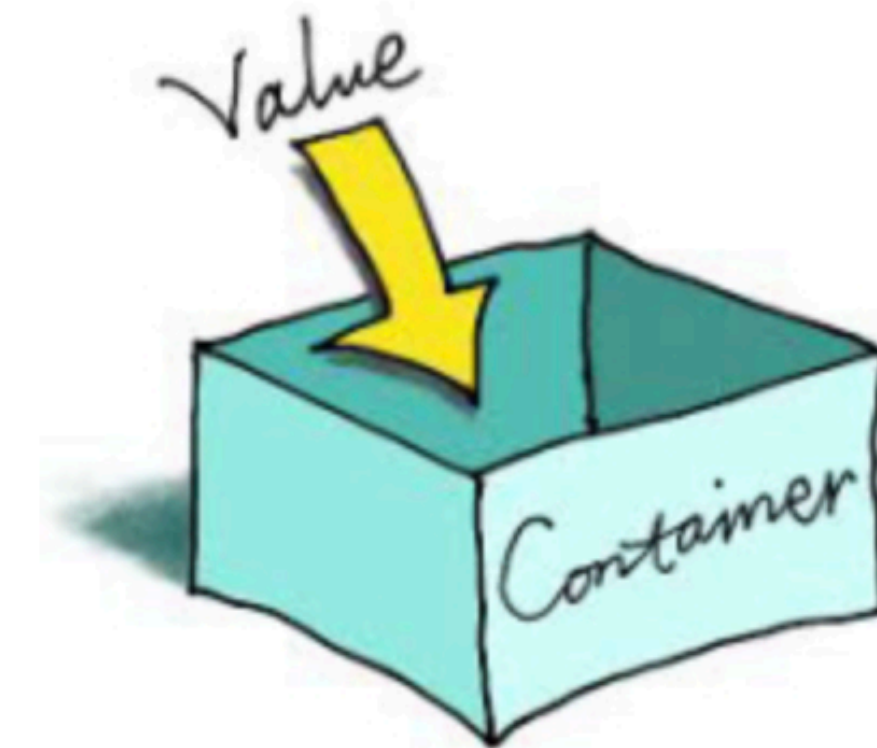


Variables & Logic

Variables &
Logic



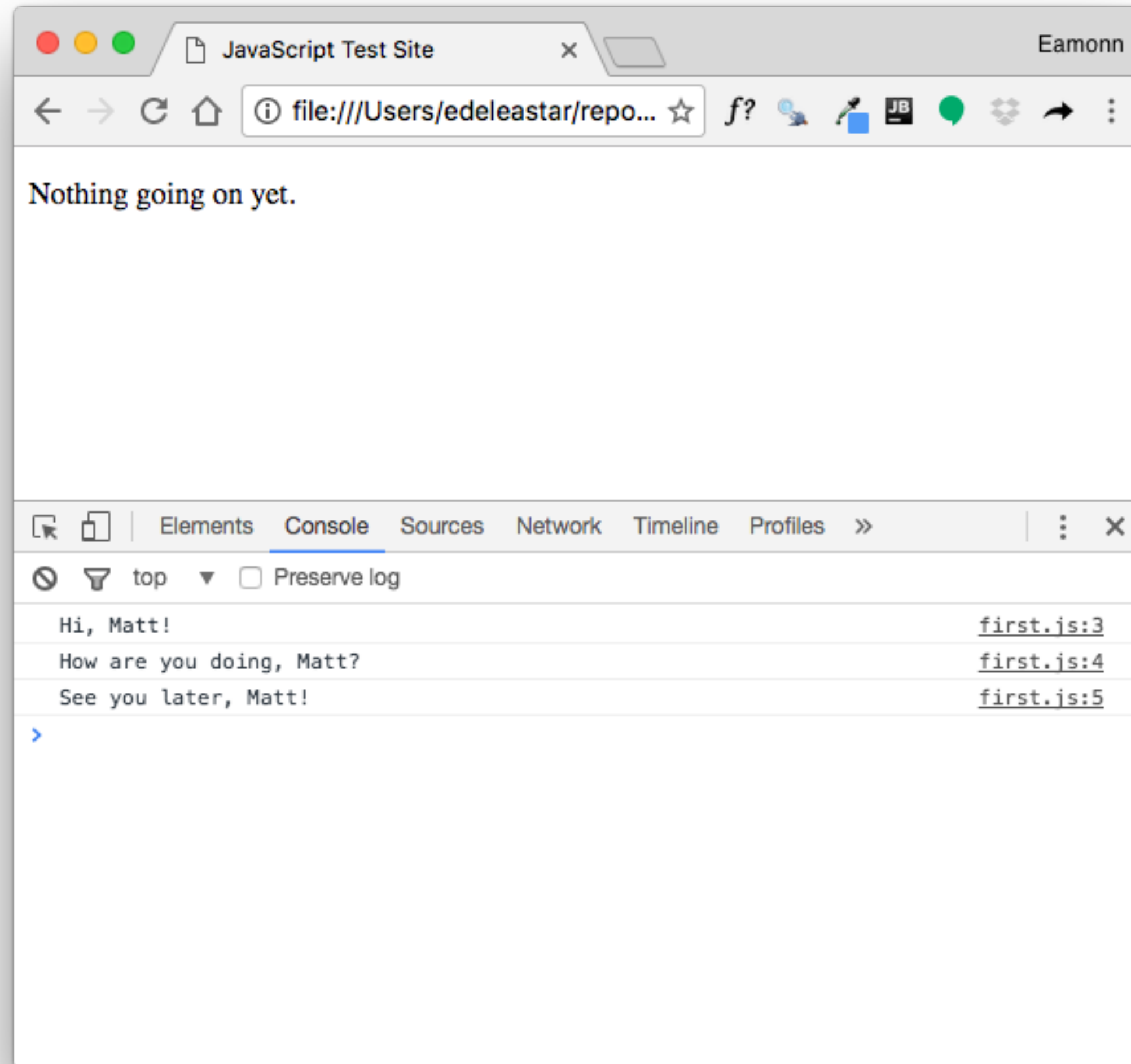
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Explore the javascript variables, including the basic types, conversion and usage

Variables

- Initialize and assign variables in JavaScript
- Store variables using the prompt function
- Write comments in your JavaScript code
- List all of the data types in JavaScript
- Compare and contrast primitive data types with objects

Variable Fundamentals



```
<!DOCTYPE html>
<html>
  <head>
    <title>JavaScript Test Site</title>
    <script src="first.js"></script>
  </head>
  <body>
    <p>Nothing going on yet.</p>
  </body>
</html>
```

first.js

```
console.log("Hi, Matt!");
console.log("How are you doing, Matt?");
console.log("See you later, Matt!");
```

- what if we want to change the person's name from "Matt" to something else?

var keyword

declare a variable

```
var firstName = "Matt";  
console.log("Hi, " + firstName + "!");  
console.log("How are you doing, " + firstName + "?");  
console.log("See you later, " + firstName + "!");
```

use a variable

Primitive Data Types

- 6 Primitive Data Types
- JavaScript is known as a "weakly" typed language.
- This means is that when you create variables and assign them to values, you do not have to specify the type of data you are working with.

```
// String  
var greeting = "hello";  
  
// Number  
var favoriteNum = 33;  
  
// Boolean  
var isAwesome = true;  
  
// undefined  
var foo;  
var setToUndefined = undefined;  
  
// null  
var empty = null;
```

Strings

```
// a string is a set of characters enclosed in quotes.  
//A string can be defined using double quotes:  
var greeting = "Hello Whiskey";  
  
// or using single quotes:  
var greeting = 'Hello World';  
  
// if We want quotes in a string, we can mix them, keeping them balanced:  
var phrase = 'Matt said, "I have not been to Chile", the other day.';
```

Numbers

```
//JavaScript numbers can be positive:  
var num = 5;  
  
// or negative:  
var num = -25;
```

