Guidelines for implementation

laboratory work No. 4 on the course " Web technologies"

**side scripting languages. Javascript**

**The purpose of the work** : to gain experience in writing and using functions in the JavaScript language .

**Rules for assessing works**

Completing the basic task is worth a maximum of 6 points. To get 10 points for the work, you must complete all the points in the "Extended Task" section.

Points will be deducted from the maximum possible grade in the following situations:

1. **Deadline.** The report is posted in the personal account after the deadline - minus 1 point every 2 weeks from the date recorded in the personal account. The date of the defense does not affect;
2. **Defense.** "Gaps" in knowledge during the oral defense of the work: "good" grade - minus 1 point, "satisfactory" grade - minus 2 points;
3. **Report.** The report contains minor violations of requirements - minus 1 point, several report items are missing - minus 2 points or more;
4. **Work.** The completed task lacks minor elements - minus 1 point, several points of the task are missing - minus 2 points or more.

Protection of work is possible only if there is a report in the personal account.

**Basic task**

Prepare several scenarios for the tasks below. All scenarios should be embedded into the site from Lab 2. It is prohibited to create a separate page for this work.

The options in Table 1 define the implementation methods (event type, scenario inclusion method, element selection method on the page, function design) of ALL scenarios.

Method view ( getElementsBy Class Name , getElementsByName , getElementsByTagName ) specified by the option MUST be applied to the majority of all instances of accessing elements on the page.

Deviations from the implementation methods specified by the option must be described in the report in the "Conclusions" section.

Tasks for which you need to write scripts:

1. Calling a pop-up window with the full name and group of the site author
2. Add a scenario according to the option from Table 1 (column "scenario")
3. Add an empty row to the table prepared in work 1
4. Change the color of any element that was created during Lab 1.
5. Change the size of an element of any element that was created during Lab 1.

**Extended task**

1.. When adding a row to the table created during lab work number 1, to fill the cells, take the data entered by the user into the interface elements ( input )

2.. Delete only the table rows added via the script (task in point 1)

3.. Apply lambda (arrow) function

4.. Use browser window events (loading, moving, scrolling)

5.. Make a function with several parameters and show its application

6.. Use addEventListener

7.. Add and remove list item

**Contents of the report**

1. front page;
2. purpose of work;
3. assignment option;
4. table with columns: function name; event that calls the function; description of the function action
5. JavaScript function texts
6. screenshots of the site pages demonstrating the operation of all functions
7. HTML code
8. Conclusions on the work: analysis of the features of the application of technical means specified by the option; description and justification of deviations from the requirements of the option.

**JavaScript client-side scripting language**

**Inserting Scripts**

There are three ways to include a script in the text of an HTML document:

1. The script is written inside a paired <script> tag . It can be placed anywhere, but it is preferable to place it in the <head> section .

< script type ="text/ javascript ">

prompt (' This is dialogic prompt window ', '' ) </script>

1. The script is located in a separate text file, which is included via the <script> tag .

< script type = “text/ javascript ” src = “filename.js”> </script>

1. The script is written as the value of an event attribute inside the page element tag:

< img src = “ im.png” onclick = “alert ('Hi')”>

The location of the script affects the order in which it is executed.

**javascript functions​**

Functions are combinations of several lines of JavaScript code and can be called from any part of the web page. Functions are defined in the web page in special <script> tags .

function keyword and a parameter list in parentheses. The parameter list contains the names of variables that provide input values. If input data is not needed, the parentheses are left empty. The function body is placed between curly brackets. If it is necessary to return the result of the function, the return operator ( return variable) is used.

There are two options for formatting a function header:

1. Traditional description:

function function\_name (parameter list)

{ function body }

function jsfunction ()

{ confirm ('This is a confirm dialog box .') ; }

1. Anonymous function - the function has no name, but is bound to a variable.

Variable = function ()

{ function body }

An anonymous function is called through a variable name.

sum = function( a,b )

{return a+b ;}

**Events and their handlers**

Events are software notifications generated by the browser in response to user actions. For example, when the user clicks the mouse , a click event occurs ; when a keyboard key is pressed, a keypress event occurs .

