

Lab W1D3

Question 1. Write an algorithm

beautiful(A, n)

Input : An integer array with n elements

such that the best-case running time is equal to the worst-case running time. Write the algorithm and give your analysis to justify your claim.

Question 2. Order them based on their complexity.

2^n , $2^{(2n)}$, $2^{(n+1)}$, $2^{(2^n)}$ (Note: ^ stands for exponent operation. Example: $2^n = 2^n$)

Question 3. Mention one algorithm you know for each of the time complexities listed.

$O(1)$, $O(\log n)$, $O(n)$, $O(n \log n)$, $O(n^2)$, $O(n^3)$, $O(2^n)$

Question 4. Apply Master Theorem and determine the time complexity of

fib(n) shown in slide 48.

Question 5. Practice Master theorem. It is a very important result in Analysis of algorithms. There are many resources on the internet. Show three different examples covering three possible cases. Show your detailed work.

Have fun!