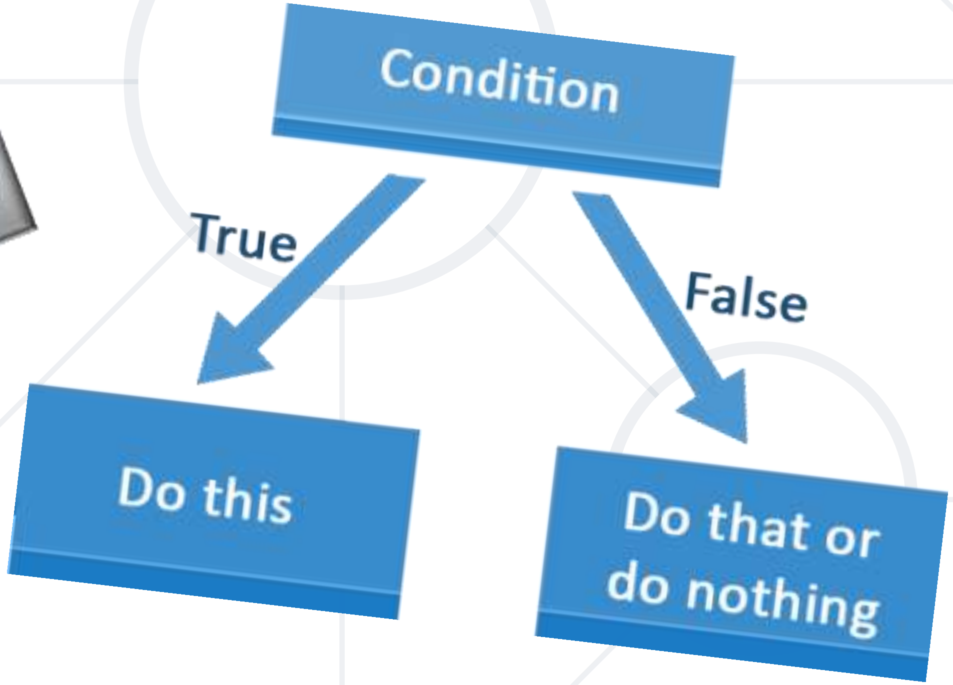
Introduction to JavaScript

Basic Syntax, Conditions and Loops



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Have a Question?

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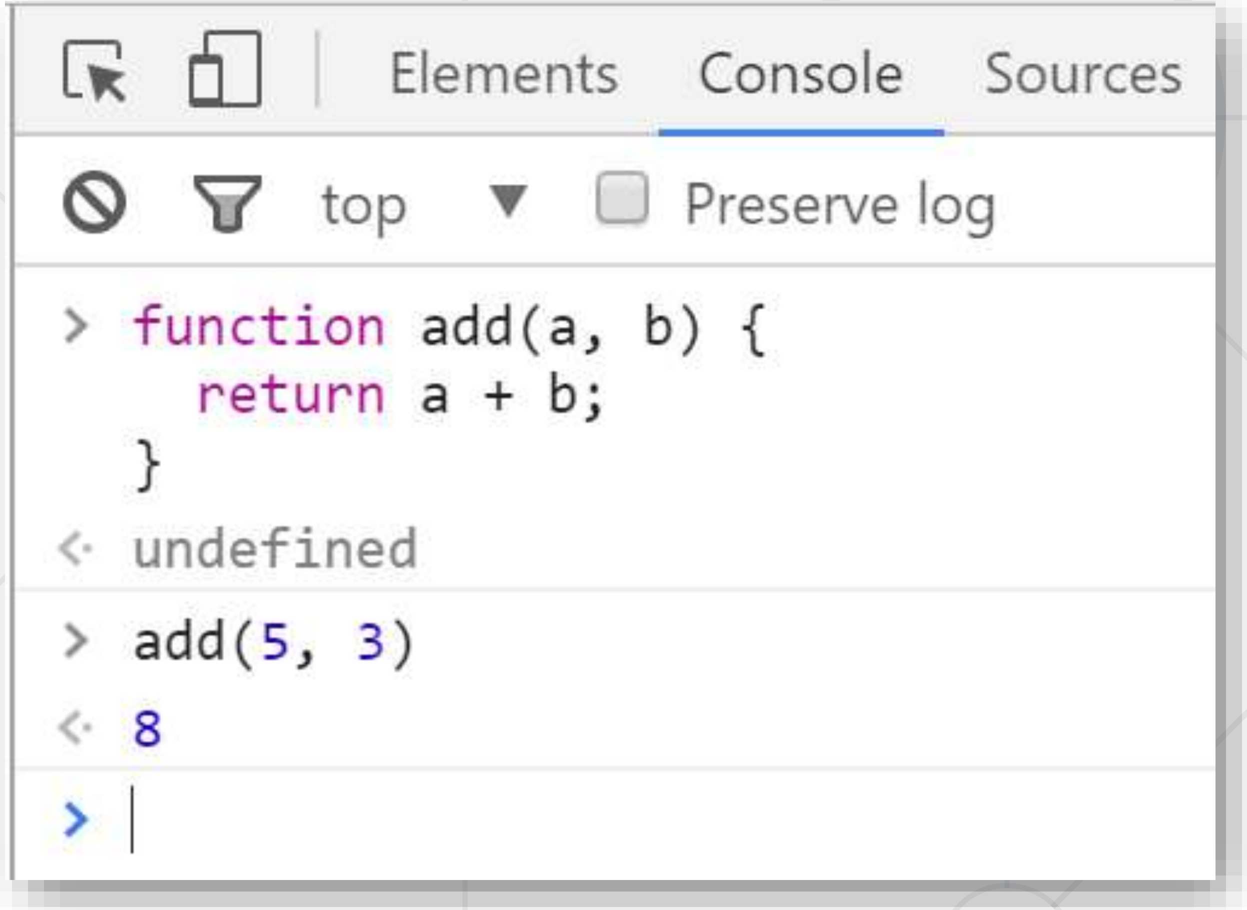
Introduction and IDE

