

Name & Section Number: _____

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.

```
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.