비동기

비동기

- **동기적(Synchronus)**

  동기적은 하나의 작업이 모두 수행될 때 까지 다른 작업을 수행 하지 못함

비동기

- **비동기적(Asynchronous)**

비동기는 작업의 결과를 기다리는 동안 다른 작업을 미리 수행하는 것
오래 걸리는 작업들에 대해 백그라운드에서 처리되며 그동안 다른 작업을 계속 수행할 수 있도록 함

비동기

- **비동기 작업의 대표적인 예시와 함수/문법**

1. Ajax, setTimeout
2. Callback 함수, Promise, async/await

- **Background vs Foreground**

Backgorund : 사용자가 보이지 않는 뒷 단에서 실행되는 작업
→ ex) 특정 앱 닫기 버튼을 눌럿을 때 사용자는 닫힌 걸로 보이지만 뒤에서 계속 실행되고 있는 상태
Foreground : 사용자가 보이는 앞 단에서 실행되는 작업
→ ex) 프로그램을 다운 받으려 할 때 설치창이 나오고 사용자가 Next를 눌러야 다음 화면으로 넘어가는 등, 사용자가 보고 명령을 내릴 수 있는 상태

비동기

- **비동기 확인하기**

예상했던 코드의 동작과 콘솔 로그에 찍히는 로그의 차이점 확인하기
→ 비동기적

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<head>
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        }, 5000);

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setTimeout
흐름 파악하기 - 1

setTimeout 흐름 파악하기

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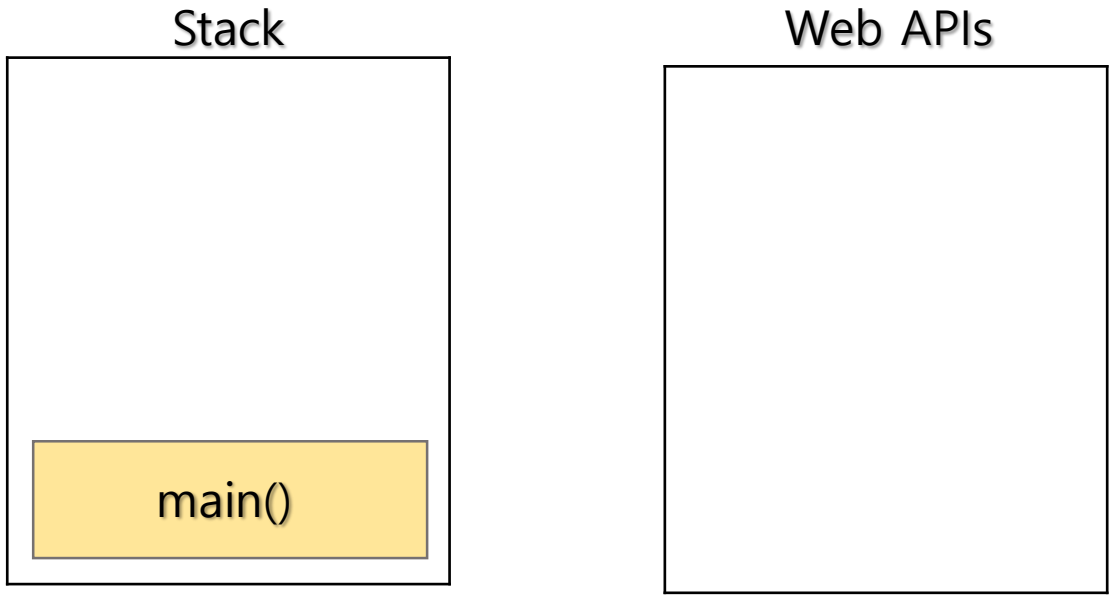

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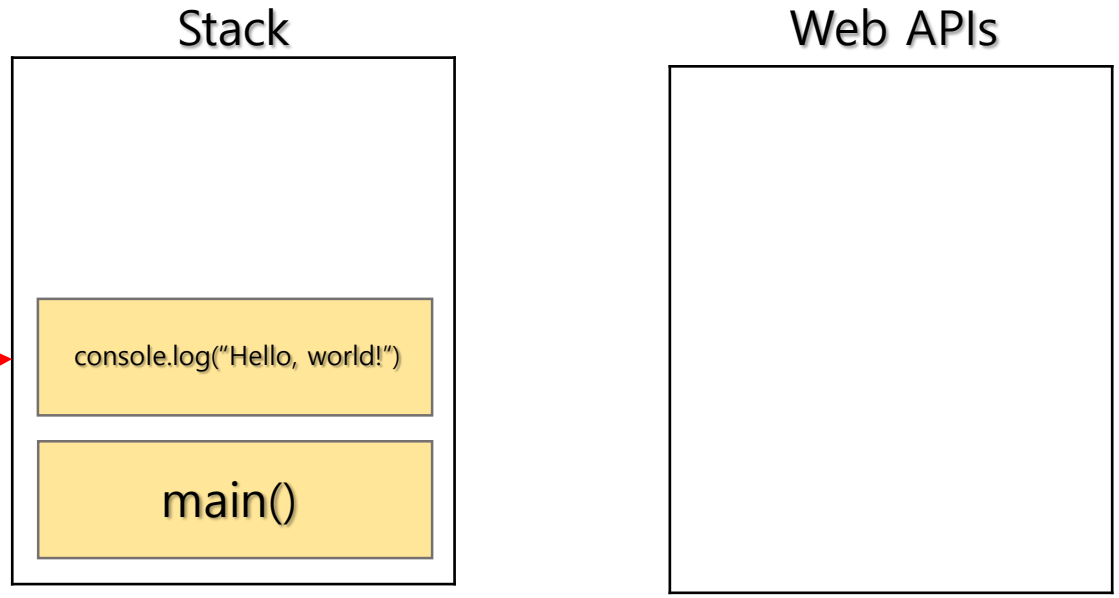

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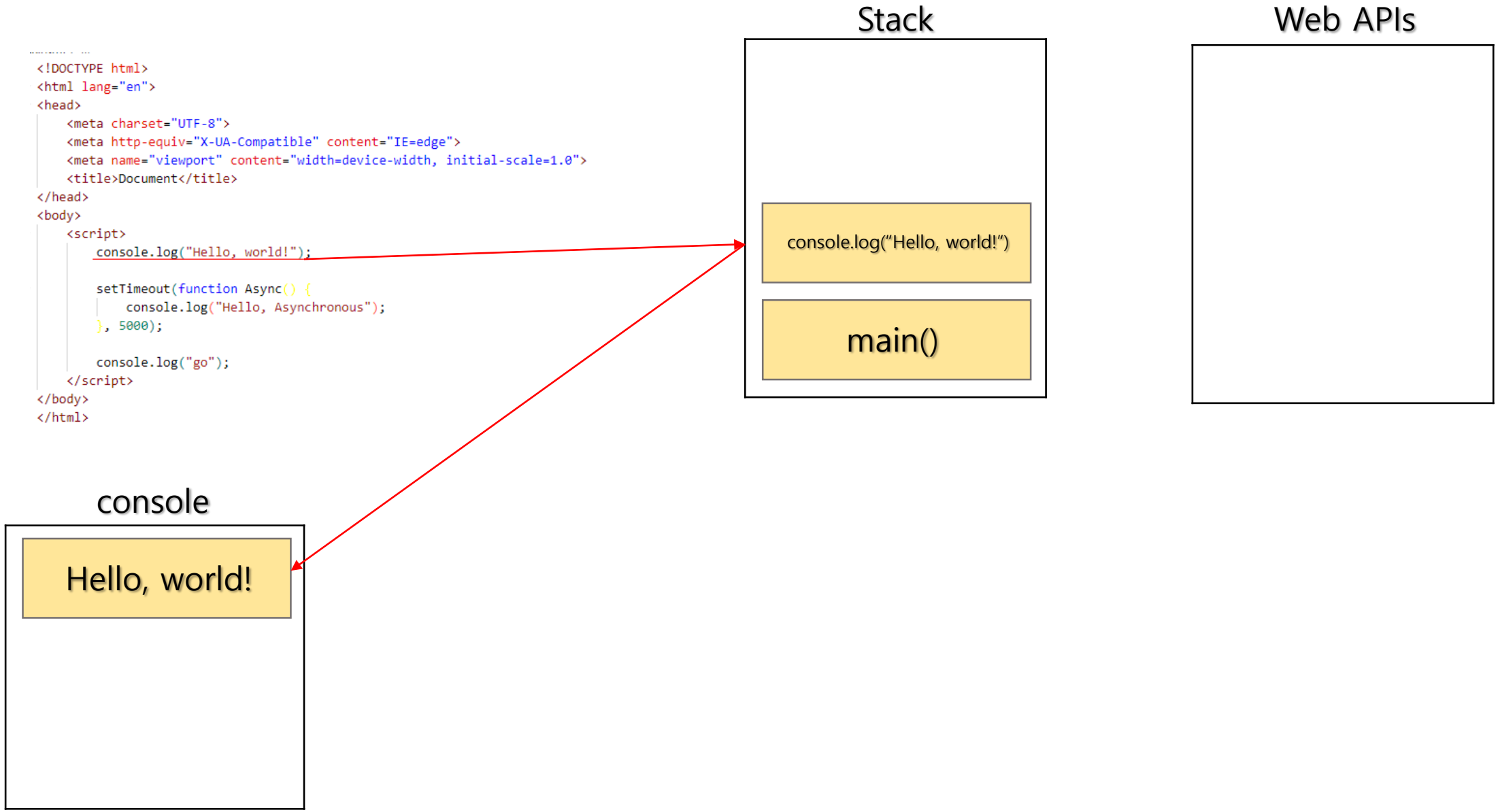

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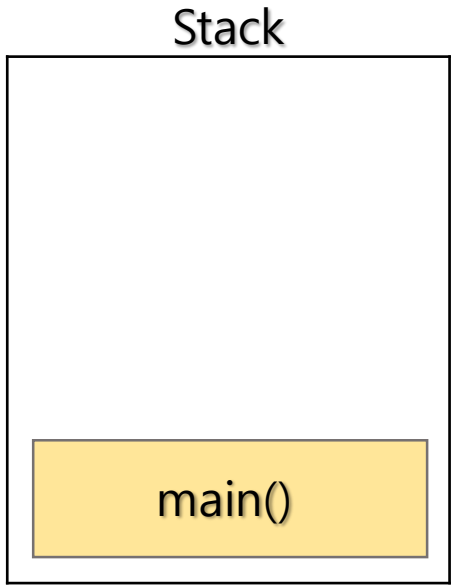

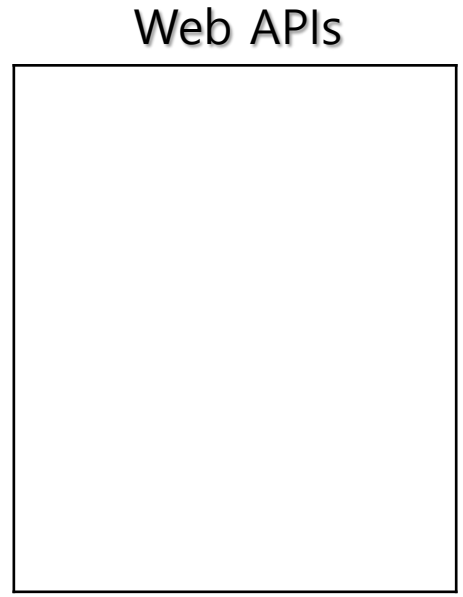

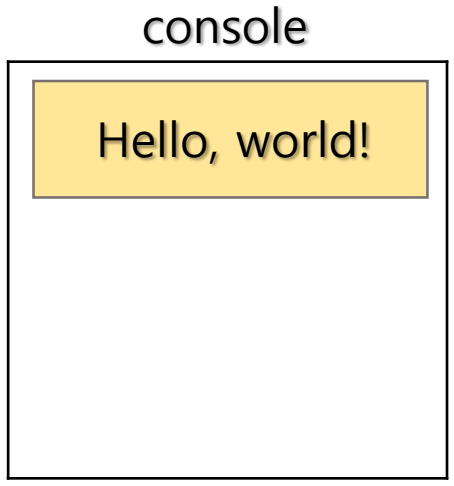

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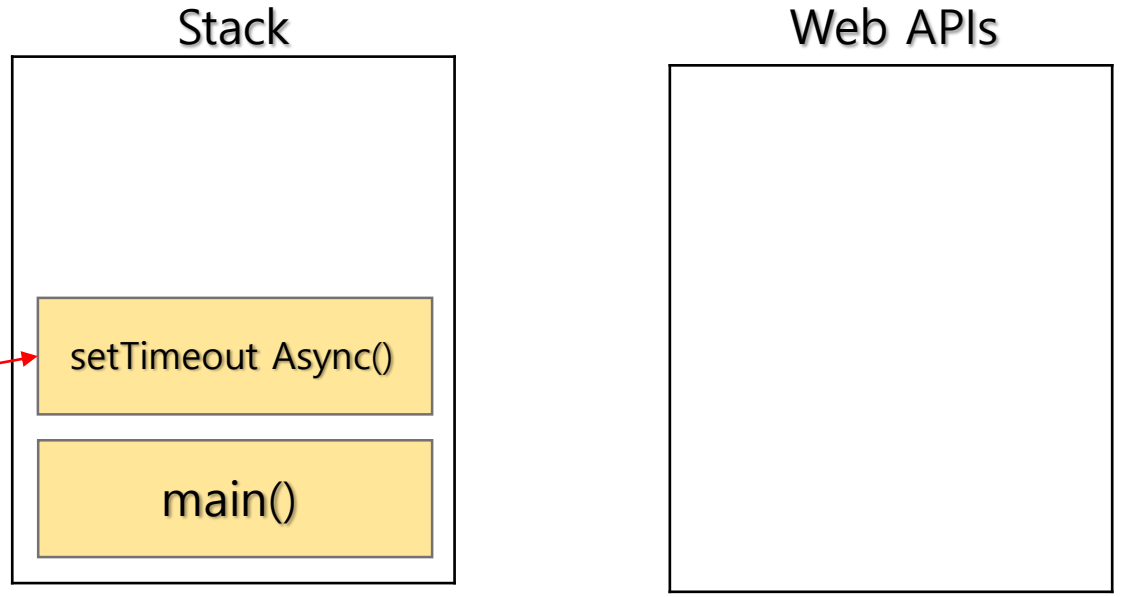

