Loops & Debugging

Week 1: Day 2

Learning Objectives

- Define **for** loop in JS
    - Implement **break** and **continue** in loops
- Analyze stack traces for errors
- Analyze code with Chrome Debugger
    - Use the **debugger** statement in chrome to inspect variable in for loop

What is a loop?

```
// Printing ‘hello world’
    console.log(‘hello world’);

// Printing ‘hello world’ 3 times
// put the code block in a loop
```

Setting up a for loop - 4 steps

1. Initial Expression

   `let i = 0;`

2. Condition Expression

   `i < 3;`

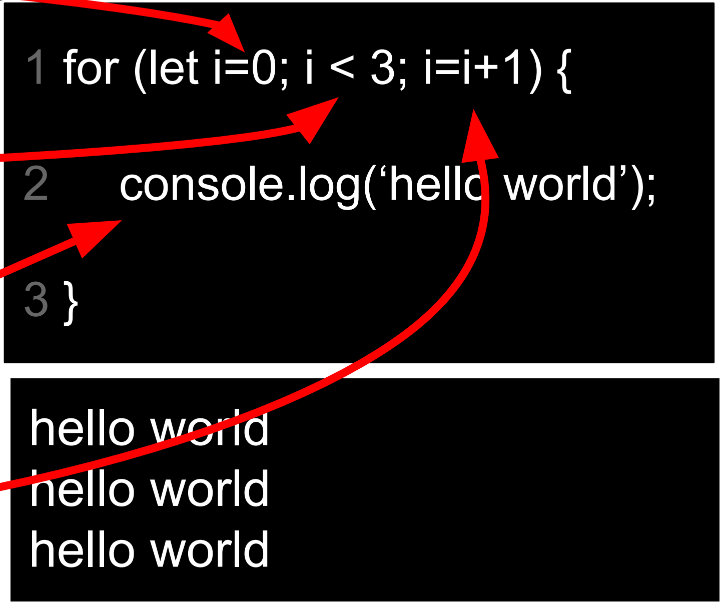
3. Code block

   `console.log('hello world');`

4. Increment Expression

   `i = i + 1;`

Loop steps 2->3->4
As long as step 2 is true



```
for (let i=0; i < 3; i=i+1) {
    console.log('hello world');
}
```

```
hello world
hello world
hello world
```

Chrome Debugger!

// Open CodePen

// Click ‘Start Coding’

// Settings > Behavior > Auto-Updating Preview to ‘Off’

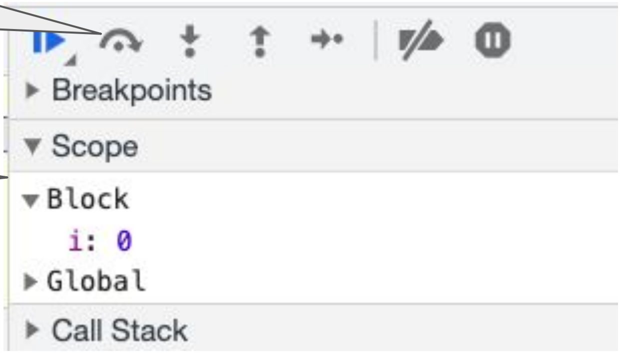
// Click ‘View > Developer > Developer tools’ (‘alt + command + j’)

// Write the for loop in ‘js’ panel, and hit ‘Run’

// Add the magic term ‘debugger’ and hit ‘Run’ again

Click the ‘Step over’ button to execute the code one line at a time

Keep your eyes on the ‘Scope’ contents



For loops to try

```
// Print odd numbers from 1 to 11
// Intro to 'Remainder' ( % )


// quick tip on i++ AND i += 2


// Count down from 10 to 0


// Infinite loop


// While and Do While are similar
```

Accessing characters in a string

// String variable representation

```
let letters = ‘world’;
```

0	1	2	3	4
w	o	r	l	d

```
console.log(letters[0])
>w
console.log(letters[4])
>d
console.log(letters[5])
>undefined
```

String properties & methods

```
let letters = ‘world’;
> letters.length //property
> 5
> letters.toUpperCase() //method
> WORLD
> letters[2].toUpperCase()
> R
> letters[5].toUpperCase()
> Uncaught TypeError
```

String in a for loop

```
let letters = ‘world’;
for (let i = 0; i < letters.length; i++) {
    console.log(letters[i]);
}
```

