



JavaScript

The Game



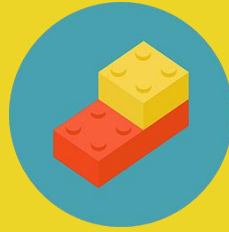
Course Prerequisites



Course Objectives



Learn about JavaScript,
its uses and really understand it.



Learn how to build dynamic and
interactive websites.



Make you fall in love with
JavaScript

Netscape wanted to make
the web more Dynamic

making a scripting
language

Netscape hired **Brendan Eich**
for that reason



Defend Idea by do a
prototype



JavaScript History

Eich do a prototype in
10 days



● LIVE



And finally be
JavaScript

JavaScript Second name
was **LiveScript**

JavaScript first name
was **mocha**

Fact #1

“

There are two types of people, One who writes it “Java Script” and the other who writes it “JavaScript”. First one has no idea about what JavaScript is.

”



JavaScript Language Core

```
document.write('Hello World')
```

```
console.log('Hello World')
```

```
alert('Hello World')
```

<http://www.example.com>

Hello World

Hello World

ok

cancel

console

> 'Hello World'



Where To ?

```
<html>
  <head>
    <script>
      alert('hello world');
    </script>
    <script src="myscript.js"></script>
  </head>
  <body>
    <p>Hello</p>

    <script>
      alert('hello world');
    </script>
    <script src="script.js"></script>
  </body>
</html>
```

index.html

```
alert('hello world');
alert('hello world');
```

script.js



- JavaScript is case sensitive **Var is not equal to var**
- JavaScript statements are separated by semicolons (;).
- Variable Names follows this rules:
 - the first character must be a letter, an underscore (_), or a dollar sign (\$).

\$dollar (✓) _underScore (✓) name (✓) 12twelve (x)

- Subsequent characters may be letters, digits, underscores, or dollar signs.

\$do22ar twelve12



Declaring Variables

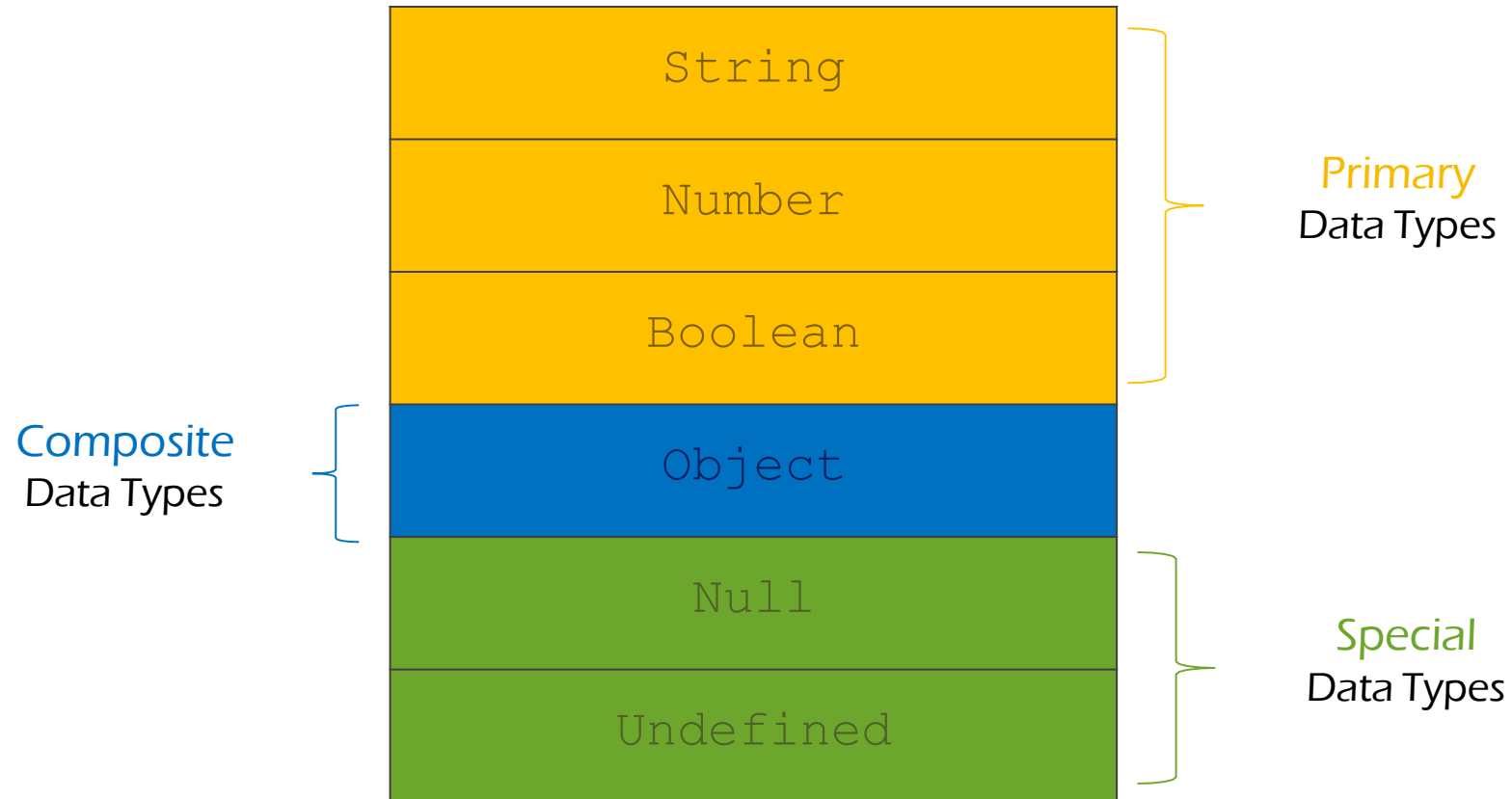
```
var name;
```

```
var name, age, email;
```

```
var name, age=12;
```



