuprinse “ ” sau “ ”
 - pot contine \n (newline), " (ghilimele), etc.
- Valorile logice (boolean)**: true sau false



Operatori

- ❑ **Aritmetici:** + - * / % ++ --
- ❑ **Comparatie:** < <= == != > = >
- ❑ **Logici:** && || !
- ❑ **Biti:** & | ^ ~ << >> >>>
- ❑ **Atribuire:** = += -= *= /= %= <<= >>= >>>= &= ^= |=
- ❑ **Concatenarea siruri:** +
- ❑ **Conditional :** conditie ? val_if_true : val_if_false
- ❑ **Testare egalitate:** == si !=
- ❑ Alti operatori : new typeof delete



8.3. Instructiuni

- ❑ **Atribuire:** idVar = expresie;
- ❑ **Instructiunea compusa**

```
{ instructiune1;
    instructiune2;
    ...
    instructiune n; }
```
- ❑ **Comentarii:** (similar C++ sau Java)
// comentariu pe o singura linie
/* comentarii pe mai multe linii */



Instructiuni conditionale

Selectie simpla:

```
if (conditie) instructiune;  
if (conditie) instructiune1; else instructiune2;
```

Selectie multipla:

```
switch(n) {  
    case constanta1: bloc instructiuni 1 break;  
    ...  
    case constantaN: bloc instructiuni N break;  
    default: bloc instructiuni n+1 }
```



Instructiuni ciclare

Instructiunea for

```
for (expr_i;conditie; expresie_reinitializare) instructiune
```

Exemplu

```
<script type="text/javascript">  
var i=0, s=0;  
for (i=0;i<=5;i++)  
    { s+=i;  
    }  
document.write(" Suma este " + s);  
</script>
```



Instructiuni ciclare

□ Instructiunea while

while (conditie) instructiune

Exemplu

```
<script type="text/javascript">
var i=0, s=0;
while (i<=5)
    { s+=i;
      i++ }
document.write(" Suma este " + s);
</script>
```



Instructiuni ciclare

□ Instructiunea do ... while

do

```
{ instructiuni }
while (conditie);
```

Exemplu

```
<script type="text/javascript">
var i=0, s=0;
do {
    s+=i;
    i++ }
while (i<=5);
document.write(" Suma este " + s);
```



8.4. Functii

- se definesc de regula in <head>

- Sintaxa definire functie:

```
function numeFunctie(p1, ..., pN)
```

```
{ //declaratii de variabile locale (var)  
instructiuni }
```

- O functie poate returna o valoare cu return valoare;

- Sintaxa apel functie

```
numeFunctie(vp1, ..., vpN)
```

- Parametri simpli sunt transmisi prin valoare, obiectele prin referinta



8.4. Functii

Exemplu:

```
<html>  
<head>  
<title>Instructiuni</title>  
<script type="text/javascript">  
function factorial(n){  
    var i, p=1;  
    for (i=1;i<=n;i++) {  
        p*=i;  
    }  
    return p;  
}</script>  
</head>  
  
<body>  
<h1>Functii</h1>  
<script type="text/javascript">  
var n=3;  
document.write( n + "!=" +  
factorial(n));  
</script>  
</body>  
</html>
```



8.5. Tablouri

Exemplu:

```
var masini= new Array();
masini[0]="Audi";
masini[1]="Logan";
var masini= new Array("Audi", "Logan"); //tablou condensat
var masini= ["Audi", "Logan"]; //tablou de literali
var masini= ["Audi", "Logan", "Ford"]; //tablou de literali
masini.sort();
var i=0;
for(i=0;i<masini.length;i++){
    document.write(masini[i]);
}
```



8.6. Obiecte

Creare obiecte JavaScript:

- ❑ Utilizand obiecte literal:

```
var curs = {"D02", "TMPAM"}
```

- ❑ Cream un obiect "gol" cu ajutorul operatorului new, apoi adaugam proprietati:

```
var curs = new Object();
curs.id = " D02 "; curs.nume = "TMPAM";
```

- ❑ Cu ajutorul constructorilor:

```
function Curs(id, nume)
{ this.id = id; //cuvantul cheie this e obligatoriu
  this.nume = nume; }
var curs =new Curs("D02", "TMPAM");
```



Creeare ferestre pop-up JavaScript

Alert Box

- se foloseste pentru a afisa o fereastra de alerta catre utilizator
- Cand apare o fereastra Alert box utilizatorul trebuie sa de click "OK" sa continue.