Event handlers are used to process events. The handler name consists of the on prefix and the event name. For example, the mouse button click handler is onclick , the keyboard key press handler is onkeypress . To assign the f () function as a click event handler that occurs when a button is pressed , you need to write the following in the HTML code:

<button onclick =”f ();”> Click me !</button>

If you click on this button, the f () function will be called .

**Comments on Listing 1**

The script describes the sum function , which is called by pressing the button with the inscription “I will solve the problem!” (< button onclick = " summ ()">). After entering numbers in the prompt window , the strmm variable contains a string of numbers separated by spaces. Using the split () string method after splitting by spaces, you can get an array of strings ( mm = strmm . split (" ")). The getElementsByTagName () document method returns **an array** ( el ) of all page elements with a given tag (with a span tag in this case). To access a single element, you need to use the array index ( el [0]).

Using the innerHTML element property , you can change the appearance and content of this tag. line

el[ 0]. innerHTML = "<b style='font-size:14;color:green;'>"+mm +"</b>"

a new design is installed and the array is displayed on the screen.

When performing operations on an array, we need to convert strings to numbers. That's why we use the Number () function.

Using a line

< div style =" width : 100%; height : 3 px ; background - color : #97070 B ;"></ div >

a line is displayed on the screen.

**Listing 1. An html document with a script that solves the array problem.**

< html > < head >

< title >Example of working with an array</ title >

< script >

function summ ()

{ strmm = prompt ("Enter array elements separated by spaces.");

mm = strmm.split (" ")

el= document.getElementsByTagName ("span")

el[ 0]. innerHTML = "<b style='font-size:14;color:green;'>"+mm +"</b>"

var ss=0;

for( var i =0; i < mm.length ; i ++)

ss += Number(mm[ i ]);

el[ 1]. innerHTML = "<b style='font-size:14;color:green;'>"+ss +"</b>" }

</ script > </ head >

< body >

Task: find the sum of the array elements.< br >

<div style="width: 100%; height: 3px; background-color: #97070B;"></div>< br >

entered array : <span ></span>< br >

sum elements : <span ></span>< br >< br >< br >

<button onclick = " summ ( )"> i I will decide task !</button>

</ body ></ html >

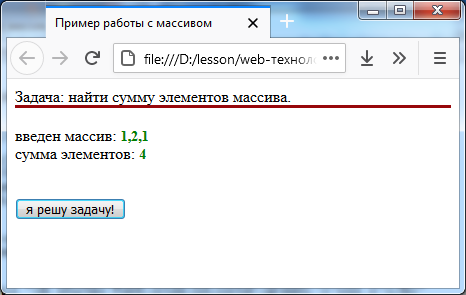


Fig. 1 Example of javascript script operation . Listing 1

**Example of working with scripts and functions**

The example demonstrates:

- working with dialog boxes alert (), confirm (), prompt ();

- different ways to include a javascript script in an html document ;

- different ways of designing a function

**Listing 2** . File jspodkluchenie.htm

<html><head> <title> Script+function </title>

< script type ="text/ javascript ">

prompt (' This is dialogic prompt window . I have an input box and two buttons.\ n From the script in the script tag ', '') </ script >

<script type= "text/javascript" src = "myfilejs.js"> </script>

<script type= "text/javascript">

function mult (a,b) {return a\*b}

summa = function(a,b)

{return a+b;} </script>

</head>

< body > < h 1 > Methods of connecting the script </ h 1 >

< button onclick = " alert ('This is an alert dialog from the script after the event attribute.\ n I have one OK button .')">

script after attribute-event</ button > < br >< br >

<button onclick = " jsfunction ( )"> call functions from file </button>

< h 1>Ways to write a function</ h 1>

< button onclick = " alert ( 'Multiplication result: ' + String ( mult (5,10))) "> function call with parameters</ button > < br >< br >

< button onclick = " alert ( 'Addition result: '+ String ( summa (2,4)))"> anonymous function called via variable</ button >

</ body > </ html >

**Listing 3** . The myfilejs file . js

function jsfunction ()

