Your Questions

29 total questions submitted.
567 total votes cast.

“An example of AI that we can understand based on CS106a exposure”

A Fun Website

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“Crash course in coding websites”

“Crash course in coding websites”

“What is the approach to start with relatively big project like app development or basic website? How can learning from CS106A be transformed to those implementations?”

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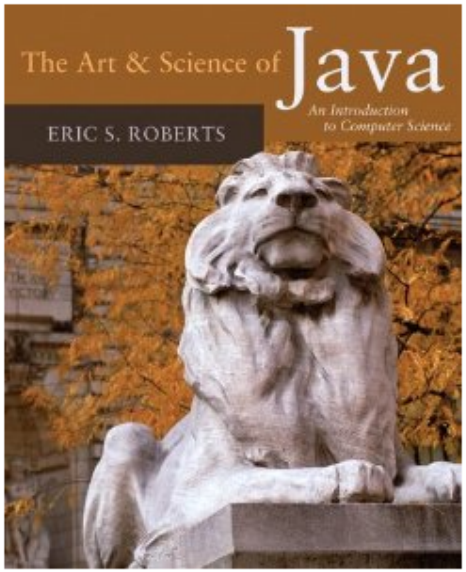

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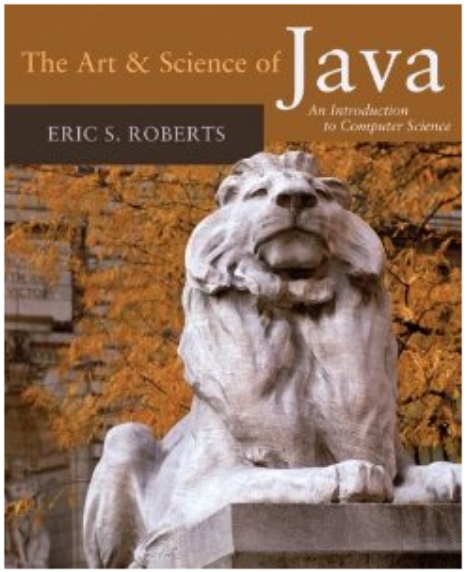