Development Environments for JS

Chrome Web Browser

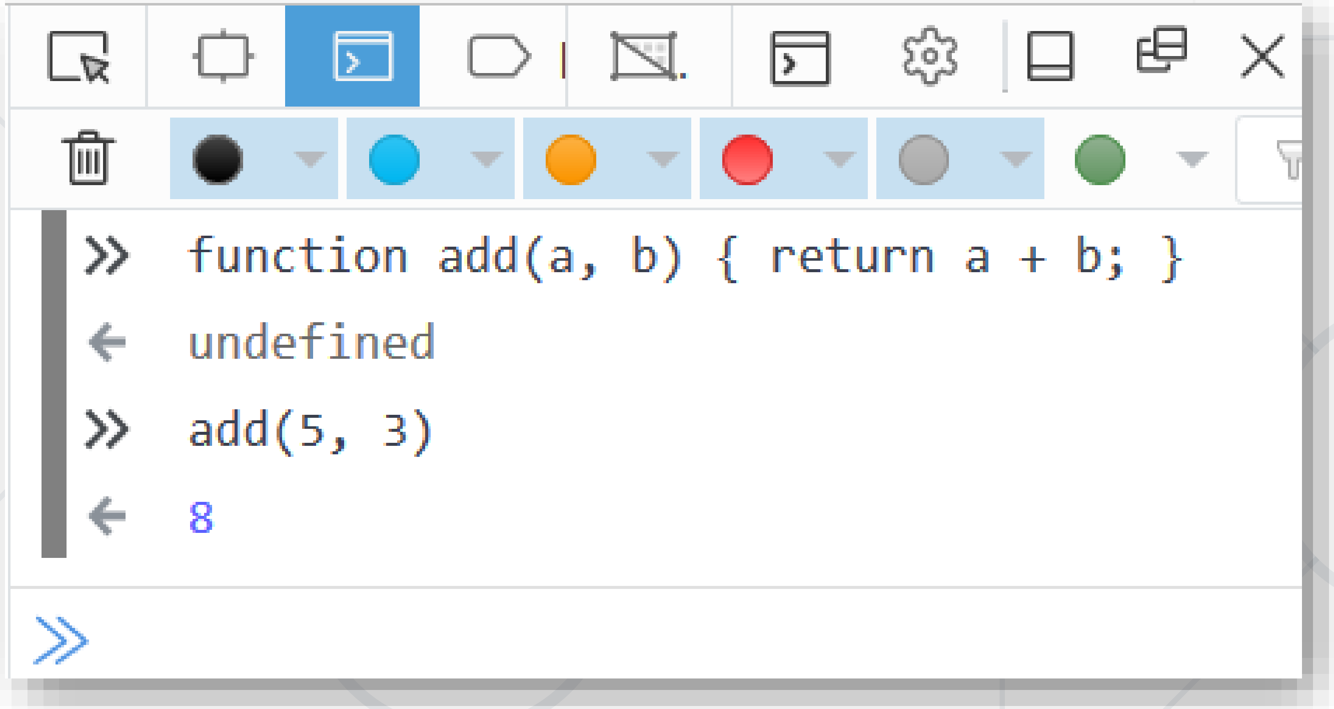
Developer Console: **[F12]**



```
> function add(a, b) {
    return a + b;
  }
<· undefined
> add(5, 3)
<· 8
> |
```

Firefox Web Browser

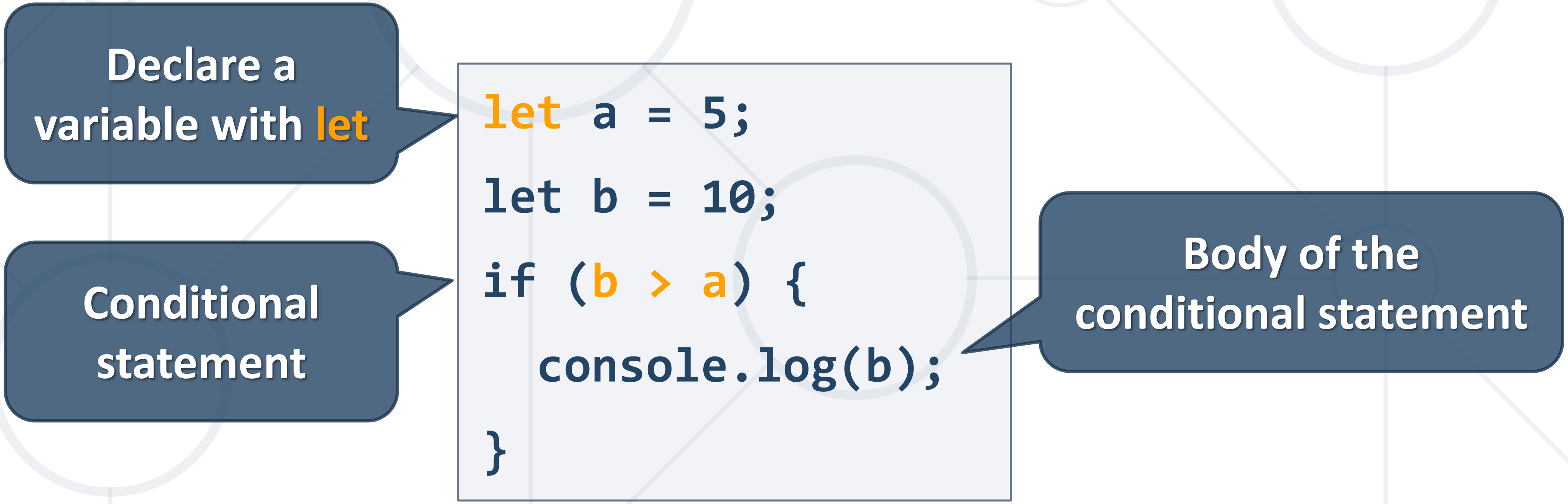
- Developer Console: **[Ctrl] + [Shift] + [i]**



```
>> function add(a, b) { return a + b; }
← undefined
>> add(5, 3)
← 8
>>
```

JavaScript Syntax

- The JavaScript syntax is similar to C#, Java and PHP
  - Operators, Variables, Conditional statements, loops, functions, arrays, objects and classes.



