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Launch School
Introduction to Programming With JavaScript
Loops and Iterating – Exercises

1: This exercises asks us to modify the age.js file from the Input/Output chapter to use a for loop to display the future ages. I did this modification as follows:

```
let rlSync = require('readline-sync');
let age = Number(rlSync.question("How old are you? "));

console.log(`You are ${age} years old.`);
for (let i = 10; i <= 40; i += 10) {
  console.log(`In ${i} years you will be ${age + i} years old.`);
}
```

2: This exercises asks us to write a function that computes and returns the factorial of a number using a for loop (assuming the argument is a nonnegative integer.) I did this as follows:

```
function factorial(num) {
  let fac = 1;
  for (let i = 1; i <= num; i++) {
    fac = fac*i;
  }
  return fac;
}
```

3: This exercise asks us to explain why the following code causes an infinite loop:

```
let counter = 0;

while (counter = 1) {
  console.log(counter);
  counter += 1;

  if (counter > 2) {
    break;
  }
}
```

The answer is that because the while statement has an assignment expression as condition which returns the assigned value 1, which is truthy, the while loop condition will always evaluate to a truthy value, and so the loop will never stop.

4: This exercises asks us to explain whether the following code produces an error:

```
for (let i = 0; i < 5;) {
  console.log(i += 1);
}
```

The answer is that this code does not produce an error. We can define a loop with missing expressions (such as a missing iteration action as in this case) without any problem. We can also use a variable assignment as argument to a function, as a variable reassignment is a valid expression. Furthermore, the loop will terminate since the iteration variable is increased every time the console log is called.

5: This exercise asks us to refactor the code below so that we do not need to call randomNumberBetween() from two different locations:

```
function randomNumberBetween(min, max) {
  return Math.floor(Math.random() * (max - min + 1) + min);
}

let tries = 0;
let result = randomNumberBetween(1, 6);
tries += 1;

while (result <= 2) {
  result = randomNumberBetween(1, 6);
  tries += 1;
}

console.log('It took ' + String(tries) + ' tries to get a number greater than 2');
```

I did this as follows:

```
function randomNumberBetween(min, max) {
  return Math.floor(Math.random() * (max - min + 1) + min);
}

let tries = 0;
let result;
do {
  result = randomNumberBetween(1, 6);
  tries += 1;
} while (result <= 2);

console.log('It took ' + String(tries) + ' tries to get a number greater than 2');
```

6: This exercise asks us to reimplement the factorial function from exercise 2 using recursion. I did this as follows:

```
function factorial(num) {
  if (num === 0) {
    return 1;
  } else {
    return num * factorial(num - 1);
  }
}
```