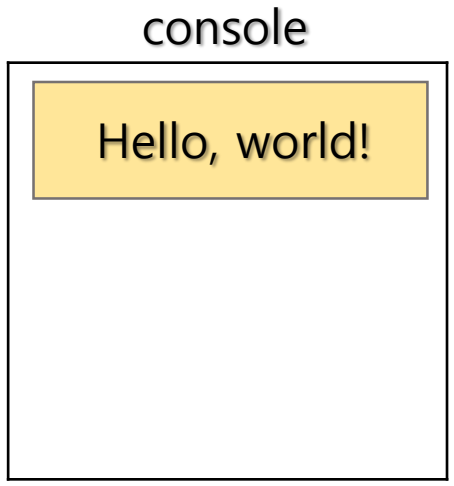

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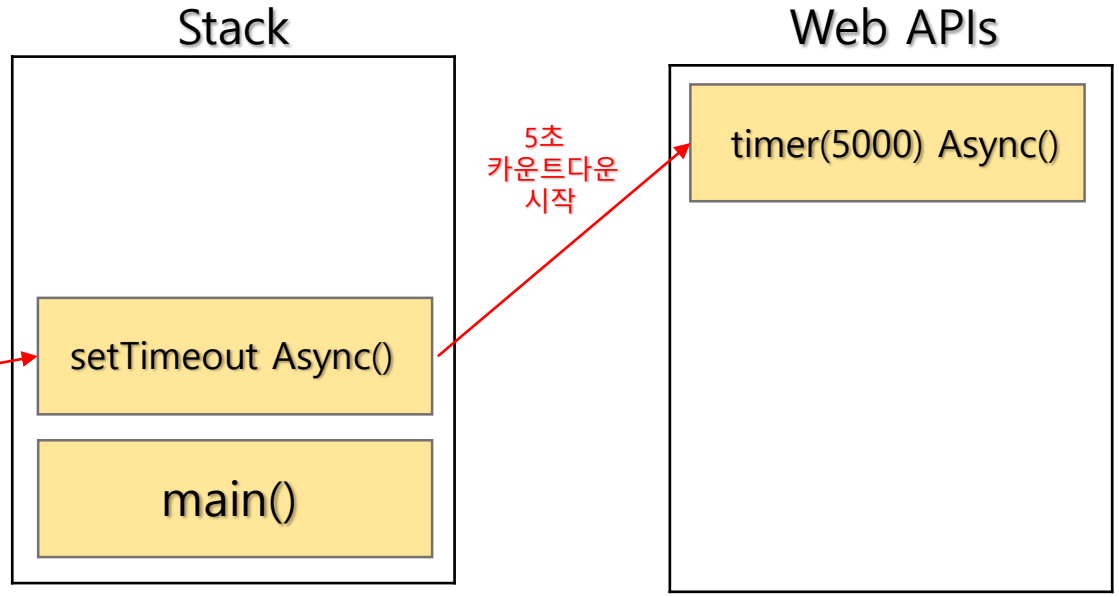

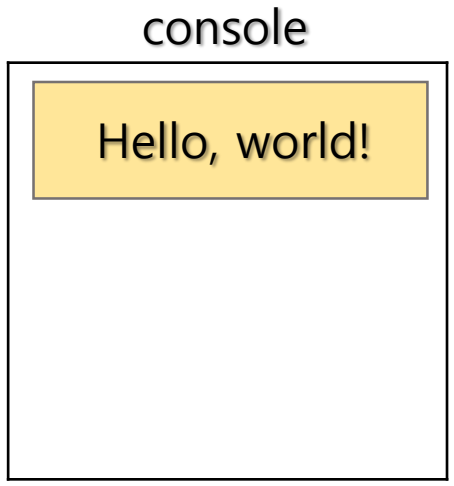

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Stack

setTimeout 호출이 완료되었으므로 스택에서 제거

main()

Web APIs

timer(5000) Async()

console

Hello, world!

setTimeout 흐름 파악하기

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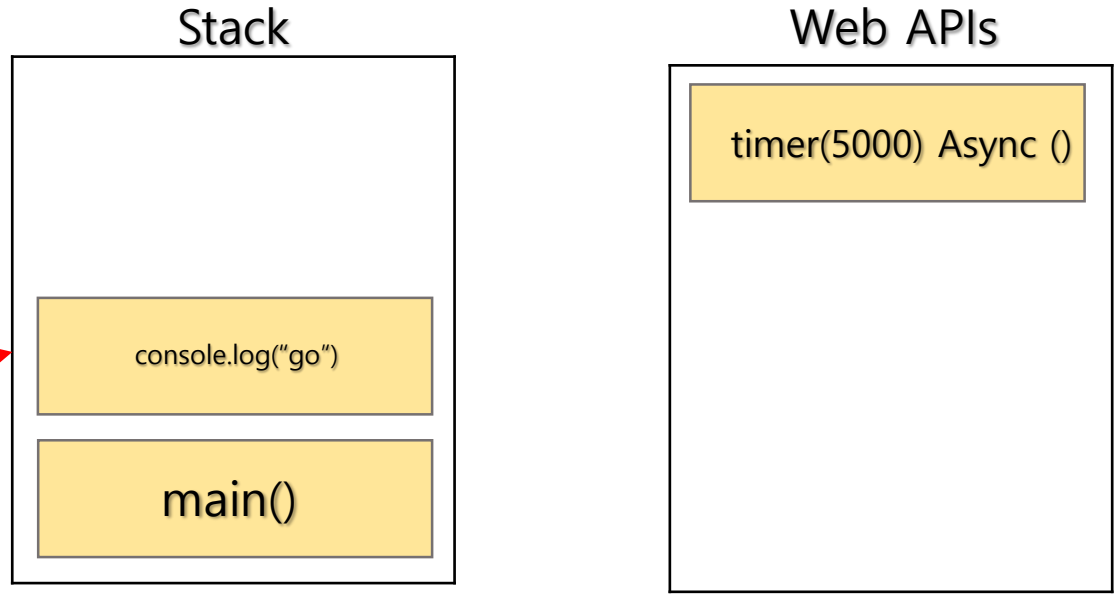

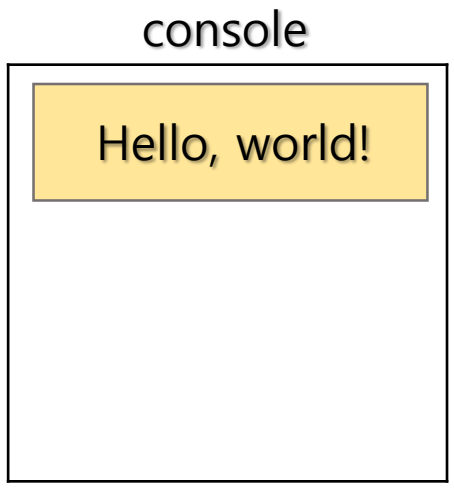

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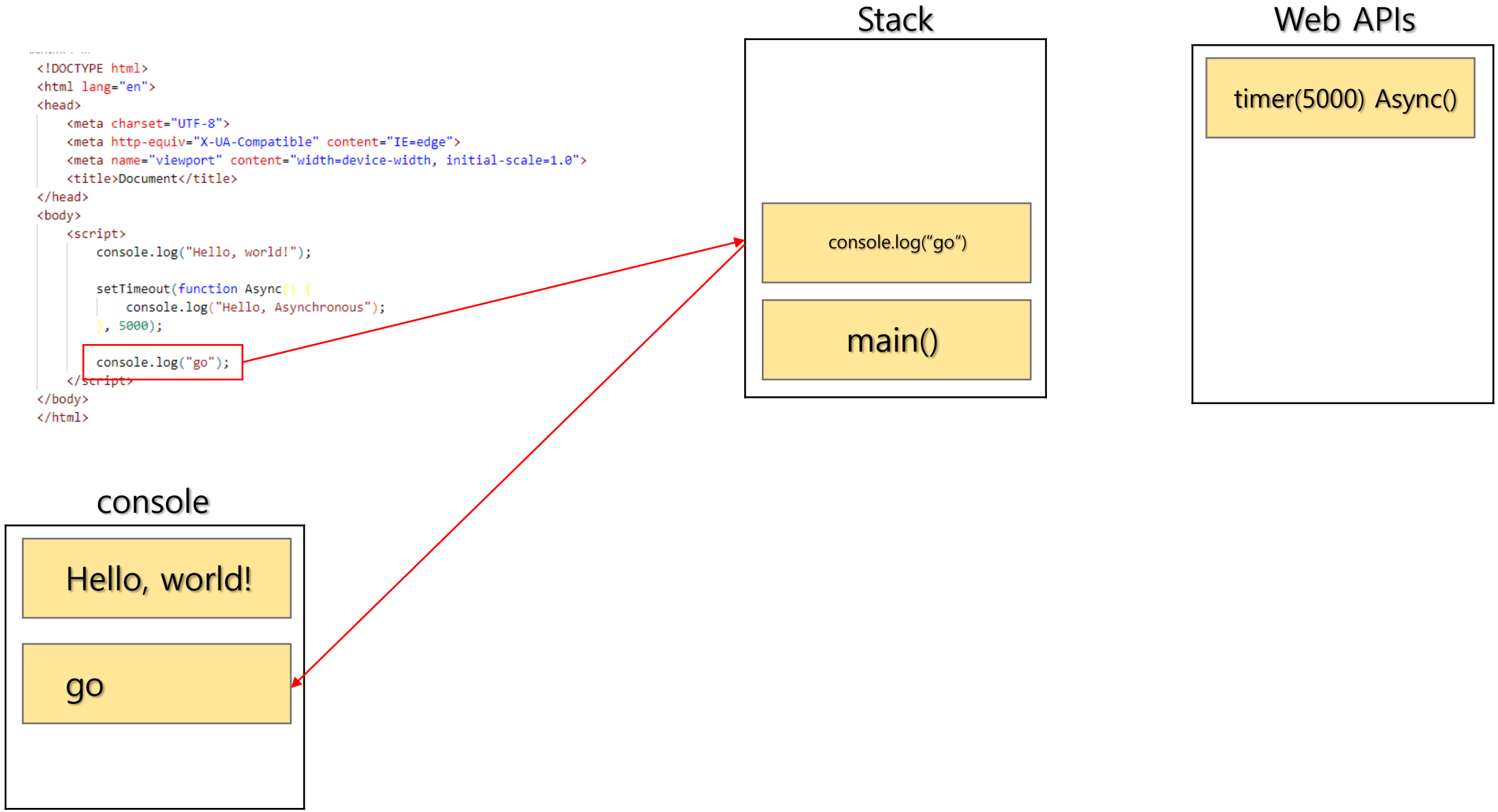

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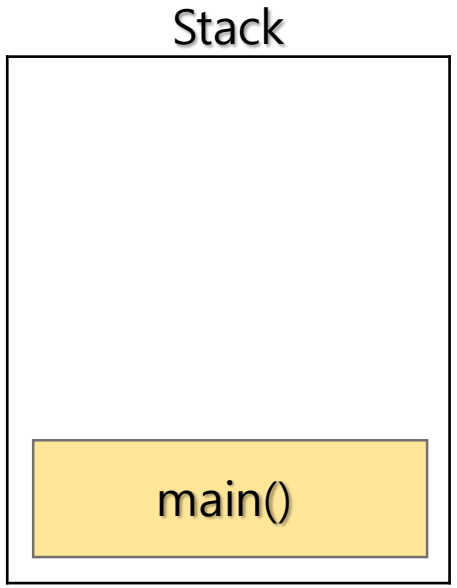

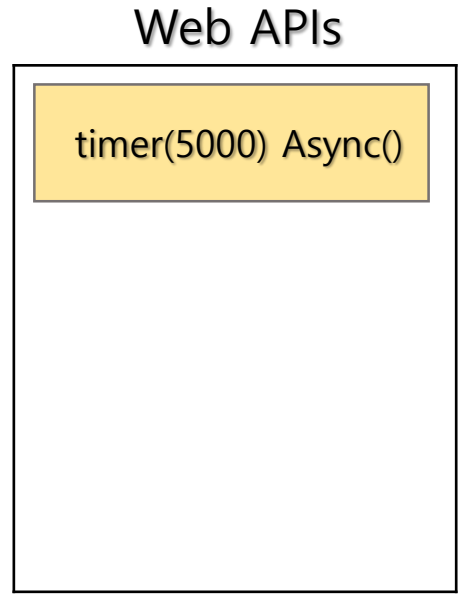

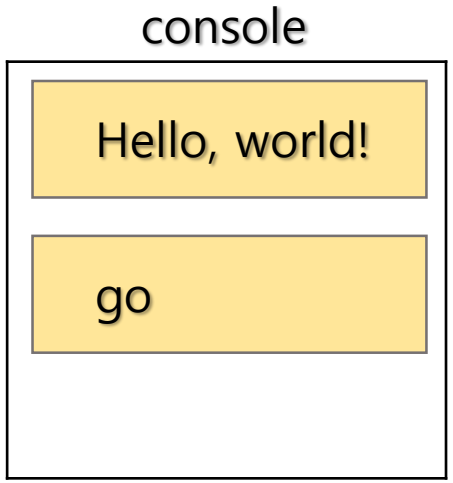

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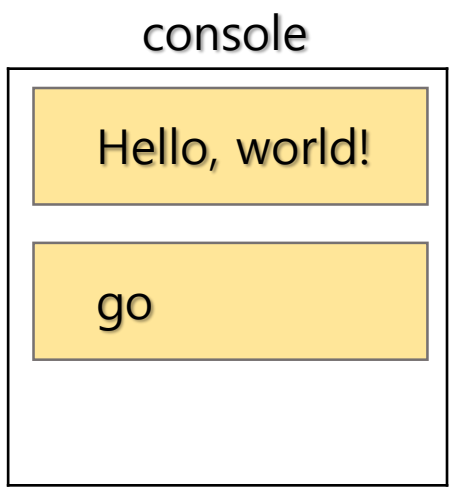

