

Problem 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?]

Problems 2 and 3. The following two problems refer to Slowsort. We want to count the number of COMPARISONS. Try to make your analyses as exact as possible. For each problem write out a summation and then solve the summation.

Slowsort:

```
i ← 1
while i < n do
  if a[i] > a[i+1] then
    a[i] ↔ a[i+1]
    i ← 1
  else
    i ← i+1
  end if
end while
```

Problem 2. Assume you start with a sorted list. Pick two distinct elements at random and interchange them.

- (a) What is the best case?
- (b) What is the worst case?
- (c) What is the average case?

Problem 3. Assume you start with a random list.

- (a) What is the best case?
- (b) What is the worst case?
- (c) **Challenge problem.** What is the average case?