

## Homework 3: Programming

INFO/CSE 100 Spring 2005

Print out this page and write your answers to the following questions. Use a separate sheet of paper if you need more space. The last problem requires an additional sheet of paper. Be sure to put your name, student ID, and section at the top of this page, on any attached pages, and securely fasten all sheets together with a staple. *You may lose points if you do not do so!* Have fun.

### **Concepts**

#### 1. Algorithms

a. In *your own words*, clearly explain what an algorithm is.

b. Why is it important to have well-specified algorithms? What are algorithms useful for?

c. I have ten people standing in line, and I want to order them in alphabetical order by first name, from "A" at the beginning of the line to "Z" at the end. Give a well-specified algorithm to do so. These people are not too bright, so they will only respond to direct orders/questions given to each of them individually (i.e. you can't just yell at them "Everybody get in line by alphabetical order!"), but you can use things like "for" loops.

2. What is/are the benefit(s) of having functions? Why not just write all the code out in the place where it is needed, instead of calling a function somewhere else to do the job?
3. Give a specific, *compelling* example of where using a variable (`var temp = 10; var result = 3 * temp;`) instead of a literal value is better (`var result = 3 * 10;`). Explain your example, and why it is better to use a variable in that specific case.

## **Javascript**

For some of the following problems, it may behoove you to run it by creating an HTML page and placing the code in that page and loading it in Mozilla (and possibly using the Javascript Console), or by using W3School's TryIt Editor ([http://www.w3schools.com/js/tryit.asp?filename=tryjs\\_text](http://www.w3schools.com/js/tryit.asp?filename=tryjs_text)) to test what the code does.

1. Why will the Javascript code below not work? How should it be fixed?

```
<script type="text/javascript">
document.write(greeting);
var greeting = "Ni hao!";
</script>
```

2. I have a variable called `myGrade` that stores a number. Write an if-else statement that will give an alert box that says "Woohoo!" if `myGrade` is greater than 3.4 and less than or equal to 4.0. (Hint: you will need to review Boolean and relational operators.) Otherwise, it will give an alert box that says "Boooo!" Please be careful with your capitalization, spelling, punctuation, etc. If your code doesn't run, you lose points.

3. Pretend you are writing the following code for an assignment. Copy and paste it somewhere, and run it, as directed above. It is supposed to count the number of both upper and lowercase s's, and then print out the total number, but as you can see, it's got a lot of errors. Write down EACH STEP of your debugging process. What did you first do to figure out where the errors are? What are the errors? What steps did you do to figure out the error? Also, *print out* a copy of your corrected code.

```
<script type="text/javascript">
var myWord = 'Supercalifragilisticexpialidocious';
var count = 0;

for(var i = 1; i > myWord.length; i++) {
    if(myWord.charAt(i) == 's') {
        count++;
    }
}
document.write('You have ' + count + " s's.");

</script>
```