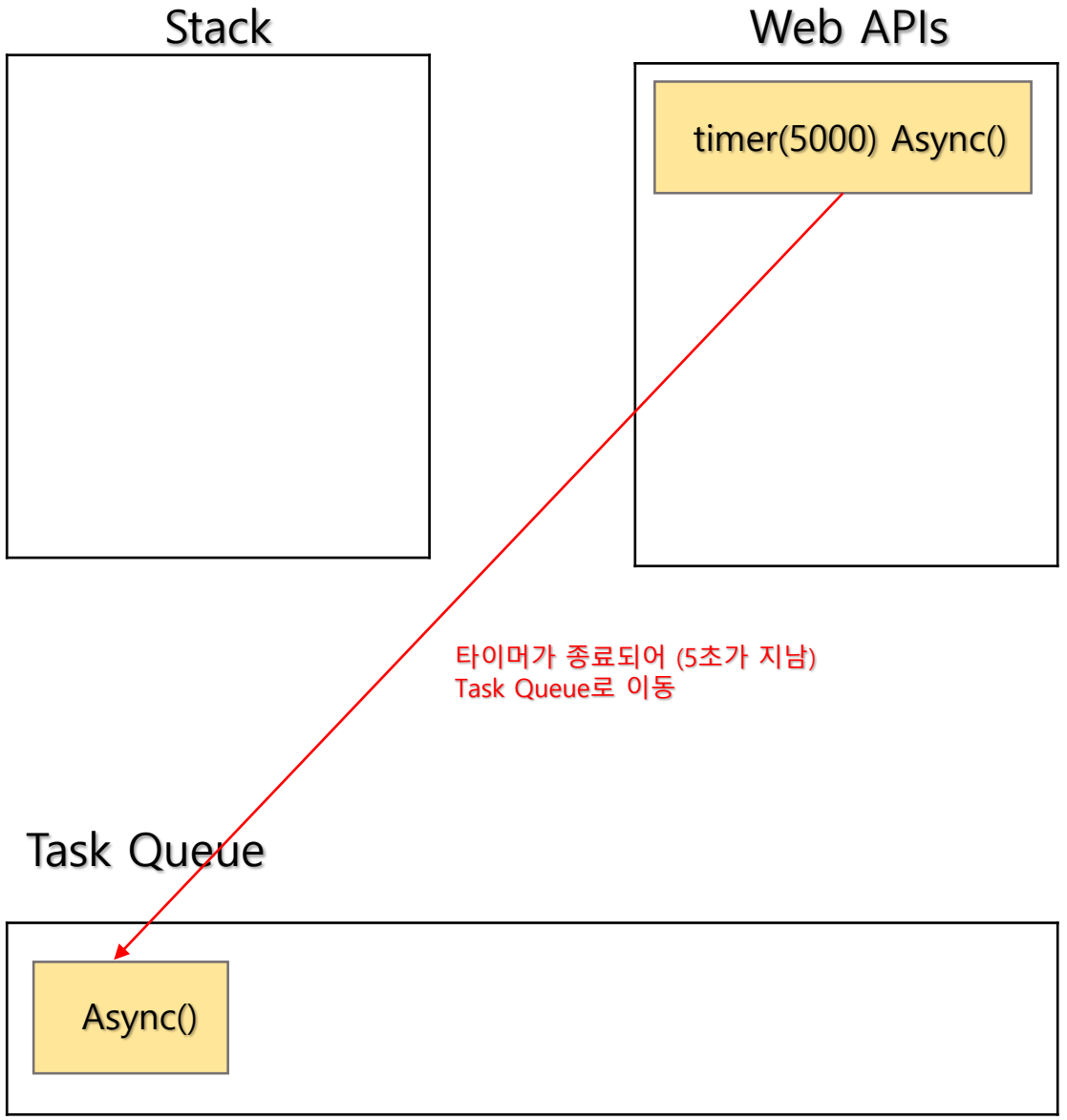

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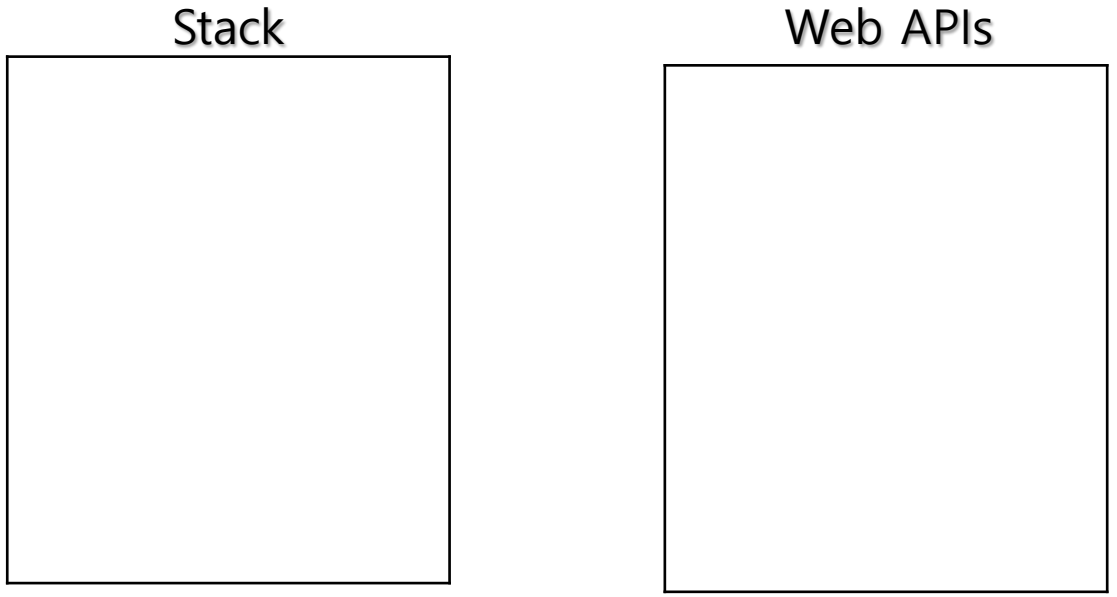

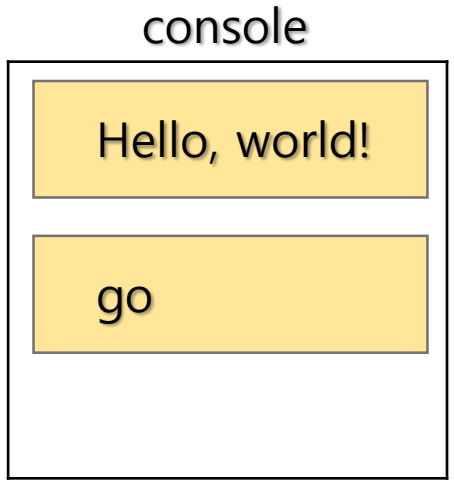

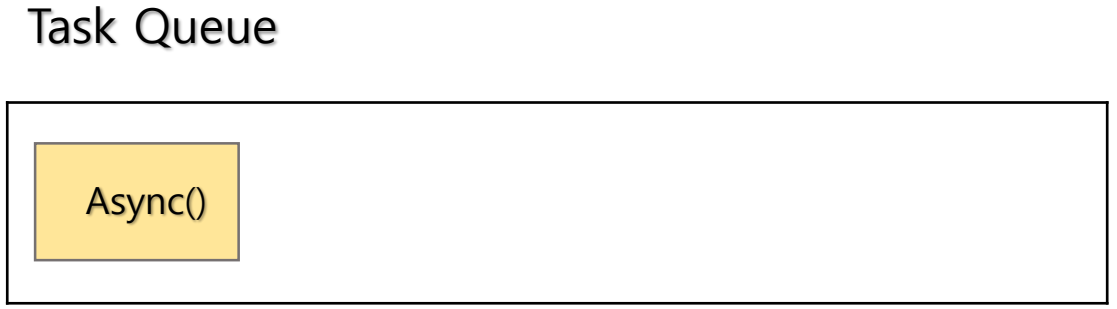

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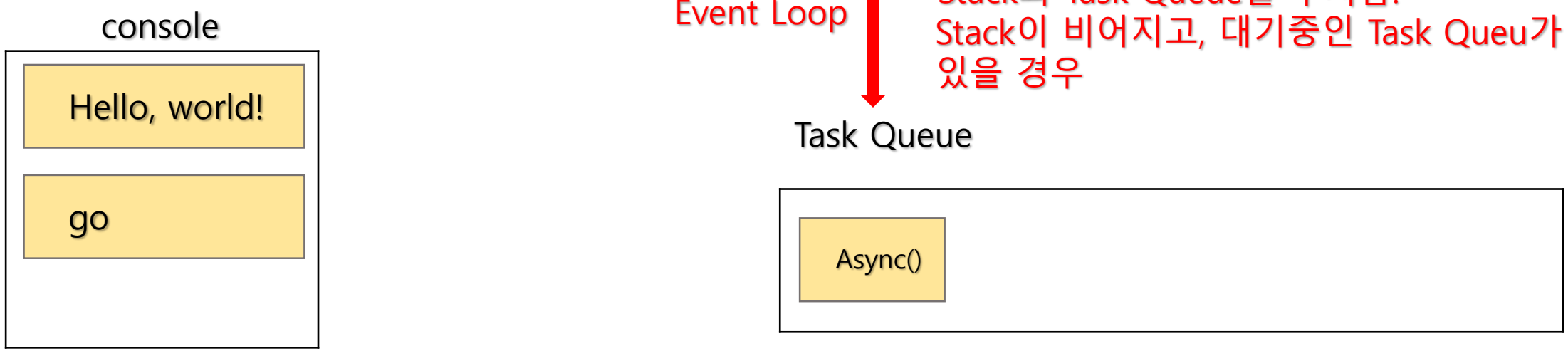

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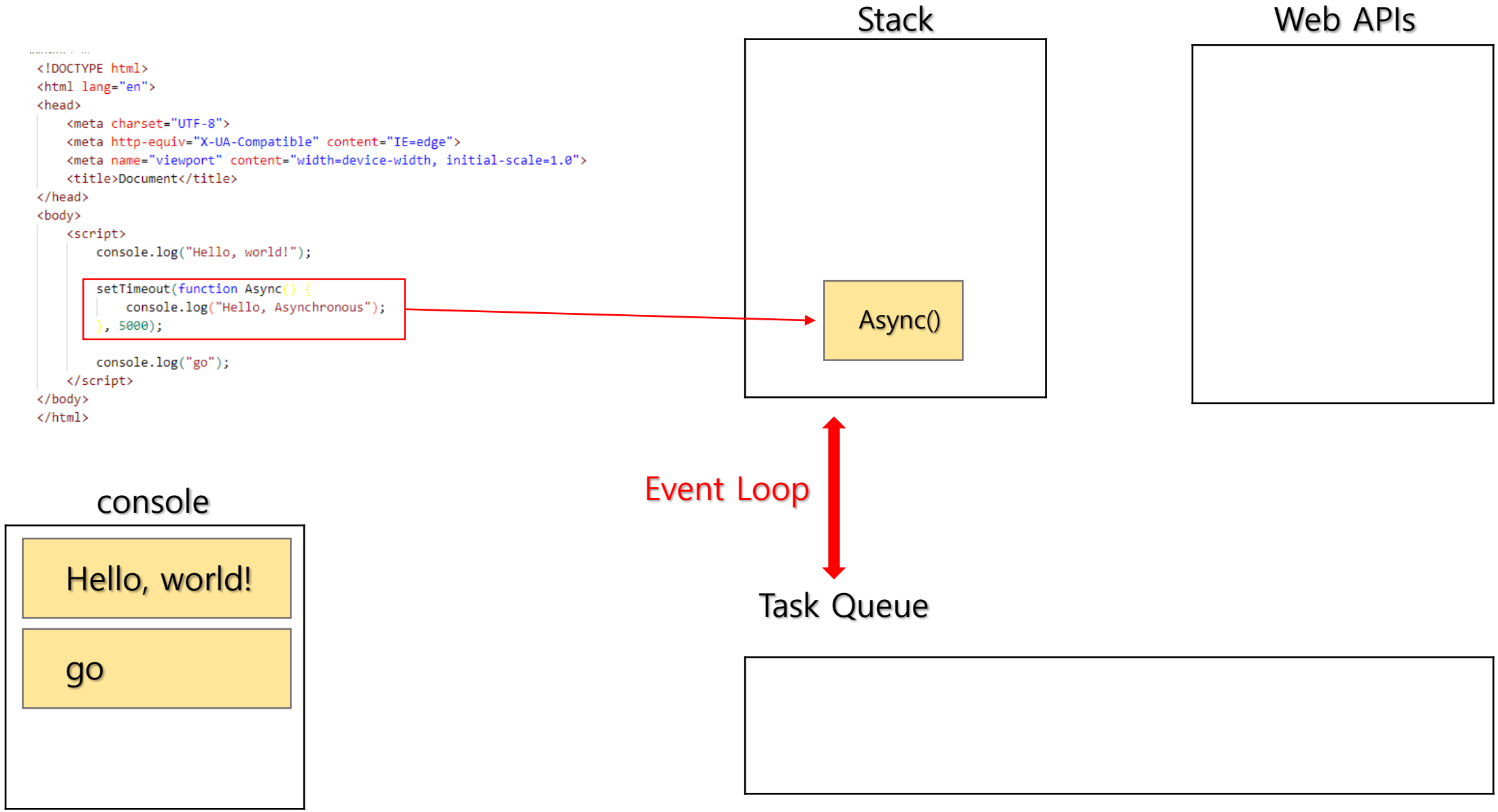

