Universitatea Tehnică din Cluj-Napoca
Facultatea de Inginerie Electrică

CURS Master

Tehnologii moderne de proiectare a aplicatiilor multimedia

CAP.8. LIMBAJUL JavaScript

CUPRINS

8.1. Introducere

8.2. Elemente Limbaj JavaScript

8.3. Instructiuni

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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

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8.1. Introducere

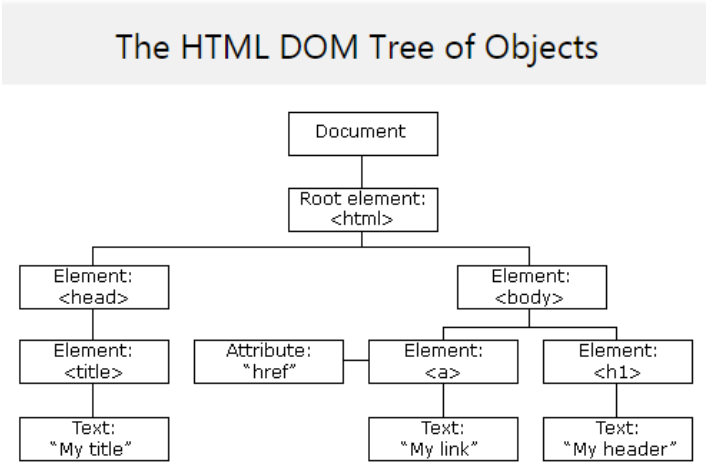
JavaScript: limbaj de scripting client-side (ruleaza la nivelul browser-ului)

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



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8.1. Introducere

Utilizand DOM, JavaScript: poate creea 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 reactiona la orice eveniment HTML din pagina
- Poate creea noi evenimente HTML in pagina

Caracteristici JScript

Javascript permite:

- executia scripturilor la nivelul browerului
- 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

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Inserarea codului JavaScript in pagina

- Prin tag-ul <script>

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

unde: Atributul type stabileste 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>
```

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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 in 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>
```

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Inserarea codului JavaScript in pagina

JavaScript se poate insera:

a) Intern in documentul HTML

- Atât in <head> cât şi în <body>
- funcţiile JavaScript se definesc de regulă în <head>
- Codul JavaScript din <body>se va executa în momentul in care este incarcata pagina in browser

b) **Extern** intr-un fisier cu extensia .js

Avantaj: fisierul poate fi inclus in mai multe pagini HTML

Ex. Includere in document HTML in sectiunea <head>:

```
<script type="text/javascript" src="/cale/numefiser.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)

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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

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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 }

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Instructiuni ciclare

- **Instructiunea for**

for (expr_i;conditie; expresie_reitializare) 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>
```

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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

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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]);
}
```

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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>
```

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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>
```

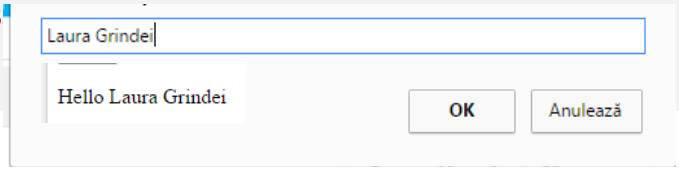
Creeare ferestre pop-up JavaScript

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 utilzator . Pentru "Cancel“, returneaza null.

Exemplu :

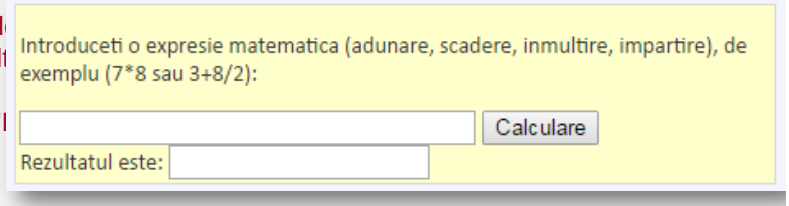
```
<script type="text/javascript">
 x=prompt (“Laura Grindei”, “ ”)
document.write(“S
</script>
```



Exemple JavaScript: creare ferestre

Exemplu : interfata calculator

```
script type="text/javascript">
function cal
  form.rezult
}
eval("alert('I
</script>
<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.