{confirm(' This is dialogic confirm window . I have two buttons.\n Calling a function from a file') ; }

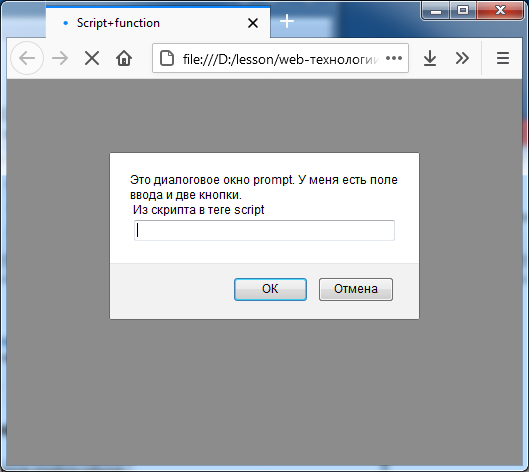


Fig. 2 Executing the script from Listing 2.

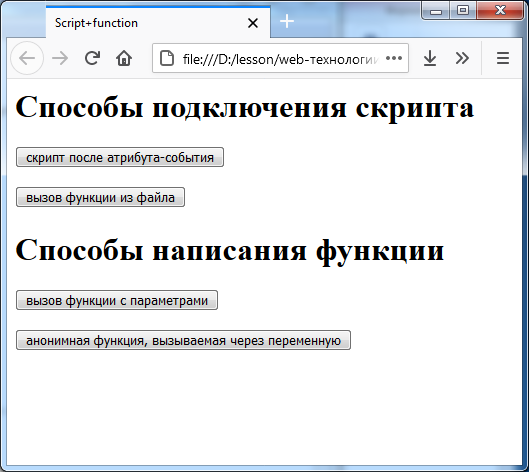


Fig. 3 Displaying the html document from Listing 2

**Script examples**

HTML document code fragment

<input type="button" onclick=" left\_ arrow ( )" value=" Back "/>

<img src = "DSC05853.JPG" width = "60" height = "40" id = "img" > </img>

<input type="button" onclick="right\_arrow()" value="Вперед"/>

Листинг 5. Галерея. Фрагмент кода скрипта

var mas = ["DSC05853.JPG","DSC05854.JPG","DSC05855.JPG","DSC05856.JPG"]

// array of images

var to = -1; // Counter pointing to the current image

function right\_ arrow ( ) // Open the next picture (move to the right)

{ var obj = document.getElementById (" img ");

if (to < mas.length -1) to++ else to = 0;

obj . src = mas [ to ]; }

function left\_ arrow ( ) // Open the previous image (move left)

{ var obj = document.getElementById (" img ");

if (to > 0) to--; else to = mas.length-1;

obj.src = mas[to ]; }

Listing 6. Clock

<html><head>

<script type= "text/javascript">

var tmrid;

function bigben ()

{ var datecur, hour, minute; var time ="";

datecur = new Date();

hour = datecur.getHours();

minute= datecur.getMinutes();

sec = datecur.getSeconds();

time = ((hour <10) ? "0" : "" ) + hour+"\_";

time += ((minute <10) ? "0" : ":\_" ) + minute;

time += ((sec <10) ? "0" : ":\_" ) + sec;

tmr = document.getElementById ('tmr');

tmr.innerText = time;