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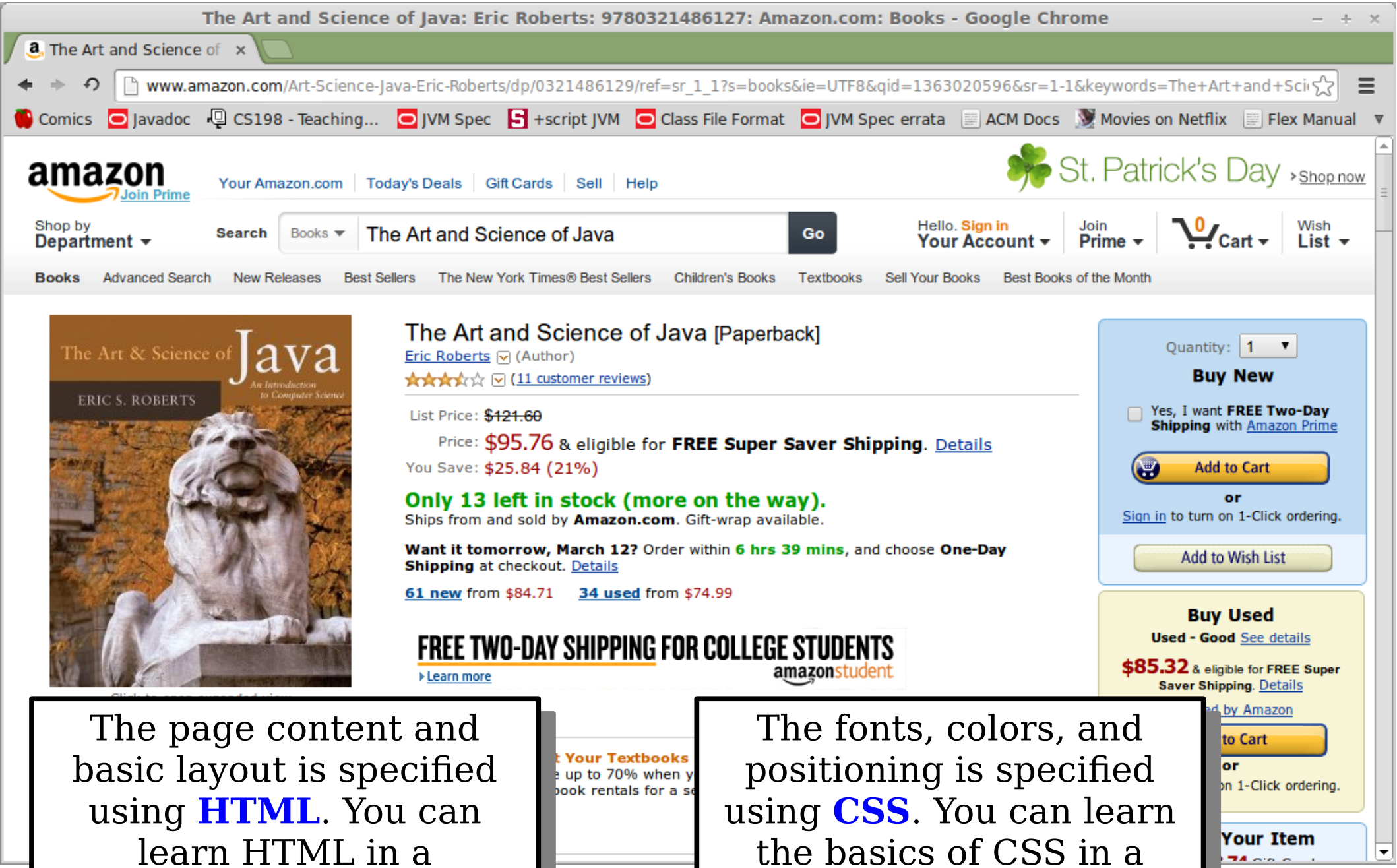
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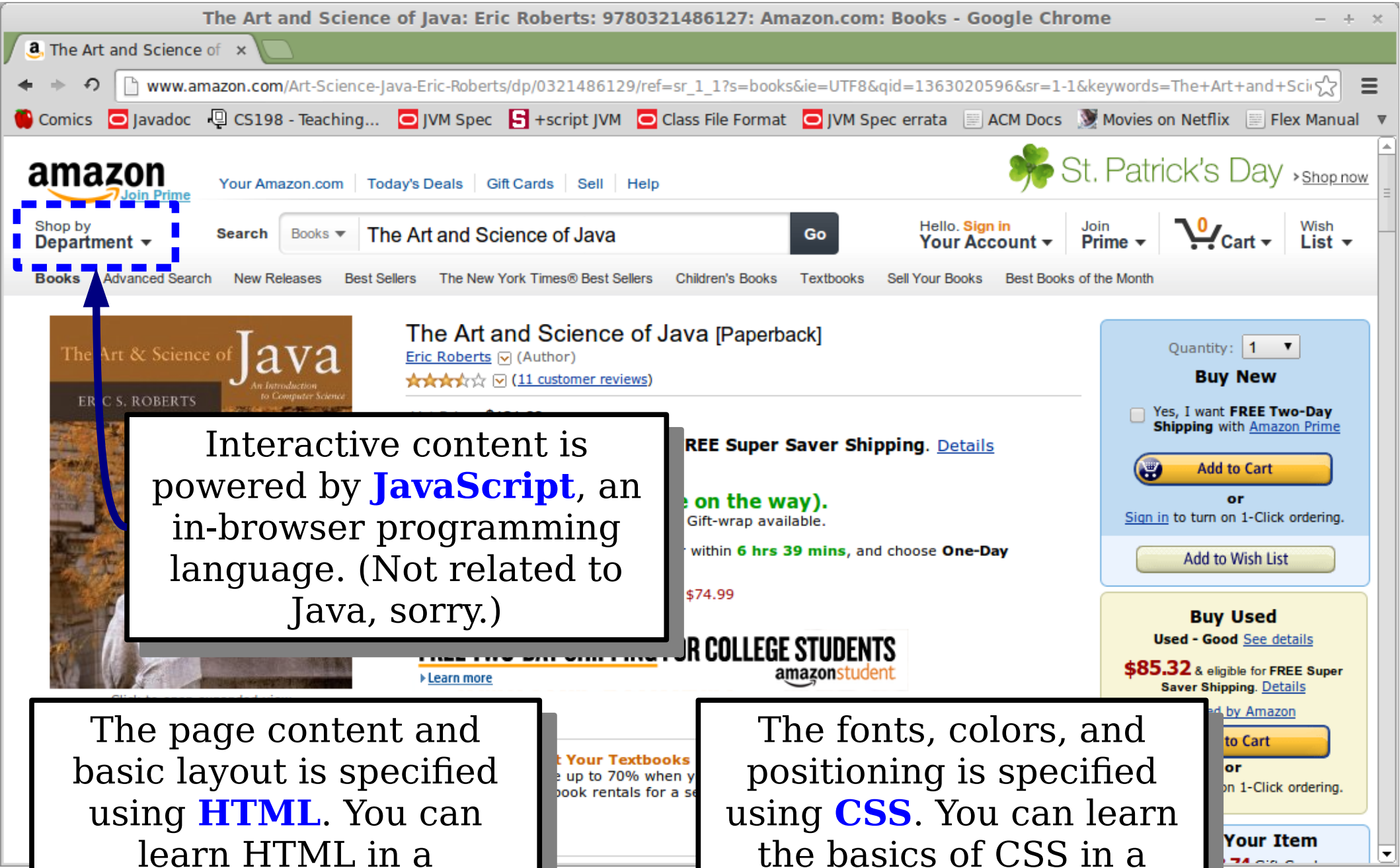
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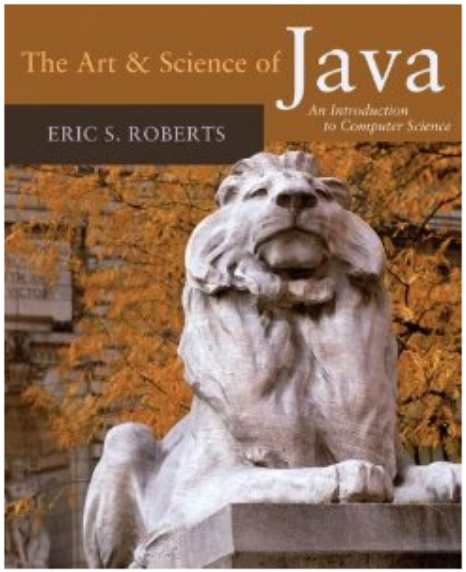