Decimal Numbers

```
var piApproximation = 3.14159265;  
  
var x = 1 + 3;  
var a = 4.5;  
var b = 5.9;  
var c = Math.sqrt(a * a + b * b);  
var studentTeacherRatio = 4 / 1;
```


Boolean

```
// A boolean type can only be in one of two states,  
// true or false.
```

```
var pizzaIsGood = true;  
var pizzaIsBad = false;
```

Undefined

```
// Any variable that is created in JavaScript  
// that is not assigned a value is undefined:  
var noValue; // The value here will be undefined  
  
//You can also explicitly set a variable to undefined:  
var favoriteFood = "Candy";  
  
// Changed your mind  
var favoriteFood = undefined;
```

Null

```
// Null is not the same as undefined.  
It signifies an intentional absence of data.  
var secondEmailAddress = null;
```

- It is important to remember that null and undefined are different types in JavaScript
- This can be a confusing feature of JavaScript, even for people who know other programming languages.
- The distinction can seem somewhat arbitrary when you're first learning the language, but as you get more comfortable the distinction will become clearer.

Figuring out a variable's type

- In JavaScript, we have a keyword called `typeof` that returns the type of the variable.

```
typeof "";           // - "string"  
typeof 5;           // - "number"  
typeof false;       // - "boolean"  
typeof undefined;  // - "undefined"  
typeof null;        // this is not what we expect,  
                       // it returns "object"!
```

Converting to a string: toString

- The toString method will convert any value which is not undefined or null into a string

```
var num = 5;  
var bool = true;  
  
num.toString(); // "5";  
bool.toString(); // "true";
```

Converting to a number using *parse*

- There are several ways you can convert a value to a number.
- One way is to parse the number, using `parseInt` or `parseFloat`:
- Each function will look at a string from left to right and try to make sense of the characters it sees as numbers.

```
parseInt("2"); // 2
parseFloat("2"); // 2
parseInt("3.14"); // 3
parseFloat("3.14"); // 3.14
parseInt("2.3alkweflakwe"); // 2
parseFloat("2.3alkweflakwe"); // 2.3
parseInt("w2.3alkweflakwe"); // NaN (not a number)
parseFloat("w2.3alkweflakwe"); // NaN (not a number)
```

Converting to a number using *Number*

- This doesn't parse, it simply tries to convert the entire string directly to a number

```
Number("2"); // 2  
Number("3.14"); // 3.14  
Number("2.3alkweflakwe"); // NaN  
Number("w2.3alkweflakwe"); // NaN
```

Converting to a number using +

- This doesn't parse, it simply tries to convert the entire string directly to a number.

```
+ "2"; // 2  
+ "3.14"; // 3.14  
+ "2.3alkweflakwe"; // NaN  
+ "w2.3alkweflakwe"; // NaN
```


Boolean Logic

- Write conditional logic using boolean operators
- List all of the falsey values in JavaScript
- Use if/else and switch statements to include conditional logic in your JavaScript code
- Explain the difference between `==` and `===` in JavaScript
- Convert between data types explicitly in JavaScript

Conditional Logic

- An essential part of writing programs is being able to execute code that depends on certain conditions. For example:
 - You want the navigation bar on your website to look different based on whether or not someone is logged in
 - If someone enters their password incorrectly, you want to let them know; otherwise, you want to log them in
 - You're building a tic-tac-toe game, and want to know whether it's X's turn or O's turn
 - You're building a social network and want to keep person A from seeing person B's profile unless the two of them are friends

```
var instructor = 'Brenda';  
  
// we begin with an "if" statement  
// followed by a condition in (  
// and a block of code inside of {}  
if (instructor === 'Brenda') {  
  console.log('Yes!');  
} else {  
  console.log('No');  
}
```



- Notice that we used a === instead of =.
- Anytime that we use more than one equals operator (we can either use == or ===) we are doing a comparison (comparing values).
- When we use a single equals operator =, we are doing an assignment (setting a variable equal to some value).

```
var favoriteFood = prompt('What\'s your favorite food?');  
  
if (favoriteFood === 'pizza') {  
    console.log('Woah! My favorite food is pizza too!');  
} else {  
    console.log('That\'s cool. My favorite food is pizza.');
```

- In this version, the boolean expression will be true/false depending on the value entered in 'prompt'

Difference between “==” and “===”

- Two different operators for comparison: the double and triple equals.
- Both operators check whether the two things being compared have the same value, but there's one important difference.
 - == allows for **type coercion** of the values,
 - === does not.
- To understand the difference between these operators, we first need to understand what is meant by **type coercion**.

