

Modern Web Apps

Dr. Devdatta Kulkarni

Fall 2022

Announcements

- Piazza
 - <https://piazza.com/utexas/fall2022/52998>

cs.utexas.edu/~devdatta/

kubernetes/stagin... Kubernetes TensorFlow Modern-Web-Apps Research Taxes Product-Manage... Customers-Users Logging Golang

Testing etags
I am Adjunct Assistant Professor in Computer Science department. -----

Teaching:

- **Elements of Web Programming** (Spring 2020)
- **Cloud Computing** (Spring 2018, Spring 2019, Spring 2020)
- **Modern Web Applications** (Fall 2017, Fall 2016, Spring 2016, Spring 2015, Fall 2014)

Research:

- Application CI/CD on OpenStack - Building a Solution Using Jenkins and OpenStack Solum
In this [work](#) we investigated how to build a continuous integration / continuous delivery solution for Docker-based containerized applications using OpenStack Solum and Jenkins.
- Provenance Issues in Platform-as-a-Service (PaaS) model of cloud computing (*Published at HotCloud 2015*)
In this [research](#) I am investigated issues related to provenance, auditability, tracking in platform-as-a-service model of cloud computing.
- Provenance Issues in Non-relational key-value stores (*Published at TaPP 2013*)
In this [research](#) I investigated provenance issues in NoSQL systems, such as Cassandra.
- Access control in Non-relational key-value stores (*Published at CODASPY 2013*)
In this [work](#) I investigated how to build fine-grained access control models for non-relational key-value stores (NoSQL systems) such as Cassandra, HBase, MongoDB.

Service:

- Project Team Lead (PTL) of [OpenStack Solum](#) which is an application Platform-as-a-Service (aPaaS) for OpenStack
- Guide for [OpenStack Outreachy internships](#)
- Guide for [UT Austin's Bridging Disciplines Program](#)

I received [PhD](#) in Computer Science from the University of Minnesota at Minneapolis

Contact:

Devdatta Kulkarni

cloudark.io

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CloudARK

SAAS ON K8S

Deliver your enterprise Kubernetes application as-a-service.

Containerization Packaging for Kubernetes (Helm chart, Operator) Hybrid multi-cloud SaaS

Web site

Domain Name

Accessible in browsers

Secure access (https)

Not Secure | https://democustomer.kubeplus-saas-manager.com

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CloudARK

KubePlus SaaS Manager

Username

Password

Login

Powered by Open source [KubePlus Operator](#)
[Contact us](#)

Web app

Differences

Static content

Dynamic content

Web page

KubePlus SaaS Manager

Username

Password

Login

Powered by Open source [KubePlus Operator](#)

[Contact us](#)