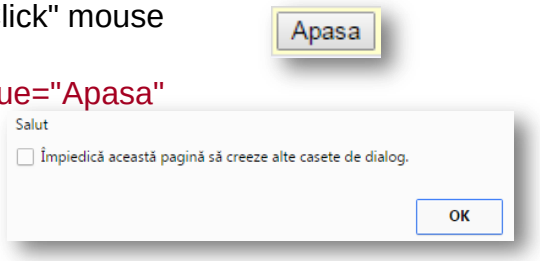
Se pot configura actiuni la detectarea de evenimente

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>
```



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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

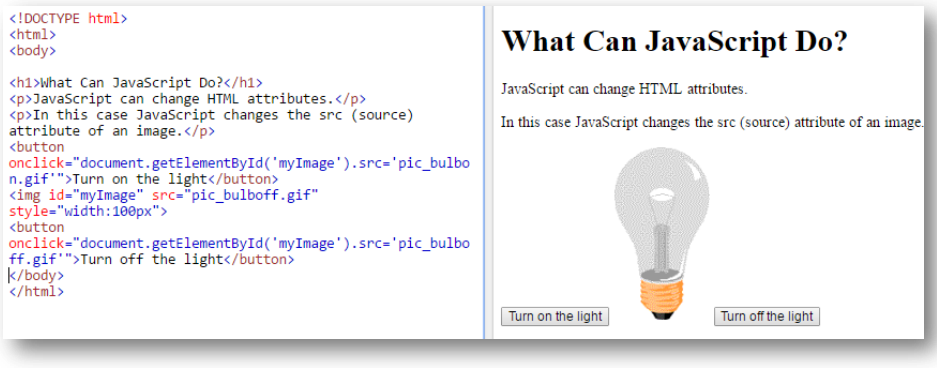
Evenimente ale formularelor :
-onsubmit
- onreset
- onchange
- onselect
- onclick
- onblur
- onfocus

Evenimente ale tastelor
- onkeydown
- onkeyup
- onkeypress

Alte exemple JavaScript

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

<h1>What Can JavaScript Do?</h1>
<p>JavaScript can change HTML attributes.</p>
<p>In this case JavaScript changes the src (source)
attribute of an image.</p>
<button
onclick="document.getElementById('myImage').src='pic_bulbo
n.gif'">Turn on the light</button>
<img id="myImage" src="pic_bulboff.gif"
style="width:100px">
<button
onclick="document.getElementById('myImage').src='pic_bulbo
ff.gif'">Turn off the light</button>
</body>
</html>
```



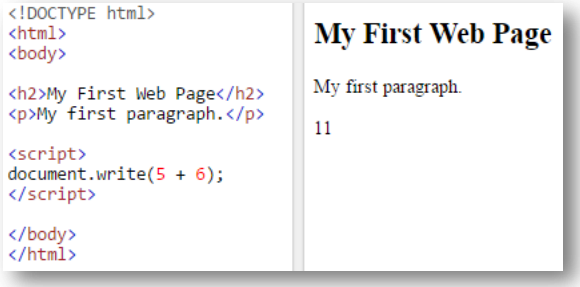
Afisarea rezultatului unei expresii: in pagina web

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

<h2>My First Web Page</h2>
<p>My first paragraph.</p>

<script>
document.write(5 + 6);
</script>

</body>
</html>
```



Afisarea rezultatului unei expresii: in alta fereastra

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

<h2>My First Web Page</h2>
<p>My first paragraph.</p>

<script>
window.alert(5 + 6);
</script>

</body>
</html>
```

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

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JavaScript Dates

Use Date() to display today's date and time
Use getFullYear() 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 Arrays

Create an array
Join two arrays - concat()
Join three arrays - concat()
Join all elements of an array into a string - join()
Remove the last element of an array - pop()
Add new elements to the end of an array - push()
Reverse the order of the elements in an array - reverse()
Remove the first element of an array - shift()
Select elements from an array - slice()
Sort an array (alphabetically and ascending) - sort()
Sort numbers (numerically and ascending) - sort()
Sort numbers (numerically and descending) - sort()
Sort numbers (alphabetically and numerically) - sort()
Sort numbers in random order - sort()
Sort objects by numeric properties - sort()
Sort objects by string properties - sort()
Add an element to position 2 in an array - splice()
Convert an array to a string - toString()
Add new elements to the beginning of an array - unshift()

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

Alte exemple JavaScript

Button Object

Disable a button
Find the name of a button
Find the type of a button
Find the value of a button
Find the text displayed on a button
Find the id of the form a button belongs to