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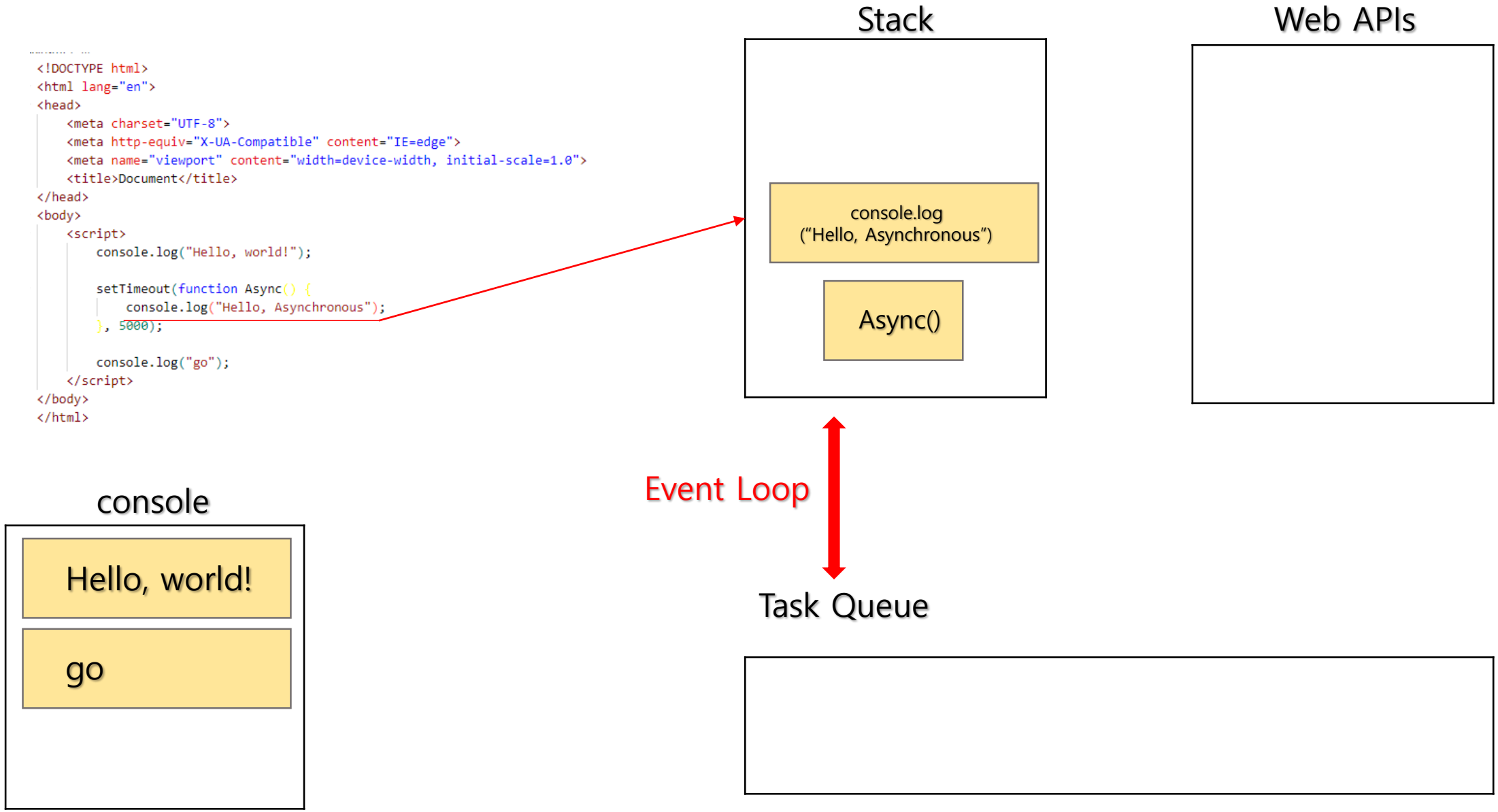

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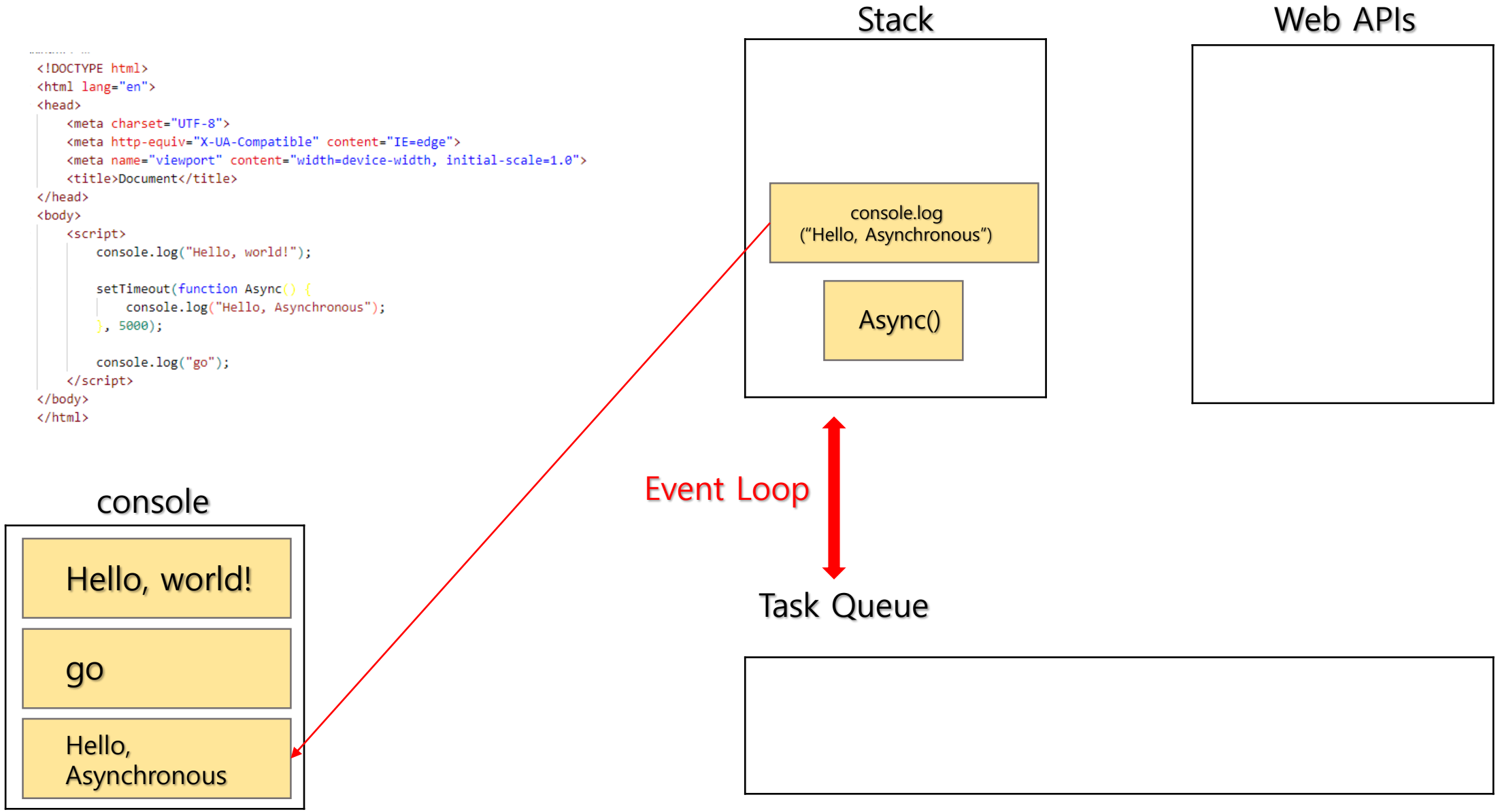

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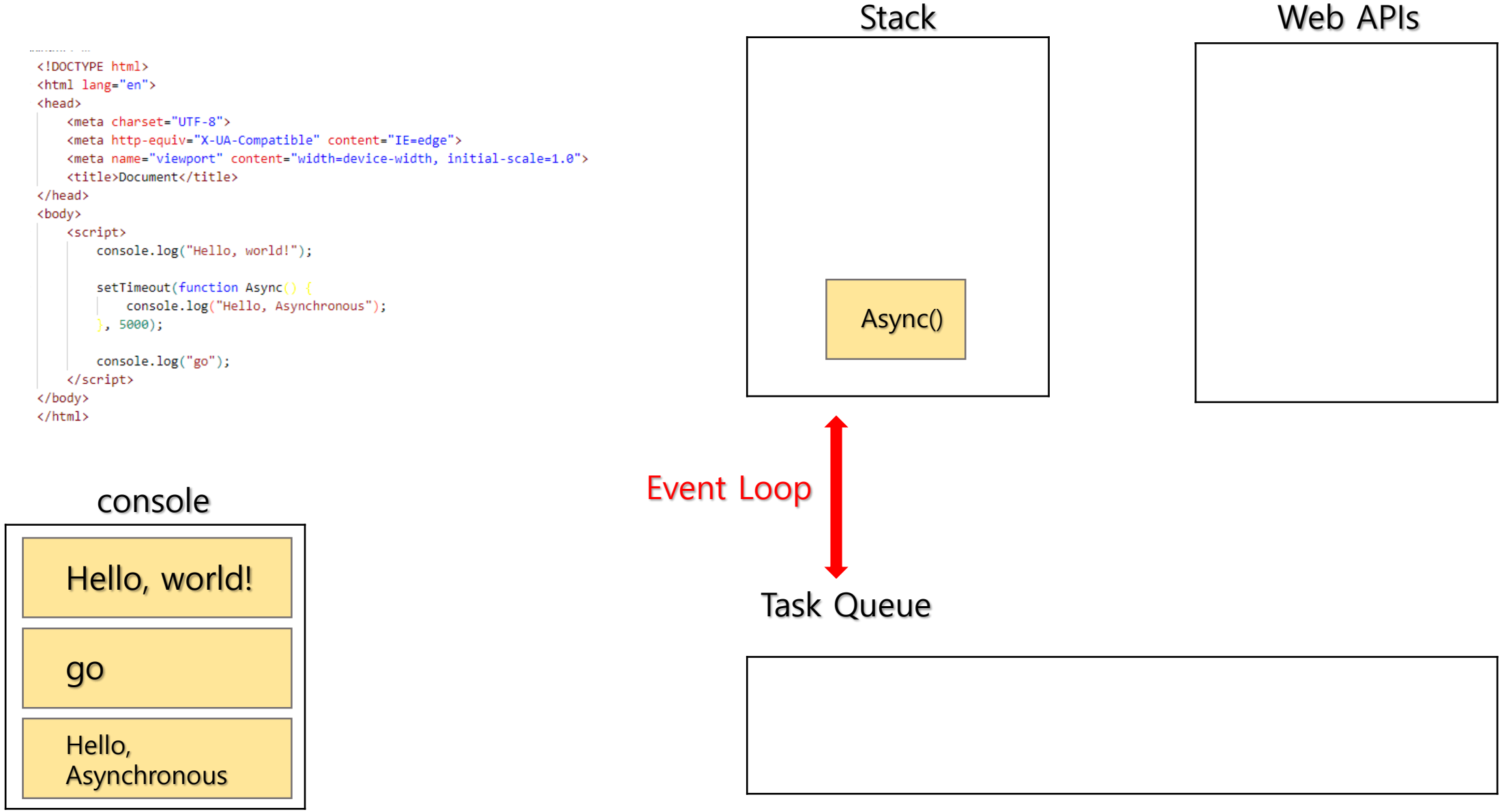
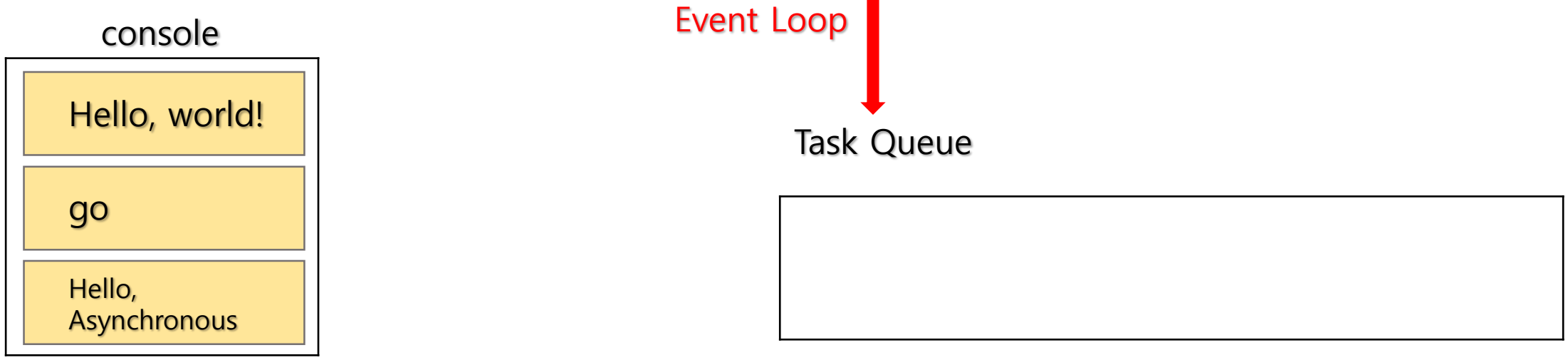


setTimeout 흐름 파악하기

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <script>
        console.log("Hello, world!");

        setTimeout(function Async() {
            console.log("Hello, Asynchronous");
        }, 5000);

        console.log("go");
    </script>
</body>
</html>
```



setTimeout
흐름 파악하기 - 2

setTimeout 흐름 파악하기 - 2

- **상황**

  setTimeout이 0초로 설정되어 있다면?

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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</head>
<body>
    <script>
        console.log("Hello, world!");

        setTimeout(function Async() {
            console.log("Hello, Asynchronous");
        }, 0);

        console.log("go");
    </script>
</body>
</html>
```