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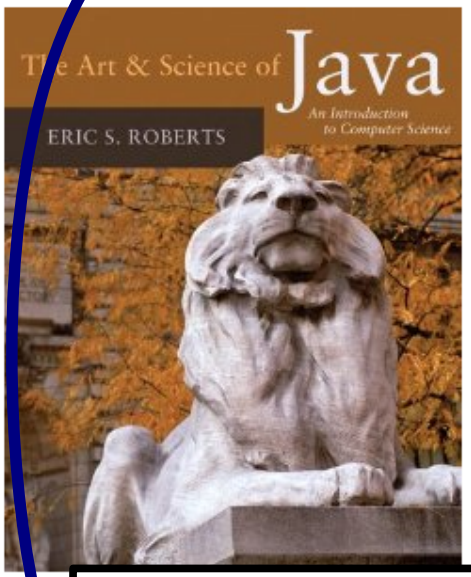

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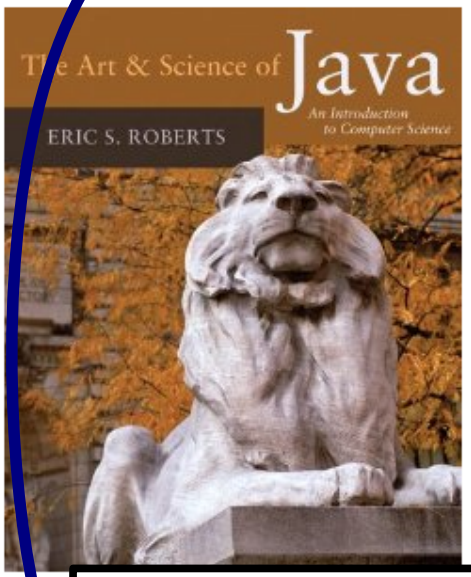