Data Types



Primary Data Types

String

Any character array or text quoted

```
var str1="hello JS";
```

```
var str2='11.26';
```

```
var str3='false';
```

Number

Any Numeric value but not quoted

```
var num1= 8;
```

```
var num2= 11.26;
```

Boolean

Has only two values **true** or **false**

```
var isBool= true;
```

```
var isStr= false;
```



Special Data Types

null

This describes the no valid value ,
And has only one value **null**

```
var thisIsNull = null;
```

undefined

The undefined value is returned when you
declare a variable that has never had a
value assigned to it.

```
var num1; //num1 is undefined
```



JavaScript is Dynamic

```
var var1;                                //its type is undefined

var1 ="ahmed";                            //Now, its type is string

var1 =12;                                 //Now, its type is number

var1 = true;                             //Now, its type is boolean
```



Checking variables data types

```
typeof variable_name
```

```
var name;
```

```
typeof name;
```

```
//undefined
```

```
name ="ahmed";
```

```
typeof name;
```

```
//string
```

```
name = null;
```

```
typeof name;
```

```
//object How??
```

```
typeof name == 'object';
```

```
//true
```



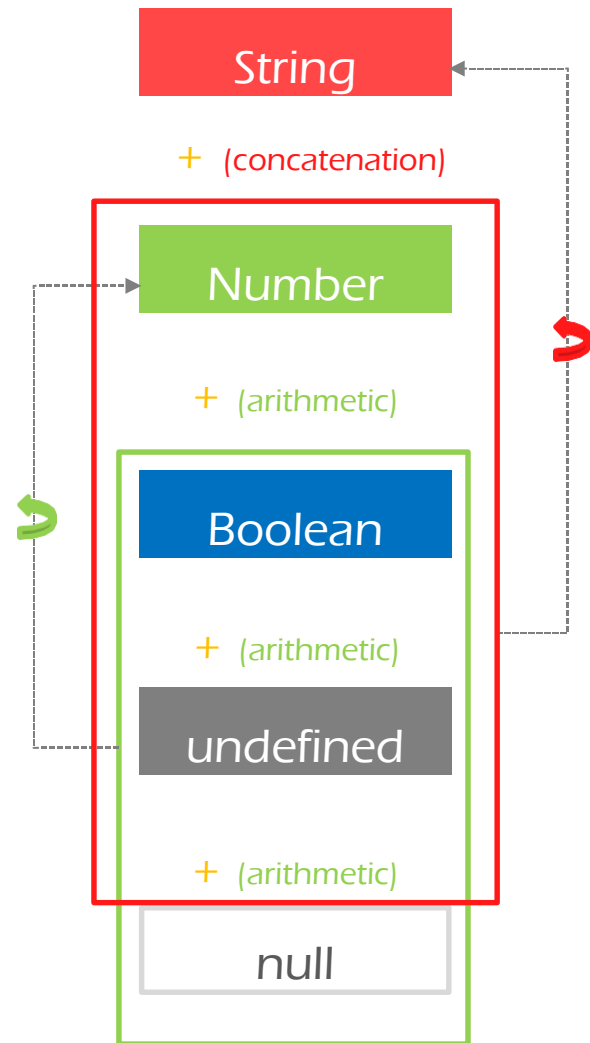
Operators

Arithmetic Operators

Operator	Example	Same As
=	$x = y$	$x = y$
+=	$x += y$	$x = x + y$
-=	$x -= y$	$x = x - y$
*=	$x *= y$	$x = x * y$
/=	$x /= y$	$x = x / y$
%=	$x \% = y$	$x = x \% y$