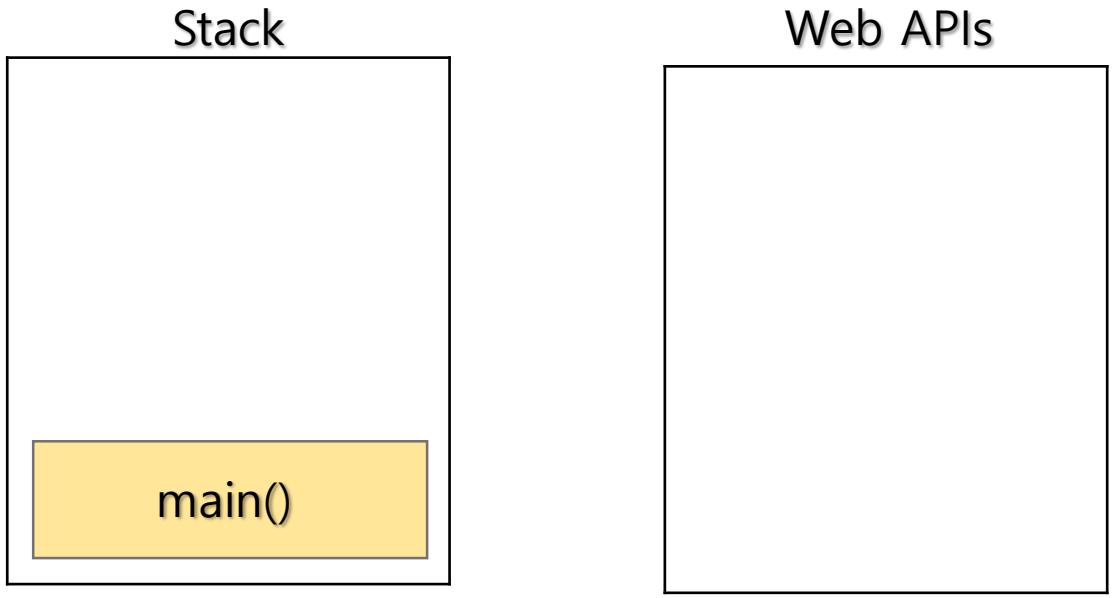

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
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        console.log("go");
    </script>
</body>
</html>
```

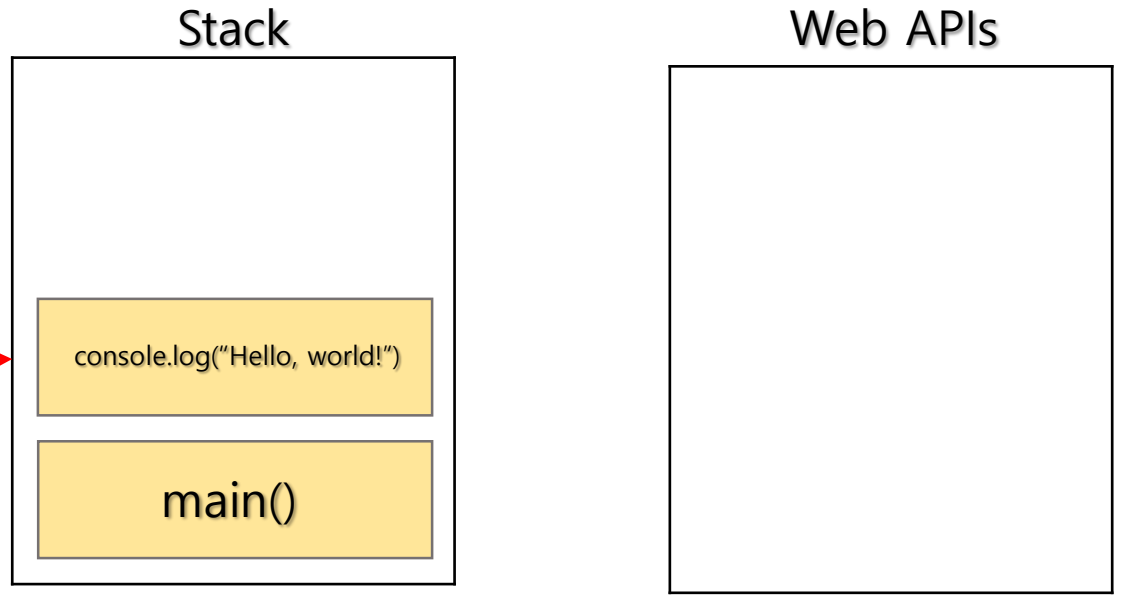

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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        console.log("go");
    </script>
</body>
</html>
```

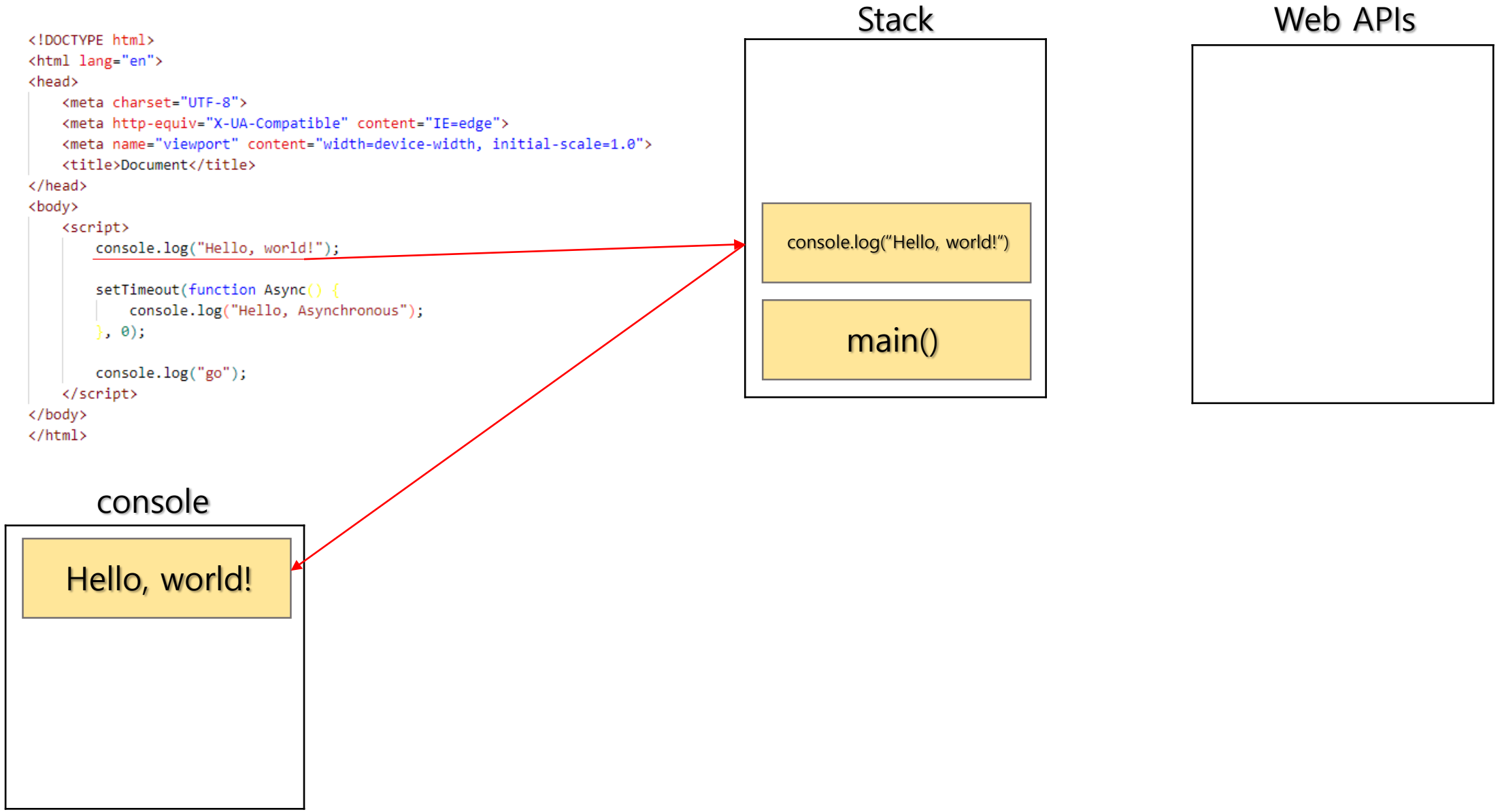

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
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            console.log("Hello, Asynchronous");
        }, 0);

        console.log("go");
    </script>
</body>
</html>
```
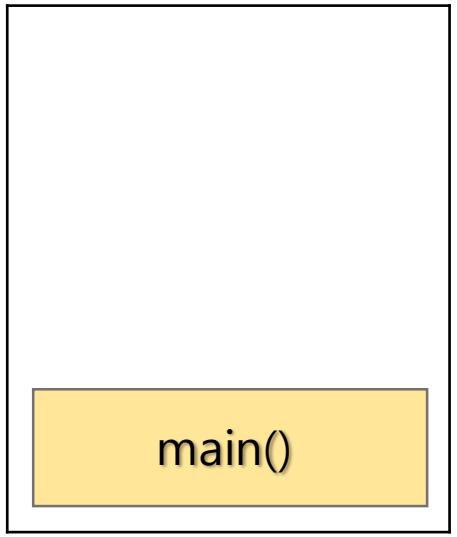
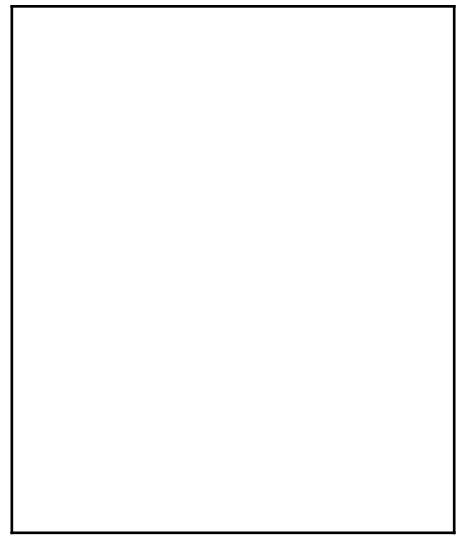
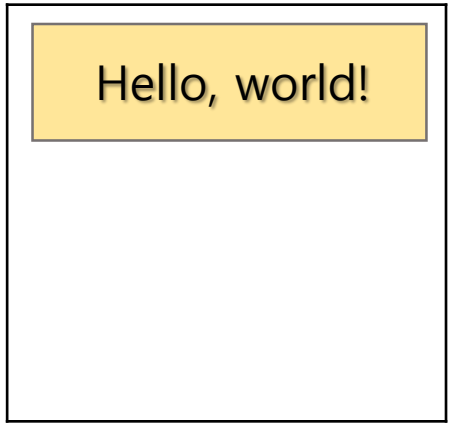

Stack



Web APIs



console



setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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    </script>
</body>
</html>
```