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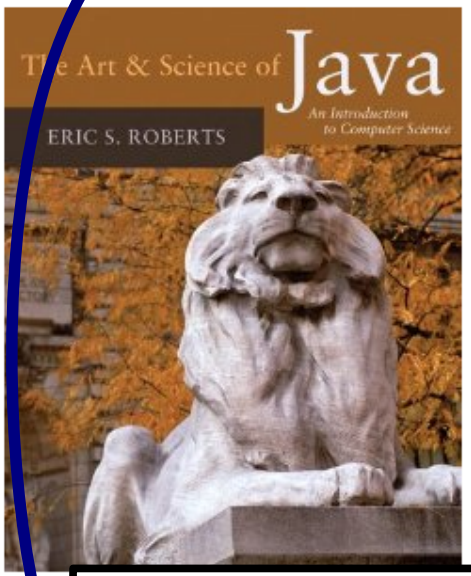

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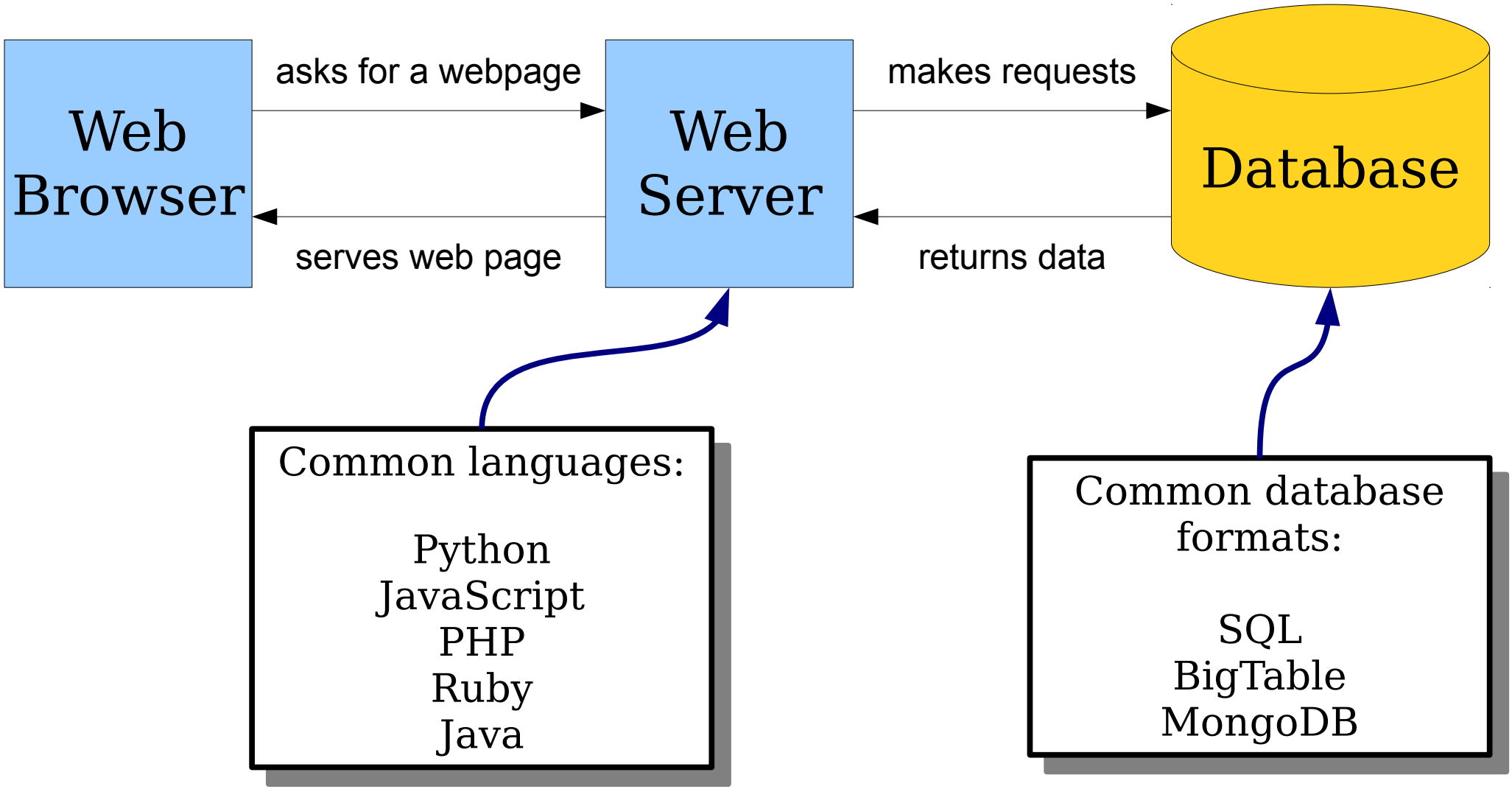