+ operator



input

"ITI" + " OS"

20 + "17"

"is Exist " + true

"not " + undefined

37 + null

37 + undefined

true + false

true + undefined

output

ITI OS

2017

is Exist true

Not undefined

37

NaN

1

NaN



Comparison Operators

a <op> **b**

Operator	Description
==	Return true if value of a <i>equal</i> to value of b.
===	Return true if value and type of a <i>equal</i> to value and type of b.
!=	Return true if value of a <i>not equal</i> to value of b.
!==	Return true if value and type of a <i>not equal</i> to value and type of b.
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to



Fight No#1

JS

==

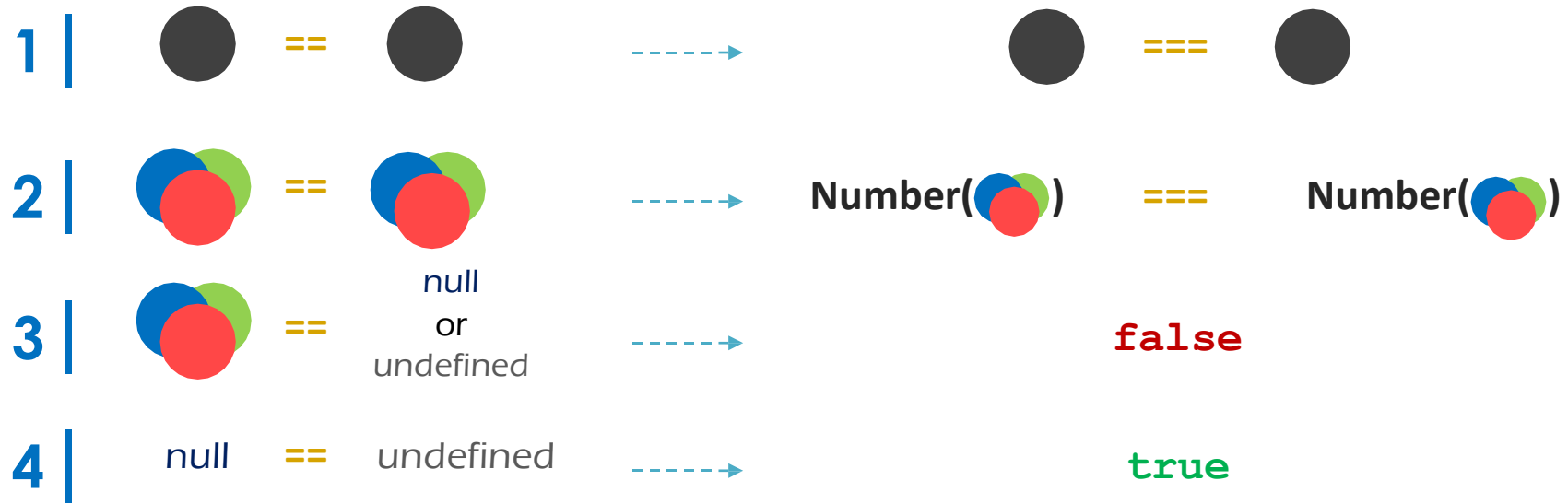
It compares only the variable value

===

It compares the variable type and value

== Operator

● boolean ● number ● string ● any



input	output	input	output
<code>"20" == 20</code>	<code>true</code>	<code>true == 1</code>	<code>true</code>
<code>0 == null</code>	<code>false</code>	<code>true == 4</code>	<code>false</code>
<code>"true" == true</code>	<code>false</code>	<code>false == 0</code>	<code>true</code>
<code>NaN == NaN</code>	<code>false</code>	<code>NaN == undefined</code>	<code>false</code>
<code>undefined == null</code>	<code>true</code>		



Logical Operators

&& and Gate

|| or Gate

! not Gate

input	output
<code>(0 == null) && (true == 1)</code>	false
<code>(0 == "") ("2" == 2)</code>	true
<code>!(null == undefined)</code>	false