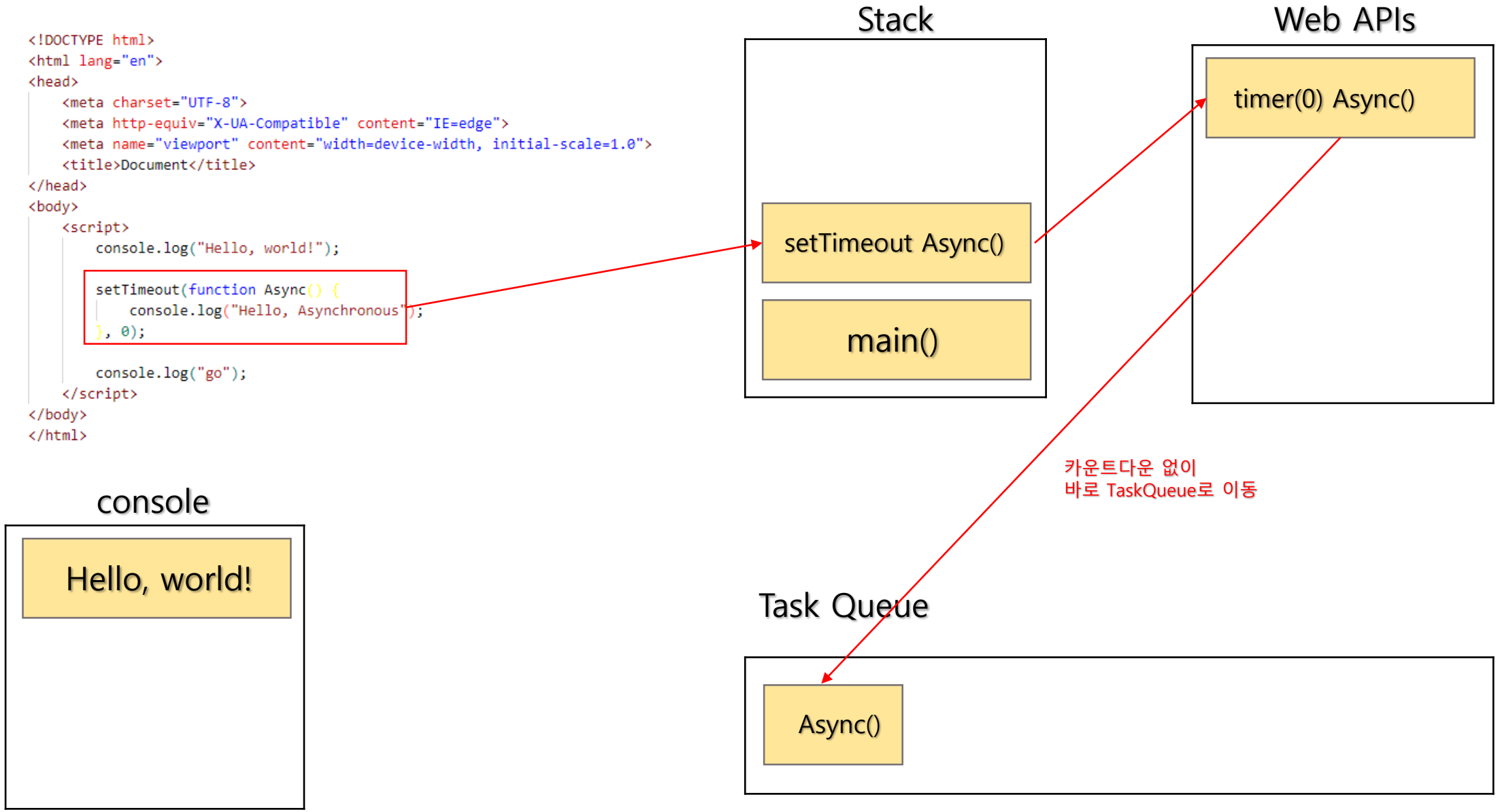

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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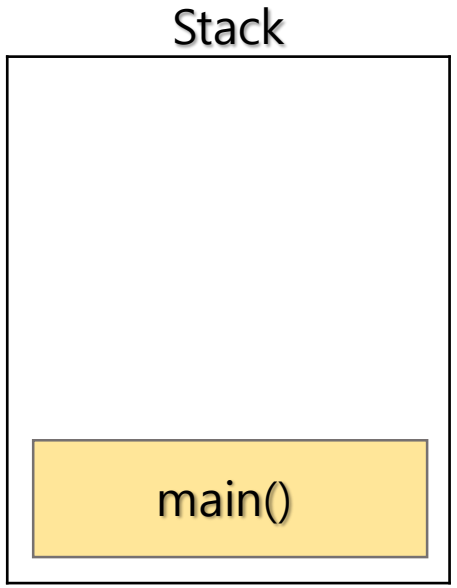

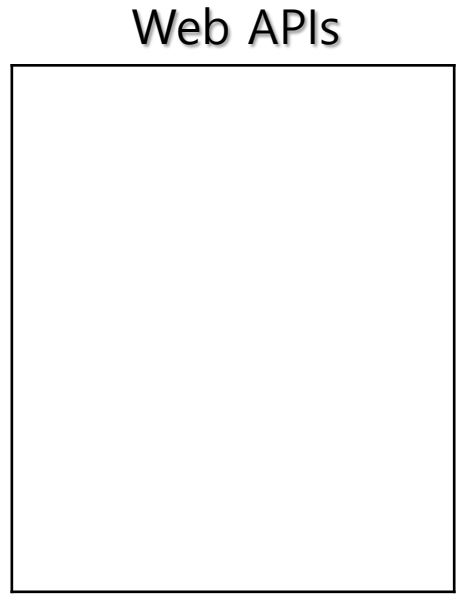

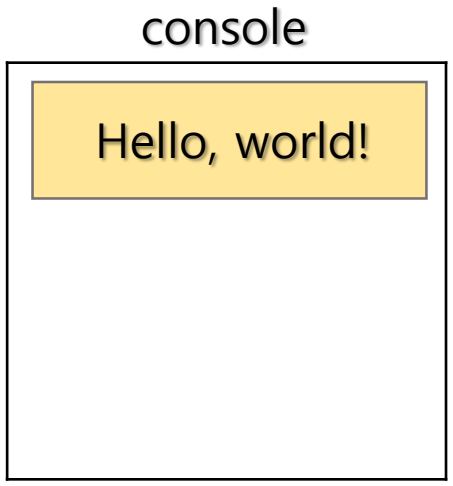

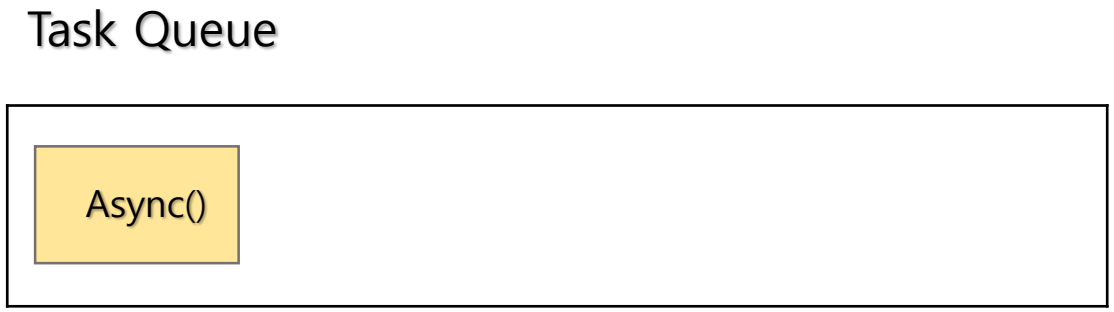

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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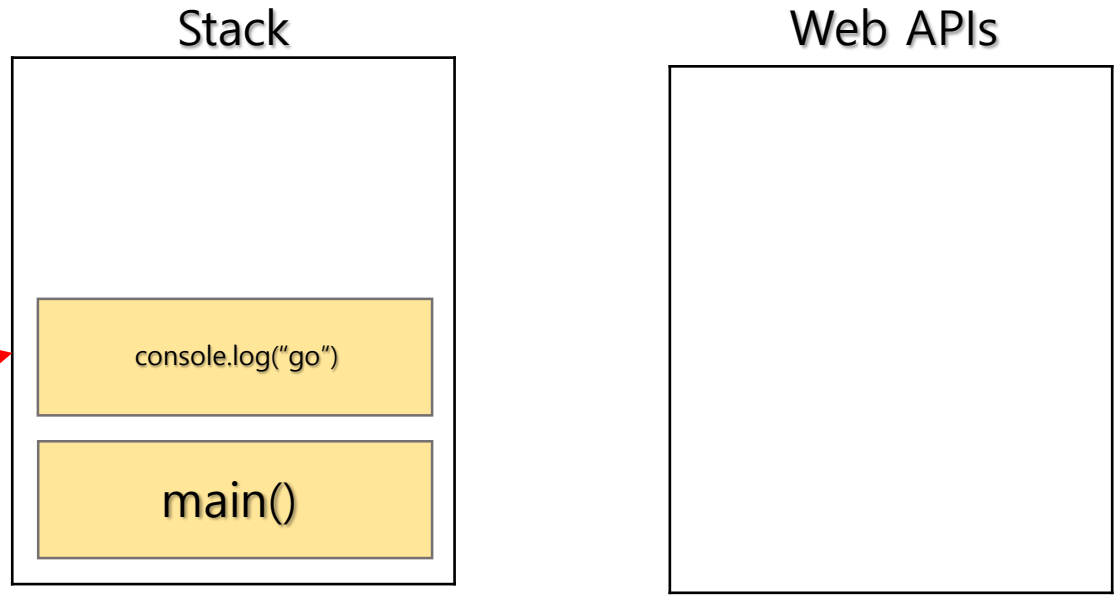

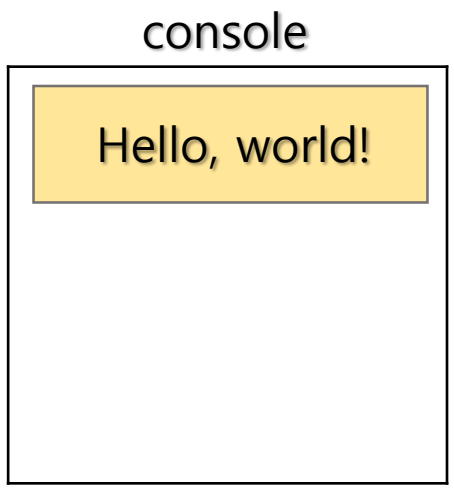

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
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        console.log("go");
    </script>
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</html>
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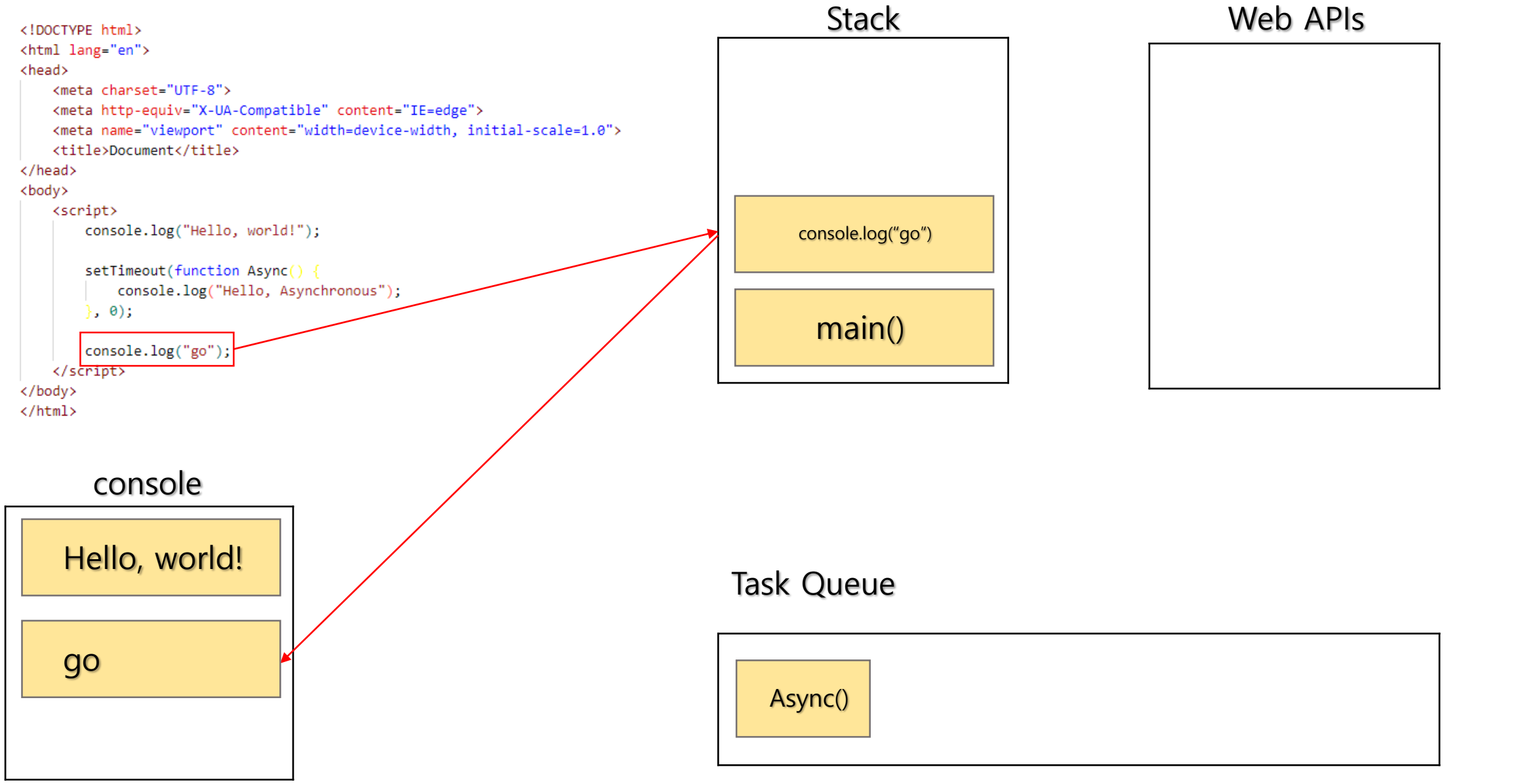

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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```

