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Homework 2

PROBLEM 1
PROBLEM 2

1. A. We're trying to find the best case or the worst case. We cannot optimize to be faster than nlogn. We can have algorithms that have worst case scenario but you cannot get faster than nlogn.

2. B. Our goal is to search for the project that corresponds to the programmer, where both variables have 2 specific attributes (level of difficulty/ability & payoff/expected pay). One way we can find the one-to-one match between each project and each programmer is to use a randomized algorithm similar to quicksort. So, we start off by picking a programmer from the list. Then find the matching project from the project list. Now, we must divide the project list into 2 parts: skills and payoff. Now, we must find the matching programmer in the programmer list and divide this specific list into 2 parts similar to the project list. Now, we have 2 subsets of programmers and projects. At each step, the 2 lists will be divided into 2 halves. Thus, the case time complexity will be O(nlogn).

PROBLEM 3

1. 1. For each university, they can possibly sort the individual scores of each participant by using counting sort, which works by counting the of objects having distinct key values. Then it does some arithmetic to calculate the position of each object in the output sequence. We chose this algorithm because we know the range However, if we wanted to use a comparison key. Quicksort

2. 2. We would use merge sort. Don't use the first step in merge sort. We only use the second step. Knowing that we have k files that are already sorted. Thus, merge sort works.

3. 3. SKIP FOR NOW

PROBLEM 4 -loop through 1 to n range and call getPuzzle - concat the day, month, year into one field - we radix sort the dates by least significant dates (sort by year, then month, then day) - algorithm using (k+n) where k is the of buckets -step trhoguh an array and make sure that each -O(8n * log10) -space complexity: 8 + n

PROBLEM 5 - SKIP FOR NOW