Declare a variable with let

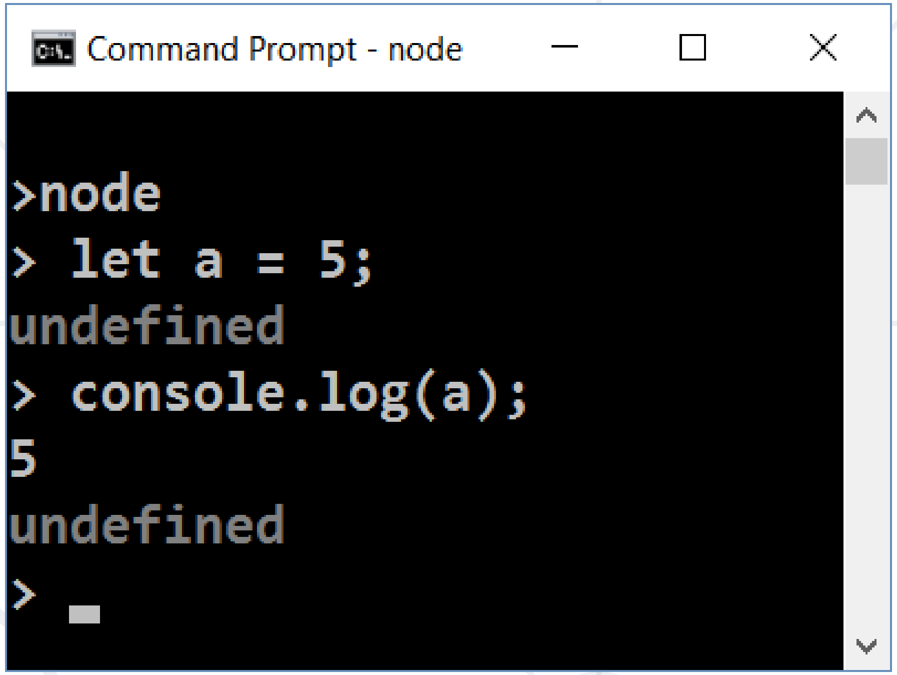
Conditional statement

```
let a = 5;
let b = 10;
if (b > a) {
  console.log(b);
}
```

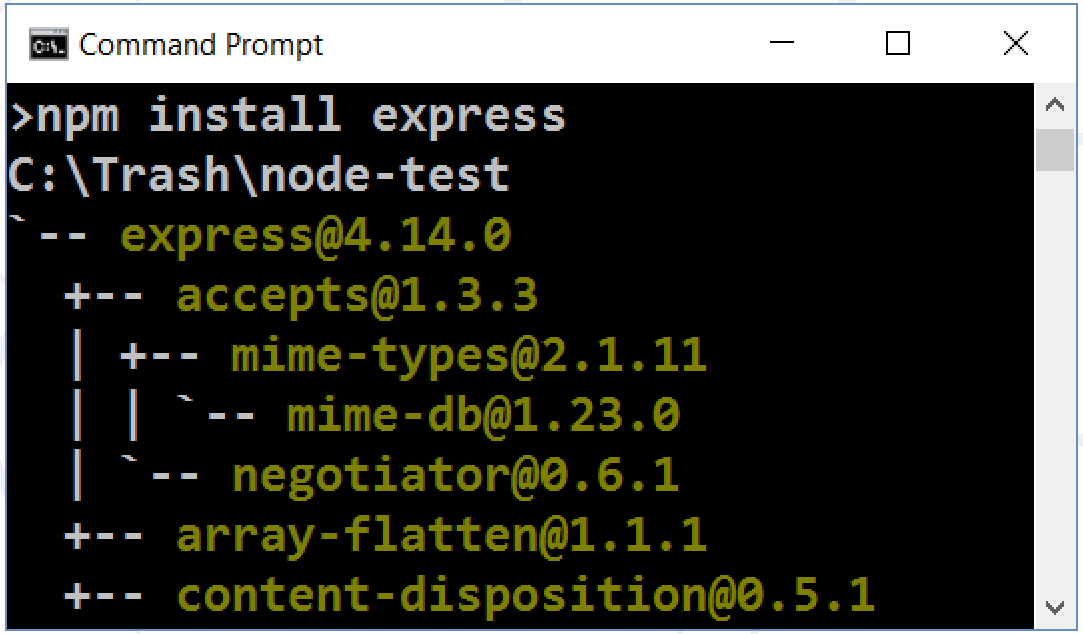
Body of the conditional statement

Node.js

- What is **Node.js**?
  - Server-side JavaScript runtime
  - Chrome **V8** JavaScript engine