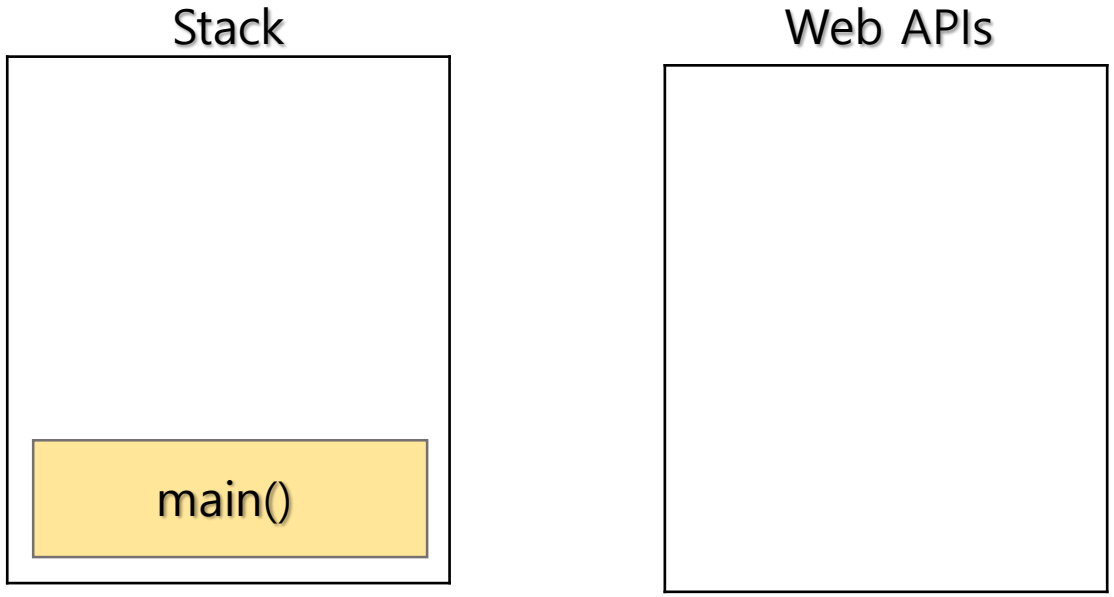

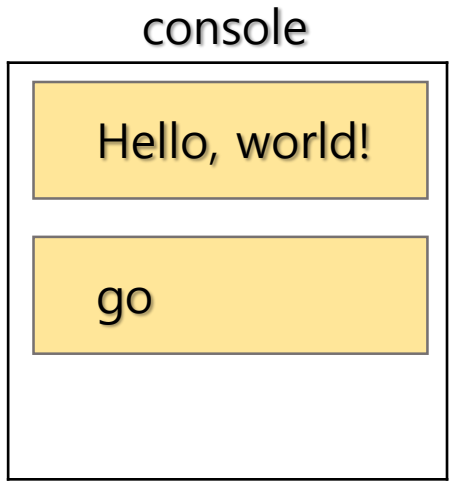

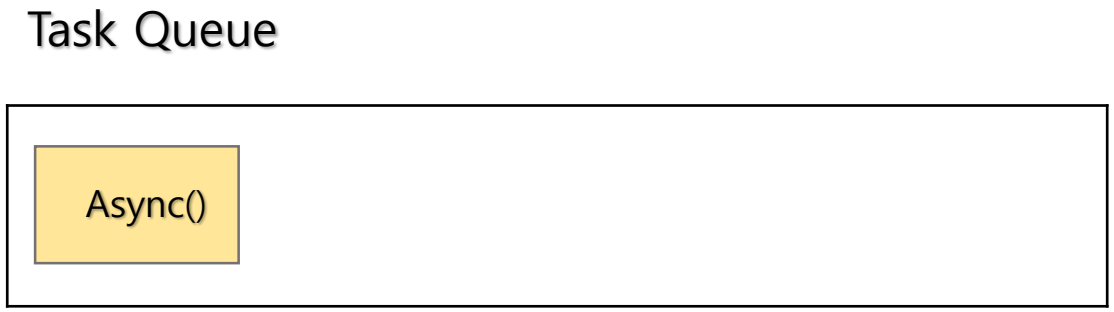

setTimeout 흐름 파악하기 - 2

```html
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<head>
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        }, 0);

        console.log("go");
    </script>
</body>
</html>
```
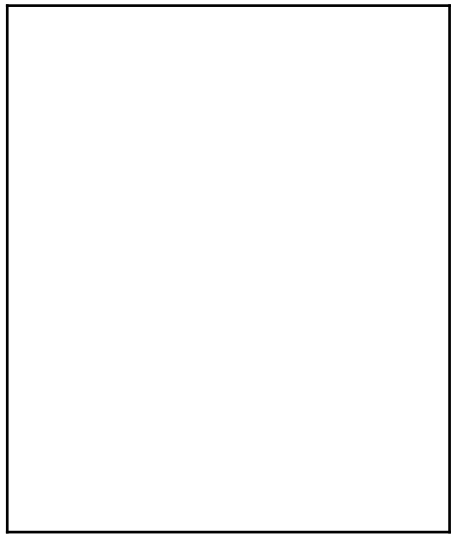
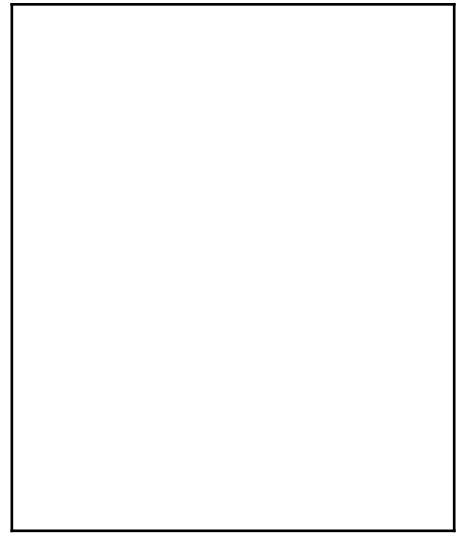
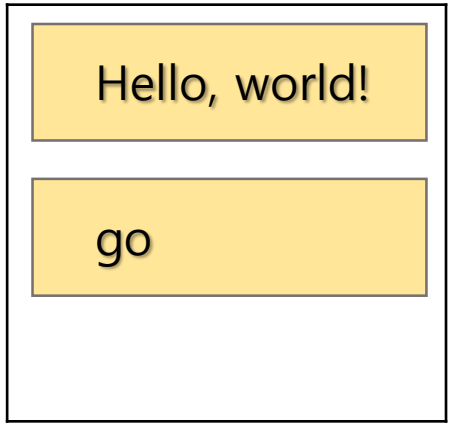

Stack



Web APIs



console



Task Queue

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
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</body>
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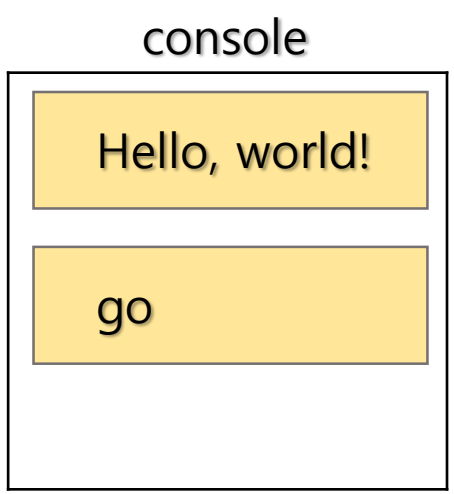

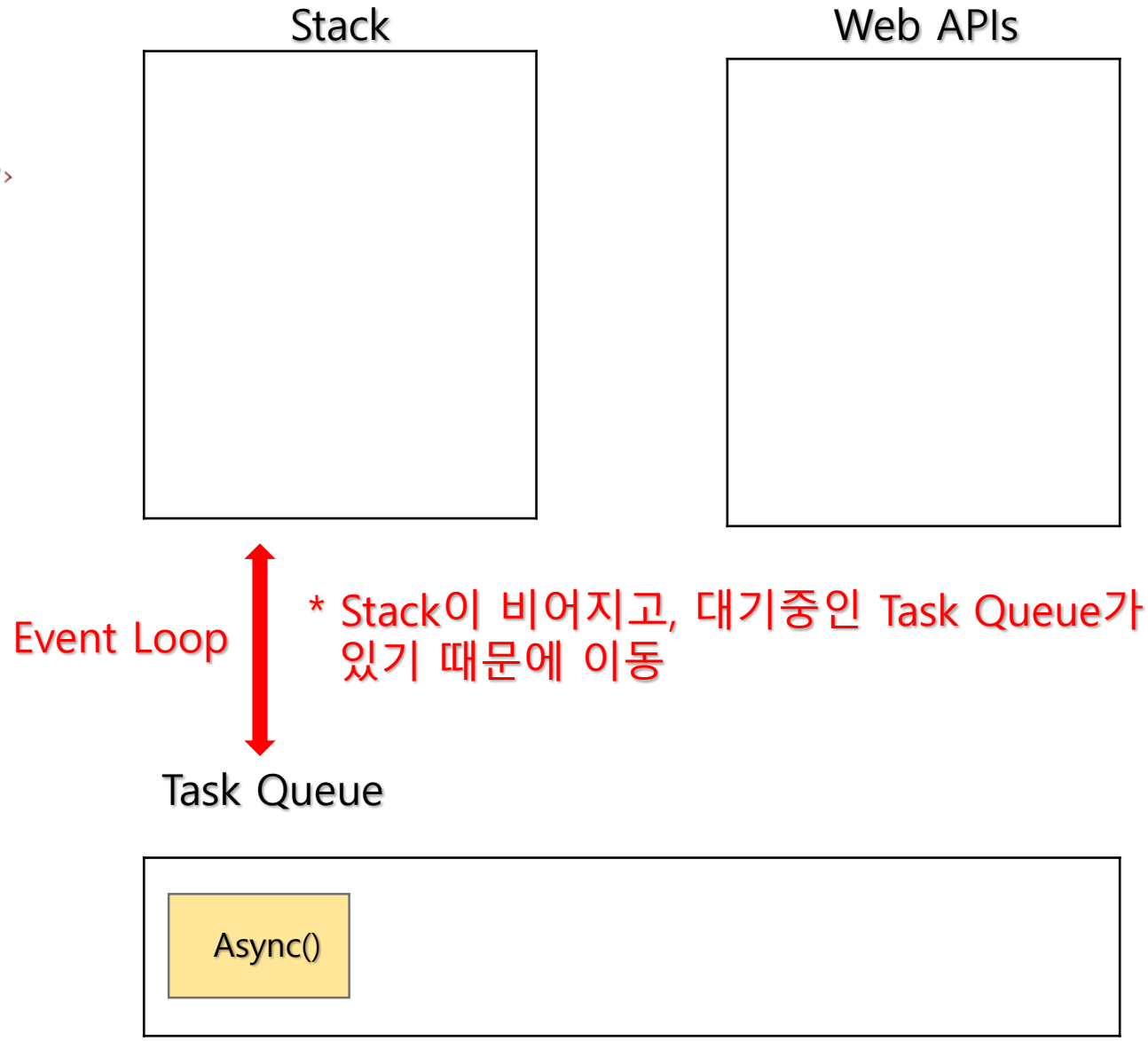

setTimeout 흐름 파악하기 - 2

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<html lang="en">
<head>
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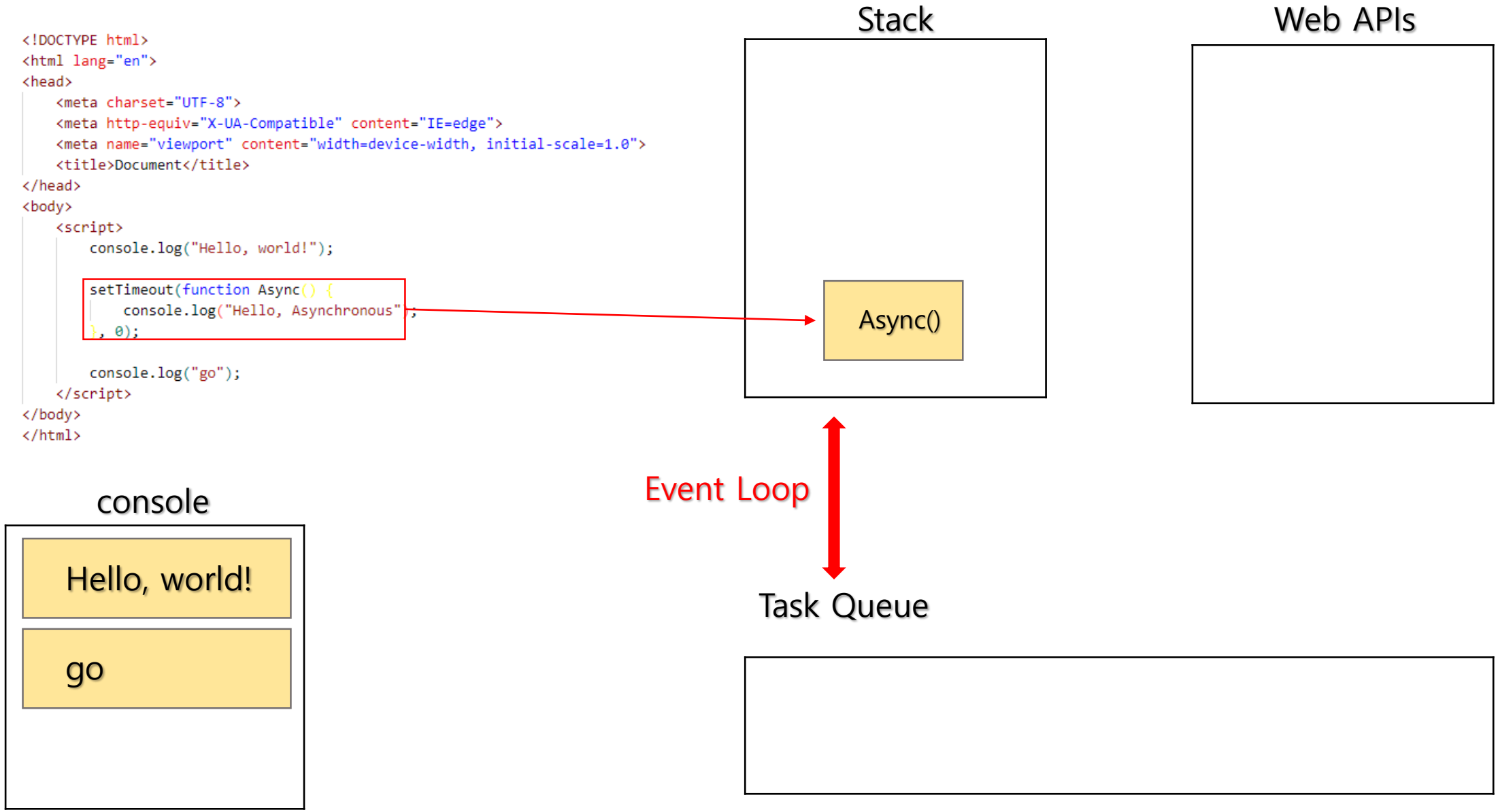