Exemplu :

```
<script type="text/javascript">
    window.alert("Bine ai venit");
</script>
```



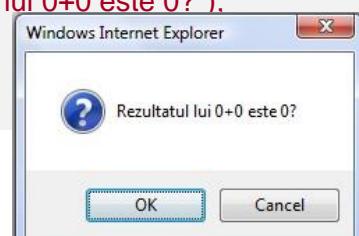
Creeare ferestre pop-up JavaScript

Confirm Box

- Se utilizeaza adeseori daca utilizatorul vrea sa verifice sau accepte o actiune/informatie
- Cand se afiseaza o fereastra Confirm box, utilizatorul va trebui sa dea click pe "OK" sau "Cancel" ca sa continue.
- Pentru "OK", Confirm box returneaza true altfel, false.

Exemplu :

```
<script type="text/javascript">
    intrebare = window.confirm("Rezultatul lui 0+0 este 0?");
    if (intrebare) alert("Corect");
    else alert("Incorect");
</script>
```





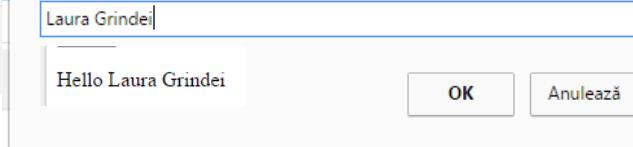
Creeare ferestre pop-up JavaScript

Prompt Box

- Se utilizeaza cand utilizatorului i se cere sa introduca o valoare inainte de a accesa o pagina web
- La aparitia ferestrei utilizatorul introduce valoarea solicitata si selecteaza "OK" sau "Cancel"
- Pentru "OK", the fereastra returneaza valoarea introdusa de utilizator . Pentru "Cancel", returneaza null.

Exemplu :

```
<script type="text/javascript">
x=prompt ("Laura Grindei", " ")
document.write("S"
```



Exemple JavaScript: creare ferestre

Exemplu : interfata calculator

```
script type="text/javascript">
function calc()
{
    form.resultat.value = eval(form.expresie.value);
}
eval("alert('
<form>
    <p>Introduceti o expresie matematica (adunare, scadere, inmultire, impartire), de exemplu (7*8 sau 3+8/2):</p>
    <input type="text" name="expresie" size="35" >
    <input type="button" name="calc" value="Calculare"
    onclick="calculeaza(this.form)">
    <br>
    Rezultatul este:<input type="text" name="rezultat" size="18">
</form>
<p>Introduceti o expresie matematica (adunare, scadere, inmultire, impartire), de exemplu (7*8 sau 3+8/2):</p>
<input type="text" name="expresie" size="35" >
<input type="button" name="calc" value="Calculare"
onclick="calculeaza(this.form)">
<br>
Rezultatul este:<input type="text" name="rezultat" size="18">
</form>")");
```



Limbajul JavaScript: Evenimente

Evenimente: actiuni care pot fi detectate de JavaScript.