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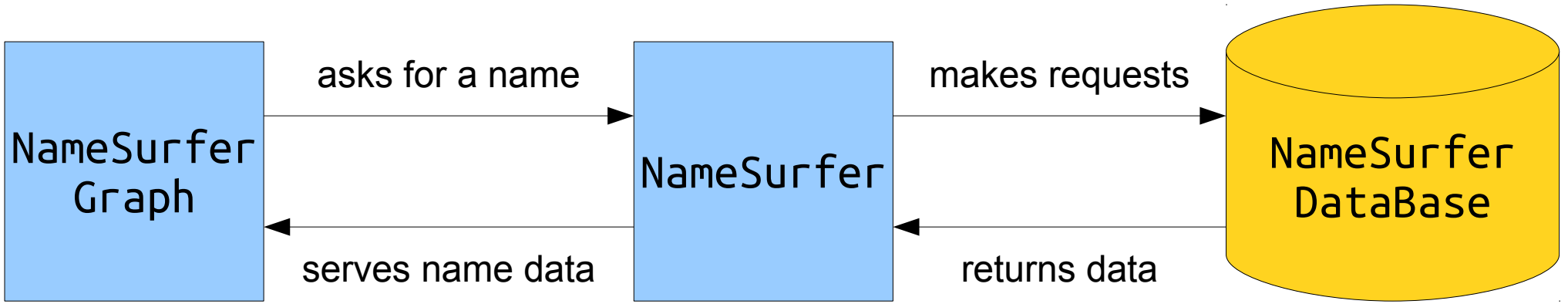

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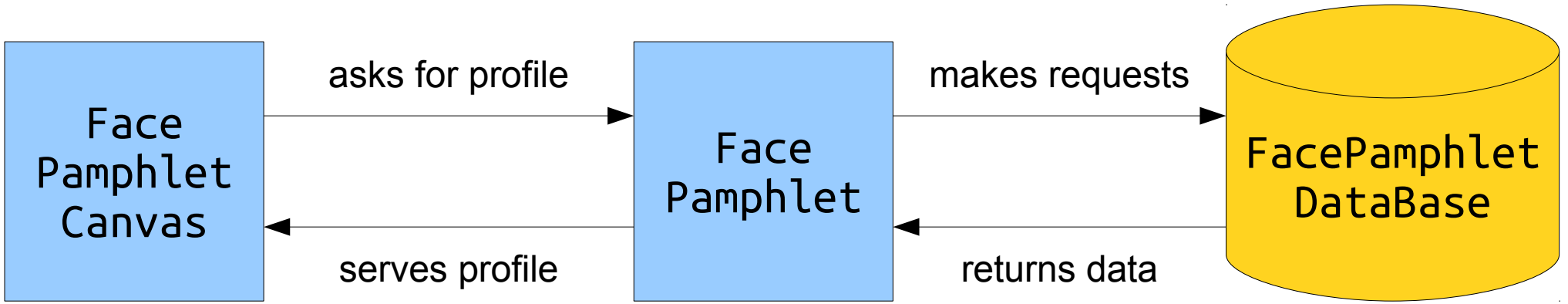

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“How are 3D graphics, such as those in animated movies or video games, created?”

