JavaScript: The Basics

CS50 Seminar by Sela Kasepa

What is JavaScript and What can you do with it?

JavaScript:

- Programming language
- Single-threaded, asynchronous language
- Originally built only to run in browsers (Client-Side JavaScript):
  - Browsers have embedded JavaScript engines (e.g Firefox - SpiderMonkey, Chrome - v8)
- Run outside browsers via node.js framework (Server-Side JavaScript)

Working with JavaScript in the Browser

JavaScript and the DOM

What is the DOM?

- Programming interface for HTML and XML documents
- A single object that represents an entire web page so that programs can change the document structure, style, and content.
- represents the document and objects

Accessing the DOM: commonly used interfaces

- document.getElementById(id)
- document.querySelector(selector)
- document.querySelectorAll(selector)
- element.innerHTML
- window.onload
- element.addEventListener()

What is JavaScript

Single-threaded, asynchronous language

What does it mean for JavaScript to be Single-Threaded

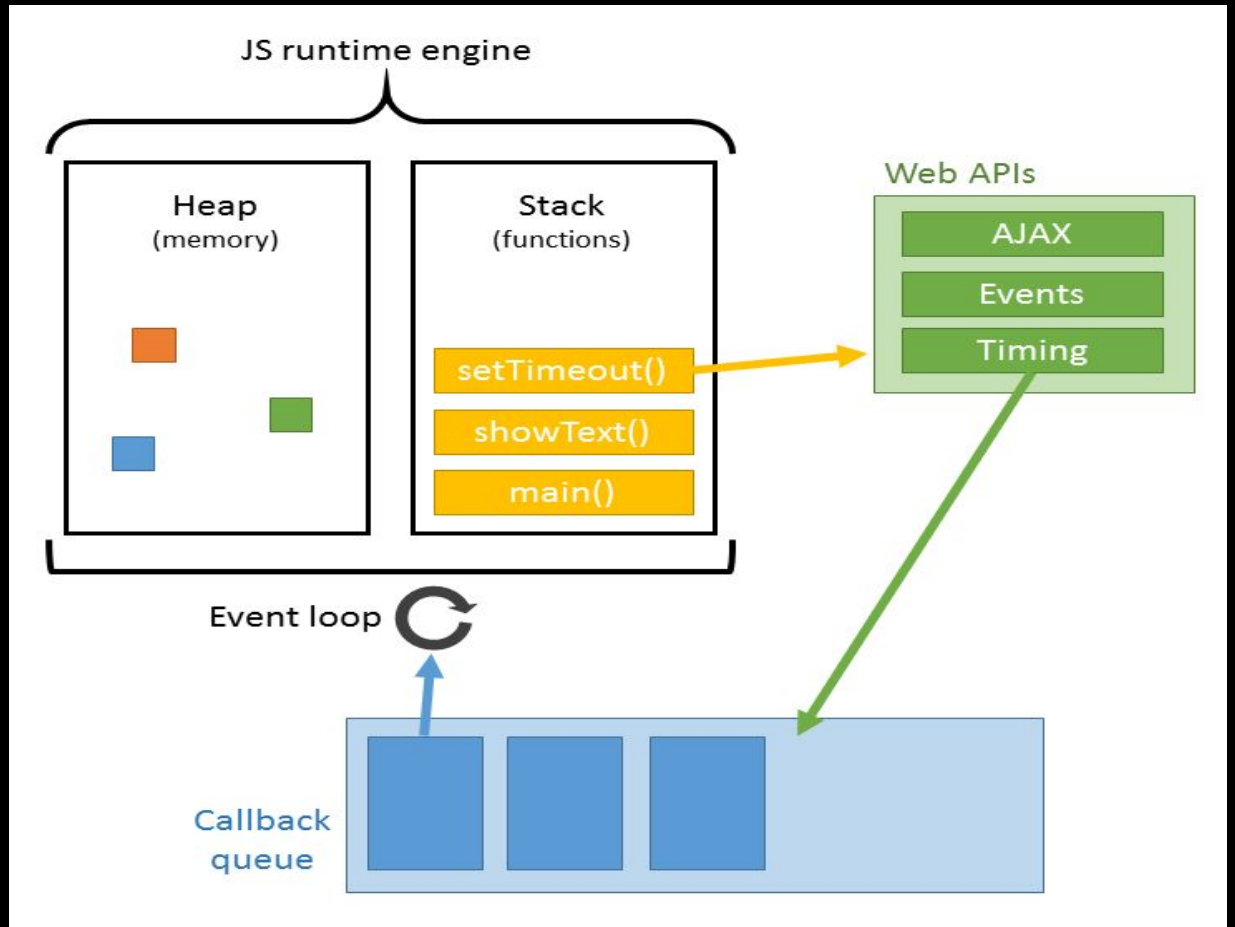
Can only do one thing at a time

Has a single Call Stack

What is a Call Stack?

Data Structure that records where we are in the program

JavaScript Environment



source:http://prashantb.me/javascript-call-stack-event-loop-and-callbacks/

Asynchronous language

- The JavaScript runtime can only do one thing at a time
- Our browsers have extra features that allow us to perform tasks Asynchronously:
  - WebAPIs
  - Event Loop
- What happens when function provided by web API is called:
  - function in web API is called
  - function is pushed off stack whilst being executed
  - when done - function is added to task queue
  - event loop monitors task queue; when call stack is empty, it pushes the first function in task queue onto the stack

Promises, Async ….. Await

- Promise - an object that may produce a value some time in the future.
- Promises can be in one of the following states:
  - fulfilled
  - rejected
  - pending
- Promises enable us to dictate when we want functions to execute.

Constructing a promise

```
const promiseExample  =  new Promise(( resolve, reject ) => {

    // asynchronous task

    // resolve()

    // or

    // reject

})
```