Se pot configura actiuni la detectarea de evenimente

Exemple de evenimente:

- ❑ S-a efectuat click pe un buton
- ❑ S-a terminat de incarcat pagina

Exemplu : eveniment "onClick" mouse
<form>

```
<input type="button" value="Apasa"  
onClick="alert('Salut')" />  
</form>
```



Limbajul JavaScript: Evenimente

Evenimente ale ferestrelor

- onload
- onunloavd - onresize: (Netscape)
- onmove
- onabort
- onerror
- onfocus
- onblur

Evenimente de mouse:

- onmousedown
- onmouseup
- onmousemove
- onmouseover
- onmouseout
- ondblclick
- onclick

Evenimente ale formularelor :

- onsubmit
- onreset
- onchange
- onselect
- onclick
- onblur
- onfocus

Evenimente ale tastelor

- onkeydown
- onkeyup
- onkeypress



JavaScript Maths

Math.PI returns the value of PI
Math.round(x) returns the rounded value of x
Math.pow(x, y) returns the value of x to the power of y
Math.sqrt(x) returns the square root of x
Math.abs(x) returns the absolute (positive) value of x
Math.ceil(x) returns the value of x rounded up
Math.floor(x) returns the value of x rounded down
Math.sin(x) returns the sin of the angle x (given in radians)
Math.cos(x) returns the cosin of the angle x (given in radians)
Math.max() return the number with the highest value from a list of arguments
Math.min() to return the number with the lowest value from a list of arguments
Converting Celsius to Fahrenheit

https://www.w3schools.com/js/js_examples.asp



JavaScript Dates

Use Date() to display today's date and time
UsegetFullYear() display the year
Use getTime() to calculate the number of milliseconds since 1970
Use setFullYear() to set a specific date
Use toUTCString() to convert today's date (according to UTC) to a string
Use getDay() to display the weekday as a number
Use getDay() and an array to display the weekday as a name
Display a clock

https://www.w3schools.com/js/js_examples.asp



JavaScript validator

<https://www.piliapp.com/javascript-validator/>

The screenshot shows a browser window with the URL <https://www.piliapp.com/javascript-validator/>. A modal dialog box displays the message "Congrats! Javascript looks fine." with an "OK" button. Below the modal, the page content shows a code editor with the following JavaScript code:

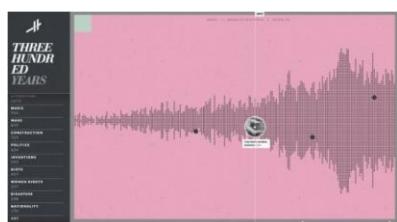
```
document.write(  
"<p><b>Math.E:</b> " + Math.E + "</p>" +  
"<p><b>Math.PI:</b> " + Math.PI + "</p>" +  
"<p><b>Math.SQRT2:</b> " + Math.SQRT2 + "</p>" +  
"<p><b>Math.SQRT1_2:</b> " + Math.SQRT1_2 + "</p>" +  
"<p><b>Math.LN2:</b> " + Math.LN2 + "</p>" +
```

On the right side of the browser window, there is a sidebar titled "Related Links" containing links to PHP code syntax check, MySQL Syntax Check, Regex Tester, and Compress JS and CSS.



Exemple website-uri JavaScript

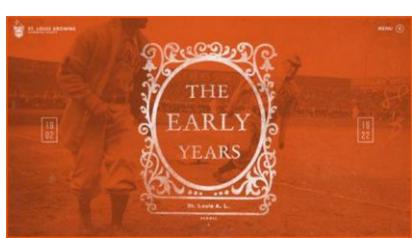
01. [Histogramy](#)



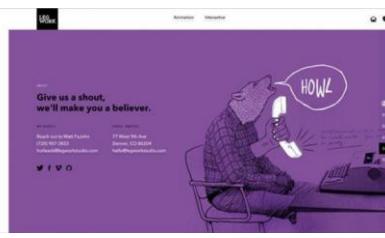
02. [Filippo Bello](#):



03. [The St. Louis Browns](#)



04. [Leg Work Studio](#)