&& Operator

&& operator seeks for falsy value and return the first truthy value it find or the last value it stops at

input	output
<code>true && 4</code>	<code>4</code>
<code>0 && true</code>	<code>0</code>
<code>1 && 2</code>	<code>2</code>
<code>'Ahmed' && ''</code>	<code>''</code>
<code>false && null</code>	<code>false</code>



|| Operator

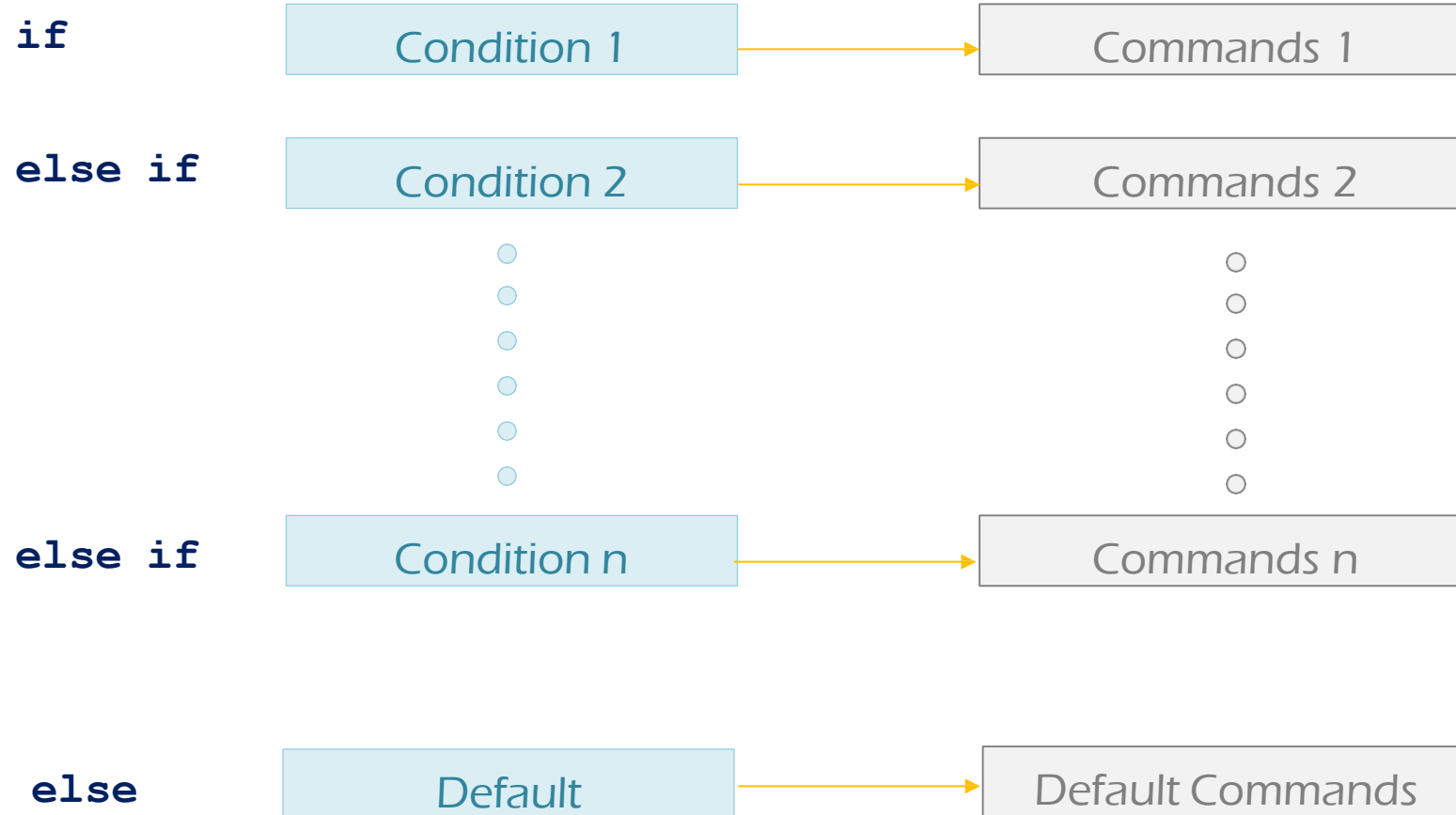
|| operator seeks for truthy value and return the first truthy value it find or last value it stops at

input	output
<code>true 4</code>	<code>true</code>
<code>0 true</code>	<code>true</code>
<code>1 2</code>	<code>1</code>
<code>'Ahmed' ''</code>	<code>'Ahmed'</code>
<code>false null</code>	<code>null</code>



Control Flow

If statement



Falsy Values

```
if (name) {  
    alert("hi");  
}else{  
    alert("Bye");  
}
```

If `name` has `falsy` value it will execute the code in the `Else` statement

So what is the falsy values :

