

AP Computer Science Searching/Sorting Mini-Project Mr. Lew

For this project you will be given a sorting and/or searching algorithm to analyze and explain to the class. On your presentation day you will present the following:

Powerpoint presentation (which will include the following slides)

- a. "Description" slide – This slide describes the searching and/or sorting algorithm. This should be a qualitative description...no code yet. A "line-by-line comparison chart" should be presented to show the searching/sorting process and logic flow.

12	9	4	99	120	1	3	10
↑							
12	9	4	99	120	1	3	10
	↑						
9	12	4	99	120	1	3	10
		↑					
4	9	12	99	120	1	3	10
			↑				
4	9	12	99	120	1	3	10
				↑			
4	9	12	99	120	1	3	10
					↑		
1	4	9	12	99	120	3	10
						↑	
1	3	4	9	12	99	120	10
							↑
1	3	4	9	10	12	99	120

- b. "Role Play" slide – This slide will introduce the role play. Each member will direct the sort at least once using the other members in the class as "data". Therefore if there are three persons in your group, person "A" will direct the sort, person "B" will direct a sort with a different set of data, and person "C" will direct a sort with another set of data (i.e. mixing up the people again). Each person will be graded according to his ability to explain searching or sorting algorithm correctly.

- c. "Java code Demonstration" slide – Here you will demonstrate the searching and/or sorting algorithm in a small Java program that meets the following specifications:
 - i. the program allows user to input the number of integers to sort (0 – Integer.MAX_VALUE). Use Math.random to generate integers.
 - ii. the program prints the time elapsed for the search or sort algorithm to complete its task. Use the provided Timer test program as your testbench.
 - iii. students discuss the "best case scenario" set of data (no simulation needed)
 - ii. students discuss the "worst case scenario" set of data (no simulation needed)
 - iv. students discuss the code and how it corresponds to the algorithm demonstrated in the role play.

- d. "Execution Time" slide – This slide will show a graph of "Execution Time vs. Number of Array Elements". A short discussion should follow that discusses the relationship between these two variables.

- e. "Advantages and disadvantages" slide – Here you discuss the advantages and disadvantages of the searching and/or sorting algorithm (when you might WANT to use it, and when you might NOT want use it. IMPORTANT slide...spend some time on this!!

- f. "Memory issues" slide – discuss how much extra memory (if any) is needed in order to run your searching and/or sorting algorithm.