setTimeout 흐름 파악하기 - 2

```html
<!DOCTYPE html>
<html lang="en">
<head>
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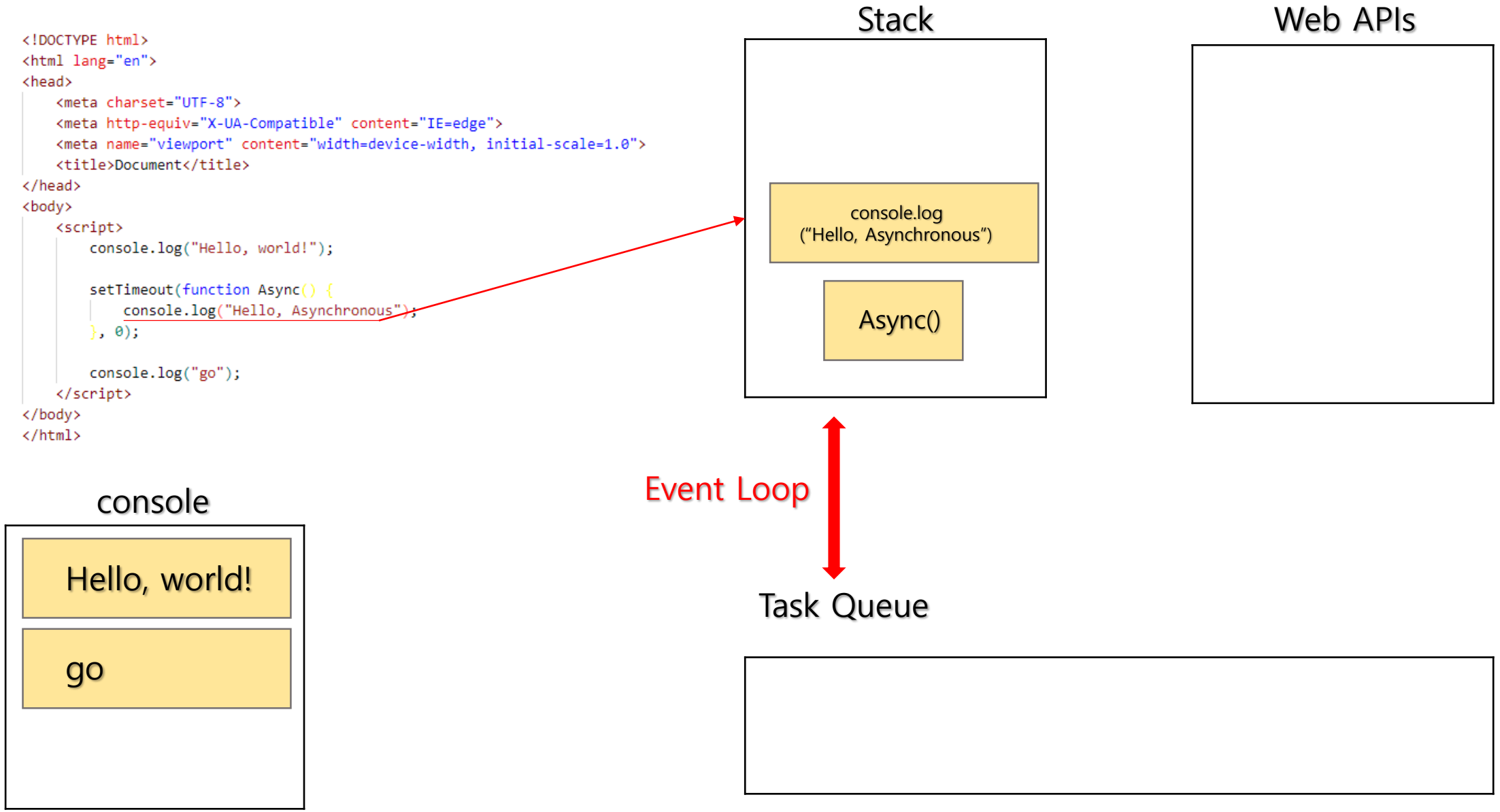

setTimeout 흐름 파악하기 - 2

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<!DOCTYPE html>
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<head>
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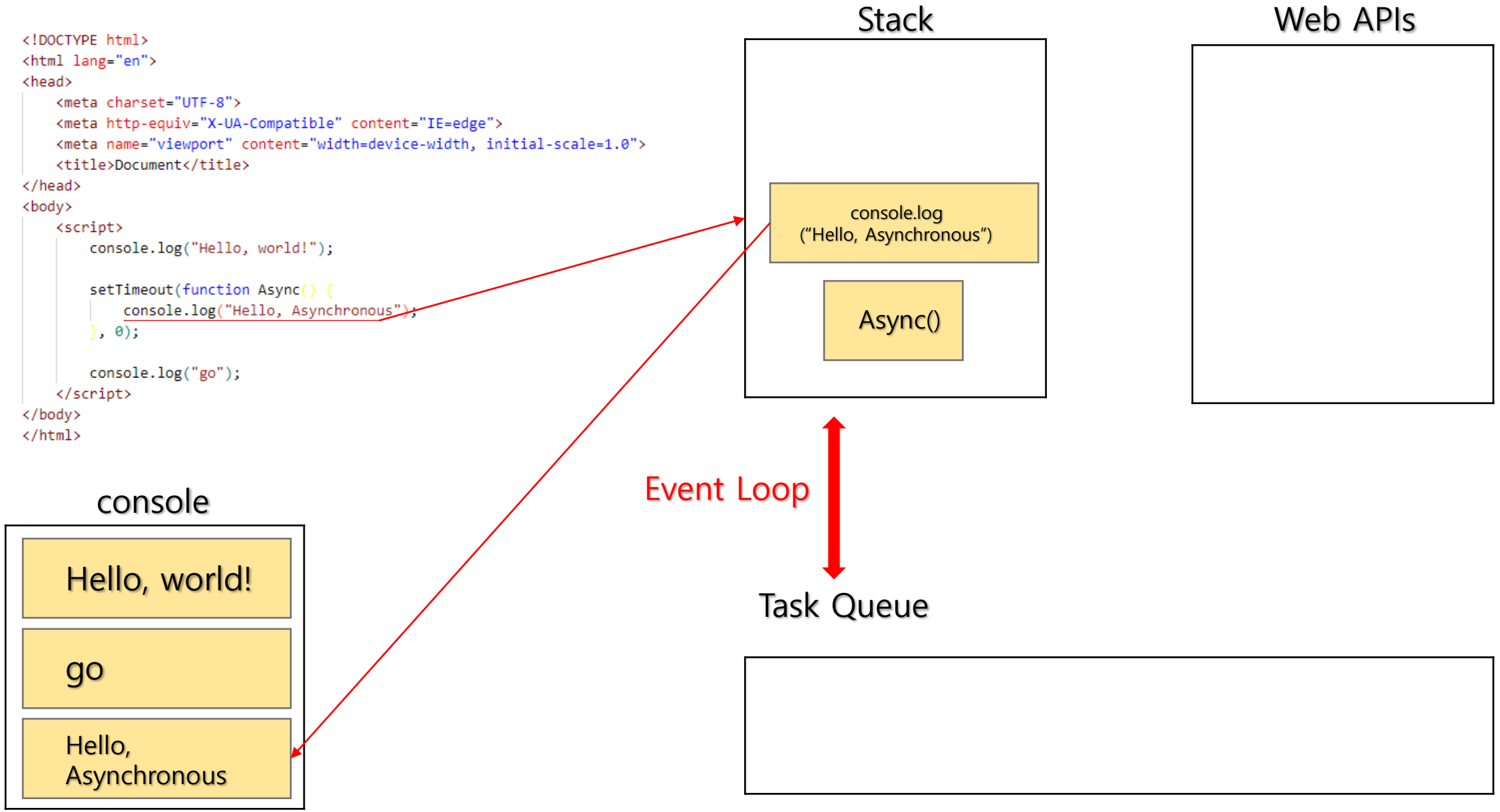

setTimeout 흐름 파악하기 - 2

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<head>
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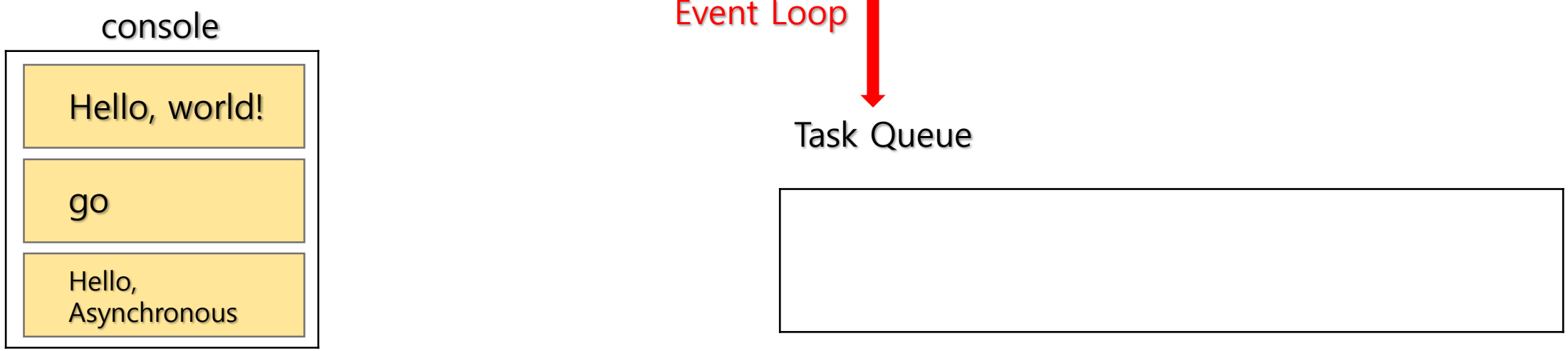

setTimeout 흐름 파악하기 - 2

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<html lang="en">
<head>
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        }, 0);

        console.log("go");
    </script>
</body>
</html>
```
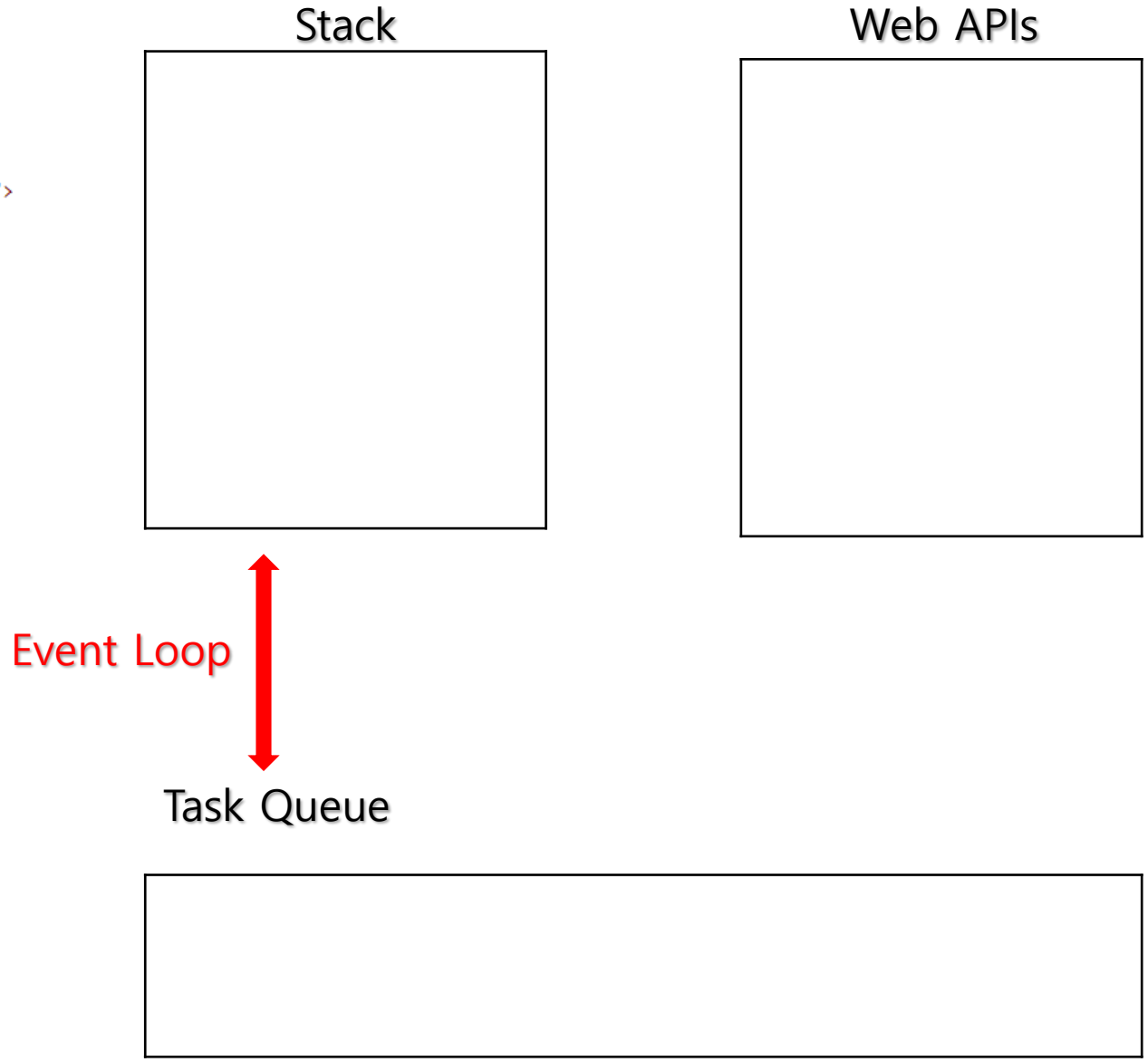

console

- Hello, world!
- go
- Hello, Asynchronous



setTimeout 흐름 파악하기 - 2

- 결론

0초로 설정되어 있더라도 앞에서 실행되는 코드를 기다려야 하므로
코드가 실제로 실행 되는 건 0초가 아니고 +α된 시간이며, 아래와 같은 코드들이 있더라도 모두 1초에 실행 되지 않음

```
setTimeout(function Async() {
    console.log("Hello, Asynchronous");
}, 1000);

setTimeout(function Async() {
    console.log("Hello, Asynchronous");
}, 1000);
setTimeout(function Async() {
    console.log("Hello, Asynchronous");
}, 1000);
setTimeout(function Async() {
    console.log("Hello, Asynchronous");
}, 1000);
```