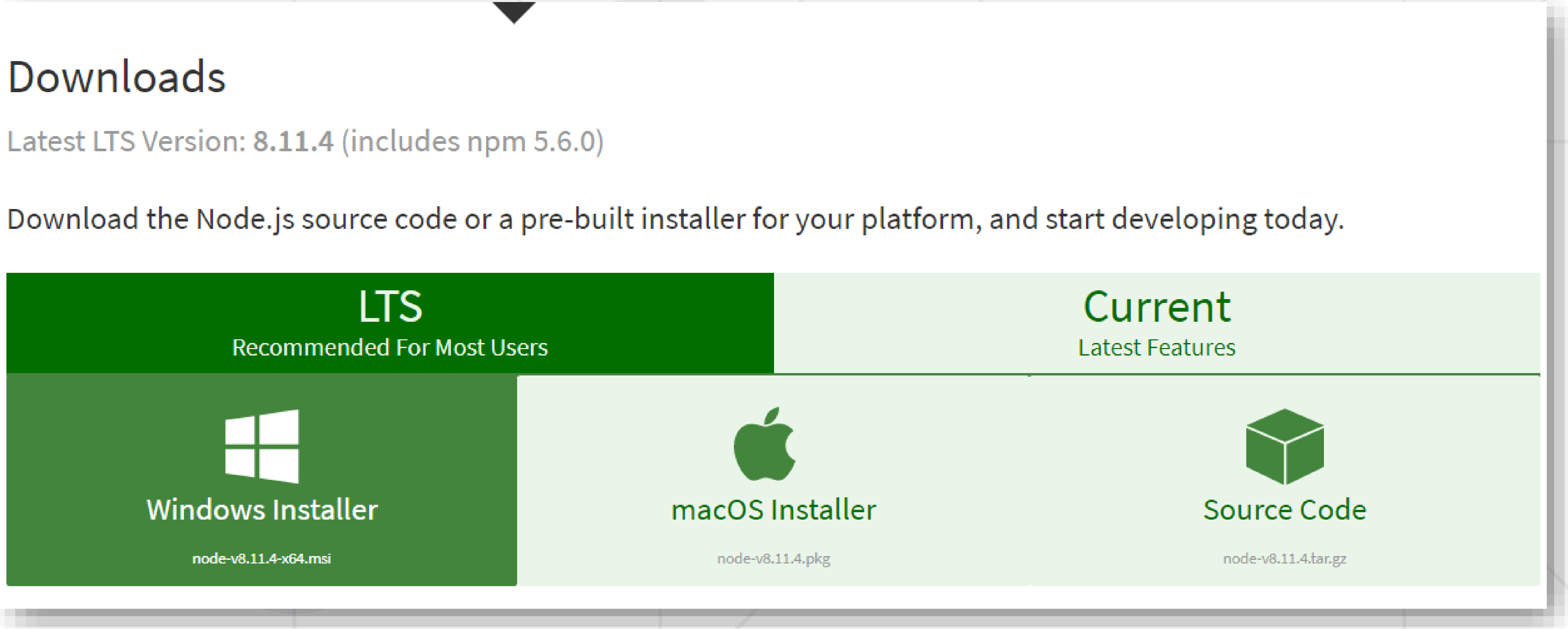
```
>node
> let a = 5;
undefined
> console.log(a);
5
undefined
> _
```



```
>npm install express
C:\Trash\node-test
`-- express@4.14.0
  +-- accepts@1.3.3
  | +-- mime-types@2.1.11
  | | `-- mime-db@1.23.0
  | `-- negotiator@0.6.1
  +-- array-flatten@1.1.1
  +-- content-disposition@0.5.1
```

- **npm** package manager
  - Install node packages

Install the Latest Node.js



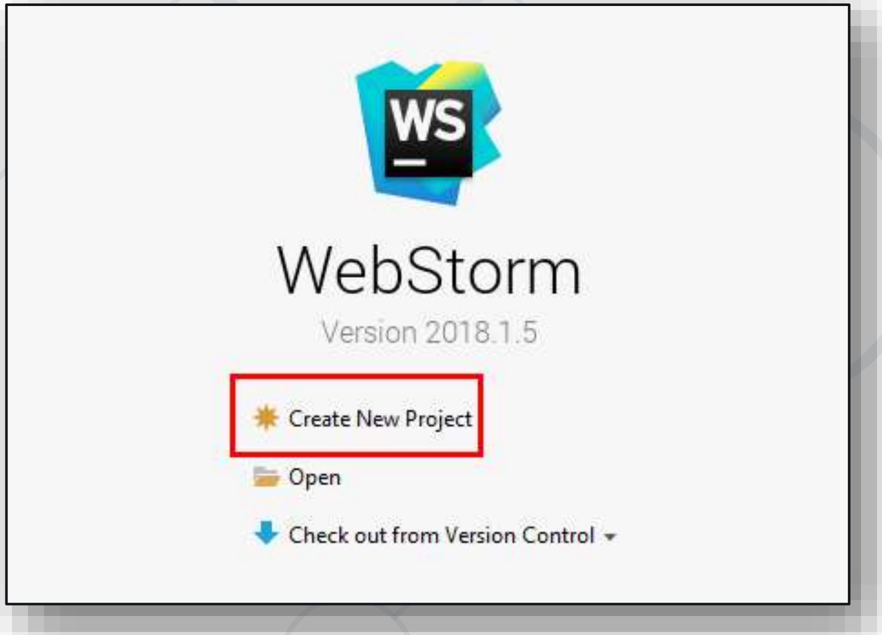
Downloads

Latest LTS Version: **8.11.4** (includes npm 5.6.0)

Download the Node.js source code or a pre-built installer for your platform, and start developing today.

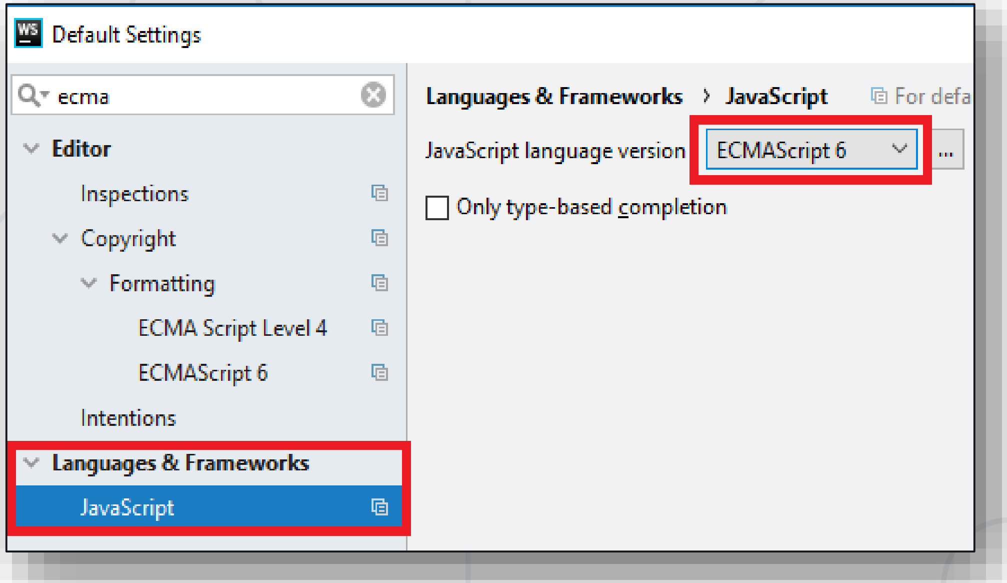
Using WebStorm

- **WebStorm** is powerful IDE for JavaScript and other languages
- Create a **new project**



