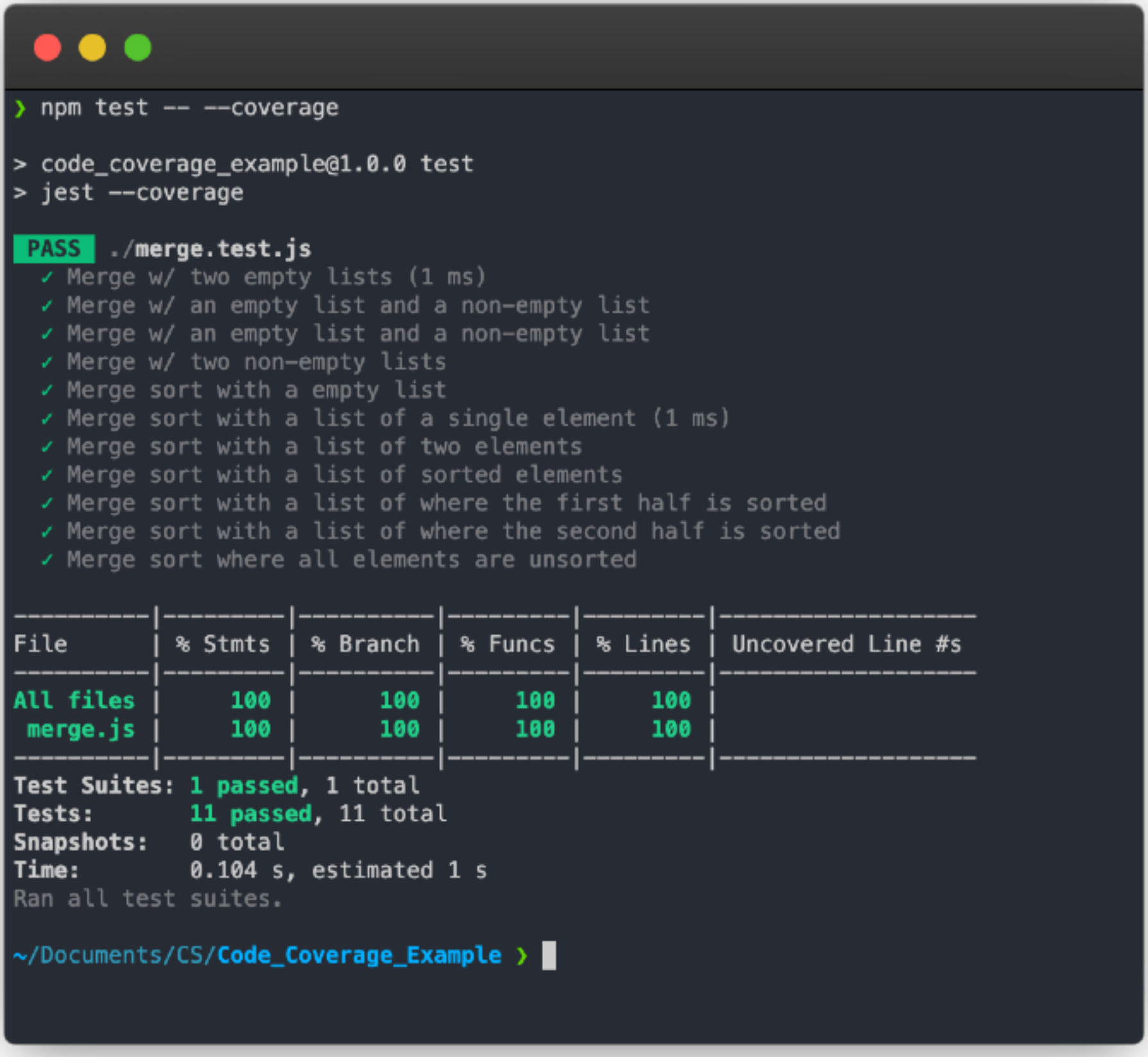
```
function merge(list1, list2) {
  if (list1.length < 1) {
    // List 1 is empty
    return list2;
  } else if (list2.length < 1) {
    // List 2 is empty
    return list1;
  } else {
    var first, rest, other;
    if (list1[0] < list2[0]) {
      // First element of list1 is smaller
      first = list1.slice(0, 1);
      rest = list1.slice(1, list1.length);
      other = list2;
    } else {
      // First element of list2 is smaller
      first = list2.slice(0, 1);
      rest = list2.slice(1, list2.length);
      other = list1;
    }
    return first.concat(merge(rest, other)); // Recursively merge the rest of the lists
  }
}

// Splits the list for merge sort
function mergeSort(array_list) {
  if (array_list.length <= 1) {
    return array_list;
  } else {
    return merge(
      mergeSort(array_list.slice(0, array_list.length / 2)),
      mergeSort(array_list.slice(array_list.length / 2, array_list.length))
    );
  }
}

module.exports.merge = merge;
module.exports.mergeSort = mergeSort;
```

```
const mergeSortLib = require('./merge');
const merge = mergeSortLib.merge;
const mergeSort = mergeSortLib.mergeSort;

test('Merge w/ two empty lists', () => {
  expect(merge([], [])).toEqual([]);
});

test('Merge w/ an empty list and a non-empty list', () => {
  expect(merge([], [1, 2, 3])).toEqual([1, 2, 3]);
});

test('Merge w/ an empty list and a non-empty list', () => {
  expect(merge([1, 2, 3], [])).toEqual([1, 2, 3]);
});

test('Merge w/ two non-empty lists', () => {
  expect(merge([5, 6, 7], [1, 2, 3])).toEqual([1, 2, 3, 5, 6, 7]);
});

test('Merge sort with a empty list', () => {
  expect(mergeSort([])).toEqual([]);
});

test('Merge sort with a list of a single element', () => {
  expect(mergeSort([5])).toEqual([5]);
