Quiz 5, March 18, 2002

The quiz concerns the stability of sorting algorithms.

**Stability:** A sorting algorithm is **stable** if elements with the same value appear in the output array in the same order as they appear in the input array. **Example:** Stable sorting: Input $A = (10, 3_1, 5, 2, 3_2, 6)$; Output $A = (2, 3_1, 3_2, 5, 6, 10)$.

For each of the following algorithms, state whether they are stable or not.

1. **Insertion-Sort:** $\text{YES}$
2. **Heapsort:** $\text{NO}$
3. **Quicksort($A$):** $\text{NO}$
4. **Counting-Sort($A, B, C, k$), $k = O(n)$:** $\text{YES}$
5. **Radix-Sort($A, d$) (d constant):** $\text{YES}$
6. **Bucket-Sort($A$):** $\text{YES}$