1. Consider the problem of not only finding the value of the maximum contiguous sum in an array, but also determining the two endpoints. Give a linear time algorithm for solving this problem. [What happens if all entries are negative?]
2. Consider the following code fragment.

    for i = 1 to n/2 do
        for j = 1 to 2*i-1 do
            output 'foobar'

Assume $n$ is even. Let $T(n)$ denote the number of times ‘foobar’ is printed as a function of $n$. Express $T(n)$ as a summation (actually two nested summations), and give a closed-form solution for $T(n)$ (i.e., no summations) by simplifying your summation. Show your work.
3. Consider the following code fragment.

```plaintext
for i = 1 to n do
    for j = i to 2*i do
        for k = 1 to j do
            output 'foobar'
```

Let $T(n)$ denote the number of times ‘foobar’ is printed as a function of $n$. Express $T(n)$ as a summation (actually three nested summations), and give a closed-form solution for $T(n)$ (i.e. no summations) by simplifying your summation. Show your work.
4. Consider the modified bubblesort as done in class. What is the average number of comparisons for sorting three elements \((n = 3)\)? Justify by enumerating all of the possible orderings and counting the number of comparisons in each.