Form Object

Submit a form
Reset a form

Find the value of each element in a form
Find the accepted character set of a form
Find the action attribute of a form
Find the value of the enctype attribute in a form
Find the number of elements in a form
Find the method for sending form data
Find the name of a form
Find the target of a form

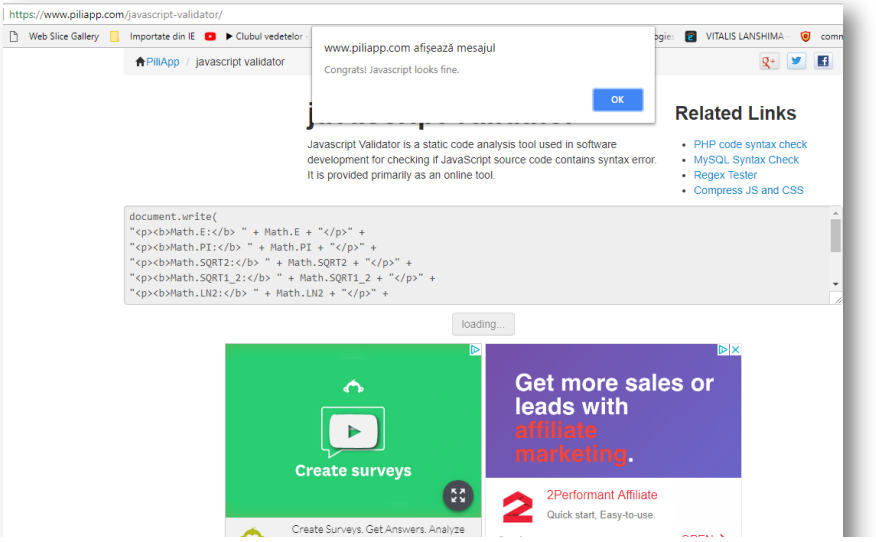
Window Object

Open a new window when clicking on a button
Open a new window and control its appearance
Blur and Focus a new window
Close the new window
Checks whether the new window has been closed or not
Write some text to the source (parent) window
Move the new window relative to its current position
Move the new window to the specified position
Print the current page
Resize a window by the specified pixels
Resize a window to a specified size
Scroll the content by the specified number of pixels
Scroll the content to a specified position

