

Exercise 2: Programming basics

JavaScript is a general purpose programming language like Java, C++, C#, Python or PHP. The basic programming structures are very similar all, e.g. variables, comparison operators, conditional statements, loops. If you know one programming language the only thing to learn is to find out how they are done in JavaScript. On the other hand if you don't know other languages knowing JavaScript helps you learn them.

The objective here is to get familiar with a few essential programming structures in JavaScript which you will need to be able to proceed to learn to write more interesting programs and to study further.

Programming exercise

The task is to write a classic number guessing game. The game picks a random number between 0 and 100. The player makes guesses and is told if the number to guess is higher or lower.

The game also keeps track of the best guess above and below so far. This is done only after guesses have been made. If there are no higher or lower guesses yet there is nothing to show. If the latest guess is worse than earlier guesses the best guesses are not affected.

Numeropeli

Arvaa luku väliltä 0-100:

Paras arvaus alapuolella 50

Paras arvaus yläpuolella 90

Luku on pienempi

When the player guesses right, the number of guesses is reported and all the numbers from zero to the correct answer are listed.

Numeropeli

Arvaa luku väliltä 0-100:

Onneksi olkoon, 7 oli oikein! Arvauksia 4

0

1

2

3

4

5

6

7

Feel free to style the page as pretentious as you like!

Questions

1. Explain
 - what is a variable and how do you define one in JavaScript,
 - how to you give (assign) a value to a variable and
 - how do you retrieve the value of a variable.
2. Explain how If-else statement works and give examples.
3. Explain how while statement works and give examples.
4. What other loop statements are there in JavaScript?
5. Explain
 - function and how do you define one in JavaScript,
 - function parameter and how do you give it a value (argument),
 - function return value and how do you set it.

Bonus

Challenge yourself to get to the next level!

1. Reset: Add an element for resetting the game, define a function to reinitialize the game and set the function as click handler to the element.
2. Visualization of best guesses: There is a simple html bar structure to visualize the best guesses:



The bar consists of nested elements. The length of inner elements can be changed by setting the relative size of each element, i.e. the percentage of each bar element of the whole width of the enclosing element. In this example the width of the blue element is 21% and the green element 34%. The width of the yellow element can be deduced easily.

Update the bar to visualize how the guesses converge towards the correct answer inevitably.

Submission

- Document with the name(s) of the author(s) and answers to all the questions
- Link a web page that contains the working program

Assess your learning and give feedback about the exercise in the text field on the submission form.

Hints

- There is a template for the page in the course folder. The comments in the template provide guidance.
- W3Schools tutorial helps here too but for this exercise this Mozilla Developer Network article is very fitting: https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/JavaScript_basics