



Final Review: 2013

This review extends the Midterm Review to cover the second half of the course.

Note: You may bring 1 sheet of 8.5x11 paper with handwritten notes to the exam.

CSE120 has covered two kinds of information: Ideas and details concerning programming, such as for-loops, and ideas about computational topics, such as binary. The test covers the whole course, and therefore will cover both kinds of material.

Did You Get It?

Here the main idea(s) from the final 13 lectures:

XIV. Recursion – recursion – the term for functions containing calls to themselves – exhibits the property that the code has a basis case and a recursive case.

XV. Assistive Technologies – computers can make the world better for disabled people, and everyone else ends up benefitting; is it goodness or just self-interest? Crowd sourcing is also goodness vs self-interest case much of the time.

XVI. Privacy In The Digital World – How to maintain privacy is known; we just don't have it in the US. Invading people's privacy can cause extreme harm, but we apparently don't care.

XVII. Internet and the WWW – One is the hardware, the other is the information and services; they shouldn't be confused.

XVIII. Computer Security and Encryption – Software can protect you from viruses and malware, but YOU have to protect yourself from your own stupidity. Be careful!

XIX. Arrays: Variables With Parts – An array is a simple extension of the concept of a variable from one to many; because computers are good at repeating, they are powerful!

XX. Searching and Tagging – Tags, both metadata and formatting tags, provide essential information to make searching work; search engines are designed to exploit them.

XXI. Database Principles – We learn XML and how it is used in online software to structure data; we notice that there are three basic ways to use XML.

XXII. Using XML Personally – Using XML and the style sheet language XSL, it is possible to make a Web browser create a fancy Web that only requires added data to keep current.

XXIII. Domain Name System – [The professor was out with the flu.]

XXIV. Majoring In CS with Raven – Everything you need to know.

XXV. Artificial Intelligence – AI is the part of CS that cannot be solved directly with algorithms; it asks if computers can think and has offered a variety of answers to that.

XXVI. Steganography – This is an amazing technology, analogous to encryption, that hides information in plain sight. Wow!

Questions Related To The Lectures & Labs

[This question will not be on scored part of the final, but please think about it.] This class claimed it would change how you think. Do you believe it has happened?


XIV. Say what it means for a function to be *recursive*.

- (a) What happens if you comment-out the “basis” case in a recursive program?
- (b) Write a recursive Processing program to draw a row of 10x10 box pairs of purple and gold, drawn side-by-side up to the edge of the canvas, but not beyond.
- (c) In the recursive program of Lab 07, how does the result change when the two `box ()` calls are moved so that they come together?

XV. Define the term *assistive technology*.

- (a) Name five assistive technologies that became mainstream; include one or more non-computer based examples.
- (b) What technologies do you use that began as assistive technologies?
- (c) Stevie Wonder said the reading machine gave him what benefit?
- (d) Give four examples of crowd sourcing; include at least one example not mentioned in the lecture.
- (e) LAB 08: Using the Show Code as a guide, write an HTML file that displays “Hello, World!” in white letters on a black background.

XVI. Give our definition of *privacy*.

- (a) Offer examples of cases where surreptitious recordings have caused severe harm.
- (b) What is the summary of the Offensensitivity discussion?
- (c) What are the OECD “Fair Information Practices.”
- (d) If you are told by Google that they need your phone number to recover in case you forget your password, and then they use it to identify you in a DUI story, what privacy principle have they violated?
- (e) Target follows the existing privacy laws, but they still “creep people out” ... by doing what?
- (f) What is this symbol for? 
- (g) If your CSE120 homework were displayed without your permission, what privacy principle it violate?

XVII. Explain the difference between the Internet and the WWW.

- (a) What is “IP,” what’s an IP-Address and how many bits does it have (usually)?
- (b) Explain how the Ethernet protocol works using a party conversation as an illustration.
- (c) Explain how TCP/IP works using postcards as an illustration.
- (d) “Humans prefer a logical address, computers need the physical address;” explain this comment referring to Internet addresses.
- (e) Describe the client/server protocol; name a UW client computer; name a UW server computer.

