

CS 311 Data Structures and Algorithms, Spring 2008
Quiz 6 Solutions

Quiz 6 was given in class on Monday, March 17, 2008.

1. [2 pts total] **Insertion Sort.**

1a. [1 pt] What is the **order** of Insertion Sort?

Insertion Sort is $O(n^2)$, that is, quadratic time.

1b. [1 pt] Is Insertion Sort **stable**? *Circle one.*

STABLE

NOT STABLE

2. [3 pts total] **Merge Sort.**

2a. [1 pt] What is the **order** of Merge Sort?

Merge Sort is $O(n \log n)$, that is, log-linear time.

2b. [1 pt] Is Merge Sort **stable**? *Circle one.*

STABLE

NOT STABLE

2c. [1 pt] Merge Sort has a significant **disadvantage** when used to sort an **array** (but not when used to sort a Linked List). What is it?

Merge Sort on an array is not in-place. It uses a buffer requiring $O(n)$ (that is, linear) additional space.

Note: Merge Sort can be done efficiently in place on a Linked List.

Another correct answer would be that Merge Sort is significantly slower than that fastest known sorting algorithm for an array. However, it is the fastest known sorting algorithm for a Linked List.