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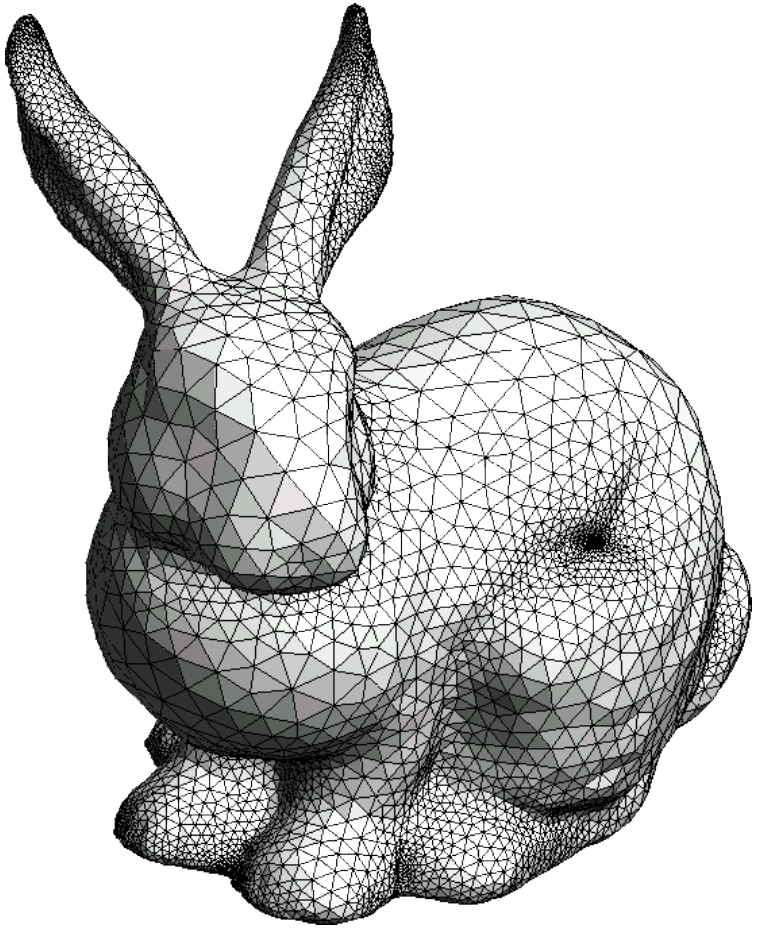
Rasterization



- Most real-time 3D graphics systems (video games, simulators, surgical robots, etc.) use a technique called ***rasterization***.
- ***Idea:*** Decompose the object into triangles, then work out the math to map each triangle onto the screen.

Ray Tracing

- ***Ray tracing*** is a technique that produces photo-realistic images.
- ***Idea:*** Trace the path that photons would take when bouncing around a scene.

Ray Tracing versus Rasterizing

- Ray tracing produces photorealistic images, but takes an enormous amount of processing time.
  - Can take hours to render a few seconds.
- Rasterizing produces lower-quality images, but can generate them very quickly.
  - Can do 60FPS or more on a graphics card.
- Want to learn more? ***Take CS148***!

“Intro to hacking”