Configurations

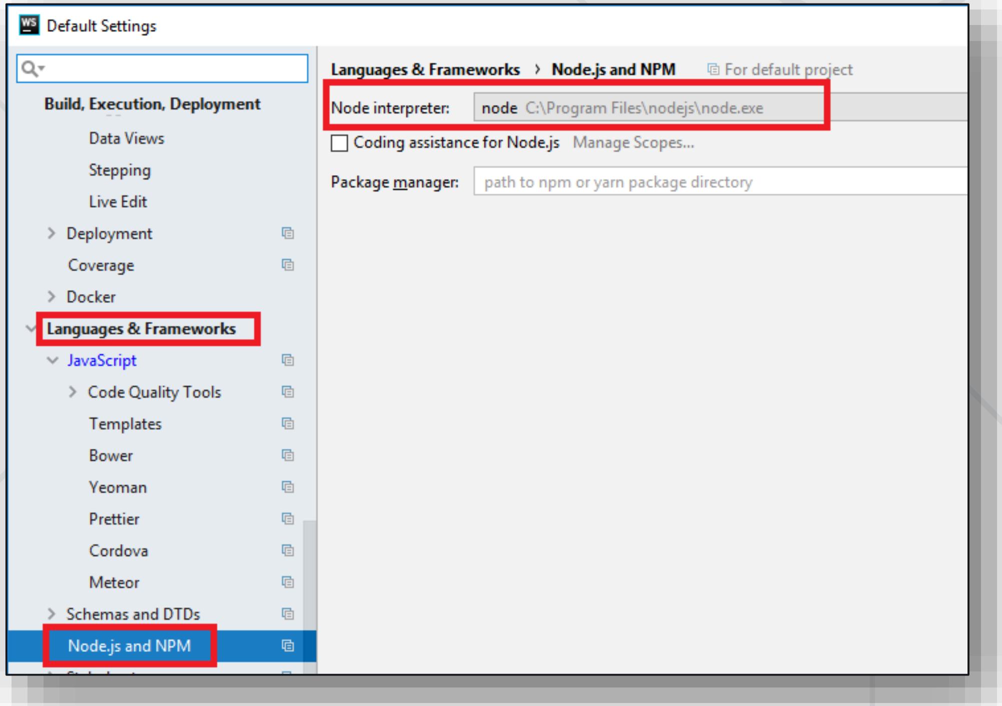
- Set up ECMAScript 6 and Node.js
  - ECMAScript6 is a standard for JavaScript
  - Node is environment for JavaScript



Languages & Frameworks › JavaScript For defa

JavaScript language version: ECMAScript 6

☐ Only type-based completion



Languages & Frameworks › Node.js and NPM For default project

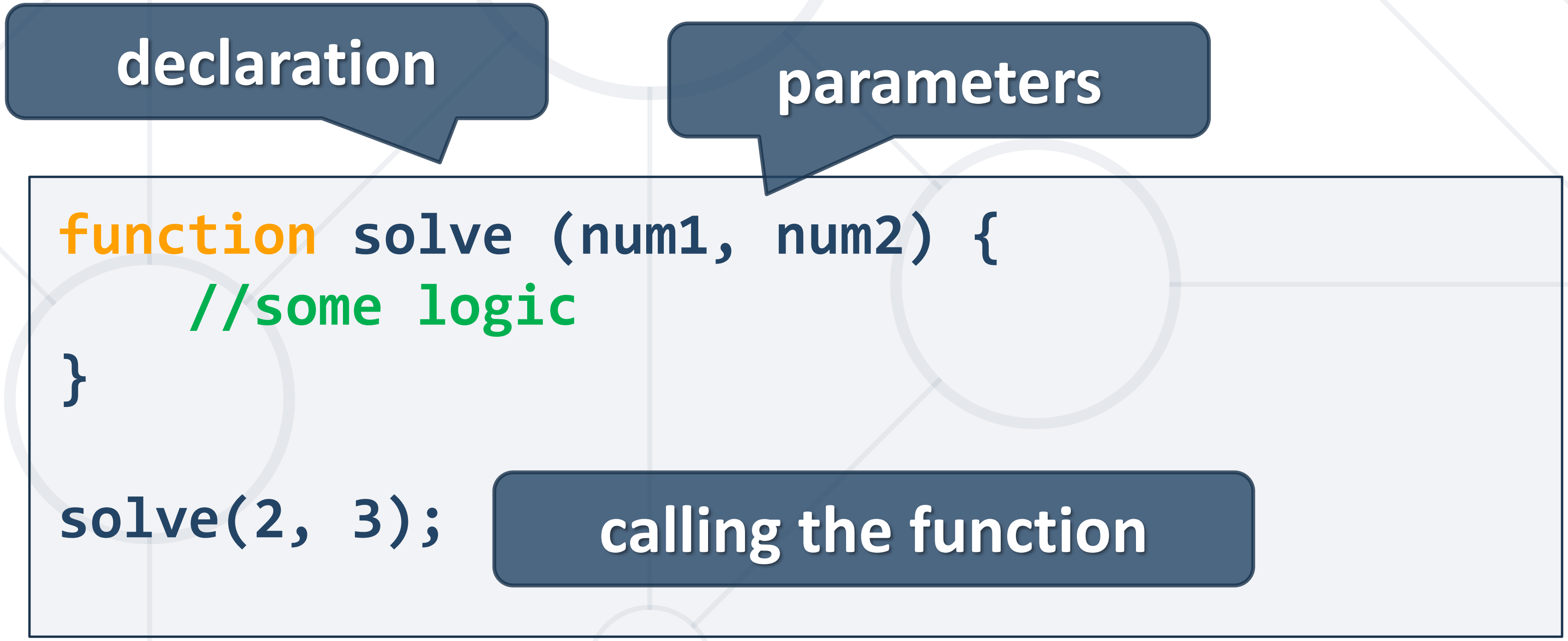
Node interpreter: node C:\Program Files\nodejs\node.exe

☐ Coding assistance for Node.js Manage Scopes...