`0` , `false` , `null` , `undefined` , `""` , `NaN`



switch...case

```
switch (typeof typedVar) {  
  case 'boolean':  
    console.log('blue')  
    break  
  case 'number':  
    console.log('green')  
    break  
  case 'string':  
    console.log('red')  
    break  
  default:  
    console.log('grey')  
    break  
}
```

● boolean ● number ● string ● default

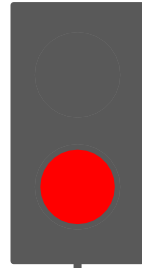
```
var typedVar = 3
```

```
> green  
> red  
> grey
```



while Loop

while



Condition:

```
(Green === true && Red === false)
```

```
{
```

Command:

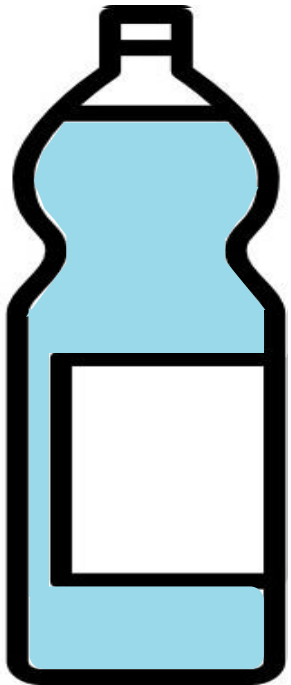
```
Car.move ();
```

```
}
```



for Loop

```
for (var i=0; i<5; i++) {  
    Bottle.fill(cup, water);  
}
```



$i = 4 \leq 5$

For loop will finish
executing here

}



JS

continue

It makes program skip the current iteration of loop without completing it

break

It makes program exit loop without completing the remaining iterations

Dialogs

Alert Dialog

```
alert(text);
```

Return : Doesn't Return any value

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

OR

```
var greetings = "Hello JavaScript!";  
alert(greetings);
```



```
prompt(text, default return value);
```

Return : String

```
var person = prompt("Please enter your name", "Ahmed");
```

```
console.log(person) //person = Ahmed
```



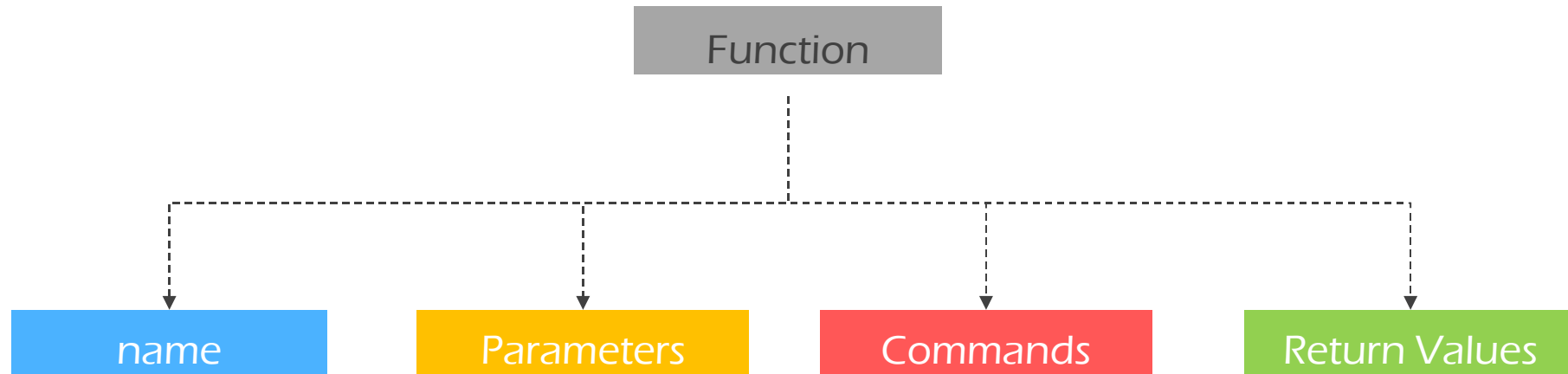
```
confirm(message)
```

Return : Boolean

```
var isReady = confirm("Are you ready?");  
  
if(isReady) {  
    alert("Yes");  
} else {  
    alert("No");  
}
```