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

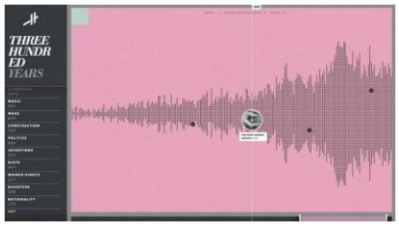
JavaScript validator

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



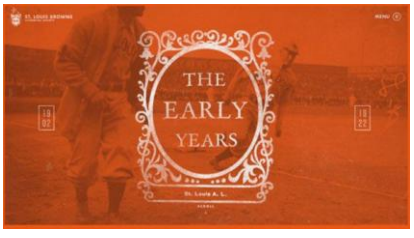
Exemple website-uri JavaScript

01. Histography

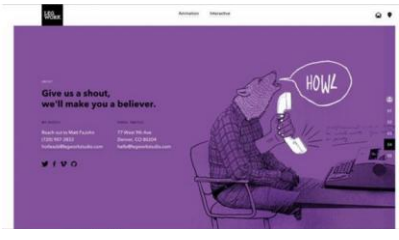


02. Filippo Bello:

03. The St. Louis Browns

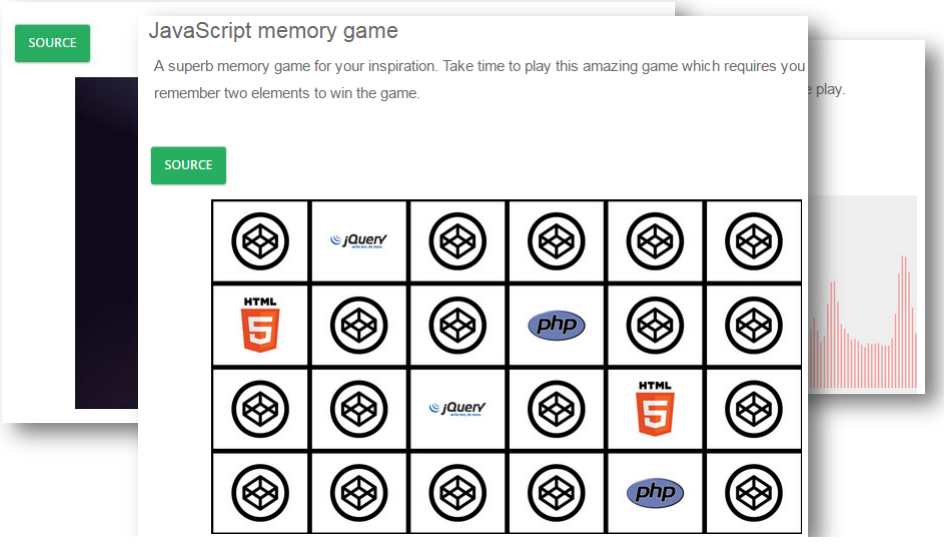


04. Leg Work Studio



Exemple website-uri JavaScript

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



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Exemple website-uri JavaScript

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

Exemple website-uri JavaScript

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

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GRAFICE ON LINE: Am Charts

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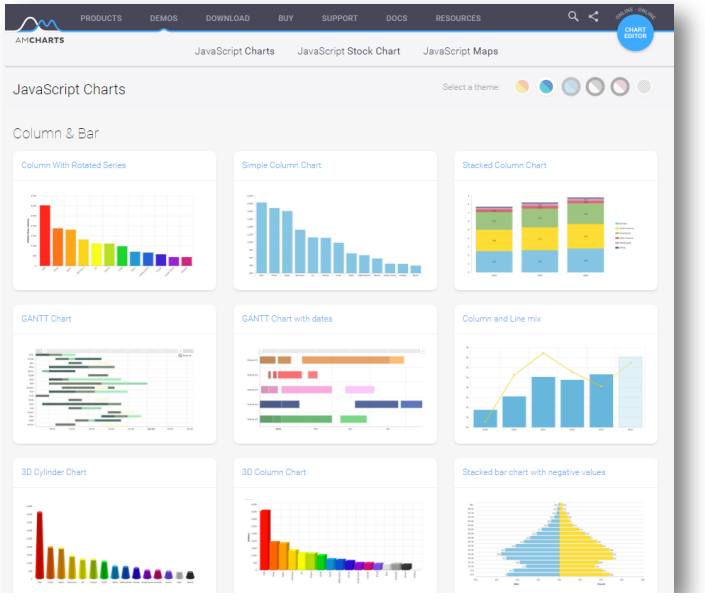

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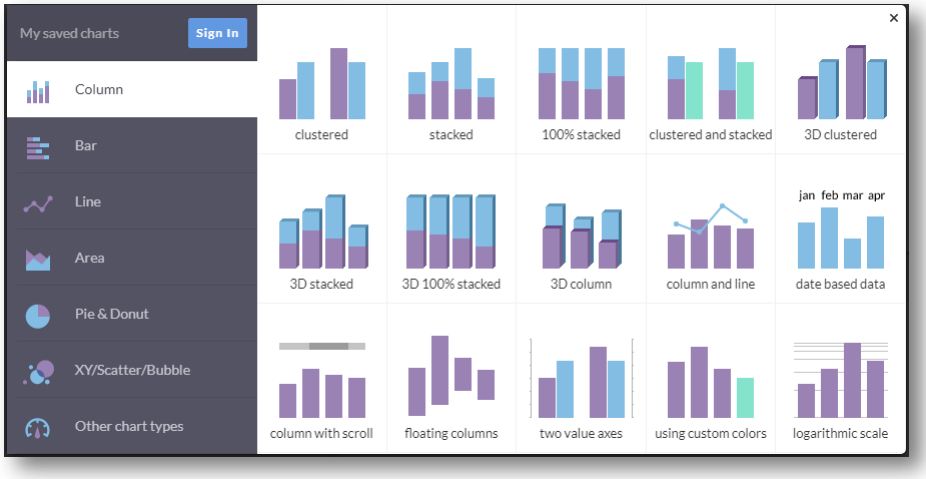
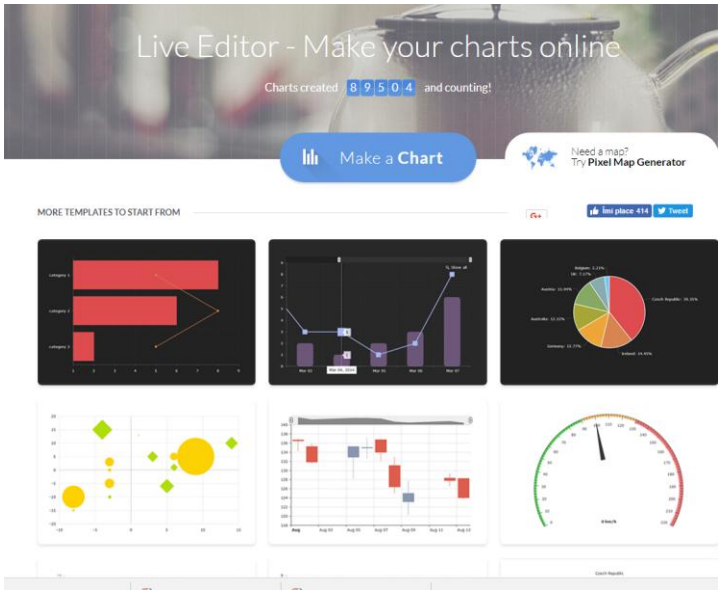
GRAFICE ON LINE: Am Charts



