CSCI 350 Spring 2005

QUIZ 5

Assigned Tuesday, 05-02-08

Consider the version of the bubblesort sorting algorithm given below.

```
Algorithm BubbleSort(A[0..n-1])
// Input: an array A[0..n-1] of orderable elements
// Output: the array with the elements sorted in ascending order

for i = 0 to n-2 do
  for j = 0 to n-2-i do
    if A[j+1] < A[j] swap A[j] and A[j+1]
```

Use comparison of keys as a characteristic operation.

1. Set up a sum to count the number of characteristic operations

   Answer: See p.101 of textbook

2. Solve the sum

   Answer: Break out the sum into three parts (for n, 1, and i, respectively). $\sum_{i=0}^{n-2} n = n(n-1)$; $\sum_{i=0}^{n-2} 1 = n-1$; $\sum_{i=0}^{n-2} i = n(n-1)/2 - (n-1)$.