

ZadGen

- Generating interactive knowledge check-ups tool -

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Introduction

The *IDIaSU* project is project for creating interactive multimedial digital content on proportionality, percentage and interest account. To meet the needs of the *IDIaSU* project it was necessary to create different knowledge check-ups which would be generated on Web pages. The basic concept of this type of knowledge check-ups was:

- to be executed on the owner's computer;
- enable creation of the so-called assignment templates, where parts of the assignments will be fix, whereas they will be parameters that will be generated randomly out of a certain defined set of values or out of a certain interval of value (in case it is about numerical values);
- knowledge check-up is gotten by random choice of a defined number of templates, where certain variable parts are generated themselves directly before printing of the check-up on the Web page;
- enable automatic evaluation.

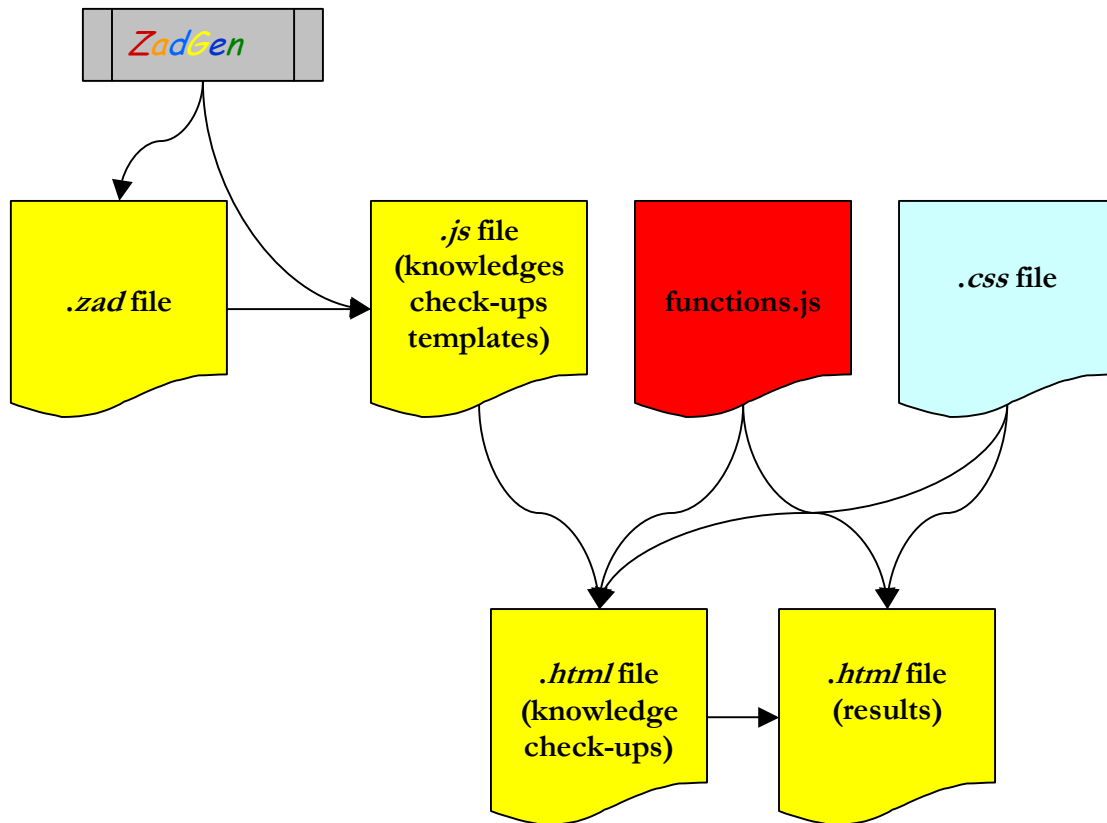
Creating knowledge check-ups in JavaScript imposed itself as the most acceptable solution considering the mentioned limitations and demands.

What is *ZadGen*?

ZadGen is tool which enables interactive knowledge check-up creating. Through simple and intuitive users interface, this tool enables quick creating of Web pages with dynamic knowledge check-ups.

How does *ZadGen* work?

The basis of this tool is a set of functions created in JavaScript. The *ZadGen* program creates the assignment templates combining of the existing functions. Program menu assigns instructions to the functions. Therefore, the *ZadGen* creates several various documents.