String in a for loop 2

// Create a string from another string

// by including only alternate characters

```
let letters = ‘world’;
let oddLetters = ‘’;

for (let i = 0; i < letters.length; i++) {
   if ( i%2 === 0) {
          oddLetters += letters[i];
          // oddLetters=oddLetters + letters[i];
   }
}
console.log(oddLetters);
```

Continue in a for loop

// the continue keyword will cause the loop to skip to the next iteration

```
let letters = ‘world’;
for (let i = 0; i < letters.length; i++) {
    if(letters[i] === ‘r’) {
            continue;
    }
    console.log(letters[i]);
}
```

Break in a for loop

// the break keyword breaks out of the loop permanently

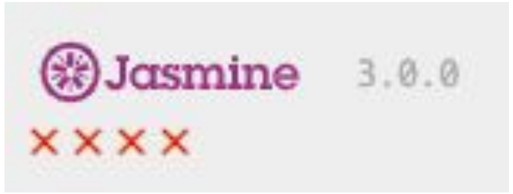
```
let letters = ‘world’;
for (let i = 0; i < letters.length; i++) {
    if(letters[i] === ‘r’) {
            break;
    }
    console.log(letters[i]);
}
```

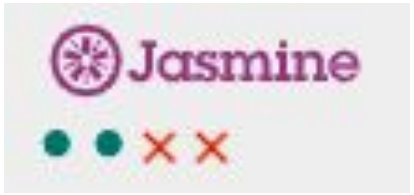
Codepen workshop before solving

// 1. Read the Readme tab

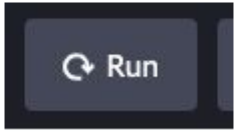
// 2. Look at the Specs tab

Codepen workshop reading Specs

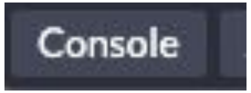




// each x or ● signals a failed or passed test



// click ‘Run’ button on top bar to rerun code



// click ‘Console’ on bottom left to see console output

Codepen workshop Solving

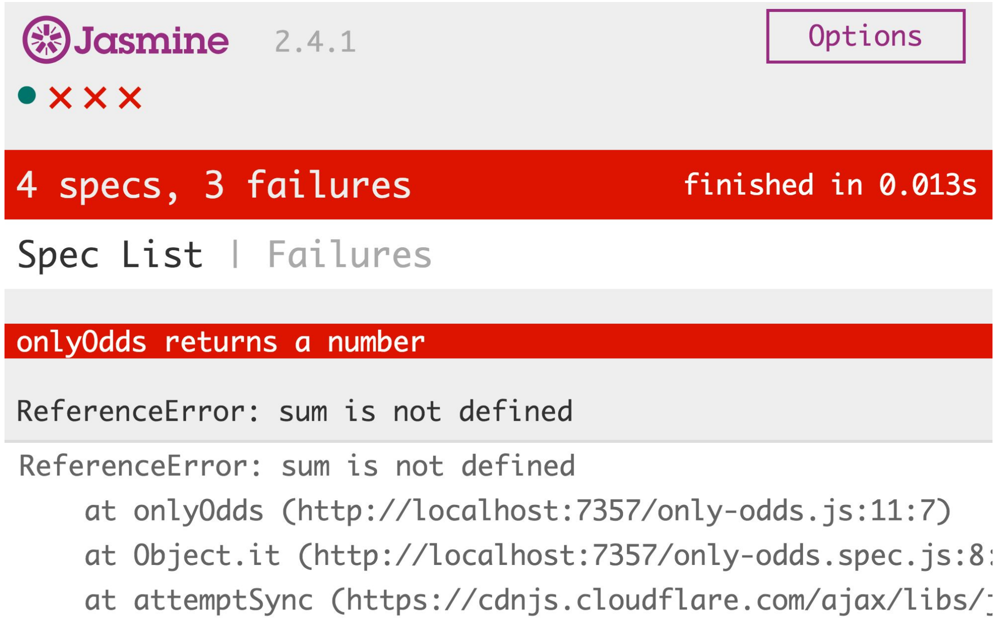
```
// 1. Function syntax with name and argument(s)
// 2. Initialize return variable with default value
// 3. Return the variable from step 2
// 4. Write your solution
```

Debugging - error messages

/* Let's start by considering bugs that come from writing invalid JavaScript code. */

/* The testem page in your browser passes helpful error messages to you if it couldn't run your code as written */

