Unit 7 Practice Test

Question 1 refers to the following method:

```
public static void sort(double a[]) {
     int i, j, n;
     double temp;

     n = a.length;
     for (i = 1; i < n; i++) {
         temp = a[i];
         j = i;
         while (j > 1 && a[j-1] > temp) {
             a[j] = a[j-1];
             j--;
         }
         a[j] = temp;
     }
}
```

____ 1. In the method above, the number of times that the comparison `a[j-1] > temp` is evaluated grows in proportion to what function of `n`?

A. `n`
B. `n!`
C. `n*log(n)`
D. `log(n)`
E. n^2

____ 2. The following array is to be sorted in ascending order using **insertion sort**:

18 10 8 35 9 29 5

Which of the following shows the contents of the array at the end of one of the iterations of the algorithm?

A. 5 10 8 35 9 29 18
B. 5 8 9 35 10 29 18
C. 8 9 10 35 18 29 5
D. 8 10 18 35 9 29 5
E. 10 8 18 9 29 5 35

____ 3. Here is an array that has just been partitioned by the first step of **quicksort**:

3 0 2 4 5 8 7 6 9

Which of the following statements is correct?

A. 5 could be the pivot, but 7 could not be.
B. 7 could be the pivot, but 5 could not be.
C. Neither 5 nor 7 could be the pivot.
D. Either 5 or 7 could be the pivot.

____ 4. The following array is to be sorted in ascending order:

12 22 1 13 53 34 2

Which algorithm will cause the array to be ordered

1 12 22 2 13 53 34

at an intermediate stage in the sorting process?

A. insertion sort
B. bubble sort
C. quicksort (initial pivot = 13)
D. selection sort
E. radix sort

____ 5. Through experiment, you determine that **selection sort** performs 5000 **comparisons** when sorting a array of some size k. If you doubled the size of the array to 2k, approximately how many comparisons would you expect it to perform?

A. 5000
B. 10000
C. 20000
D. 40000
E. the value would depend on the contents of the array

____ 6. Through experiment, you determine that **selection sort** performs 5000 **moves** when sorting a array of some size k. If you doubled the size of the array to 2k, approximately how many moves would you expect it to perform?

A. 5000
B. 10000
C. 20000
D. 40000
E. the value would depend on the contents of the array

7. The array below is to be sorted in ascending order.

17 53 71 62 36 46 41 23 12

a. After the initial partition step of the version of quicksort discussed in lecture, with 36 as the pivot, how would the array be ordered?

b. After the initial pass of radix sort, how would the array be ordered?

c. After the initial pass of bubble sort, how would the array be ordered?

d. After the initial pass of Shell sort (with an increment of 3), how would the array be ordered?