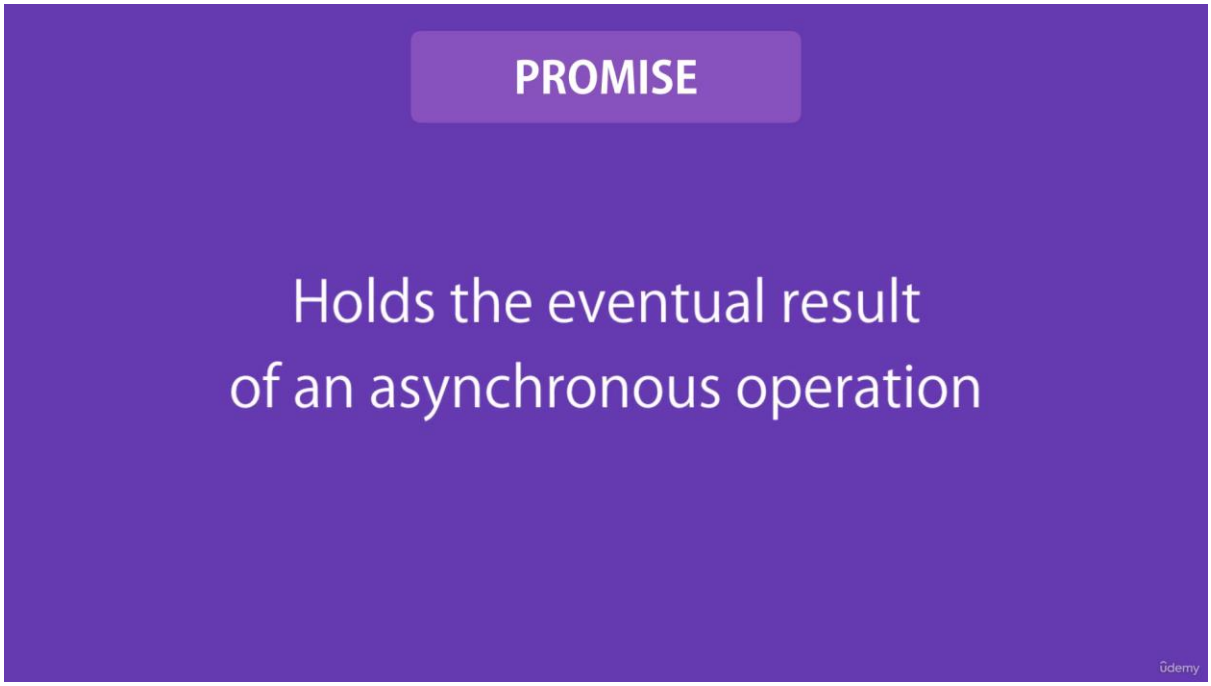
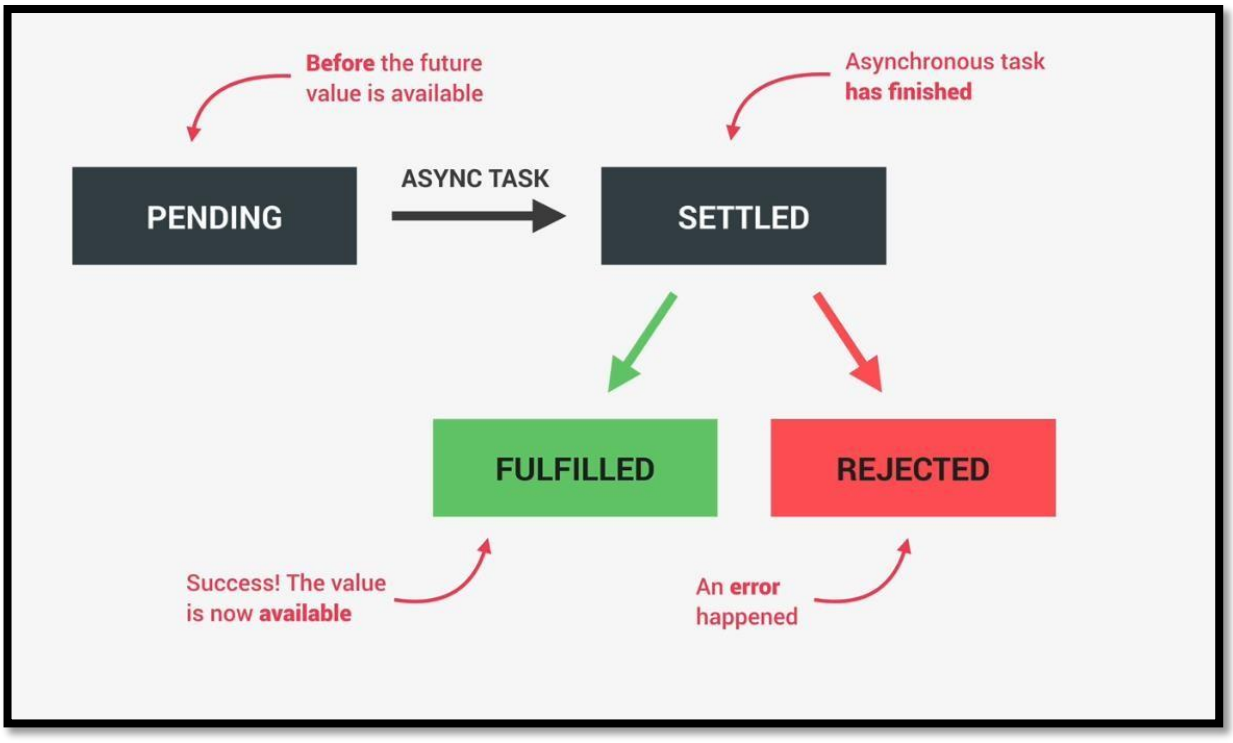
Promises