GRAFICE ON LINE: Am Charts



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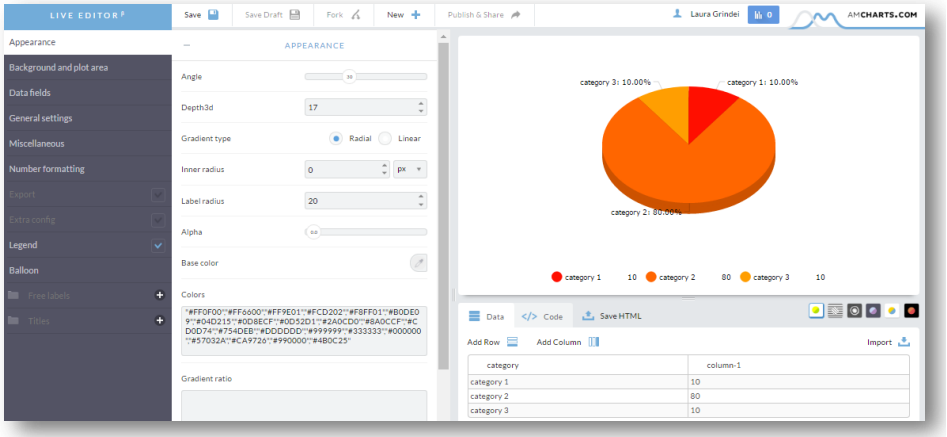
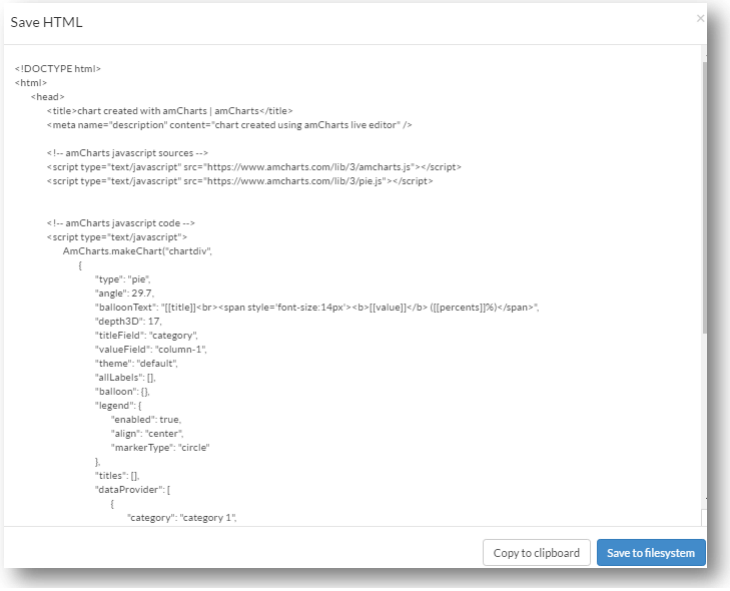
GRAFICE ON LINE: Am Charts