Package manager: path to npm or yarn package directory

Functions

- In order to solve different problems, we are going to use **functions** and the input will come as parameters.
- A function is block of code, that executes when called



```
function solve (num1, num2) {
    //some logic
}

solve(2, 3);
```

Problem: Multiply number by two

- Write a function that receives a **number** and prints as result that number **multiplied by two**

Input	Output
2	4

Solution: Multiply number by two

- Execute the code with **Shift+F10**

```
function solve (num) {
    console.log(num * 2);
}

solve(2);
```

Check your solution here: https://judge.softuni.bg/Contests/1189

Comparison Operators

Operator	Notation in JS
Equal value	==
Equal value and type	===
Not equal value	!=
Not equal value/type	!===
Greater than	>
Greater than or Equal	>=
Less than	<
Less than or Equal	<=

If (a > b)

Conditional Statements

Implementing Control-Flow Logic

What is conditional statement

- The **if-else** statement:
  - Do action depending on condition

```
let a = 5;
if (a >= 5) {
  console.log(a);
}
```

If the condition is met, the code will execute

  - You can chain conditions

```
else {
  console.log('no');
}
```

Continue on the next condition, if the first is not met

Problem: Excellent grade

- Write a function that receives a single number and checks if the grade is excellent or not. If it is, print "Excellent", otherwise print "Not excellent"

Input	Output
5.50	Excellent
4.35	Not excellent

Solution: Excellent grade

- Check if the grade is **greater than 5.50**
- If it is, print **"Excellent"**
- Otherwise, print **"Not excellent"**

```
function solve (grade) {
    if (grade >= 5.50) {
        //TODO
    } else {
        //TODO
    }
```

Check your solution here: https://judge.softuni.bg/Contests/1189

for
while

Loops

Code Block Repetition

What are loops

- The **for** loop:
  - Repeats until a the condition is broken:

```
for (let i = 1; i <= 5; i++){
    console.log(i)
}
```

Incrementation in the condition

- The **while** loop:
  - Does the same, but has different structure

```
let i = 1
while (i <= 5) {
    console.log(i)
    i++
}
```

Incrementation outside the condition

Problem: Numbers from 1 to 5

- Create a function that prints all the numbers from 1 to 5 **(inclusive)** each on a separate line

Output
1 2 3 4 5

Solution: Numbers from 1 to 5

- Create a for-loop
- Increase the step
- Print the step

```
function solve () {
    for (let i = 1; i <= 5; i++) {
      //TODO: print
  }
}
```

Check your solution here: https://judge.softuni.bg/Contests/1189

Problem: Numbers from N to 1

- Write a function that receives a **number** and prints the numbers form **N to 1**. Try using **while loop**

Input	Output
5	5 4 3 2 1

Solution: Numbers from N to 1

- Create while loop
- Print the number
- Decrease the number

```
function solve(n) {
    while(/*TODO*/) {
        console.log(n);
        n--;
    }
}

solve(5);
```

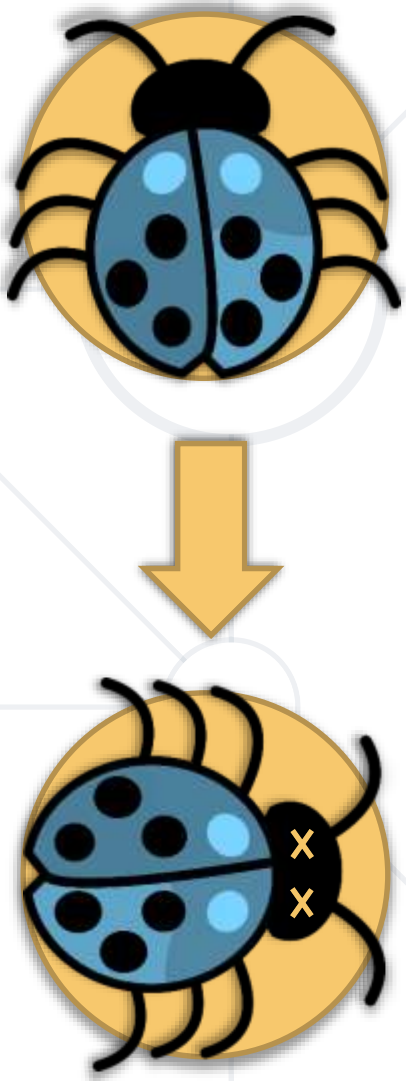
Check your solution here: https://judge.softuni.bg/Contests/1189