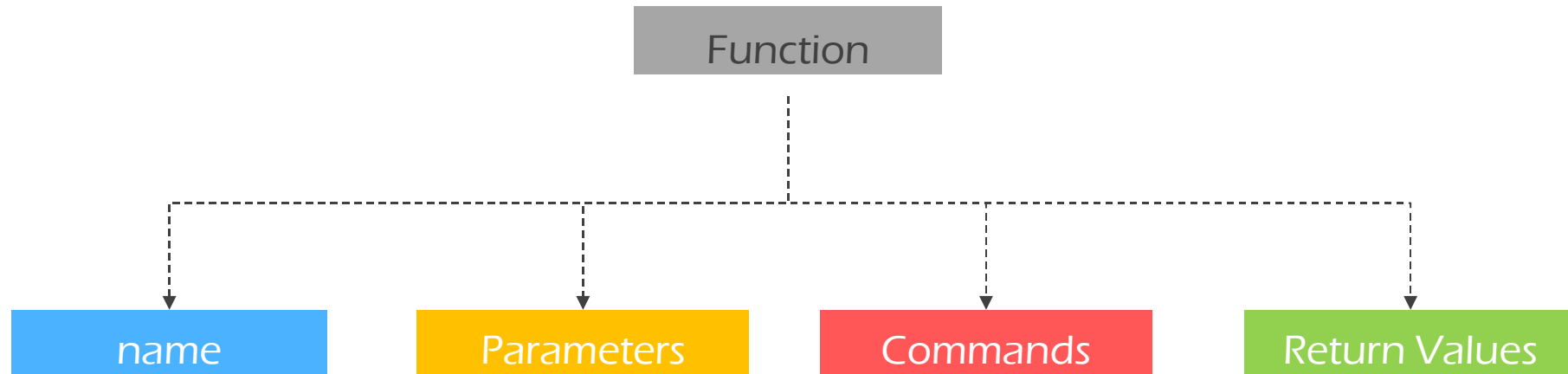


Functions



```
function name(parameter1, parameter2, parameter3)
{
  code to be executed
  return true;
}
```





```
function multiply(num1,num2) {  
    var result = num1 * num2;  
    return result;  
}
```

Calling it:

```
var result = multiply(3,4);  
alert(result); // result = 12
```



Scope

Global Scope

```
var globalVar = 0;
```

function1

```
{  
  var funcOneVar = 1;  
  globalVar++;  
  console.log(globalVar);  
  console.log(funcTwoVar);  
}
```

function2

```
{  
  var funcTwoVar = 4;  
  globalVar++;  
  console.log(funcTwoVar);  
  console.log(funcOneVar);  
}
```

```
function1();  
function2();  
console.log(globalVar);  
console.log(funcOneVar);
```

Result

```
1  
undefined  
4  
undefined  
2  
undefined
```



Objects



Everything in JavaScript is an Object



Bike is an Object

It has characteristics

Properties

`Bike.color`
`Bike.height`
`Bike.width`
`Bike.weight`

`Bike.move()`
`Bike.stop()`
`Bike.brake()`
`Bike.jump()`

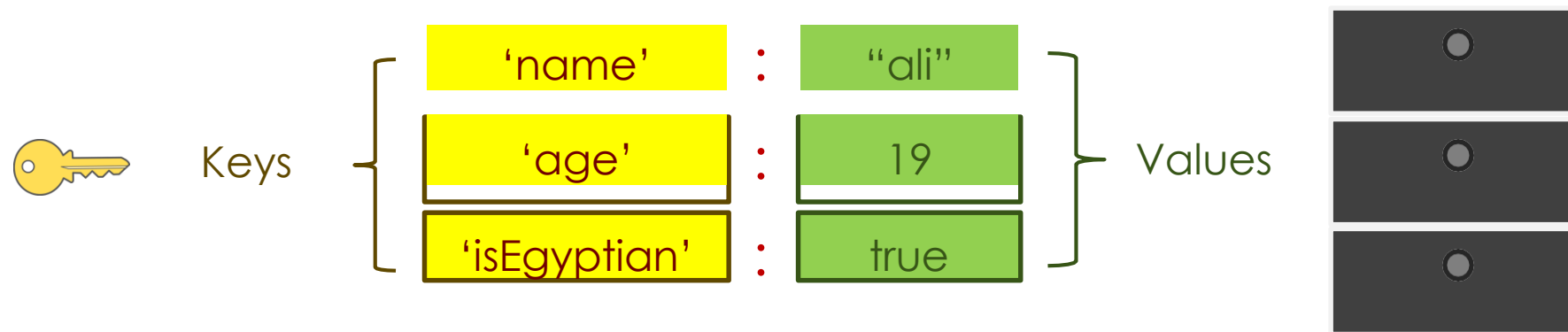
Methods

It does some actions



Literal Object

```
{  
  name: 'ali',  
  age: 19,  
  isEgyptian: true  
}
```



That's Enough for now !