/* This ReferenceError means the the code tried to reference a variable called sum that was never defined */



```
4 specs, 3 failures                    finished in 0.013s

Spec List | Failures

onlyOdds returns a number

ReferenceError: sum is not defined

ReferenceError: sum is not defined
    at onlyOdds (http://localhost:7357/only-odds.js:11:7)
    at Object.it (http://localhost:7357/only-odds.spec.js:8:
    at attemptSync (https://cdnjs.cloudflare.com/ajax/libs/
```

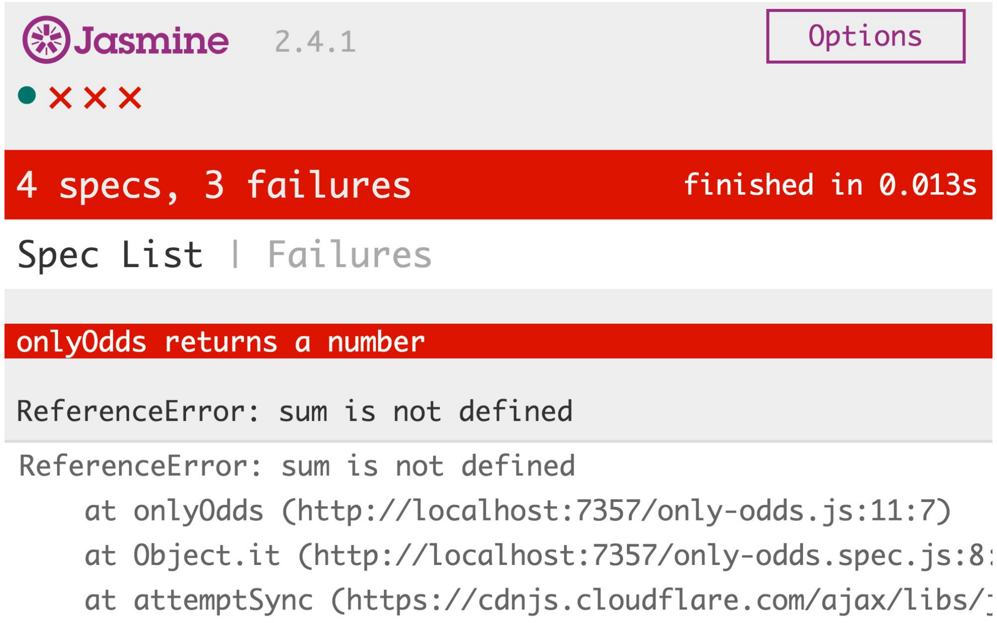
Debugging - error messages

/* Note the stack trace below the error */

/* The first at… line gives the location where the error occurred in ‘01 Only Odds’: it looks like the error happened on line 11. */

/* This line number may not always be accurate, but its often a good place to start */

/* Google unfamiliar errors */



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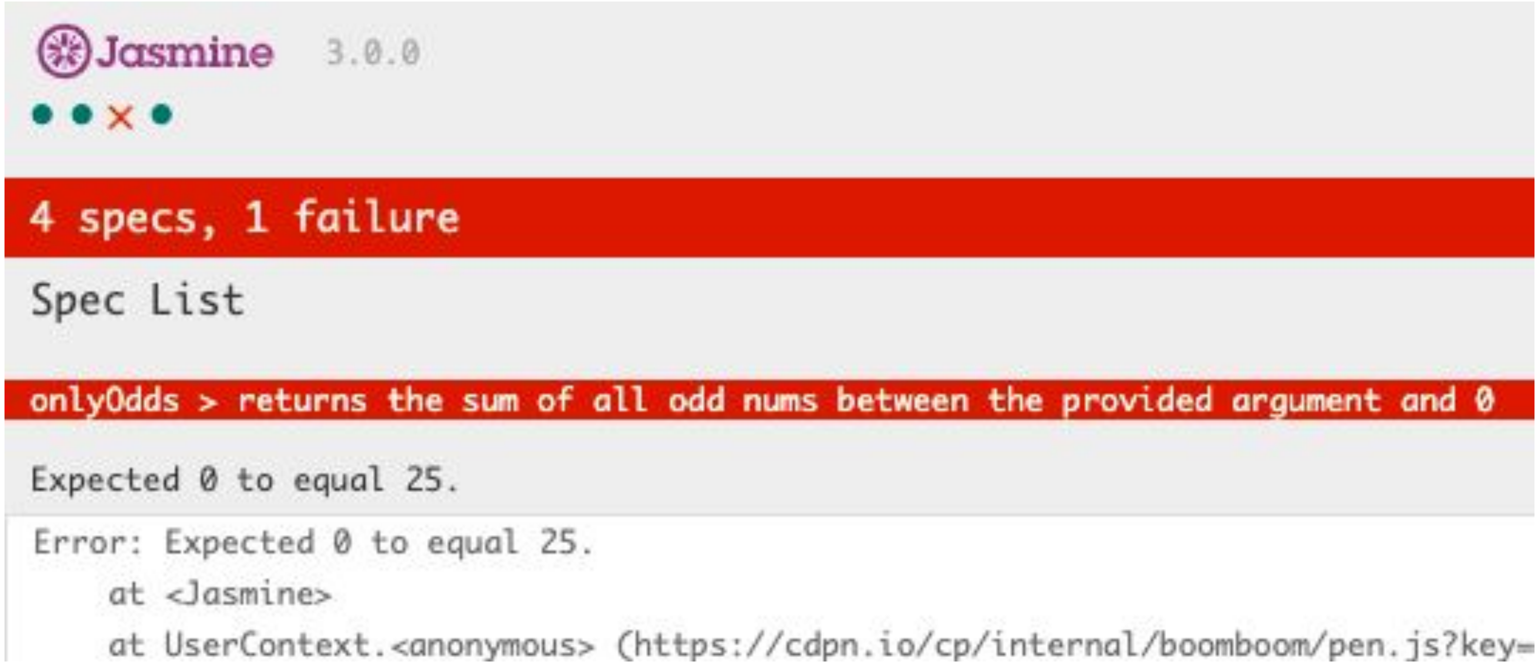
Debugging - failing tests