The Promise object represents the eventual completion (or failure) of an asynchronous operation and its resulting value.



A Promise is in one of these states:
pending: initial state, neither fulfilled nor rejected.
fulfilled: meaning that the operation was completed successfully.
rejected: meaning that the operation failed.



```
const promise1 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(resolve, 500, "Promise1 is resolved");
  });
};

const promise2 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(resolve, 600, "Promise2 is resolved");
  });
};

const promise3 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(resolve, 700, "Promise3 is resolved");
  });
};


const fetchResults = async () =>
{
  try
  {
    const beforeTime = new Date();
    const p1 = await promise1();
    const p2 = await promise2();
    const p3 = await promise3();
    const afterTime = new Date();
    console.log(p1);
    console.log(p2);
    console.log(p3);
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
  catch (error)
  {
    console.log(error.message);
  }
}
```

```
fetchResults();
```

Output:

```
//Promise1 is resolved
//Promise2 is resolved
//Promise3 is resolved
//Time taken is: 1826
```

all
It short circuits when an input value is rejected.

```
const fetchResults = async () =>
{
  try
  {
    const beforeTime = new Date();
    const results = await Promise.all([promise1(), promise2(),
promise3()]);
    const afterTime = new Date();
    results.forEach((result) => console.log(result));
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
  catch (error)
  {
    console.log(error.message);
  }
}

fetchResults();
```

Output:

```
//Promise1 is resolved
//Promise2 is resolved
//Promise3 is resolved
//Time taken is: 704
```

```
const promise1 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(resolve, 500, "Promise1 is resolved");
  });
};

const promise2 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(reject, 600, new Error("Promise2 is rejected"));
  });
};

const promise3 = () =>
{
  return new Promise((resolve, reject) =>
  {
    setTimeout(resolve, 700, "Promise3 is resolved");
  });
};


const fetchResults = async () =>
{
  const beforeTime = new Date();
  try
  {
    const results = await Promise.all([promise1(), promise2(),
promise3()]);
    console.log(results, "results");
    results.forEach((result) => console.log(result));
  }
  catch (error)
  {
    console.log(error.message);
  }
  finally
  {
    const afterTime = new Date();
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
}

fetchResults();
```

Output:

```
//Promise2 is rejected
//Time taken is: 609
```

race
It short circuits when an input value is settled(rejected or resolved).

```
const fetchResults = async () =>
{
  const beforeTime = new Date();
  try
  {
    const result = await Promise.race([promise1(), promise2(),
promise3()]);
    console.log(result);
  }
  catch (error)
  {
    console.log(error.message);
  }
  finally
  {
    const afterTime = new Date();
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
}

fetchResults();
```

