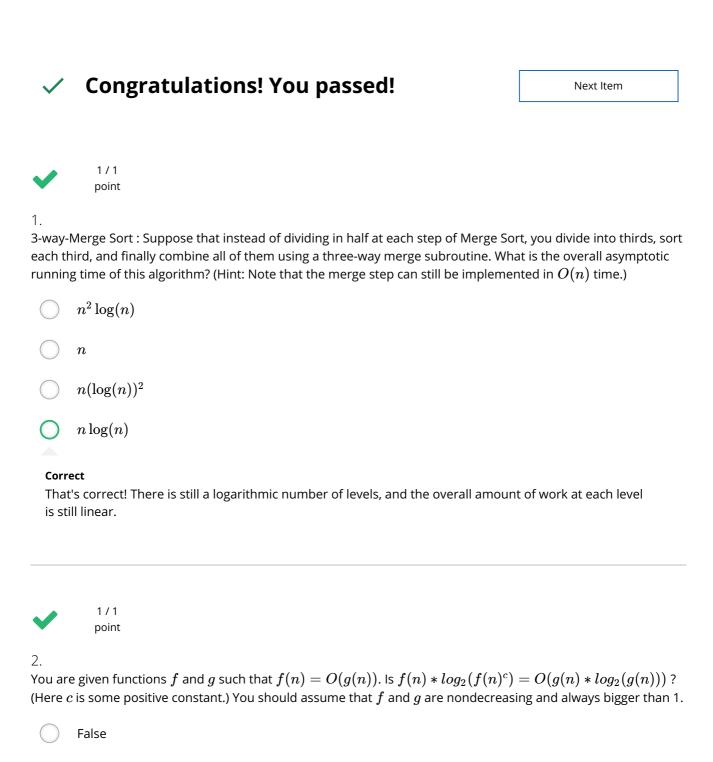
Problem Set #1

Quiz, 5 questions

5/5 points (100%)



Correct

True

That's correct! Roughly, because the constant c in the exponent is inside a logarithm, it becomes part of the leading constant and gets suppressed by the big-Oh notation.

igcup Sometimes yes, sometimes no, depending on the functions f and g

Sometimes yes, sometimes no, depending on the constant c

Probler Quiz, 5 quest	n Set #1 cions 1/1 point	5/5 points (100%)
	e again two (positive) nondecreasing functions f and g such that $f(n)=O(g(n)).$ Is $2^{f(n)}$ le answers may be correct, you should check all of those that apply.)	$=O(2^{g(n)})?$
	Sometimes yes, sometimes no (depending on f and g)	
Corre	ect	
	Never	
Un-so	elected is correct	
	Always	
Un-se	elected is correct	
Corre	Yes if $f(n) \leq g(n)$ for all sufficiently large n	
~	1/1 point	
into a s lecture arrays, merge	Merge Sort. Suppose you are given k sorted arrays, each with n elements, and you want to complete array of kn elements. Consider the following approach. Using the merge subroutine to a you merge the first 2 arrays, then merge the 3^{rd} given array with this merged version of the then merge the 4^{th} given array with the merged version of the first three arrays, and so on in the final (k^{th}) input array. What is the running time taken by this successive merging algorate of k and k (Optional: can you think of a faster way to do the k -way merge procedure?)	aught in e first two until you
	$ heta(n\log(k))$	
	$ heta(n^2k)$	
	heta(nk)	
0	$ heta(nk^2)$	

Correct

That's correct! For the upper bound, the merged list size is always O(kn), merging is linear in the size of ProblemgSetr#1 and there are k iterations. For the lower bound, each of the last k/2 merges takes points (100%) Quiz, 5 $\P(ki)$ time.



1/1 point

5

Arrange the following functions in increasing order of growth rate (with g(n) following f(n) in your list if and only if f(n) = O(g(n))).

- a) \sqrt{n}
- b) 10^n
- c) $n^{1.5}$
- d) $2^{\sqrt{\log(n)}}$
- e) $n^{5/3}$

Write your 5-letter answer, i.e., the sequence in lower case letters in the space provided. For example, if you feel that the answer is a->b->c->d->e (from smallest to largest), then type abcde in the space provided without any spaces before / after / in between the string.

You can assume that all logarithms are base 2 (though it actually doesn't matter).

WARNING: this question has multiple versions, you might see different ones on different attempts!

Preview

daceb

Please note: Each of the following will be interpreted as a single variable, not as a product of variables: daceb. To multiply variables, please use * (e.g. enter x*y to multiply variables x and y).

daceb



One approach is to graph these functions for large values of n. Once in a while this can be misleading, however. Another useful trick is to take logarithms and see what happens (though again be careful, as in Question 3).

Your answer, daceb, is equivalent to the instructor's answer daceb.

Problem Set #1
Quiz, 5 questions

5/5 points (100%)