Debugging the Code

Using the WebStorm Debugger

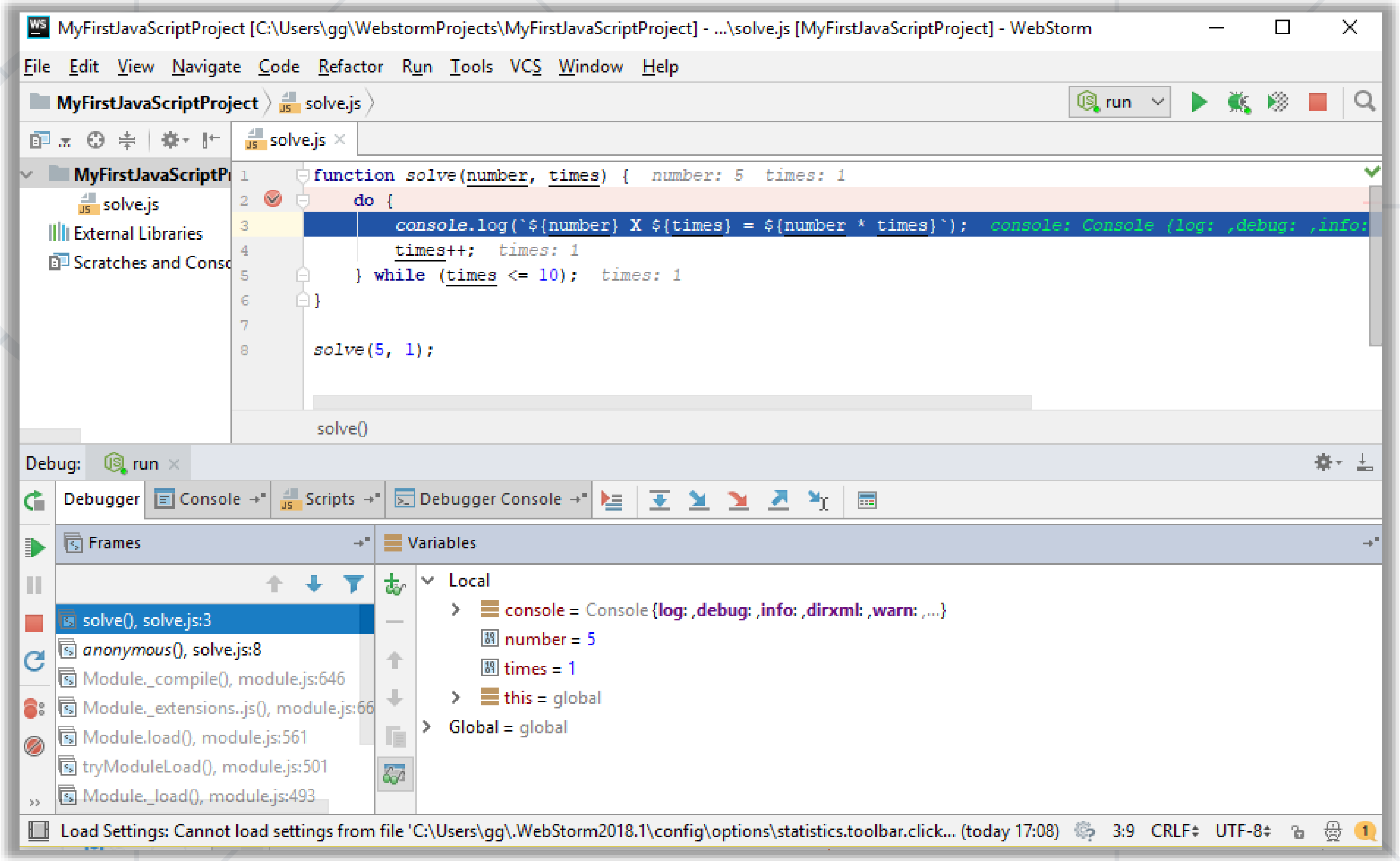
Debugging the Code

- The process of **debugging application** includes:
  - Spotting an error
  - Finding the lines of code that cause the error
  - Fixing the error in the code
  - Testing to check if the error is gone and no new errors are introduced
- Iterative and continuous process



Debugging in WebStorm

- WebStorm has a built-in **debugger**
- It provides:
  - **Breakpoints**
  - Ability to **trace** the code execution
  - Ability to **inspect** variables at runtime



MyFirstJavaScriptProject [C:\Users\gg\WebstormProjects\MyFirstJavaScriptProject] - ...\solve.js [MyFirstJavaScriptProject] - WebStorm

File Edit View Navigate Code Refactor Run Tools VCS Window Help
MyFirstJavaScriptProject 〉 solve.js 〉
run
MyFirstJavaScriptPr
solve.js
External Libraries
Scratches and Consc
solve()
Debug: run
Debugger Console Scripts Debugger Console
Frames
Variables

```
function solve(number, times) {  number: 5  times: 1
    do {
        console.log(`${number} X ${times} = ${number * times}`);  console: Console {log: ,debug: ,info:
        times++;  times: 1
    } while (times <= 10);  times: 1
}

solve(5, 1);
```

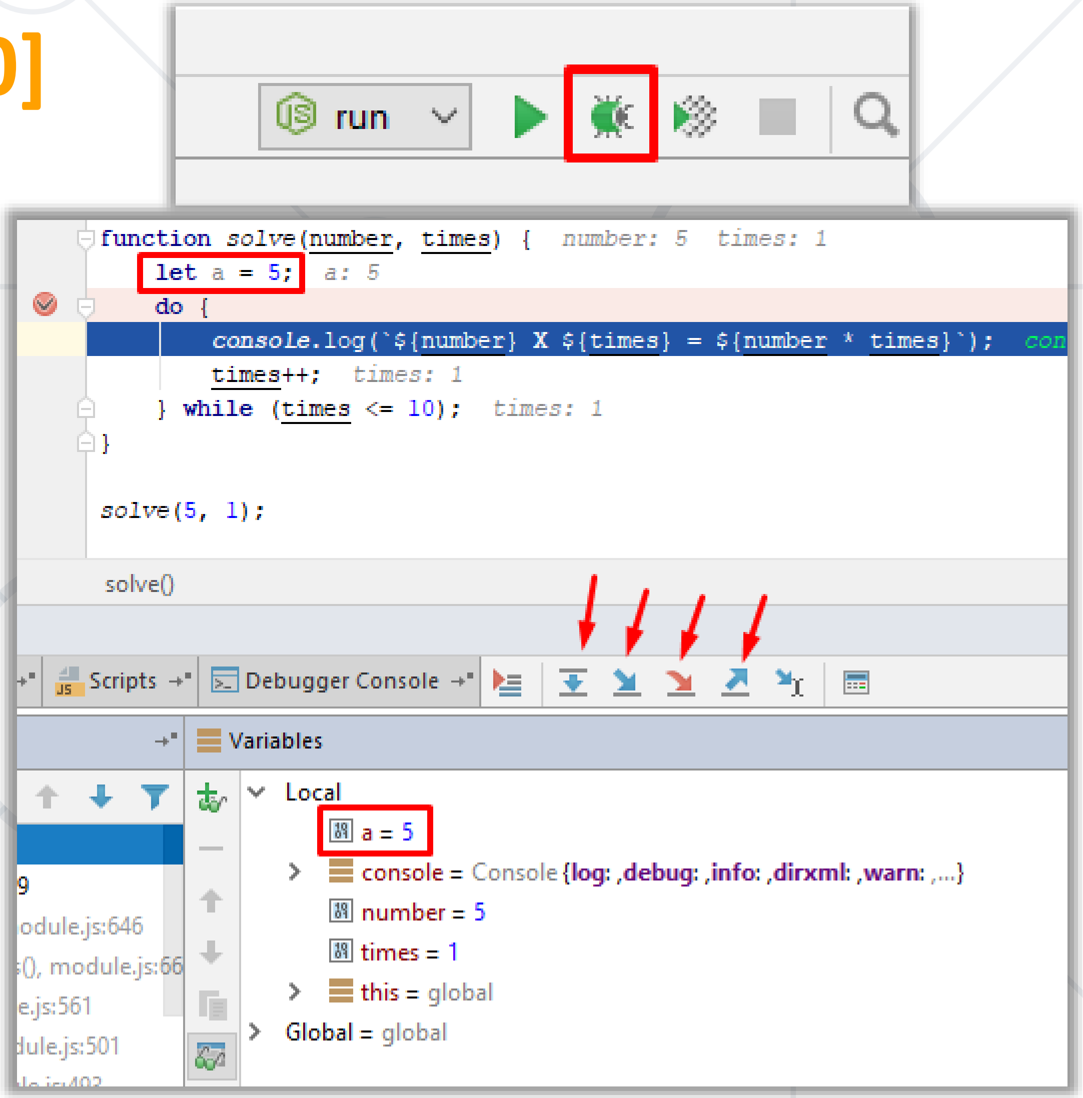
```
solve(), solve.js:3
anonymous(), solve.js:8
Module._compile(), module.js:646
Module._extensions..js(), module.js:66
Module.load(), module.js:561
tryModuleLoad(), module.js:501
Module._load(), module.js:493
```

```
Local
  console = Console {log: ,debug: ,info: ,dirxml: ,warn: ,...}
  number = 5
  times = 1
  this = global
Global = global
```