Output:

```
//Promise1 is resolved
//Time taken is: 519
```

allSettled
It does not short circuit.

```
const fetchResults = async () =>
{
  const beforeTime = new Date();
  try
  {
    const result = await Promise.allSettled([promise1(), promise2(),
promise3()]);
    console.log(result);
  }
  catch (error)
  {
    console.log(error.message);
  }
  finally
  {
    const afterTime = new Date();
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
}

fetchResults();


/*

[
  { status: 'fulfilled', value: 'Promise1 is resolved' },
  { status: 'rejected', reason: 'Promise2 is rejected' },
  { status: 'fulfilled', value: 'Promise3 is resolved' }
]
Time taken is: 723

*/
```

any
It short circuits when an input value is fulfilled.

```
const fetchResults = async () =>
{
  const beforeTime = new Date();
  try
  {
    const result = await Promise.any([promise1(), promise2(),
promise3()]);
    console.log(result);
  }
  catch (error)
  {
    console.log(error.message);
  }
  finally
  {
    const afterTime = new Date();
    console.log(`Time taken is: ${afterTime - beforeTime}`)
  }
}

fetchResults();
```

Output:

```
//Promise3 is resolved
//Time taken is: 519
```

Reject
The Promise.reject() static method returns a Promise object that is rejected with a given reason.

resolve
The Promise.resolve() static method "resolves" a given value to a Promise. If the value is a promise, that promise is returned; if the value isa thenable, Promise.resolve() will call the then() method with two callbacks it prepared; otherwise the returned promise will be fulfilled with the value. This function flattens nested layers of promise-like objects (e.g. a promise that fulfills to a promise that fulfills to something) into a single layer – a promise that fulfills to a non-thenable value.

then
The then() method of Promise instances takes up to two arguments: callback functions for the fulfilled and rejected cases of the Promise. It immediately returns an equivalent Promise object, allowing you to chain calls to other promise methods.

catch
The catch() method of Promise instances schedules a function to be called when the promise is rejected. It immediately returns an equivalent Promise object, allowing you to chain calls to other promisemethods. It is a shortcut for Promise.prototype.then(undefined, onRejected).

finally
The finally() method of Promise instances schedules a function to becalled when the promise is settled (either fulfilled or rejected). Itimmediately returns an equivalent Promise object, allowing you to chain calls to other promise methods. This lets you avoid duplicatingcode in both the promise's then() and catch() handlers.

```
const getUser = (id) => {
  return new Promise((resolve, reject) => {
    setTimeout(() => {
      const user = { id, user: `User ${id}` };
      const rd = Math.random();
      if (0.5 < rd) {
        resolve(user);
      } else {
        reject(new Error("Error while fetching user Info"));
      }
    }, 2000);
  });
};

const getRepos = (username) => {
  return new Promise((resolve, reject) => {
    setTimeout(() => {
      const repoInfo = {
        user: username,
        repos: ["Repo1", "Repo2", "Repo3", "Repo4"],
      };
      const rd = Math.random();
      if (0.5 < rd) {
        resolve(repoInfo);
      } else {
        reject(new Error("Error while fetching user repository Info"));
      }
    }, 2000);
  });
};
```

```
const getCommits = (repo) => {
  return new Promise((resolve, reject) => {
    setTimeout(() => {
      const commitsInfo = {
        repo,
        commits: ["Commit 1", "Commit 2", "Commit 3", "Commit 4"],
      };
      const rd = Math.random();
      if (0.5 < rd) {
        resolve(commitsInfo);
      } else {
        reject(new Error("Error while fetching repository  commits Info"));
      }
    }, 2000);
  });
};

console.log("Before");

getUser(10)
  .then((user) => {
    const username = user.username;
    return getRepos(username);
  })
  .then((repoInfo) => {
    const repo = repoInfo.repos[2];
    return getCommits(repo);
  })
  .then((commitsInfo) => {
    const commits = commitsInfo.commits;
    commits.forEach((commit) => console.log(commit));
  })
  .catch((error) => {
    console.log(error.message);
  });

Promise.resolve("I am working").then((data) => {
  console.log(data);
});

Promise.reject(new Error("I am a bug")).catch((error) => {
  console.log(error.message);
});

console.log("After");
//user > multiple repositories > repo > commits
```