Web app

- *Programmatic access through APIs*
- *Communicate with other web apps/APIs*

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CloudARK

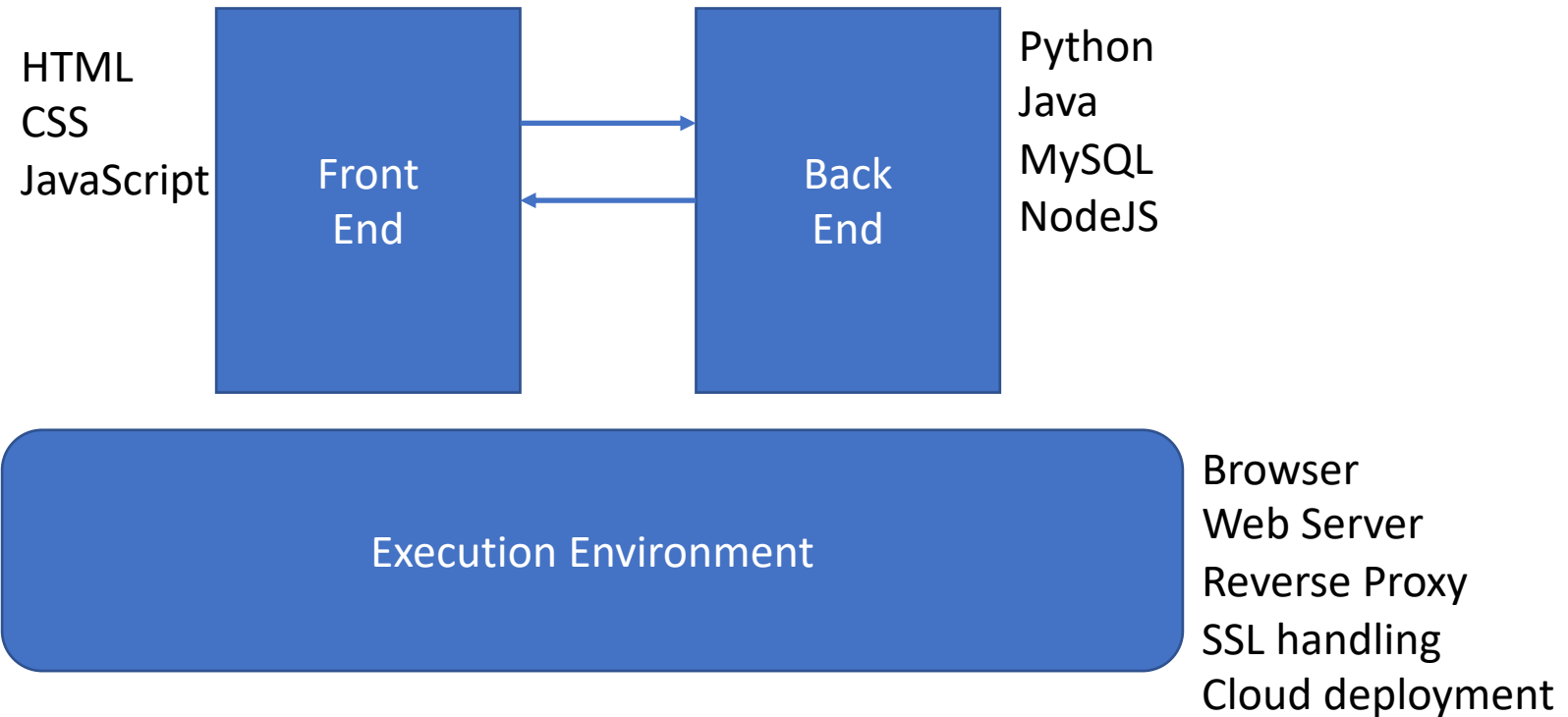
SAAS ON K8S

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Web site

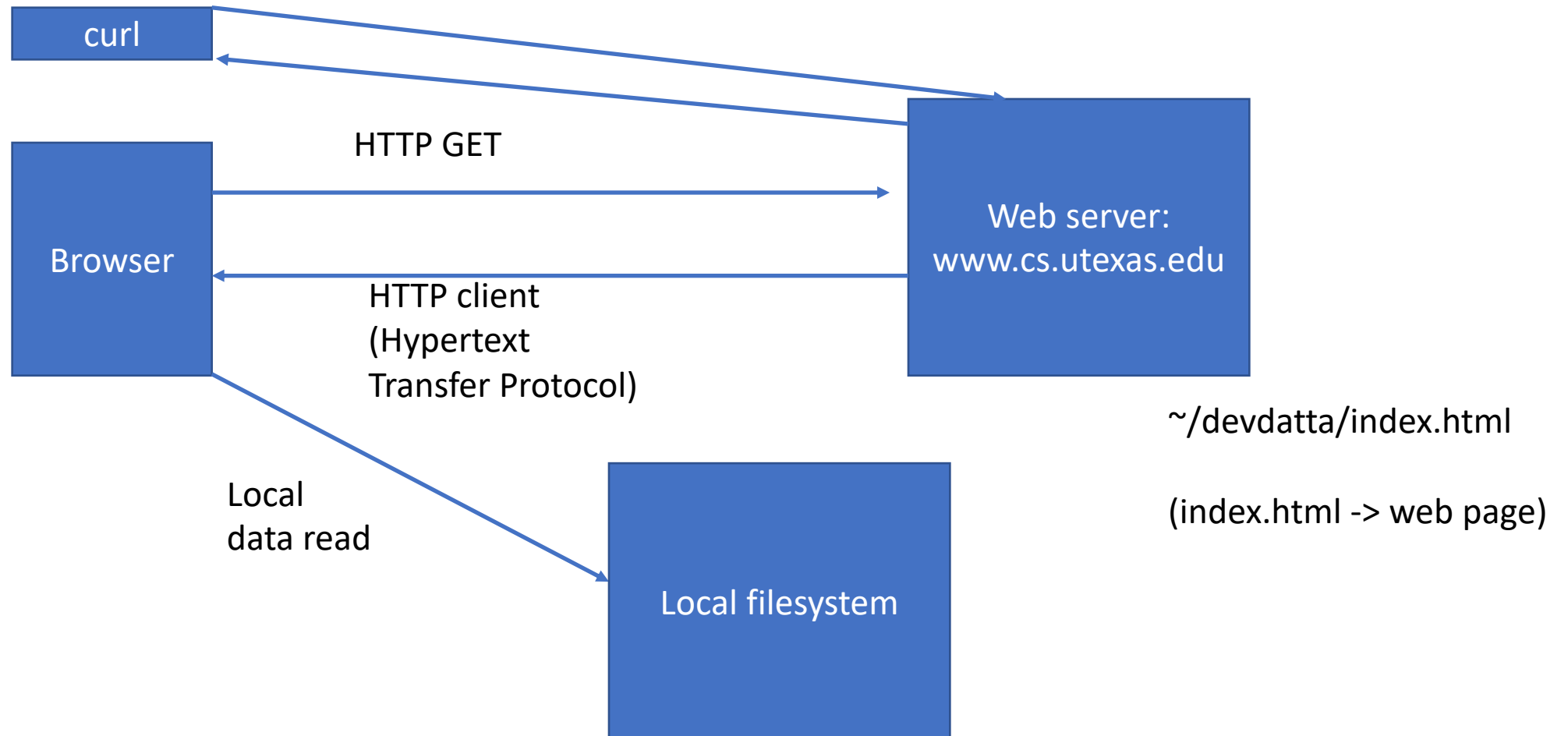
Modern Web Apps



HTML, CSS, JavaScript

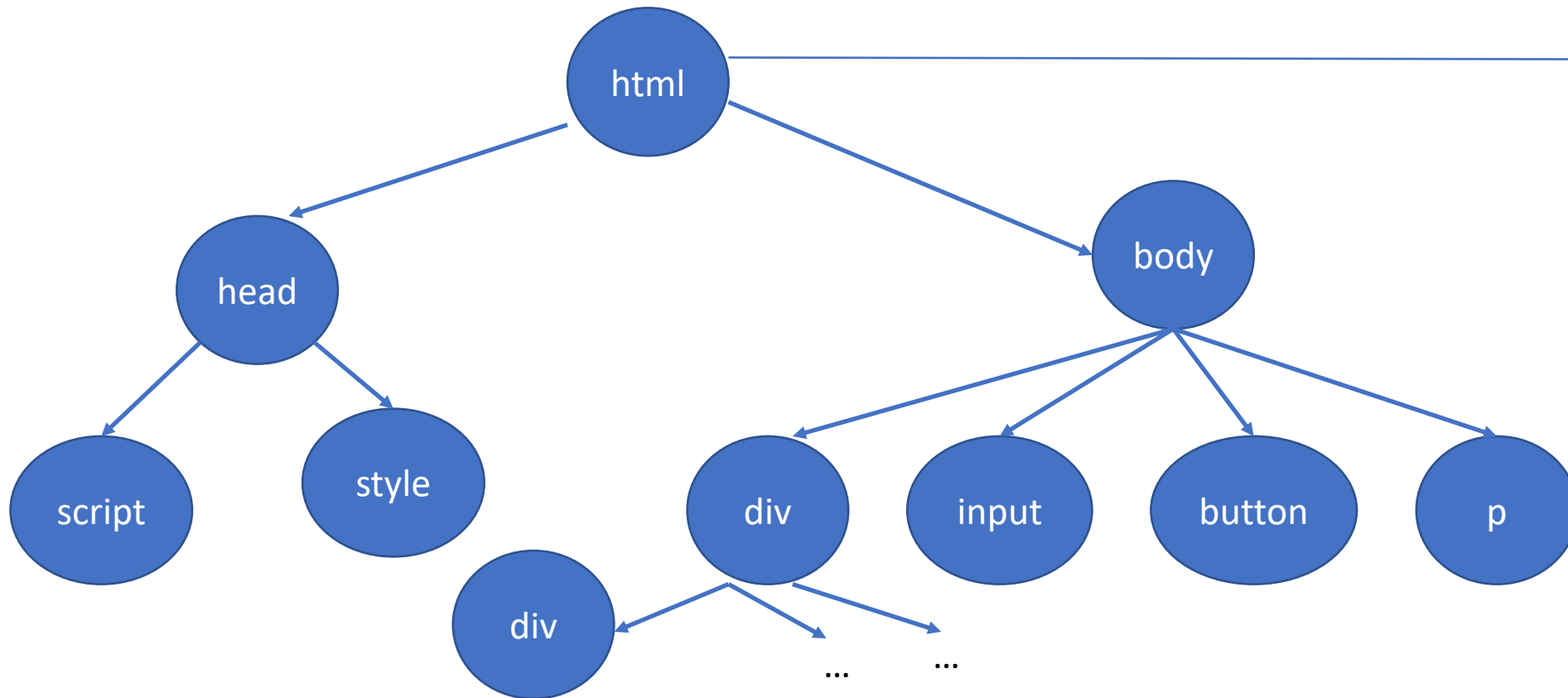
- HTML