- *.zad* document is the original **ZadGen** document which reads the program directly and enables assignment templates creation and modification;
- *.js* document is a JavaScript document which contains assignment templates; it is a document which we referred to directly from off the Web pages;
- *.html* document – here we have two html documents
 - o *.html* document for knowledge check-up creating – referred to the document with check-ups (which we had created with the tool) and document with the functions;
 - o *.html* document for listing knowledge check-ups results – referred to the document with the JavaScript functions;
- *.css* document contains defined formats for certain knowledge check-ups elements.

How to create knowledge check-up with the **ZadGen**?

To illustrate how the tool works, we will make a simple math knowledge check-up (adding, subtracting and multiplying of integers).

Before creating the check-up we make a concept:

1. task – only sum, difference or product of two integers (exp. $3*8$)
2. task – two different operations combination (exp. $12*4 + 36$ or $12 - 13 + 14$)
3. task – word task (exp. Which number is greater then 18 by 15?)

In the first task, we are going to choose among the given solutions in order to find the correct one, while in the rest of the tasks we are going to insert the solution in the textbox created for it.

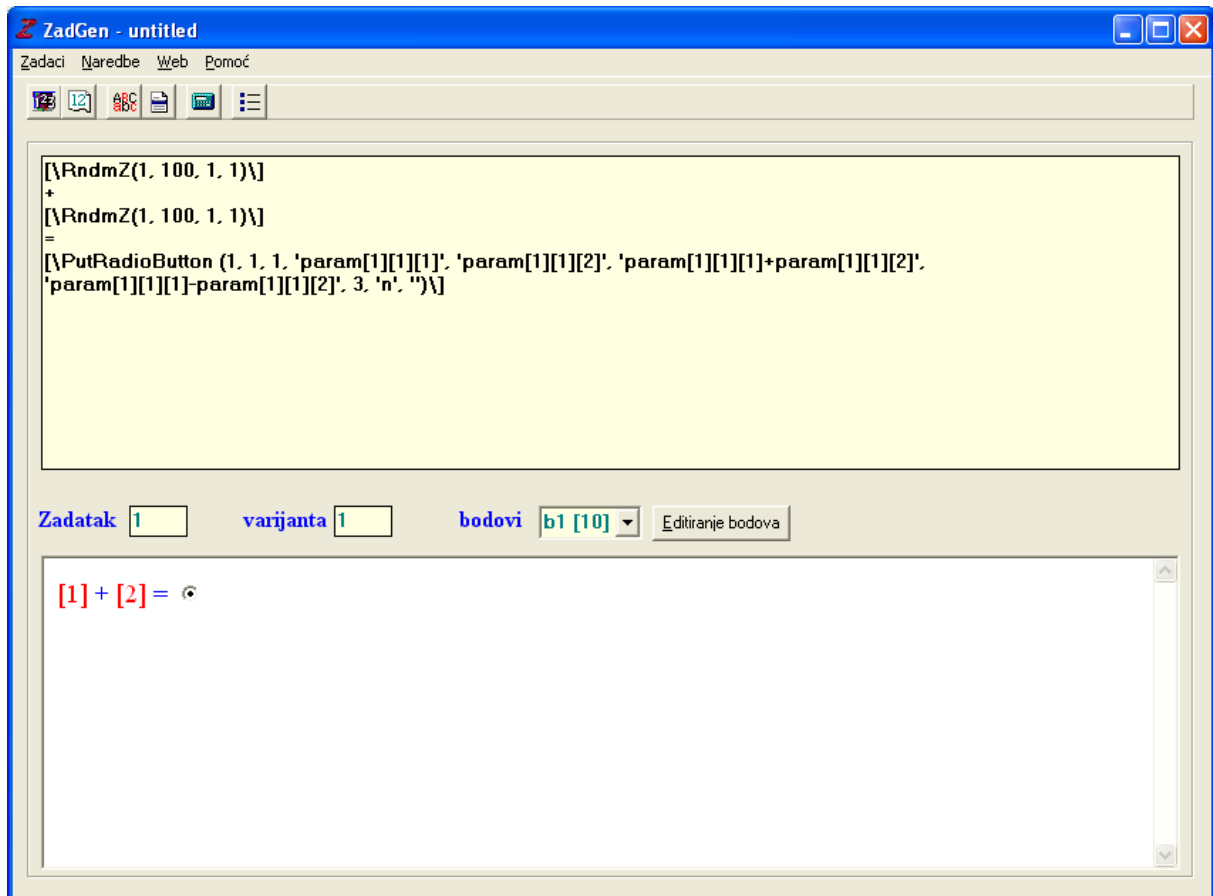
1. task

Because there are three types of operations, in this task we are going to create three templates types (for adding, subtracting and multiplying).

