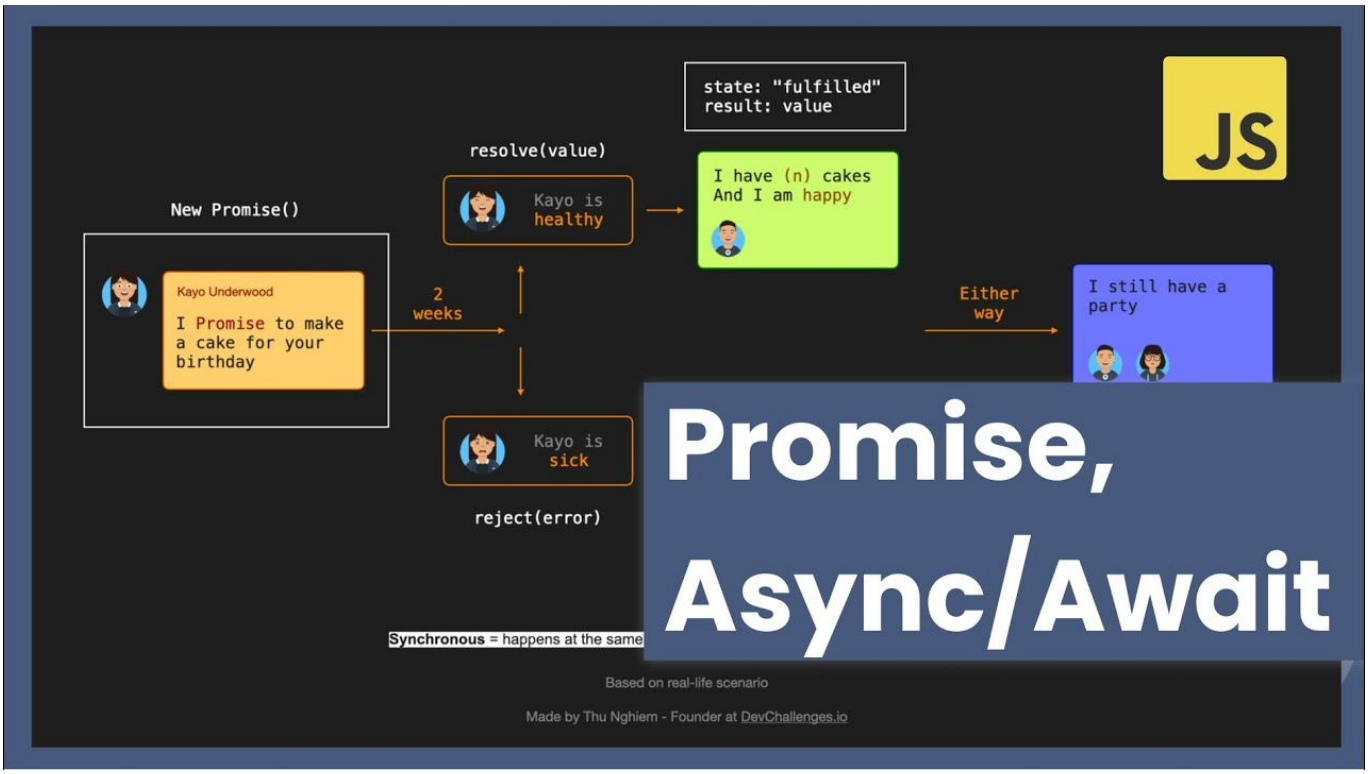
Promise



> Source: https://www.freecodecamp.org/news/learn-promise-async-await-in-20-minutes/

1. Callback hell
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4. Promise chaining
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1. Callback he

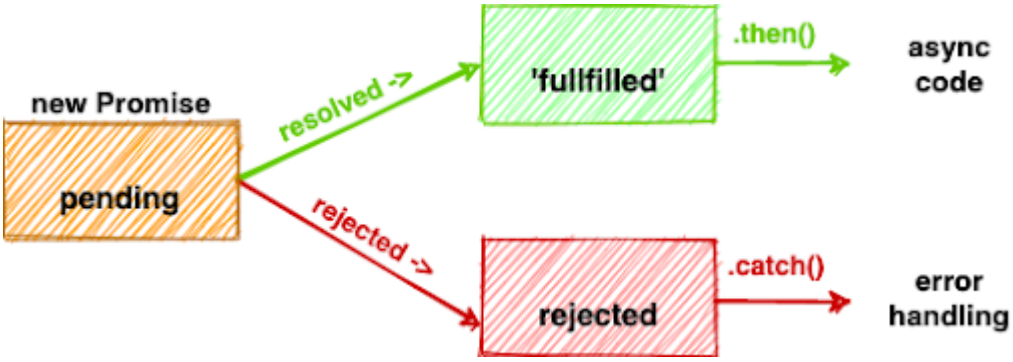
```
// Callback Hell


a(function (resultsFromA) {
    b(resultsFromA, function (resultsFromB) {
        c(resultsFromB, function (resultsFromC) {
            d(resultsFromC, function (resultsFromD) {
                e(resultsFromD, function (resultsFromE) {
                    f(resultsFromE, function (resultsFromF) {
                        console.log(resultsFromF);
                    })
                })
            })
        })
    })
});