 - Hypertext (text, images and media, links to other pages) markup language
 - What is a markup language – A set of special tags (called “elements”) with meaning associated towards how to render the content within such elements.
 - `<hr>`, `<p>`
- CSS
 - Cascading Style Sheets
 - Styling language to define “style” (fonts, layouts, background colors, etc.) for HTML elements
- JavaScript
 - Programming language that make web pages “dynamic”
 - Example: Reacting to user actions

HTTP Client <-> Server Interaction



Web Page as a Document Object Model (DOM) tree

Browser's in-memory representation of a web page



“document”
variable set by browser
to refer to the “root” of
the DOM tree

HTML, CSS and JavaScript -> instructions for the Browser on how to render a web page.

HTML Element Styling – Attributes

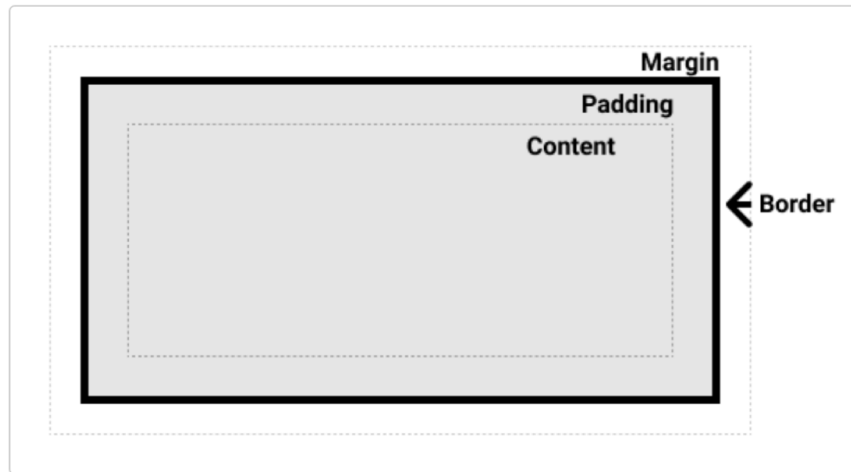
<https://www.cs.utexas.edu/~devdatta/india.html>

