Questions

1. **How many compares does insertion sort make on an input array that is *already sorted*?**

   Linear as it only needs to move through the array once as each check will not bring it into the loop to check previous elements.

2. **What is a stable sorting algorithm?**

   A stable sorting algorithm is an algorithm which maintains order of equal objects to be sorted. For example if object o comes before object j in a list but both are equal, A stable sort will maintain this positioning while an unstable sort will swap the 2 objects.

3. **What is an external sorting algorithm?**

   A- An algorithm that uses tape or disk during the sort.

4. **Identify 6 ways of characterizing sorting algorithms?**

   - Time complexity: Speed of algorithm as it scales with size
   - Comparison vs Non Comparison: Radix uses groupings rather than relative values.
   - Space Complexity: Does the algorithm sort the values without use of external arrays.
   - Stability: Are relative values of keys preserved after sort.
   - Iterative vs recursive approach.
   - Internal vs External: Can the algorithm work entirely in main memory.