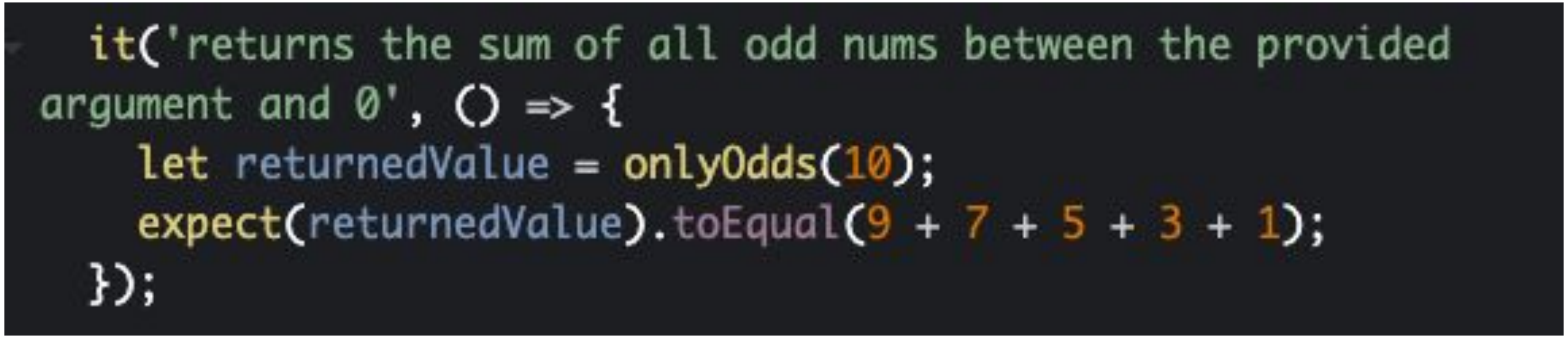
/* When your test is failing, you'll get an output that compares the value your function returned against the expected value. */



```
Jasmine 3.0.0
• • × •

4 specs, 1 failure

Spec List

onlyOdds > returns the sum of all odd nums between the provided argument and 0

Expected 0 to equal 25.

Error: Expected 0 to equal 25.
    at <Jasmine>
    at UserContext.<anonymous> (https://cdpn.io/cp/internal/boomboom/pen.js?key=
```

Debugging - failing tests

// It can also help to look directly at the code that defines how the test is supposed to work.
// You can see that the test is passing in the number 10 to your function. This can help you debug!
// All of the code inside of the tests, besides the line that starts with expect, is plain-old JavaScript
// Using ‘fit’



```
  it('returns the sum of all odd nums between the provided
argument and 0', () => {
    let returnedValue = onlyOdds(10);
    expect(returnedValue).toEqual(9 + 7 + 5 + 3 + 1);
  });
```

Recap

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  - Implement **break** and **continue** in loops
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