<https://www.cs.utexas.edu/~devdatta/france.html>

<https://www.cs.utexas.edu/~devdatta/texas.html>

<https://www.cs.utexas.edu/~devdatta/modern-web-apps.html>

- height
- viewport height (vh)
- width
- background-color
- flex direction
- float
- padding
- margin
- text-align

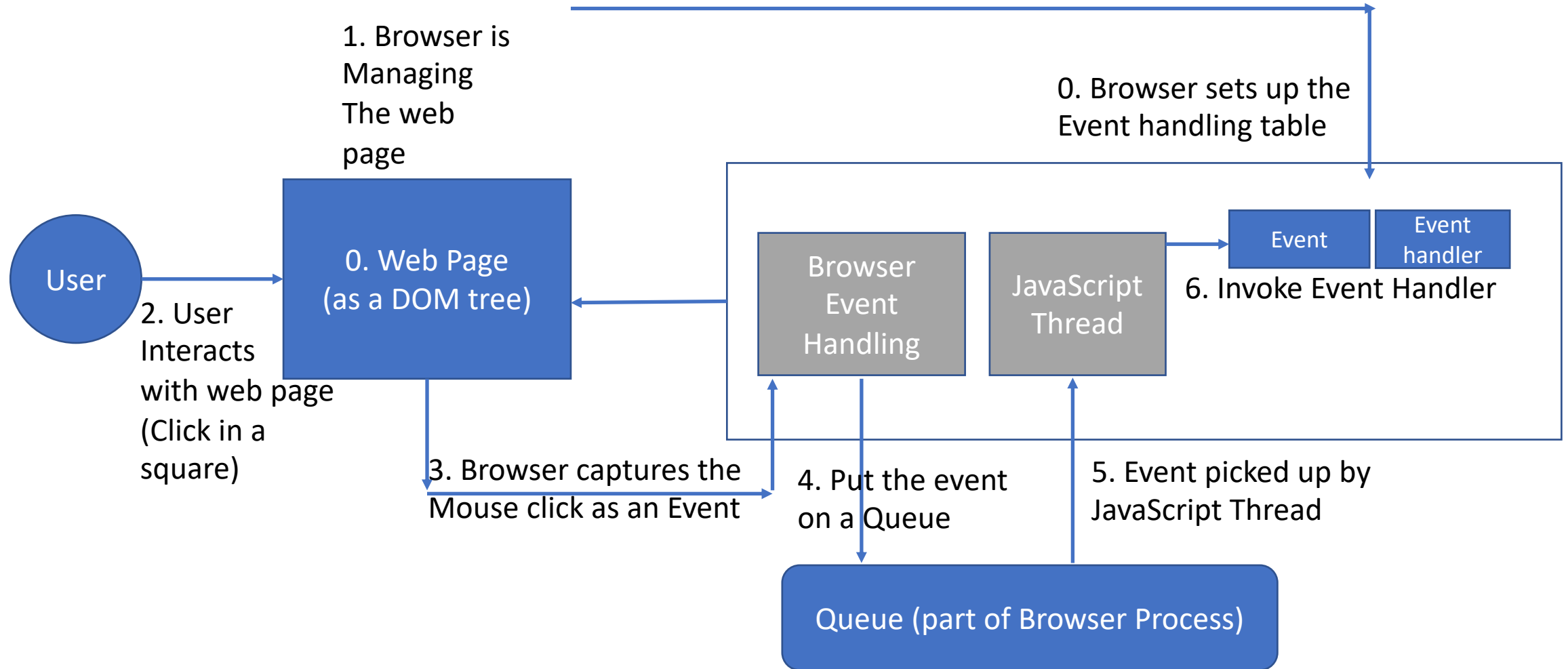


Event Handlers and dynamic HTML generation

<https://www.cs.utexas.edu/~devdatta/tic-tac-toe.html>

- Unique Ids for Elements
- Definition of Event Handler
 - onclick
- `<script>` definition
- Event Handler function definition