XVIII. From a security perspective, what is the riskiest use of a computer?

- (a) Create a good password based on the topic: Seattle
- (b) Which attachment(s) are usually safe to open? `.jpg` `.exe` `.doc` `.pdf`
- (c) What is encryption?
- (d) What is an encryption key?
- (e) What is phishing and why does it work?

XIX. Say what an “array index” is.

- (a) The first and last elements of a length 10 array have what indexes?
- (b) Declare an integer array whose initial values are the first 4 powers of 2.
- (c) Assuming enough elements, what is wrong (if anything) with these array references? $A[0]$, $A[3*\text{int}(x)+4]$, $A[A[2]]$, $A[-1*(8-9)]$, $A[\text{giveAnInt}(\)/2]$
- (d) Assuming `Even` is a declared integer array of length 50, initialize it to be consecutive even numbers starting with 8.
- (e) Declare an array containing the letters `s-p-o-t`.
- (f) If the array `Pix` contains the pixels of a `width x height` image, define a function `tooDee()` that takes a row and a column value, and returns the right index for that pixel in `Pix`.

XX. What do HTML, XML and XSL stand for?

- (a) Show the arrangement of the tags that every Web page must have.
- (b) Explain the two main parts of a “search engine” and what they do.
- (c) A search for “`mona lisa`” produces hits that will have those two words in the text – true or false? Explain.
- (d) What is Page Rank?
- (e) What does it mean that in Page Rank, one page “votes” for another?

XXI. Say the three ways to use XML tags, and give an illustration.

- (a) Explain the value of metadata in the computer representation of the Oxford English Dictionary?
- (b) Give an example of a “starting” tag, and “ending” tag, a “self-terminated” tag, and an attribute.
- (c) Your home address probably involves your name, street number, town, zip, etc. Tag your home address with XML.

XXII. Solve the equation: $\text{XML} + \text{XSL} = ?$ [Hint: $X(M+S)L$ is wrong. :)]

- (a) Highlight the portion of the following HTML text that came from the XML file shown in the lecture:

```
<table width="500">
  <tbody><tr><td><h3>Washington State</h3></td></tr>
  <tr><td style="text-size:xsmall; padding-left:10px">
    
    The State of Washington is a fun place to visit. We toured Spokane,
    Grand Coulee Dam,Seattle's Space Needle and Mt. Rainier, which
    wasn't rainy at all, but beautiful in the sun!
  </td></tr>
</tbody></table>
```

- (b) Which items of information in (a) that are not from XML came from the browser?
- (c) Define an XSL template for `<big_item>` which displays it as a third level heading in italics.
- (d) What does the tag `<xsl:apply-templates/>` do?

XXIII. Reading the slides on your own, what problem does the Domain Name System solve?

- (a) Recall the logical/physical dichotomy of question XVII(d) – what is it?
- (b) A “cache” (pronounced cash) is a place to store stuff you might use (again) soon; slide 9 tells about caching IP-addresses; why do you think this is done?

XXIV. What makes computer science the coolest topic at UW?

- (a) Give the name of your favorite rock band.
- (b) True/False, When you're tired of studying it is relaxing to get lame questions from your professor.
- (c) Does the datatype `float` get its name from the Evergreen Floating Point Bridge?

XXV. Explain the arrangement and process of a Turing Test.

- (a) Why don't computers just search the game tree for chess, and find a winning path?
- (b) Comment on whether Deep Blue's win over Kasparov is evidence that computers are intelligent.
- (c) Watson is a much more "human-like" computer system than is Deep Blue: Explain.
- (d) Explain why it is possible that computers could be considered creative.

XXVI. Where do we get the term steganography?

- (a) What does steganography mean?
- (b) What is the process by which a photo is "hidden"?
- (c) Can you think of any other cases where information is hidden in information?