});

test('Merge sort with a list of two elements', () => {
  expect(mergeSort([5, 3])).toEqual([3, 5]);
});
``;

test('Merge sort with a list of sorted elements', () => {
  expect(mergeSort([2, 4, 6, 8, 10])).toEqual([2, 4, 6, 8, 10]);
});

test('Merge sort with a list of where the first half is sorted', () => {
  expect(mergeSort([2, 11, 15, 7, 3])).toEqual([2, 3, 7, 11, 15]);
});

test('Merge sort with a list of where the second half is sorted', () => {
  expect(mergeSort([7, 8, 5, 9, 13])).toEqual([5, 7, 8, 9, 13]);
});

test('Merge sort where all elements are unsorted', () => {
  expect(mergeSort([3, -1, 8, 2, 4])).toEqual([-1, 2, 3, 4, 8]);
});
```


❯ npm test -- --coverage
> code_coverage_example@1.0.0 test
> jest --coverage
PASS ./merge.test.js
✓ Merge w/ two empty lists (1 ms)
✓ Merge w/ an empty list and a non-empty list
✓ Merge w/ an empty list and a non-empty list
✓ Merge w/ two non-empty lists
✓ Merge sort with a empty list
✓ Merge sort with a list of a single element (1 ms)
✓ Merge sort with a list of two elements
✓ Merge sort with a list of sorted elements
✓ Merge sort with a list of where the first half is sorted
✓ Merge sort with a list of where the second half is sorted
✓ Merge sort where all elements are unsorted
File | % Stmts | % Branch | % Funcs | % Lines | Uncovered Line #s
All files | 100 | 100 | 100 | 100 |
merge.js | 100 | 100 | 100 | 100 |
Test Suites: 1 passed, 1 total
Tests: 11 passed, 11 total
Snapshots: 0 total
Time: 0.104 s, estimated 1 s
Ran all test suites.
~/Documents/CS/Code_Coverage_Example ❯

Improving Our Code Coverage

- Not all conditions in the **merge function** have been accounted for.
- Cases of where **list1 is empty** or **list2 is empty.**
  - Export merge function.
  - Write test cases for these edge cases.