Maniem Agrawal Problem 3.1  $\frac{f(n) - \lim_{n \to \infty} qn - 0}{g(n)}$ a)  $\lim_{n\to\infty}\frac{g(n)-\lim_{n\to\infty}5ne^3}{f(n)}=0$ Thoretone it belongs to.  $f \in o(g)$ F = 0(9) = = 05(108) mil (10) gen (f) g ∈ w(f).  $\frac{1}{n} \frac{f(n)}{g(n)} = \lim_{n \to \infty} \frac{q_n \circ y + 2n^{0.3} + 14logn}{\int_n^\infty} = \infty$ b)  $\lim_{n \to \infty} \frac{g(n)}{f(n)} = \lim_{n \to \infty} \frac{\int n}{g_n^{0.8} + 2n^{0.3} + 1410g_n} = 0.$ Therefore it belongs to the notations. g F E rig) FEWIG) g & O (+) geo(f).

c)	$\lim f(n) = h^2 = n^3 n \log n = 5$	•
	$f_{n\to p} g(n) = \frac{\log n}{\log n}$	
	niogn	
	$\lim_{n \to \infty} f(n) = \frac{n \log n}{n} = \frac{\log n}{n} = 0$	
	$n > 8 g(n)$ $n^2$ $n^3 loch$	10
	ion the stant (all send	
	FERLY)	
	I E WIG)	
	g = O(f)	•
	g ( o (F). Ot sometial to sometime	
	(c) o 2 ?	
a).	$\lim_{n\to\infty} f(n) - \left(\log(3n)\right)^3 - \vartheta$	
	9(n) 9 log n	
	g E w (P)	
	$\lim_{n \to \infty} g(n) = a_{10} c_{n} = 0$	
46	$f(n)$ $(log(3n))^3$	(d
	The seed the seed	
	fier sig)	
	FEW(g)	
	$g \in O(F)$	
	GEO(F). Secretarion and of secretarion to such asset	
	g F E relegy	
	Problem 3.2	
	3 (CCA)	
a)	The selection soit has been implemented	
	inside the file "SelectionSort. Cpp".	

poole with mercrossy roaditions being b) To prove that the solection soit is corpor we need to show the loop involiont posses the 3 conditions 1 from 0 to 10 000 and found out Inicilization : Hove we need to show loop invariant hold prior to the first iteratoria. so initioly the sorted array has no element in it so therefore we can say it is sorted at that time. Maintainphre: Hole we need to snow that each ifarction of the loop maintains the invorion to Here the left port of the sob diray till the n element A[O. p] is always soited and the next element &. from [n+1 seemar] gets dded to the left sob-ally so it maintains the loop involo, + THE CHOICES THE ME COMPLEXING TO DE GLOS Termination. The loop invovant should show the provide useful propets to show correctness when the loop terimortes, at the end of the terimination. the left sob organ will reach the

_\$/_	Size of the loop and those will be no move	ta
	proments to be sorted	
The state of the s	involvent name print prior to the first training	
()	The random ippot sequence for case	
	A and B have been shown in the	
eller de arroca	code with necessary conditions being	
	Shown I was a series and some of	fd.
	THE POST OF THE PARTY OF THE ROOM OF THE PARTY OF THE PAR	
d)	TATES I have increased the value of	
	1 from 0 to 10,000 and found out	
	the overage case best case, worst	
	case for ouch condition, The values note	
	been stored in "Input txt" and roser	
	a CINU prot nos baon made with	
	the help of them,	
	The second of th	
e)	It we take alook at the rode	
	regardless of the best case or worst	
	case the number of comparism is	•
	cycrys. Mala all 1114 borro dos	
	$\sum_{i=0}^{n} (n-i) = n(n+i)$	
- 4	1984 schedules content the 1000 involu	
	This shows the # complexity to be O(n2	)
	and the difference being generated in	
	and the difference being generated in the graph is because of the other swop	
	Anat need to take place.	
	alphonimized south to be out to	•
	411 11200 1111 1 1000 dos 2401 out	

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