Exemple website-uri JavaScript

<https://dcrazed.com/creative-javascript-examples/>

The screenshot shows a memory game interface. At the top left is a green "SOURCE" button. The main title is "JavaScript memory game". Below it is a descriptive text: "A superb memory game for your inspiration. Take time to play this amazing game which requires you to remember two elements to win the game." To the right of the text is a small graphic of a bar chart. The central feature is a 4x6 grid of cards. Each card has a circular icon on it. The icons include: 1st row - three identical geometric shapes; 2nd row - "jQuery" logo, three identical geometric shapes, "HTML5" logo, "jQuery" logo, three identical geometric shapes; 3rd row - three identical geometric shapes, "jQuery" logo, three identical geometric shapes, "HTML5" logo, three identical geometric shapes; 4th row - three identical geometric shapes, three identical geometric shapes, "jQuery" logo, three identical geometric shapes, "HTML5" logo, three identical geometric shapes.



Exemple website-uri JavaScript

<http://www.schillmania.com/projects/snowstorm/>

The screenshot shows the homepage of the Snowstorm project. At the top center is the title "Snowstorm: A JavaScript Snow Effect for HTML". Below it is a sub-header: "Bringing snow to the web since 2003. This version: 1.44 20131208". There are three links at the bottom of this header: "Change Wind", "Stop Snowing", and "Bonus widget: Smash Christmas Lights". The main content area starts with "Let It Snow.". Below it is a question: "So, you want JavaScript snow on your web site, eh?". A detailed explanation follows: "Snowstorm is a JavaScript-driven snow effect that can be easily added to web pages. It is free for use, and easy to set up. A single-JavaScript file provides the functionality required. No images are used for the snow effect." Then there's a section titled "I'd like to use this on my site." with a note: "This is all you need to get started:". Below that is a code snippet:

```
<script src="snowstorm.js"></script>
```

. A note below the code says: "See this [basic example](#) for reference." Next is a section titled "What kind of things can I customize?". A note below it says: "You can adjust the snow speed, the amount of snow, the "wind", if and where it should stick (and if it should "melt"), and finally, whether, the snow can react to the mouse moving (i.e., "wind changes.") See [Customizing Snowstorm](#) for more." Finally, there's a section titled "And the Christmas Lights?". A note below it says: "The christmas lights are a separate experimental script which also has an [example](#). It is undocumented, but the script can be modified to taste if you're the adventurous type." At the bottom is a "Download" section with a link to a ZIP file: "ZIP file, includes this demo page and source code." and a note: "Snowstorm v1.44 20131208".



Exemple website-uri JavaScript

<https://codepen.io/juliangarnier/pen/idhuG/>

The screenshot shows a 3D Solar System visualization on CodePen. The interface includes three panels: HTML, CSS, and JS. The JS panel displays the following code:

```
$(<window>).load(function() {
    var body = $(<body>),
        universe = $(<#universe>),
        solarSys = $(<#solar-system>);

    var init = function() {
        body.removeClass(<view-3D opening>).addClass(<view-3D>);
        delay(2000).queue(function() {
            $(<html>).removeClass(<hide-UI>).addClass(<set-speed>);
            $(<html>).dequeue();
        });
    };

    var setView = function(view) {
        ...
    };
});
```

The visualization itself shows the Sun and planets in their orbits. Jupiter is currently selected as the view, with its orbital velocity of 47,002 km/h displayed. The interface includes controls for Speed, Size, and Distance.



GRAFICE ON LINE: Am Charts

The screenshot shows the AmCharts website. The main header includes links for DEMOS, DOWNLOAD, BUY, SUPPORT, DOCS, and RESOURCES. Below the header, there's a search bar and a "Smart Editor" button. The main content area features a large 3D line chart showing monthly data fluctuations. Below the chart, there are four sections: "100% responsive", "Extremely Customizable", "Superior Support", and "Accessible".

