

Bottom name	Searching algorithm
alpha	Selection sort
beta	Insertion sort
gamma	Bubble sort
epsilon	Check sort
delta	Quick sort
zeta	Merge sort

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The secret number I used was 131629. I chose to use data size of 5, 5000, 10000. I first used the data size of 5 to find the Check sort because it takes extremely long time to finish the process. And I found out that epsilon was the check sort. And then I compared the numbers of comparisons ,movements, and total time for each algorithms with data size of 5000, and 10000. And I found out that all of the statistics for alpha and beta were 4 times larger when then data size doubled. So I concluded they are Selection sort and Insertion sort because both of them have  $O(n^2)$  complexity. And then I found that alpha took more comparisons than beta. This is a property of Selection sort because it needs to compare for a lot of times. So I concluded alpha is selection sort and beta is insertion sort. And for the rest of the algorithms, I found they all have  $O(n\log(n))$  complexity because the statistics doubled as the data size doubled. Among these three statistics, gamma is bubble sort because it has the most comparisons, movements, and total time. Delta is quick sort because it does more comparisons than zeta. And then I can get zeta is merge sort.