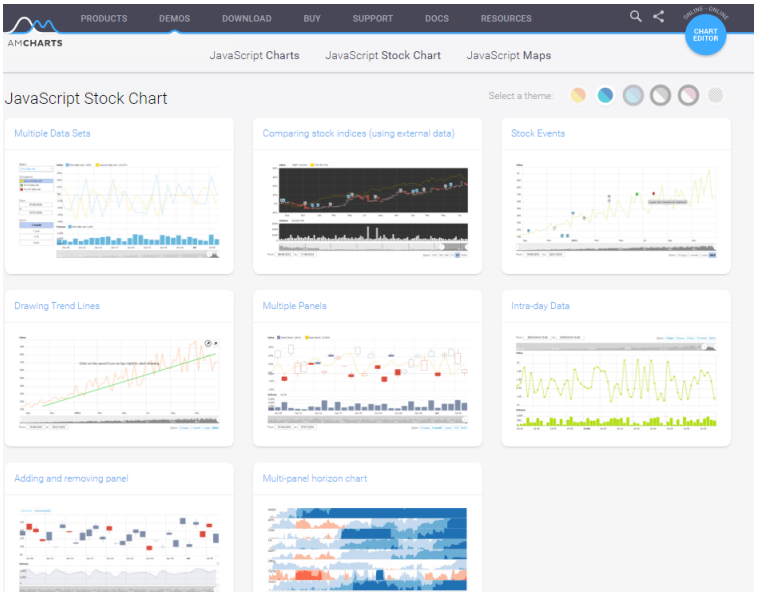


GRAFICE ON LINE: Am Charts

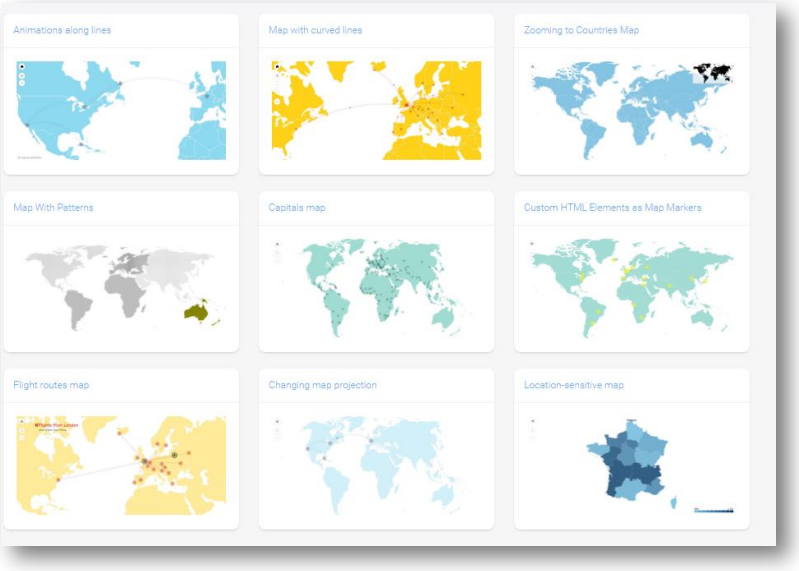


Curs: TEHNOLOGII MODERNE DE PROIECTARE A APLICATIILOR MULTIMEDIA

STOCK CHARTS ON LINE: Am Charts



MAPS ON LINE: Am Maps



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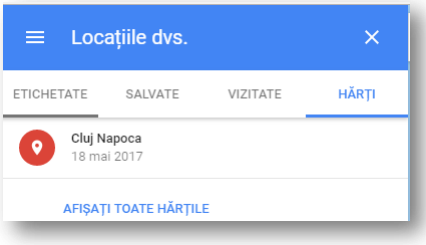
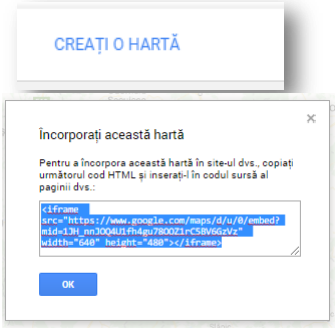
VISITED COUNTRIES ON MAP ON LINE: Am Maps

