



JavaScript debugging

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JavaScript debugging

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What is debugging?

In terms of software:

- Identifying bugs
- Removing errors



What is a debugger?

Computer program for examining the state of your program while running.

How does the debugging process work?

1. Reproduce the problem
2. Describe the bug
3. Capture the program snapshot when the problem appears.
4. Analyse the snapshot.
5. Fix the existing bug.

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Careful!
Try to not create more bugs when fixing errors. { ☹️ ☹️ }

Types of bug



SYNTAX ERRORS



RUNTIME ERRORS



LOGIC ERRORS

Syntax errors



These are errors where the interpreter finds something wrong with your program, and you can't even try to execute it.

Example:

```
1  const score = (coorX, coorY) => {  
2    let module = Math.sqrt(coorX * coorX + coorY * coorY);  
3    if (module <= 1 { ←  
4      return 10;  
5    }  
6    if (module <= 5) {  
7      return 5;  
8    }  
9    if (module <= 10) {  
10     return 1;  
11   }  
12   return 0;  
13 };
```


Syntax errors



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9    if (module <= 10) {  
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12   return 0;  
13 };
```

Error:

```
if (module <= 1 {  
                  ^
```

SyntaxError: Unexpected token '{'

Runtime errors



Also called exceptions, occur during execution

Example:

```
1  const product = (firstFactor, secondFactor) => {  
2    |  return firstFactor * secondFactor;  
3  };  
4  
5  console.log(taradiddle(4, 5));
```

Runtime errors



Also called exceptions, occur during execution

Example:

```
1  const product = (firstFactor, secondFactor) => {  
2    |  return firstFactor * secondFactor;  
3  };  
4  
5  console.log(taradiddle(4, 5));
```

Error:

```
ReferenceError: taradiddle is not defined
```

Logic errors



They occur when you make a mistake in the logic that drives your script and you do not get the result you expected.

Example:

```
18  const multiplicationTables = () => {
19    for (let i = 1; i <= 10; i++) {
20      console.log(`Tabla del ${i}`);
21      for (let j = 1; j <= 10; i++) {
22        console.log(`${i} * ${j} = ${i * j}`)
23      }
24    }
25  }
26
27  multiplicationTables();
```

Logic errors



They occur when you make a mistake in the logic that drives your script and you do not get the result you expected.

Example:

```
18 const multiplicationTables = () => {
19   for (let i = 1; i <= 10; i++) {
20     console.log(`Tabla del ${i}`);
21     for (let j = 1; j <= 10; i++) {
22       console.log(`${i} * ${j} = ${i * j}`)
23     }
24   }
25 }
26
27 multiplicationTables();
```

Output:

```
26868 1 = 26868
26869 * 1 = 26869
26870 * 1 = 26870
26871 * 1 = 26871
26872 * 1 = 26872
26873 * 1 = 26873
26874 * 1 = 26874
26875 * 1 = 26875
26876 * 1 = 26876
```



Some debugging strategies



**Incremental program
development**



Error-detection tools



Backtracking



Bug clustering



Binary search



Use a debugger

Strict mode

'use strict'; -> Defines that JavaScript code should be executed in "strict mode".

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For example:

Strict mode

1. Assign values to non-writable properties.

Strict mode

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2. Mistyping a variable name creates a new global variable.

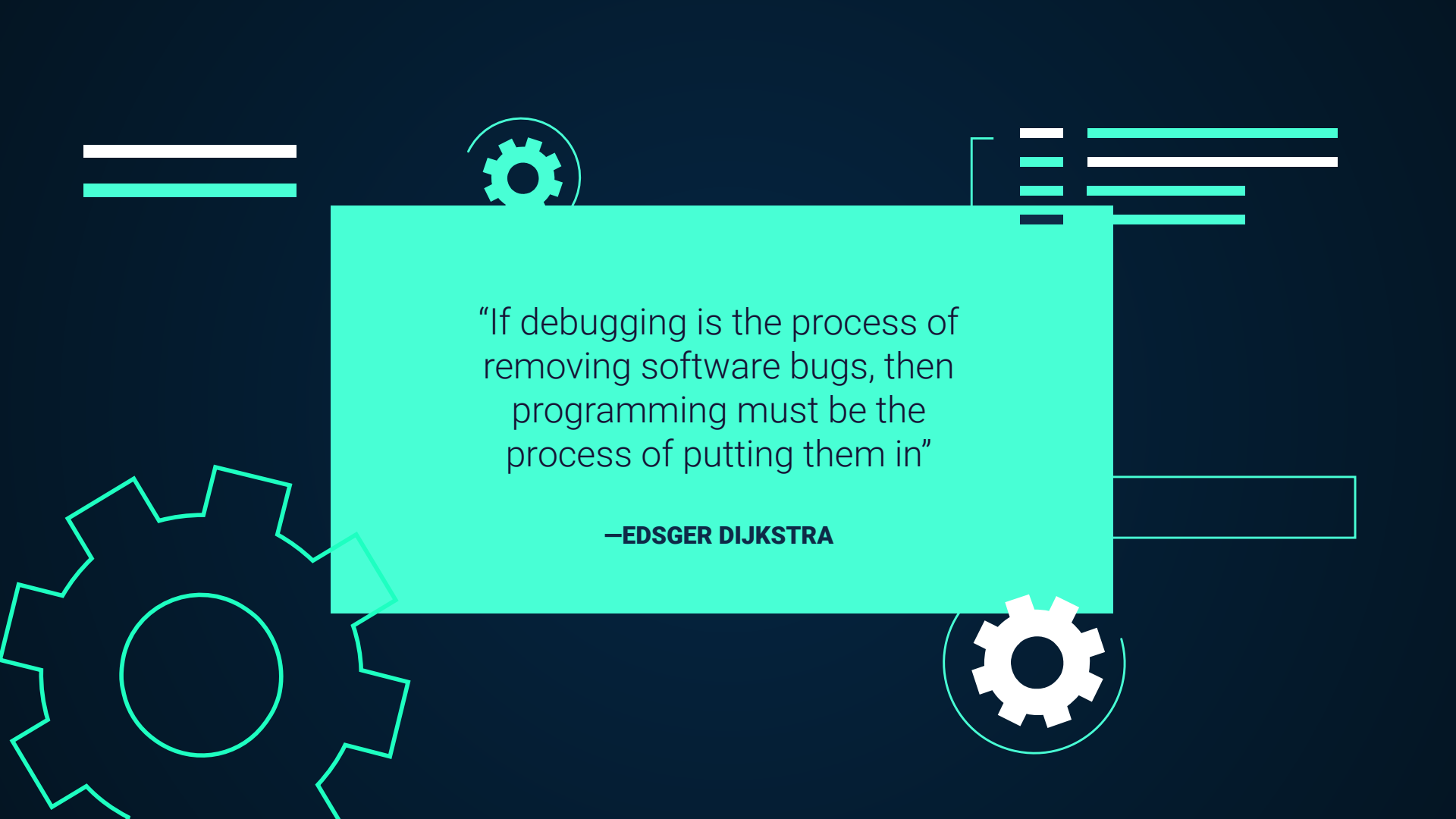
Strict mode

1. Assign values to non-writable properties.
2. Mistyping a variable name creates a new global variable.
3. Any assignment to a non-writable property, a getter-only property, a non-existing property...

Breakpoints

It is an intentional stopping or pausing place in a program.





"If debugging is the process of removing software bugs, then programming must be the process of putting them in"

—EDSGER DIJKSTRA

Debugging with Node



Debugging with VSCode



Debugging with Chrome



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Thanks!
Questions?