Built-in Objects

They are helper objects that wrap some methods and properties about something like Date, Mathematical Operations, etc.



Strings

```
var message = "this is string"
```

input

```
message.toUpperCase()
```

```
message.slice(5, 7)
```

```
message.replace("is", "was")
```

```
message.charAt(2)
```

```
message.indexOf("is")
```

```
message.lastIndexOf("is")
```

output

```
THIS IS STRING
```

```
is
```

```
thwas is string
```

```
i
```

```
2
```

```
5
```



Numbers

```
var num = 15.528
```

input

```
num.toString()
```

```
num.toFixed(2)
```

```
num.toPrecision(3)
```

```
num.toPrecision(2)
```

```
parseInt(num)
```

output

```
"15.528"
```

```
"15.53"
```

```
"15.5"
```

```
"16"
```

```
15
```

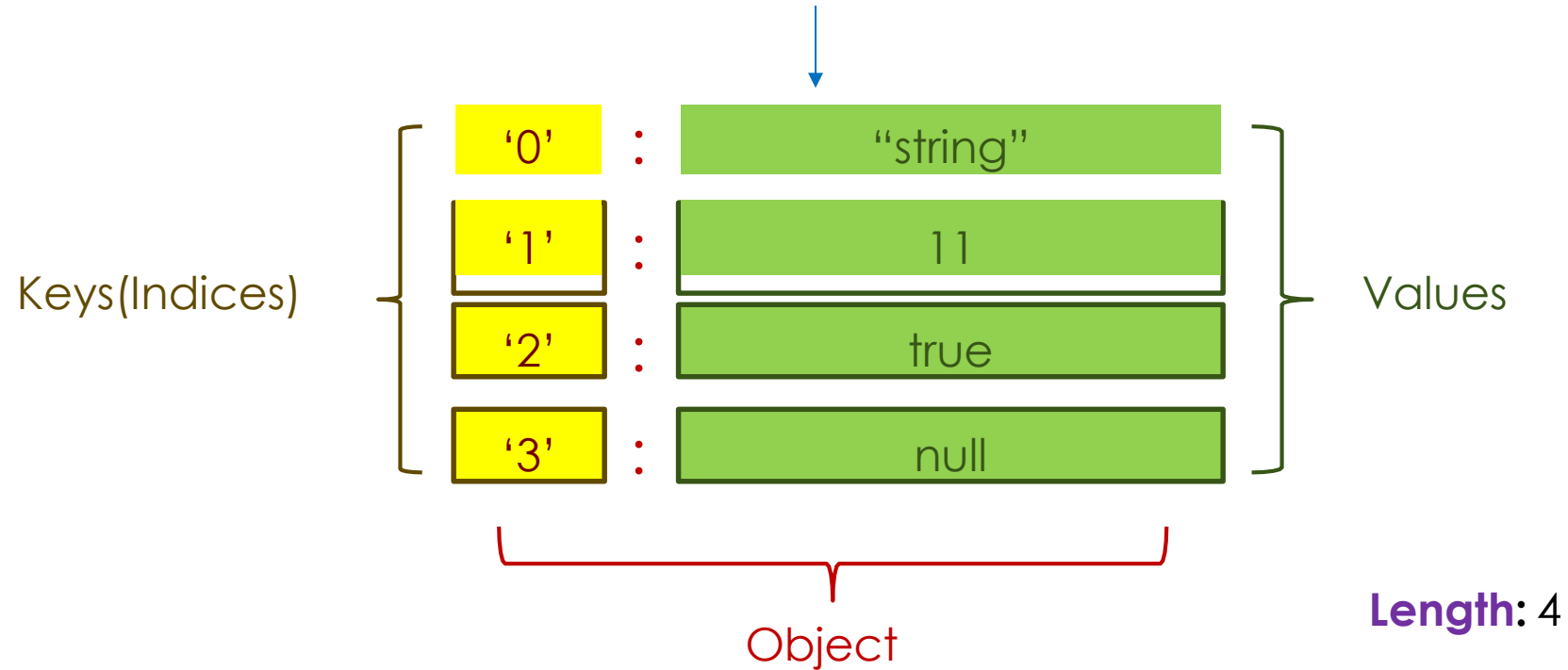


Arrays



Arrays are a special kind of objects, with numbered indexes


```
var myArr = ["string", 11, true, null];
```



```
myArr[50] = "no50";
```