}

</script> </head>

<body> <h1> Time now : <span id = "tmr"> </span> </h1>

<button onclick = " bigben ( )"> I 'll show you time </button> </body> </html>

Table 1. **Task options**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Event** | **How to enable the script** | **Search for an element** | **Function design** | **Scenario** |
| 1 | click | <script> tag​ | getElementsByClassName​​ | with the name | 1 |
| 2 | mouseover | <script> tag​ | getElementsByTagName | with the name | 2 |
| 3 | dbl click | <script> tag​ | getElementsByName | with the name | 3 |
| 4 | keydown | <script> tag​ | getElementsByClassName​​ | with the name | 4 |
| 5 | dbl click | <script> tag​ | getElementsByTagName | with the name | 5 |
| 6 | mouseover | <script> tag​ | getElementsByName | with the name | 6 |
| 7 | dbl click | <script> tag​ | getElementsByClassName​​ | with the name | 7 |
| 8 | keydown | <script> tag​ | getElementsByTagName | anonymous | 8 |
| 9 | click | <script> tag​ | getElementsByName | anonymous | 1 |
| 10 | mouseover | <script> tag​ | getElementsByClassName​​ | anonymous | 2 |
| 11 | dbl click | <script> tag​ | getElementsByTagName | anonymous | 3 |
| 12 | keydown | <script> tag​ | getElementsByName | anonymous | 4 |
| 13 | dbl click | <script> tag​ | getElementsByClassName​​ | anonymous | 5 |
| 14 | mouseover | <script> tag​ | getElementsByTagName | anonymous | 6 |
| 15 | dbl click | <script> tag​ | getElementsByName | anonymous | 7 |
| 16 | keydown | file | getElementsByClassName​​ | with the name | 8 |
| 17 | click | file | getElementsByTagName | with the name | 1 |
| 18 | mouseover | file | getElementsByName | with the name | 2 |
| 19 | dbl click | file | getElementsByClassName​​ | with the name | 3 |
| 20 | keydown | file | getElementsByTagName | with the name | 4 |
| 21 | dbl click | file | getElementsByName | with the name | 5 |
| 22 | mouseover | file | getElementsByClassName​​ | with the name | 6 |
| 23 | mousemove | file | getElementsByTagName | anonymous | 7 |
| 24 | keydown | file | getElementsByName | anonymous | 8 |
| 25 | click | file | getElementsByClassName​​ | anonymous | 1 |
| 26 | mouseover | file | getElementsByTagName | anonymous | 2 |
| 27 | mousemove | file | getElementsByName | anonymous | 3 |
| 28 | keydown | file | getElementsByClassName​​ | anonymous | 4 |
| 29 | dbl click | file | getElementsByTagName | anonymous | 5 |
| 30 | mouseover | file | getElementsByName | anonymous | 6 |

Tasks for the script

1. A watch that shows the time in three different time zones
2. A clock that displays time in the format: it is now 19:20
3. A clock in which the numbers on even minutes are colored red and on odd minutes they are colored blue.
4. A clock that shows the time immediately after the page loads
5. A clock that constantly shows the hour and minutes. The seconds are shown after pressing the button.
6. A gallery whose images change on a timer.
7. Gallery with buttons for switching between images and captions for each image.
8. Text movement from left to right.

Distribution of options for laboratory work No. 4 in the course " Web technologies"

spring 2025

Distribution of options for laboratory work 3 in the course " Web technologies"

Spring 2025

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| --- | --- | --- |
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| 2 | Alin Daniil Sergeevich | Kozlov Anton Vyacheslavovich |
| 3 | Beldenko Sofia Eniseevna | Konovalova Anastasia Vasilevna |
| 4 | Vasiliev Svyatoslav Sergeevich | Kostylev Vladimir Antonovich |
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| 9 | Kashkolda Roman Sergeevich | Lavrov Svyatoslav Aleksandrovich |
| 10 | Kirillov Ruslan Yurevich | Lapin Yaroslav Anatolievich |
| 11 | Kozlov Artem Borisovich | Mayorov Arseniy Andreevich |
| 12 | Kozyrev Nikita Aleksandrovich | Andrey Vladimirovich Matveev |
| 13 | Kondratyev Kirill Vadimovich | Grigory Petrovich Matyushkov |
| 14 | Kochemirov Maksim Alekseevich | Makhmudova Milena Ilyasovna |
| 15 | Ovchinnikova Liliya Nikolaevna | Melnik Matvey Ilyich |
| 16 | Potapov Sergey Antonovich | Mikhailov Daniil Igorevich |
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| 13 | Mazur Bogdan Vladislavovich | Chemodanova Victoria Nikolaevna |

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| 3 | Gozhev Dmitry Sergeevich |  |
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| 11 | Stadnik Evgeniy Petrovich |  |
| 12 | Erkinov Donior Bakhtior Ugli |  |

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| 8 | Nazarova Daria Vadimovna |  |
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