Load Settings: Cannot load settings from file 'C:\Users\gg\.WebStorm2018.1\config\options\statistics.toolbar.click... (today 17:08) 3:9 CRLF÷ UTF-8÷

Using the Debugger in WebStorm

- Start without Debugger: **[Shift+F10]**
- Toggle a breakpoint: **[Shift+F9]**
- Trace step by step: **[F7]**
- Force step into: **[Alt+Shift+f7]**
- Using the **Local**
- Conditional breakpoints
- Enter debug mode after exception



```
function solve(number, times) {   number: 5   times: 1
    let a = 5;   a: 5
    do {
        console.log(`${number} X ${times} = ${number * times}`);   con
        times++;   times: 1
    } while (times <= 10);   times: 1
}

solve(5, 1);
```

```
solve()
9
odule.js:646
s(), module.js:66
e.js:561
dule.js:501
```

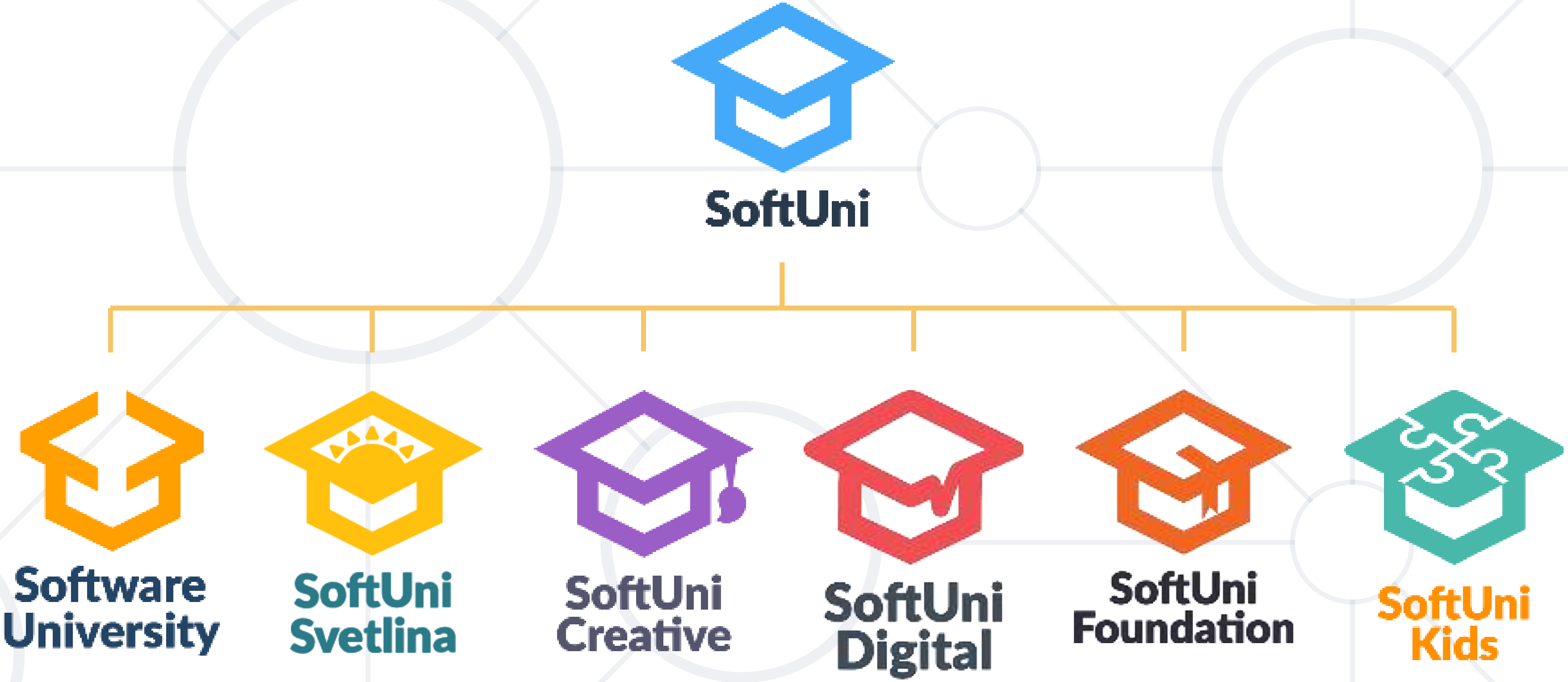
```
Local
    a = 5
  > console = Console {log: ,debug: ,info: ,dirxml: ,warn: ,...}
    number = 5
    times = 1
  > this = global
> Global = global
```

Live Exercises

Summary

- We declare variables with **'let'**
- We use **if-else** statements to check for conditions
- We use **loops** to avoid repeating code
- We use the **debugger** to check for mistakes in the code

Questions?



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