Methods

```
var myArr = ["C", "JavaScript", "Python", "Java", "php"];
```

myArr	input	output
C++	<code>myArr.pop()</code>	php
JavaScript	<code>myArr.push("go")</code>	4
Python	<code>myArr.shift()</code>	C
Java	<code>myArr.unshift("C++")</code>	0
go	<code>myArr.splice(4,0,"Scala")</code>	[]
	<code>delete myArr[3]</code>	true



Math

The Math object allows you to perform mathematical tasks

input

output

`Math.PI`

3.14

`Math.sqrt(25)`

5

`Math.abs(-1)`

1

`Math.floor(1.6)`

1

`Math.ceil(1.4)`

2

`Math.round(1.5)`

2



```
var d = new Date ()
```

MISSION #1



Try

exploring its Methods and Properties



Tips and Tricks

for ... in

for...in used to loop into object by iterating its keys

```
var obj = {  
  name: 'Ahmed',  
  age: 19  
}  
  
var info = ''  
for (var k in obj) {  
  info += 'My ' + k + ' is ' + obj[k] + '  
}  
  
// info = 'My name is Ahmed My age is 19 '
```



? operator

`condition ? success_expression : fail_expression`

```
var canFly = true  
var bird = canFly ? 'Dove' : 'Penguin'  
// bird is Dove
```



Challenges

Rules

- 1 If you have Syntax Error, Solve it yourself. You are able to do that.
- 2 Mentors exist to guide you *to the best way to solve the problem and why errors raised* not *to solve the problem or trace your code to solve syntax errors*.
- 3 Steps of Solving the problem:
 - Think.
 - Think again.
 - Use Pen and Papers to convert your thoughts into Procedures.
 - Convert your previous pseudo code into JavaScript Code using its syntax rules.
 - Don't be afraid of syntax errors. It is easy to solve. Read it clearly and you will solve it.
 - Check the output of every step you do and then check them all.
- 4 The most important rule is to enjoy challenging yourself and don't stress your mind by the headache of assignments delivery's deadlines.



Beginner

Fizz Buzz Game



Write a function that take a number ad check if the given number is divided by 3 only, 5 only or both and print the suitable sentence. Follow the below Rule.

Input

Number

15

Output

Sentence

"fizz buzz"

Notes

Rule :

divided by 3 only ="fizz", divided by 5 only ="buzz", divided by 3 & 5= "fizz buzz" ,
Neither divided by 3 nor 5 = "none"



Beginner

Bottle Game



Write a function that take an array of persons' names and return two random names of them.

Input

array

```
[“ahmed”, “islam”, “sandra”, “Fatma”, “Ali”]
```

Output

array

```
[“sandra”, “Ali”]
```



Character Game



Write a function that take a sentence and a letter to search for it in the given sentence and return its locations in that sentence.

Input	String	Letter
	"This is javaScript"	"i"
Output	array	
	[2, 5, 15]	



Advanced

Greedy Game



Write a function that take a number and follow the below rule to convert it into dollars, quarters, dime, nickels and cents.

Input

Number

15.92

Output

Sentence

You have 15 dollar, 3 quarter, 1 dime, 1 nickel and 2 cent

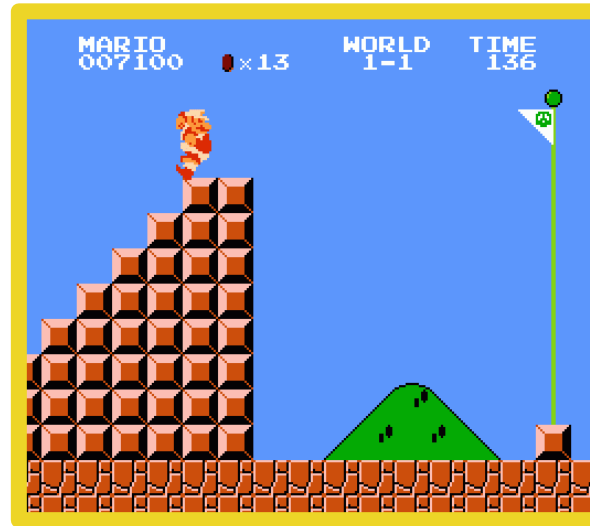
Notes

Rule :

1 dollar = 100 cent, 1 quarter = 25 cent, 1 dime = 10 cent, 1 nickel = 5 cent



Mario Game



Input

Number

5

Output

Sentence

```
*  
**  
***  
****  
*****
```



Who Am I Game

Do you fly?

Yes

No

Are You Wild?

Do you live under sea?

Yes

No

Yes

No

And
Where
am I ?



Eagle



Parrot

Are You Wild?

Are You Wild?

Yes

No

Yes

No



Shark



Dolphin



Cat

