CS174 Final Fall 2020

Name:
StudID:

Instructions:

1. This midterm is due 11:59pm PST, Dec 11, 2020.
2. To complete the final, print it out, fill in your answers on the final, and scan it back (or take pictures of the pages and make a pdf) into a file Final.pdf where the total size is less than 10MB.
3. If you don't have a printer, copy and paste each problem into a word processor document. Then after each problem write your solution. Make a less than 10MB Final.pdf file of the result and submit that.
4. Use the same submit mechanism as for the homeworks to submit your completed final.
5. Each problem on this final is worth the same amount (3pts).
6. If you have a question on the interpretation of a problem on the final, you can email me at chris@pollett.org.
7. Due to the coronavirus this is an open book, open internet final.
    a. What that means is that you can consult any static (on the order of static for weeks) source of information related to the final material.
    b. You cannot directly or indirectly ask another person how to do any problem off the final.
    c. To receive credit on problems that make use of your personal information, you need to have correctly filled in that personal information.
    d. When you submit your completed final, you are asserting all of the work in the final is your own.

1. Explain the mediating-controller MVC design pattern and give an example of code for each of its components. Here I mean the three main components. The code example can be minimal, but should be functional. Make sure the example is connected to something you intend to do over the holidays. (3pts - 1pt/component).

2. Write a simple DTD for wedding invitations that has as its main element the tag Invitation with sub-elements Bride, Groom, Date. (1pt). Your language should support an Invitation having a RSVP attribute which can only have for its value RSVP. (1pt). Give an example document in your language based on a fan fiction reference of your choice. (1pt).

3. Give the commands to create a git repository named after your favorite movie villain. (1pt). Give the commands to do three commits on this repository (say also what files you edited) (1pt), then give the command to make a patch from the last two commits (1pt) .

4. Answer the following website security problems: (a) Give two website attacks from class that involve neither data posted or getted from forms nor involve url query strings. Explain these attacks in detail and why they don't involve request variables (2pts - 1pt for each attack). (b) As presented in class inclusion attacks seem to rely on features of the PHP language. What are the prerequisites to do an inclusion attack? (0.5pt) How could they be met by a website developed in a different language (0.5pt)?

5. Write a Node and Express app which when a user requests a url with a path containing photo (1pt) serves a photo your_birthday.jpg (replace your_birthday with your actual birthday) (1pt). For routes not involving photo, it should write to the response a simple hello world page (1pt).

6. Write a Javascript function which when run attaches a DOM 2 focusout event handler (1pt) to every input tag on the current document. This handler should create an alert with the contents of the input tag (1pt) if and only if that tag contains your last name (1pt).

7. Explain and give an example of the following CSS concepts (1pt each): (a) class selector, (b) pseudo selector, (c) relative positioning. Your examples should refer to the last four digits of your student ID.

8. Explain how sessions are implemented using cookies. Be concrete and show me example HTTP messages involved in the use of cookies in this context (1pt) and also explain what role the file system plays in the implementation (1pt). Give PHP code to show setting and retrieving a session variable with name your favorite green vegetable and value the second rightmost digit of your student ID (1pt).

9. Suppose you are developing a REST AJAX api for your BLOG website. Define (say what every parameter does and detail the response format and what an example response will look like) at least two methods in this API and give the REST urls for these methods (1pt/method). Make sure one of the methods needs to return information from a Mysql database. Give PHP code to implement this method using the mysqli interface (1pt).

10. Imagine you are designing the homepage for the class CS 666 Using Computers for Constant Assessment. The work for this class consists of 1000 short homeworks Hw1, ... Hw1000 each worth 0.1pts. Write a short PHP program which outputs an HTML 5 table (1pt) with table headings Grade Component, Value (1pt) and beneath this rows for each of the homeworks and how much they are worth (1pt).