Open a new document. Into textbox **Zadatak** and **varijanta** insert 1 (first task, the first option), transfer cursor into the upper text area. Because we want to create the template of the shape $[broj1] + [broj2]$, where $[broj1]$ i $[broj2]$ are integers less than 100, we have to generate a random integer lesser than 100. Random integer lesser than 100 we will get when we choose **Cijeli broj** (**Ctrl+Alt+Z** or the right button on the mouse and then **Cijeli broj**) from the **Naredbe** in menu. Input lower limit of the interval from which we want to choose the number (0) and the upper limit of the interval (100). There will be a sign $[1]$ in the lower frame, which means it is about a variable part of the template to which sign 1 is added.

Forward, we insert $+$ and generate another number in the same manner.

The next step for us is to make assignment evaluation. In the menu **Naredbe** we are going to choose **RadioButton (rješenje)** (**Ctrl+Alt+R** or the right button on the mouse and then **RadioButton**), because the correct solution is going to be chosen among the given solutions. In the continuation, the window for defining the solutions will be open together with given signs of the variable parts of the task template. Here we will define the given solutions and after each one of them we will press **Dodaj**. In the end we click on the **Spremi** button and insert the ordinal number of the correct answer. What we are left with now is to define the number of points to the correct answer. In order to define the number of the points to the correct solution we will choose **b1[?]** from **Bodovi** menu and then we will click the **Editiranje bodova** button. We are going to choose the solution for which we wish to define the points (**R1**) in the window which will open and then we will click on the **Spremi** button and insert number of points to the correct solution.



This way we have created template for the first option of the first task.

Before the creating the second option of the first task (subtraction) in the textbox **varijanta** we insert 2, and in the textbox **Zadatak** we leave 1 (first task, the second option) and then we generate the subtraction assignment template in the same way.

The template to the third option we will create in the analogous way.

2. item

Here we will have three types of templates again (there three possible operation combinations). Before we start with defining of the first template, in the textbox **Zadatak** we insert 2 and into textbox **varijanta** we insert 1 (second task, first option). We define the task in the same way we did it in the previous task. The correct answer will be written into the textbox in this task.

Therefore, in **Naredbe** menu we are going to choose **TextBox (rješenje)**. Window for defining solutions will be open, similar to the one in the previous task. Here we are going to define the correct solution only using the marks of the variable parts of the assignments. In the end we are going to click the **Spremi** button and insert size of the answers input textbox. We are left with defining the number of points and that we are going to do in the same way as in the previous task.

Analogous, we are going to define the rest of the two template options.

3. item

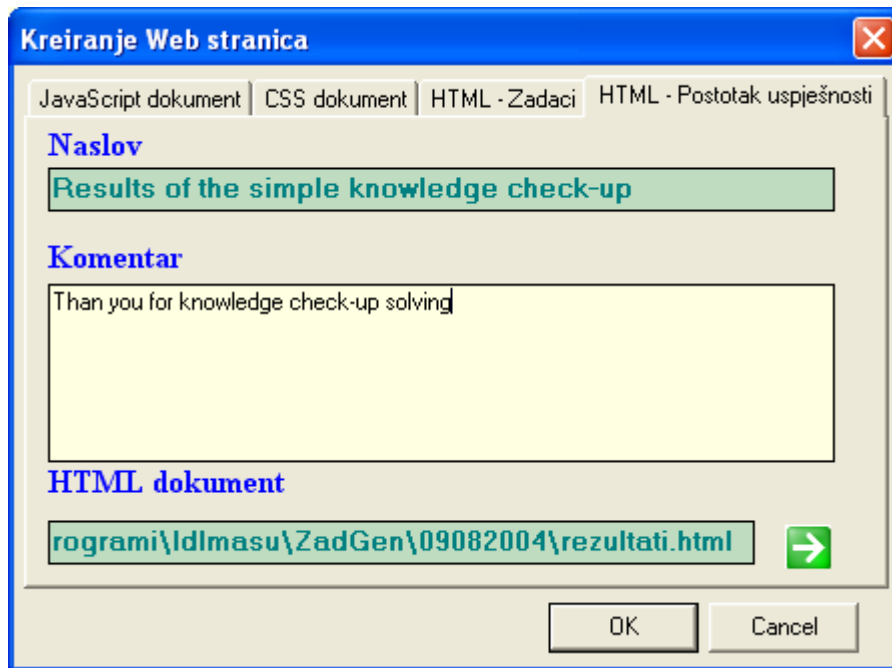
Differently from the previous two items, here we will have only one option of the form: ***Which number is greater than [broj1] by [broj2]?***