```

> Source: https://medium.com/@jaybhoyar1997/avoiding-callback-hell-in-node-js-7c1c16ebd4d3

2. Promise overview

Promise states

#	Desc
pending	initial state
fulfilled	operation completed successfully
rejected	opeation failed



> Source https://scoutapm.com/blog/async-javascript

Create a new promise

```
> const promise = new Promise();
  console.log(promise);
✖ ▸Uncaught TypeError: Promise resolver undefined is not a function
      at new Promise (<anonymous>)
      at <anonymous>:1:17
```

```
const promise = new Promise((resolve, reject) => {});
console.log(promise);
```

```
> const promise = new Promise((resolve, reject) => {});
  console.log(promise);
  ▾Promise {<pending>} i                                  react_devtools_backend.js:4049
    ▸[[Prototype]]: Promise
     [[PromiseState]]: "pending"
     [[PromiseResult]]: undefined
```

Retrieve promise value

```
const promise = new Promise((resolve, reject) => {
    setTimeout(() => resolve(1), 3000);
});
promise
    .then(result => console.log(result))
    .catch(error => console.log(error));
```

```
const promise = new Promise((resolve, reject) => {
    reject(new Error('oops, something wrong!!!'))
});
promise
    .then(result => console.log(result))
    .catch(error => console.log(error));
```

GOLDEN RULE: Always handle error when using promise.

```
> const promise = new Promise((resolve, reject) => {
    reject(new Error('oops, something wrong!!!'))
  });

  promise.then(result => console.log(result))
<·  Promise {<rejected>: Error: oops, something wrong!!!
  ▸     at <anonymous>:2:10
        at new Promise (<anonymous>)
        at <an…}
✖ ▸Uncaught (in promise) Error: oops, something wrong!!!
      at <anonymous>:2:10
      at new Promise (<anonymous>)
      at <anonymous>:1:17
```

Otherwise, you will get uncaught (in promise) error as captured abov

3. Promise methods

Static methods

#	Name	Desc
1	Promise.resolve(value)	returns a promise, `value` can be a promise or not
2	Promise.reject()	return a promise with rejected reason
3	Promise.all()	Wait for all promises to be resolved, or for any to be rejected.
4	Promise.allSettled()	Wait until **all promises have settled** (each may resolve or reject).
5	Promise.any()	Wait until any of the promises is **fulfilled**.
6	Promise.race()	Wait until any of the promises is **fulfilled or rejected**

```
const b = new Promise((resolve) => {
 resolve('BBB');
})
const promiseA = Promise.resolve('AAA');
const promiseB = Promise.resolve(b);
Promise.all([promiseA, promiseB])
    .then(([resultA, resultB]) => {
        console.log(resultA, resultB)
    })
    .catch(error => console.log(error))
```

Instance methods

#	Name	Desc
1	then	return a new promise, happens when promise is fulfilled
2	catch	catch error if promise is rejected
3	finally	go here no matter the promise is fulfilled or rejected

```
Promise.resolve('tada')
    .then(message => console.log(message))
    .catch(error => console.log(error))
    .finally(() => {
    // usually we hide loading here
 })
```

4. Promise chaining

```
Promise.resolve(5)
    .then(n => n * 2)
    .then(n => Promise.resolve(n * 2))
    .then(n => {
    const finalNumber = n + 10;
    console.log(finalNumber);
    return finalNumber;
    })
    .catch(error => console.log(error));
```

```
fetch('https://js-post-api.herokuapp.com/api/students?_page=1')
    .then(response => response.json())
    .then(data => console.log(data))
    .catch(error => console.log(error));
```

5. Fake API

- Sometimes, the API from Backend is not ready, you need to fake it your self first to not block your works.

```
// studentApi.js
const studentApi = {
    getAll() {
        return new Promise((resolve) => {
            setTimeout(() => {
                resolve({
                    data: [
                        { id: 1, name: 'Alice' },
                        { id: 2, name: 'Bob' },
                    ],
                    pagination: {
                        _total: 2,
                        _page: 1,
                        _limit: 10,
                    }
                })
            }, 1000);
        })
    }
}
```

```
// app.js
studentApi.getAll()
    .then(response => console.log(response))
    .catch(error => console.log(error));
```

Tham khảo

- https://scoutapm.com/blog/async-javascript
- https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Promise