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

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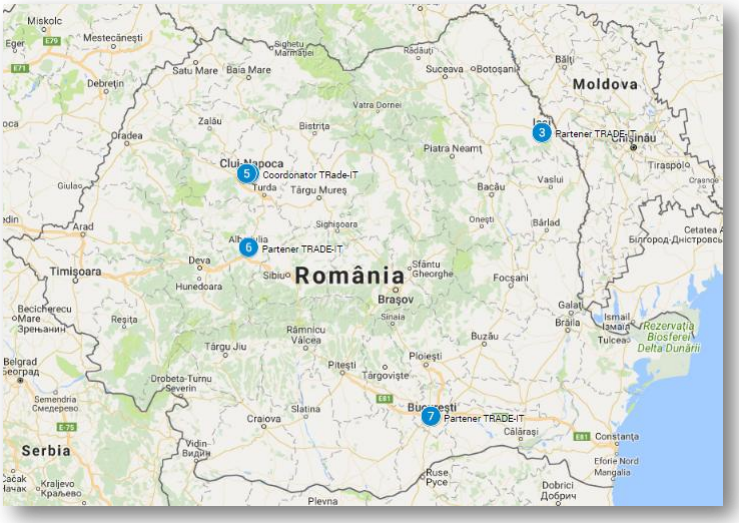
MAP ON LINE: Google Maps