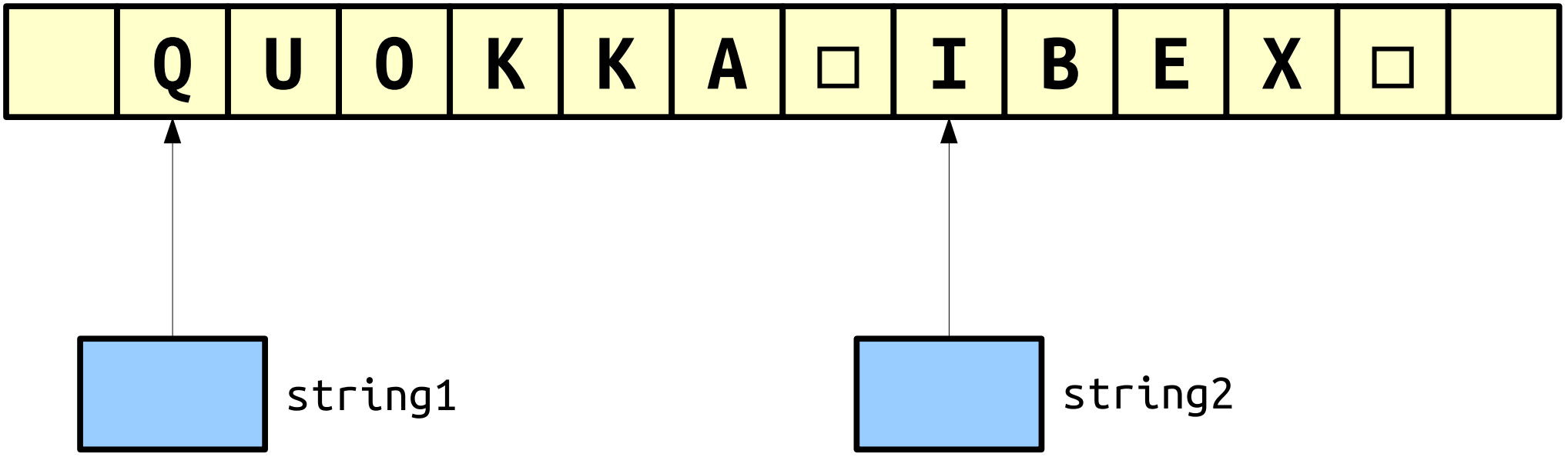
Heartbleed

- The ***heartbleed bug*** was a serious security flaw that let hackers steal encryption keys from web servers.
- What was it? And how did it work?

Array Bounds Errors

- In Java, if you read off the end of an array, `String`, or `ArrayList`, you get an `IndexOutOfBoundsException`.
- This is because Java is specifically programmed to check all array accesses.
- However, this is *not* the case in lower-level languages like C or C++.

Memory Layouts in C



Why Security is Hard

- There's a tradeoff between speed and security.
- Many security-critical applications are also time-sensitive.
- At a low level, hardware does not contain many security features.
- The sorts of errors that you likely made in Assignment 5 and Assignment 6 can, in other languages, lead to security issues.
- Want to learn more? ***Take CS155!***

“How can we use CS to do social good (ex: NGO type application?)”

Some Opportunities

- **cs-for-social-good@lists.stanford.edu**
  - Excellent mailing list with frequent announcements about opportunities at the intersection of computer science, public policy, and social activism.
- A few wonderful student groups:
  - SENSA (social entrepreneurship)
  - ESW (engineering as public service)
  - The Haas Center
  - HOPES (Huntington's disease outreach)
  - SOLE, SBSE, AISES, SWE, SASE, WiCS (diversity outreach, education, etc.)

“Is there a general approach to learning new programming languages independently?”

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“At a high level, how does what we learned relate to building a website or app? What would be the next steps to learn how to build those?”

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“At a high level, how does what we learned relate to building a website or app? What would be the next steps to learn how to build those?”

“How can we best learn new CS on our own?”

Learning New Languages

- Good news! Picking up your second programming language will be way easier than picking up your first.
- You'll learn languages best if
  - you're surrounded by people who know it,
  - you have a good tutorial, and
  - you know how to get your questions answered.

Learning New Languages

- There are a lot of really good (and really bad) programming tutorials online.
- A few suggestions:
  - ***CodeCademy*** is a good way to learn the basics of many standard programming languages.
  - ***Learn X the Hard Way*** is a well-respected book/set of exercises for learning many programming languages. (“The hard way” means “by doing it a lot and getting practice.”)

Getting Help

- ***Stack Overflow*** is a great place to get programming help online.
- General Q&A forum with lots of active users.
- If you have a question:
  - Try your best to answer it on your own first.
  - If you're stuck, try Googling or search Stack Overflow.
  - If you can't find anything, ask a question on Stack Overflow. (Be sure to read the FAQ first!)

“Legal issues in CS and tech- right to be forgotten, network neutrality, etc”

Take CS181!

“How can we share the programs we've made? (send them to friends / parents / whoever to play)”

“A lot of what we've done is trivial, seeming more like a puzzle: in disciplines like Philosophy or Physics, paradigmatic, meaningful knowledge is imparted more abundantly, whereas we seem to be only gaining programming dexterity. Why should we do CS?”

Science is what we understand well enough to explain to a computer. Art is everything else we do.

-Don Knuth, “$A = B$”

Questions in CS Theory

- What problems can we solve with a computer?
- What problems can we ***not*** solve with a computer?
  - And why not?
- Are some problems fundamentally harder than others?
  - And why?
- Want to learn more? ***Take CS103!***

“Is this the last question?”