Type Coercion 1

- Add a number and a string.
- In a lot of programming languages, this would throw an error, but JavaScript is more accommodating
- It evaluates the expression `5 + "hi"` by first coercing `5` into a string, and then interpreting the `+` operator as string concatenation.
- So it combines the string `"5"` with the string `"hi"` into the string `"5hi"`

```
5 + 'hi'; // '5hi'
```

Type Coercion 2

- JavaScript expects the values inside of parentheses that come after the keyword `if` to be booleans.
- If you pass in a value which is not a boolean, JavaScript will coerce the value to a boolean according to the rules for ***truthy/falsey*** values (more on this later)

```
if ('foo') {  
  console.log('this will show up!');  
}  
  
if (null) {  
  console.log('this won\'t show up!');  
}
```

Type Coercion 3

- A very common way to coerce a stringified number back into a number.
- By prefacing the string with the plus sign, JavaScript will perform a coercion on the value and convert it from a string value to a number value.

```
+ '304'; // 304
```


“==” Vs “===” again

== → loose

```
5 == '5'; // true
'true' == true; // false
true == 1; // true
undefined == null; // true
```

=== → strict

```
5 === '5'; // false
'true' === true; // false
true === 1; // false
undefined === null; // false
```

- == allows for coercion while === doesn't.
- *If you don't want to have to think about coercion in your comparisons, stick to ===.*

```
var x = 4;
if (x <= 5) {
  console.log('x is less than or equal to five!');
} else {
  console.log('x is not less than or equal to five!');
}
```

Comparison Operators

Operator	Description
==	equal to
===	equal value and equal type
!=	not equal
!==	not equal value or not equal type
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
?	ternary operator

Falsey Values

- Some values (aside from false) are actually false as well, when they're used in a context where JavaScript expects a boolean value
- Even if they do not have a "value" of false, these values will be translated (or "coerced") to false when evaluated in a boolean expression.

6 Falsey Values in Javascript

```
0  
...  
null  
undefined  
false  
NaN // (short for not a number)
```

Logical Operators

Operator	Description	Example
&&	and	(x < 10 && y > 1) is true
	or	(x == 5 y == 5) is false
!	not	!(x == y) is true

If-Else

- Sometimes you may have more than two conditions to check.
- In this case, you can chain together multiple conditions using else

```
if (number >= 1000) {  
  console.log('Woah, thats a big number!');  
} else if (number >= 0) {  
  console.log('Thats a cool number.');
```

```
} else {  
  console.log('Negative numbers?! Thats just bananas.');
```

```
}
```

Switch

- Another way to write conditional logic is to use a switch statement.
- While these are used less frequently, they can be quite useful when there are multiple conditions that can be met.
- Notice that each case clause needs to end with a break so that we exit the switch statement.

```
switch (feeling) {  
  case 'happy':  
    console.log("Awesome, Im feeling happy too!");  
    break;  
  case 'sad':  
    console.log('Thats too bad, I hope you feel better soon.');
```

```
    console.log('Me too, lets go eat some pizza!');
```

```
  default:  
    console.log('I see. Thanks for sharing!');
```

```
}
```

Modulus Operator

```
5 % 3 === 2 // true (the remainder when five is divided by 3 is 2)
```

```
var num = prompt('Please enter a whole number');  
if ( num % 2 === 0 ) {  
    console.log('the num variable is even!')  
} else if ( num % 2 === 1 ) {  
    console.log('the num variable is odd!')  
} else {  
    console.log('Hey! I asked for a whole number!');  
}
```