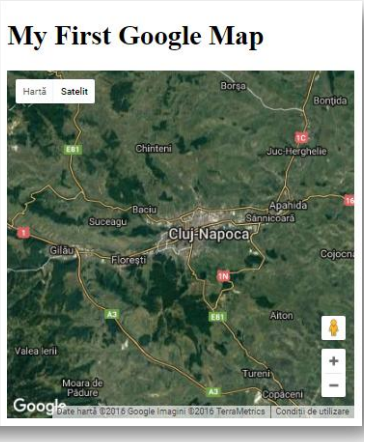
Harta partenerilor proiect Trade-IT



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>
```



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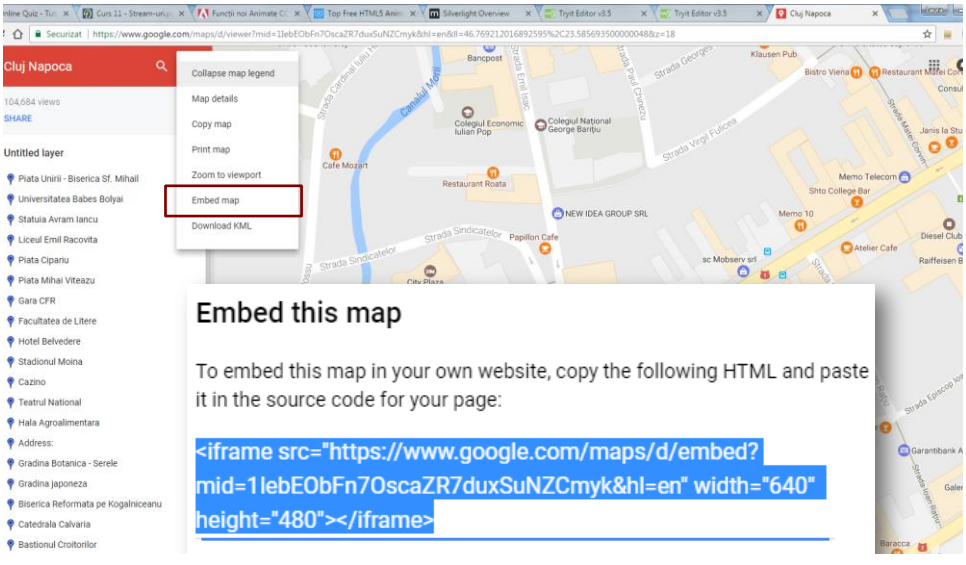
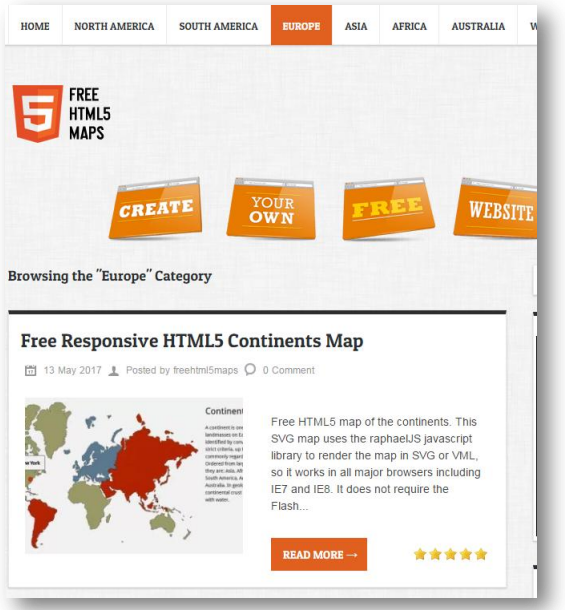
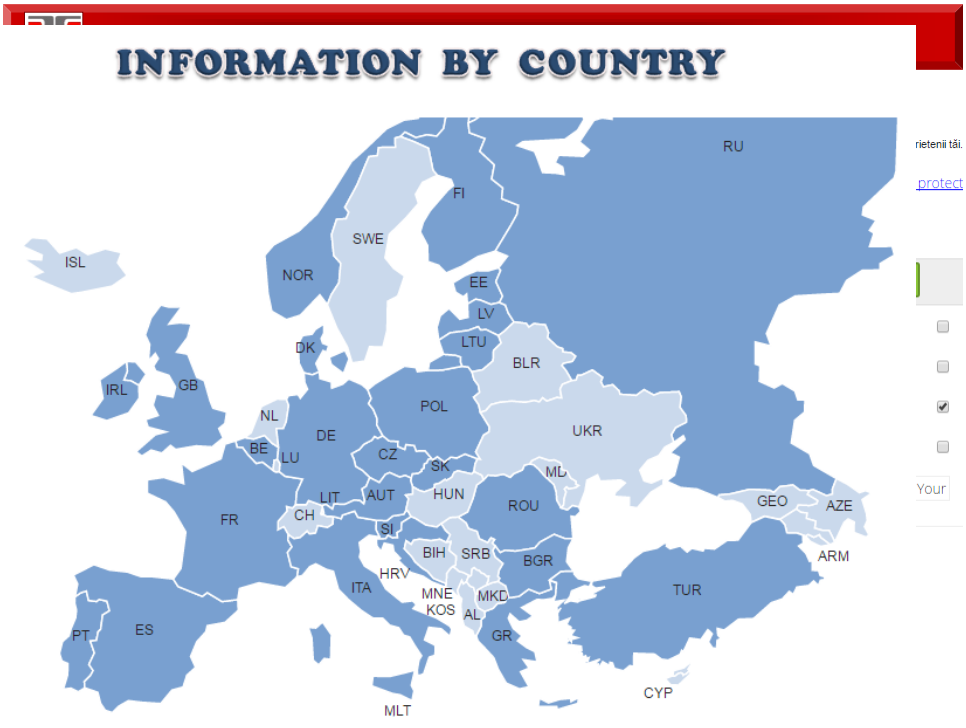
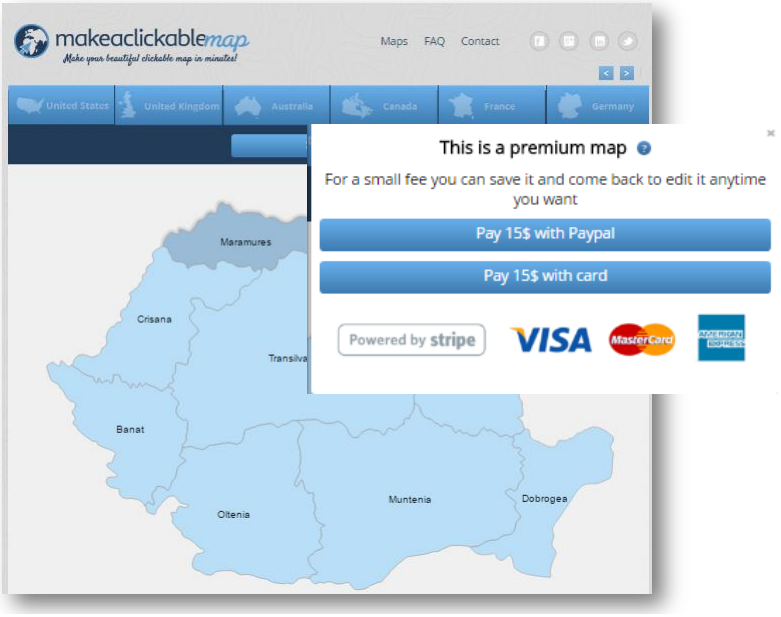
12.7 Inserare harti

Google maps in HTML 5



INSTRUMENTE GRATUITE CLICKABLE MAPS





INSTRUMENTE COMERCIALE CLICKABLE MAPS