Browser and JavaScript Event Handling



Cascading Style Sheet (CSS)

<https://www.cs.utexas.edu/~devdatta/tic-tac-toe-css.html>

- `<style>`
- class definition
- class association with an element

JavaScript

<https://www.cs.utexas.edu/~devdatta/chess-css.html>

- onload event handler
- Function definition
- for loop
- logic operators
- arithmetic operators
- if/else statement
- createElement
- setAttribute
- appendChild

HTML Debugging

- Debugging
 - Browser -> View -> Developer -> JavaScript Console
- Page source code
 - Right click on HTML page -> View Page Source

JavaScript cont.

<https://www.cs.utexas.edu/~devdatta/musicmarketplace.html>

- button
 - onclick handler
- header
 - h1, h2
- display
 - block, none
- label
- Input
 - text, select, radio, checkbox
- ul
- table
 - td, tr
- JS Object
- alert function
- querySelector
- innerHTML
- style override
 - Register button width

Bootstrap

- Mobile first UI framework with pre-defined CSS classes to support wide variety of devices
- Built at Twitter; Now open source (MIT license)
 - <https://github.com/twbs/bootstrap>
- <https://getbootstrap.com/docs/4.1/getting-started/introduction/>
- In HTML,
 - <link> to download bootstrap CSS in head section
 - <script> tag referring to jquery, popper, bootstrap JavaScript libraries in the body section
 - <meta> tag in the head section

Main concepts – Grid layout

<https://www.cs.utexas.edu/~devdatta/france-bootstrap.html>

- 12 column grid
- Data displayed in columns
- A row encapsulates a column
- CSS classes
 - container-fluid
 - row
 - col-*

Main concepts – tables

<https://www.cs.utexas.edu/~devdatta/bootstrap-examples.html>

- Bordered tables
- Borderless tables
- Column span

- CSS classes
 - table
 - table-bordered
 - colspan

Bootstrap example websites

- City of Austin Utilities
 - <https://coutilities.com/wps/wcm/connect/occ/coa/home>
- Spectrum
 - <https://www.spectrum.com/business> -> custom/extended CSS classes
- Texas Gas Service
 - <https://www.texasgasservice.com/>

Modal

<https://getbootstrap.com/docs/4.0/components/modal/>

- data-target
- modal fade

Iframe – Embed an HTML page inside another

<https://www.cs.utexas.edu/~devdatta/iframe.html>

- iframe
- Cannot mix and match http and https contents
- Embedding needs to be allowed by the target HTML page server

Home work

Home work

- HW1: <https://www.cs.utexas.edu/~devdatta/mwa-hw1.txt>
- HW2: <https://www.cs.utexas.edu/~devdatta/mwa-hw2.txt>

Assignments

Assignments

- Assignment1:

- <https://www.cs.utexas.edu/~devdatta/mwa-assignment1.pdf>

References

- [https://developer.mozilla.org/en-US/docs/Learn/Getting started with the web/CSS basics](https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/CSS_basics)
- [https://developer.mozilla.org/en-US/docs/Web/CSS/CSS Flexible Box Layout/Basic Concepts of Flex box](https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Flexible_Box_Layout/Basic_Concepts_of_Flex_box)

Clarification

- In previous lecture I made a mistake when discussing about flex-direction property.
 - “flex-direction: vertical” is not valid value. Valid values are row, row-reverse, column, and column-reverse.
 - In all our html examples, float:left is achieving the end result. We don't really need the flex-direction attribute. I have updated all the example pages by removing the flex-direction property.