In the **Zadatak** textbox we insert 3, and in the option textbox we insert 1 (third item, the first option). First we are going to insert text: ***Which number is greater then***, and then define a number lesser than 100 in the way how we did it in the previous items.

After we have defined the items we can save them into the *.zad* file. In the **Zadaci** menu we choose **Spremi zadatke (Ctrl+S)**. If we are certain that we will not change the knowledge check-up which we have just made, we do not have to create the *.zad* file.

Further, we have to create the *.js* file with the items. We will make that by choosing **Kreiraj JavaScript** from the **Web** menu.

After we have created the file with the items, we are able to create Web pages as well as those on which the check-up and the results of the check-up will be. That will be made in the way that in **Web** menu we choose **Kreiraj Web stranice**. In the window which opens, we choose the *.js* file with functions, the *.css* file with defined formats for check-up display, and then we define and save the pages for knowledge check-up and results display.



It is essential to mention that all the documents (the *.js* document with the items, *.css* document, *.html* documents, and *.js* document with functions) are supposed to be in the same directory.

Simple Knowledge Check-up

- $71 + 26 =$
 - 71
 - 26
 - 97
 - 45
- $85 + 19 * 77 =$
- Which number is greater than 47 by 47 ?

Spremi

Results of the simple knowledge check-up

1. 10
2. 0
3. 10

Postotak rjesenosti: 66.67 %

Thank you for knowledge check-up solving

Where to look for the *ZadGen*?

You are able to download it from the URL:

<http://www.tssibenik.hr/Idimasu/oprojektu/alati.htm>

Biography

Name: Predrag Brođanac

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EDUCATION AND QUALIFICATIONS

I graduated from the Zagreb Faculty of Natural Sciences and Mathematics, Department of Mathematics and obtained the following qualifications:

- mathematical engineer(computer science) - May, 2000
- Bachelor of Science in Mathematics and Informatics-October, 2001

WORKING EXPERIENCE

- I have been working as a high-school teacher, with short breaks, since October, 1996 since December, 6th, 2001 I have been working as a teacher of informatics, in the 5th science(and mathematics) program secondary school
- during 2001 and 2002 I conducted drills(training classes) for the informatics course, at the Faculty of Construction, in Zagreb
- since August, 2002, I have been working as a research assistant on the informatical projects, in Pliva, as WEB programmer (ASP, JavaScript, Visual Studio .NET and many other tools which are specific for the projects)

OTHER SKILLS (ACTIVITIES)

- I am a postgraduate student of Mathematics, in the Department of Mathematics, at the Faculty of Natural Sciences and Mathematics
- I am a research assistant of the Croatian Alliance of Informaticians where, among other things, I conduct classes in the camps for the young informaticians and I am the co-author of the items in the informatical competitions for the primary school students
- I am a research assistant in the Croatian Mathematical Association where, among other things, I publish the articles in "MATKA" and "Poučak", the magazine for the young mathematicians
- During the school year 2002/03 and 2003/04 I conducted the preparation classes in informatics for the students who wanted to enrol in a college, where is informatics one of the subjects required on the entrance examination
- I am a research assistant in the informatical magazine "ENTER", published by Bug and SysPrint
- I am an associate on the CARNET's project which deals with the production of the interactive multimedia-digital on the topic proportionality, reversed proportionality, percentage and interest account where I work as a JavaScript programmer and I work on the application which will enable generation of the interactive Web sites in JavaScript
- I am the author of the reference book "HTML, JavaScript and PHP basis" ("Osnove HTML-a JavaScripta i PHP-a")
- I am the co-author of the problem collection "Program freely in Pascal-collection of the solved problems" ("Slobodno programirajte u Pascalu – zbirka riješenih zadataka")