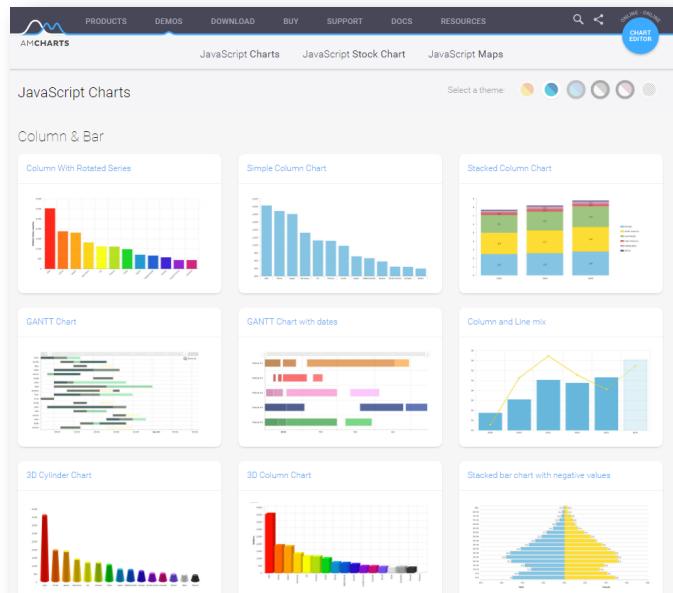
100% responsive: The charts automatically adapt to available space by re-arranging, slizing and copping their elements and controls.

Extremely Customizable: Colors, styles, layout, animations, functionality, events - almost every aspect of the libraries can be customized with config or custom code.

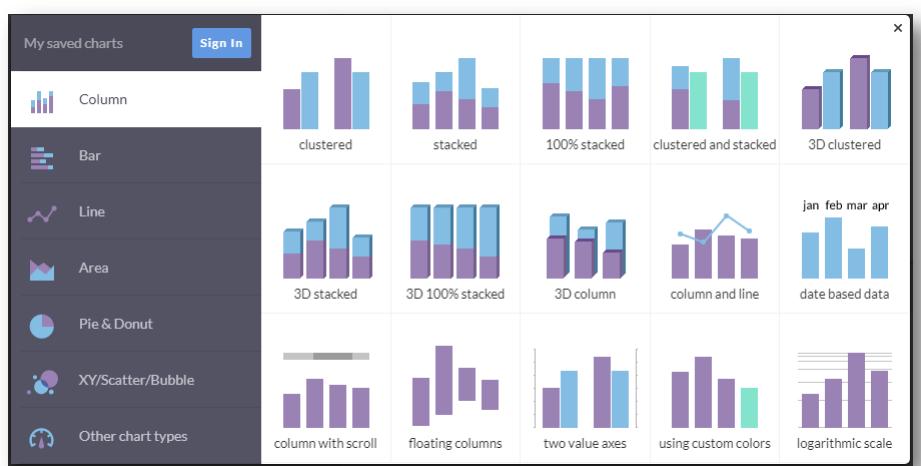
Superior Support: We go out of our way to provide the best support experience to our users. We got your back!

Accessible: It's not just a promise. We did make our software truly accessible by following Section 508, WCAG and community-established techniques.

