P.PORTO

ESMAD | TSIW | POO
Exercise Sheet Resolution nº1
Variables, Data Types and Operators

Use Visual Studio Code to solve the following exercises:

1. Create an instruction that displays the message "Hello JavaScript!".

```
alert( "Hello JavaScript!" );
```

2. Variables

a. Working with variables
   i. Declare two variables: admin and name.
   ii. Assign the value "John" to the variable name.
   iii. Copy the value from name to admin.
   iv. Show the value of admin using an alert box ("John" should be displayed).

```
let admin, name;
name = "John";
admin = name;
alert(admin); // "John"
```

b. Variable naming:
   i. Create a variable with the name of our planet. How would you call this variable?

```
let ourPlanetName = "Earth";
```

   ii. Create a variable to store the name of a current visitor to a website. How would you name this variable?

```
let currentUserName = "John";
```

3. Constants:

a. Examine the following code which includes a constant birthday and age is calculated from the birthday with the help of some code (not provided for the sake of focus):
const birthday = '18 .04.1982 ';
const age = someCode (birthday);

b. Would it be correct to use capital letters for the birthday variable? And to age? Or even for both?

const BIRTHDAY = '18 .04.1982 '; // capitalized?
const AGE = someCode (BIRTHDAY); // capitalized?

```
const BIRTHDAY = '18.04.1982';
const age = someCode(BIRTHDAY);
```

4. Data types:

a. What is the output of the following script:
let name = "Ilya";
console.log(`hello ${1}`); // ?
console.log(`hello ${"name"}`); // ?
console.log(`hello ${name}`); // ?

```
let name = "Ilya";

console.log( `hello ${1}` ); // hello 1
console.log( `hello ${"name"}` ); // hello name
console.log( `hello ${name}` ); // hello Ilya
```

5. Type conversion:

a. What are the results of these expressions:
"" + 1 + 0
"" - 1 + 0
true + false
6 / "3"
"2" * "3"
4 + 5 + "px"
"$" + 4 + 5
"4" - 2
"4px" - 2
7 / 0
" -9 " + 5
" -9 " - 5
null + 1
undefined + 1

```
"" + 1 + 0 = "10" // (1)
"" - 1 + 0 = -1 // (2)
true + false = 1
6 / "3" = 2
"2" * "3" = 6
```

```
4 + 5 + "px" = "9px"
"$" + 4 + 5 = "$45"
"4" - 2 = 2
"4px" - 2 = NaN
7 / 0 = Infinity
" -9  " + 5 = " -9  5" // (3)
" -9  " - 5 = -14 // (4)
null + 1 = 1 // (5)
undefined + 1 = NaN // (6)
```

1. Addition with a string "" + 1 converts 1 to a string: "" + 1 = "1", and then we have "1" + 0, the same rule is applied.
2. Subtraction - (like most mathematical operations) only works with numbers, converts an empty string "" to 0.
3. The addition with a string appends the number 5 to the string.
4. Subtraction always converts to numbers, so it makes "-9" a number -9 (ignoring surrounding spaces).
5. null becomes 0 after numeric conversion.
6. undefined becomes NaN after numeric conversion.

6. Operators:

a. What are the final values of all variables a, b, c and c after the code below?

```
let a = 1, b = 1;

let c = ++a; // ?
let d = b++; // ?
```

Answers:

- a = 2
- b = 2
- c = 2
- d = 1

b. What are the values of **a** and **x** after the code below?

```
let a = 2;
let x = 1 + (a *= 2);
```

- `a = 4` (multiplied by 2)
- `x = 5` (calculated as 1 + 4)

7. Interaction:

a. Create an instruction that prompts for a name and prints the name by adding asterisks before and after the name.

```
let name = prompt("Qual o seu nome?", "");
alert(`*${name}*`);
```

8. Comparing:

a. What will be the result of these expressions?

5 > 4
"apple" > "pineapple"
"2" > "12"
undefined == null
undefined === null
null == "\n0\n"
null === +"\n0\n"

```
5 > 4 → true
"apple" > "pineapple" → false
"2" > "12" → true
undefined == null → true
undefined === null → false
null == "\n0\n" → false
null === +"\n0\n" → false
```

1. Obviously, it's true.
2. Dictionary comparison, therefore, false.
3. Again, dictionary comparison, the first character of "2" is greater than the first character of "1".
4. Null and undefined values are equal to each other.
5. Strict equality. Different types on both sides lead to false.
6. See (4).
7. Strict equality of different types.

TIP: To practice more, go to the learnJS playground and solve the Exercise Sheets on these topics!