

Problem Set 8: Programming

due Thursday, 5 January 2006, by 5:30 P.M. ET

True or False. (2 points each.)

For each of the statements below, specify whether the statement is true or false; if false, explain why the statement is false in a sentence.

1. JavaScript is an interpreted language.
2. An interpreted language's operation typically is slower than that of a compiled language.
3. Java is an interpreted language.
4. "While" and "if" are examples of variables.
5. The Internet and the World Wide Web are the same thing.

"But we have a reservation!" (15 points.)

6. JavaScript has a large number of reserved keywords; list five, explaining the role of each in a sentence.

"Waiter, there's a bug in my ~~soup~~ pancake." (15 points.)

7. Suppose that the local International House of Pancakes (IHOP) has just purchased a robot to serve as its hostess. That is, the job of this robot is to seat the restaurant's patrons as they arrive. The restaurant's manager has configured this robot with the following "program."

```
while restaurant is open for business
  if a group of patrons is waiting to be seated then
    if the group contains fewer than five patrons then
      seat the group at a small table
    else if the group contains more than five patrons then
      seat the group at a large table
  else
    wait for a group of patrons to arrive
```

Sadly, this program contains a "bug," the result of which is that certain groups are never seated. Figure out which type of group is never seated and suggest how to fix the bug.

Programming Your Lunch. (30 points.)

8. Suppose that IHOP has decided to replace its newly purchased hostess with a human being. Rather than discard the robot, the restaurant has decided to put it to work in the kitchen. You have been hired to re-program this robot to make peanut butter and jelly (PBJ) sandwiches. (The pancake business has been slow.)

Write, in English, a “program” that instructs this robot how to make PBJ sandwiches. Think carefully about the steps involved in this process; leave nothing out of your instructions.

Your “program” must comprise at least ten steps, and it must include at least one if-then-else construct and at least one loop. Its lines should be nicely indented and numbered.

Your “program” will be graded on the basis of its correctness and thoroughness. That is, your teaching fellow will grade your answer by “de-bugging” your “program.”¹

The first step of your “program” must be the following.

Locate jars of peanut butter and jelly, a loaf of bread, and a knife.

PancakeScript (30 points.)

9. Design a webpage that utilizes JavaScript of your own creation in order to appear differently depending on the time of day. For instance, the page might display a rising sun for a background if viewed during the morning, a starry sky if viewed during the evening, and so forth. Although works of art are not expected, your page should demonstrate both thought and effort. In other words, a page that’s entirely black at night and entirely white during the day isn’t going to earn you full credit. At least give us a JPEG of the sun or something. ;-)

You may write your lines of JavaScript with the help of examples from lecture and section, the course’s required texts, and the course staff; no other resources are allowed.

Rest assured that only a few lines of JavaScript are required in order to implement this page. In fact, Lecture 11’s slides provide all skills requisite for success with this task, albeit implicitly through examples. In fact, the code from those slides does even more than your code need do!

As always, your XHTML must be well-formed, valid, and pretty-printed (*i.e.*, hierarchically indented). Your JavaScript should be pretty-printed as well.

The URL of your page must be

`http://www.people.fas.harvard.edu/~username/pancakescript.html`,

where username is your FAS username; needless to say, your page must be world-readable.

¹ Frankly, we’ll be surprised if you can write a correct and thorough “program” for making PBJ sandwiches in only ten steps. Try to “break” (and then fix) your “program” before we get the chance!

Extra Credit. (5 points.)

10. Design a webpage that prompts visitors for 1) their name, 2) their favorite color, 3) their birthday, and 4) their favorite animal and then displays that information somehow. Specifically, although the webpage may display the visitor's name as text, it should display the actual color (not its name), the visitor's age (not just his or her birthday), and a picture of the animal. Your webpage need not support *all* types of animals, but it should certainly support several. (Be sure to handle unsupported animals nicely!)

The URL of your page must be

`http://www.people.fas.harvard.edu/~username/faves.html`.

Partial credit may be award for partial implementation of this page's functionality.