GRAFICE ON LINE: Am Charts

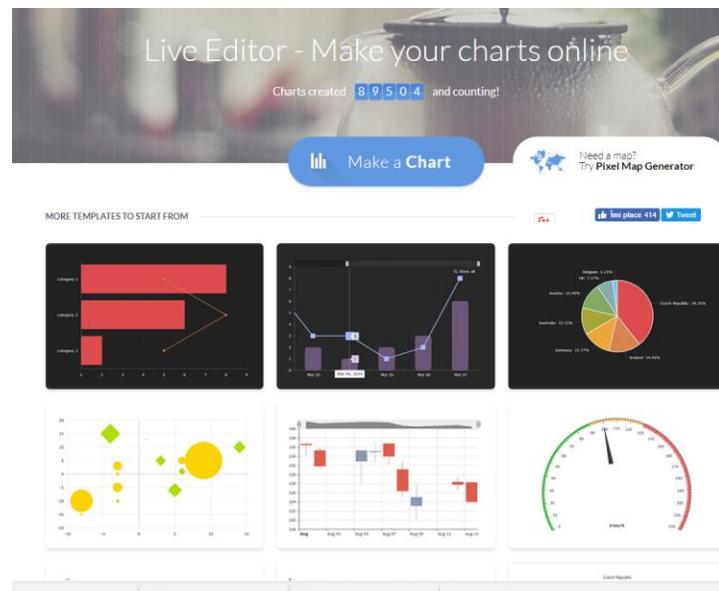


GRAFICE ON LINE: Am Charts

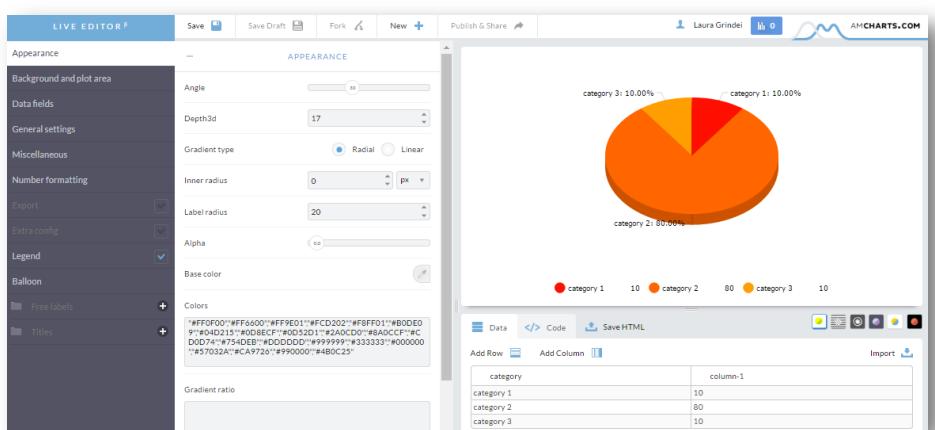




GRAFICE ON LINE: Am Charts



GRAFICE ON LINE: Am Charts





GRAFICE ON LINE: Am Charts

Save HTML

```
<!DOCTYPE html>
<html>
<head>
<title>chart created with amCharts | amCharts</title>
<meta name="description" content="chart created using amCharts live editor" />

<!-- amCharts javascript sources -->
<script type="text/javascript" src="https://www.amcharts.com/lib/3/amcharts.js"></script>
<script type="text/javascript" src="https://www.amcharts.com/lib/3/pie.js"></script>

<!-- amCharts javascript code -->
<script type="text/javascript">
AmCharts.makeChart("chartdiv",
{
    "type": "pie",
    "angle": 29.7,
    "balloonText": "[[title]]  
<span style='font-size:14px><b>[[value]]</b> ([[percents]])%</span>",
    "depth3D": 17,
    "titleField": "category",
    "valueField": "column-1",
    "theme": "default",
    "allLabels": [],
    "balloon": [],
    "legend": [
        {
            "enabled": true,
            "align": "center",
            "markerType": "circle"
        }
    ],
    "titles": [],
    "dataProvider": [
        {
            "category": "category 1",
            "value": 100
        }
    ]
});
</script>
```

Copy to clipboard Save to filesystem



STOCK CHARTS ON LINE: Am Charts

AMCHARTS PRODUCTS DEMOS DOWNLOAD BUY SUPPORT DOCS RESOURCES CHART EDITOR

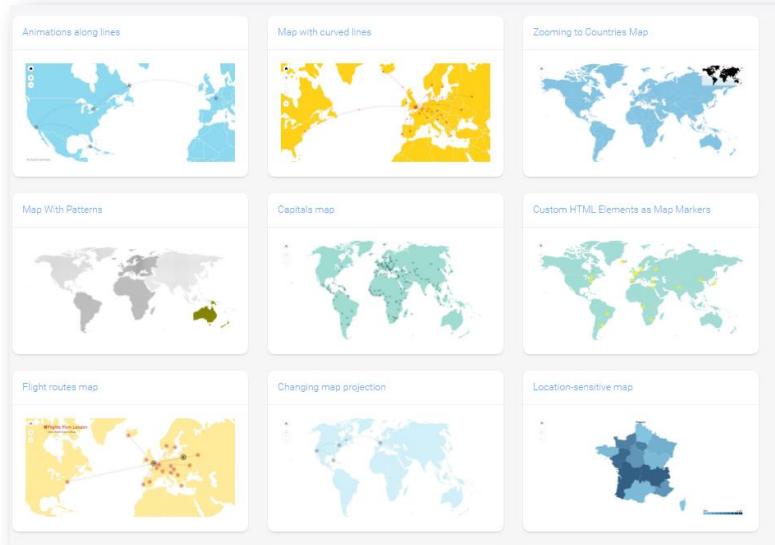
JavaScript Charts JavaScript Stock Chart JavaScript Maps

JavaScript Stock Chart Select a theme:

- Multiple Data Sets
- Comparing stock indices (using external data)
- Stock Events
- Drawing Trend Lines
- Multiple Panels
- Intra-day Data
- Adding and removing panel
- Multi-panel horizon chart



MAPS ON LINE: Am Maps



VISITED COUNTRIES ON MAP ON LINE: Am Maps





MAP ON LINE: Google Maps

1. Go to <https://www.google.com/maps/>
2. Make sure you're signed in – if not click Login button in the top-right corner
3. In the top left corner, click the **menu** icon to expand the menu
- 3.Click "Your Places", "Maps" and then click "Create Map" to edit your map

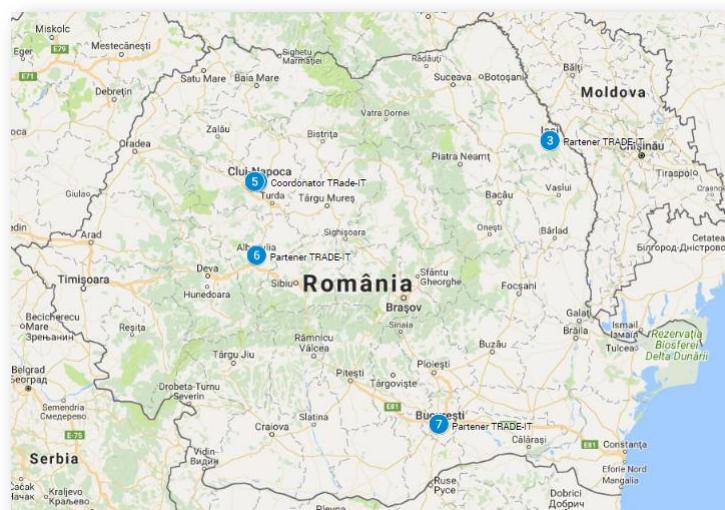
Tutorial:

<https://www.create.net/support/how-to-pin-point-multiple-locations-on-google-maps>



MAP ON LINE: Google Maps

Harta partenerilor proiect Trade-IT





12.7 Inserare harti

Google maps in HTML 5

```
<!DOCTYPE html>
<html>
<body>

<h1>My First Google Map</h1>
<div id="map" style="width:400px;height:400px;background:yellow"></div>

<script>
function myMap() {
    var mapOptions = {
        center: new google.maps.LatLng(46.76, 23.58),
        zoom: 10,
        mapTypeId: google.maps.MapTypeId.HYBRID
    }
    var map = new google.maps.Map(document.getElementById("map"), mapOptions);
}
</script>
<script src="https://maps.googleapis.com/maps/api/js?callback=myMap"></script>
</body>
</html>
```

My First Google Map

Cluj Napoca

104,684 views

SHARE

Untitled layer

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- 📍 Cazino
- 📍 Teatrul Național
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- 📍 Address:
- 📍 Grădina Botanică - Serele
- 📍 Grădina Japoneză
- 📍 Biserica Reformată pe Kogălniceanu
- 📍 Catedrala Calvaria
- 📍 Bastionul Croitorilor

12.7 Inserare harti

Google maps in HTML 5

Embed this map

To embed this map in your own website, copy the following HTML and paste it in the source code for your page:

```
<iframe src="https://www.google.com/maps/d/embed?mid=1lebEObFn7OscaZR7duxSuNZCmyk&hl=en" width="640" height="480"></iframe>
```



INSTRUMENTE GRATUITE CLICKABLE MAPS

HOME NORTH AMERICA SOUTH AMERICA EUROPE ASIA AFRICA AUSTRALIA WORLD

FREE HTML5 MAPS

CREATE YOUR OWN FREE WEBSITE

Browsing the "Europe" Category

Free Responsive HTML5 Continents Map

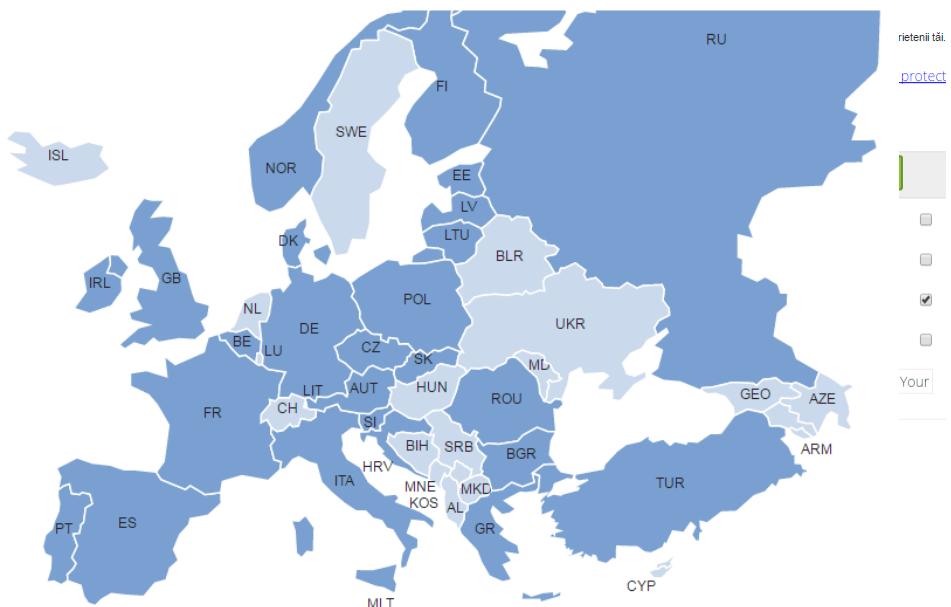
13 May 2017 Posted by freehtml5maps 0 Comment

Free HTML5 map of the continents. This SVG map uses the raphaelJS javascript library to render the map in SVG or VML, so it works in all major browsers including IE7 and IE8. It does not require the Flash...

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INFORMATION BY COUNTRY





Curs: TEHNOLOGII MODERNE DE PROIECTARE A APlicatiilor MULTIMEDIA

INSTRUMENTE COMERCIALE CLICKABLE MAPS

The screenshot shows a web-based application for creating clickable maps. At the top, there's a navigation bar with links for 'Maps', 'FAQ', and 'Contact', along with social media sharing icons. Below the navigation is a horizontal menu with icons for the United States, United Kingdom, Australia, Canada, France, and Germany. The main content area features a map of Romania divided into regions: Maramures, Crișana, Transilvania, Banat, Olténia, Muntenia, and Dobrogea. Each region is highlighted in blue. A modal window is overlaid on the map, containing the text: 'This is a premium map' with a link to 'Pay 15\$ with Paypal' and another link to 'Pay 15\$ with card'. Below these buttons are payment method icons for VISA, MasterCard, and American Express. The bottom right corner of the modal has a close button ('X').