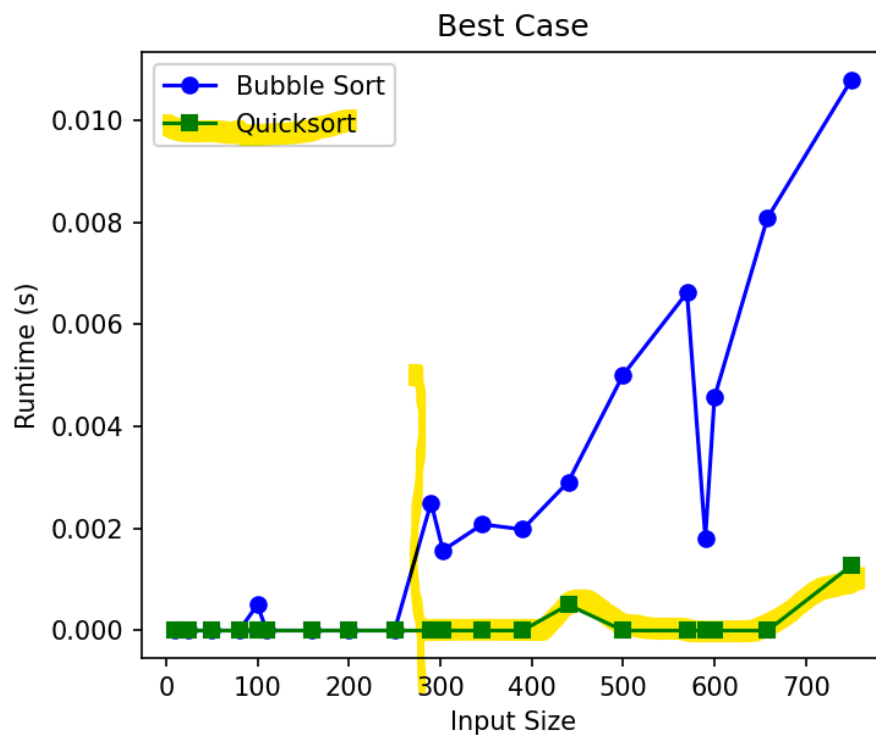
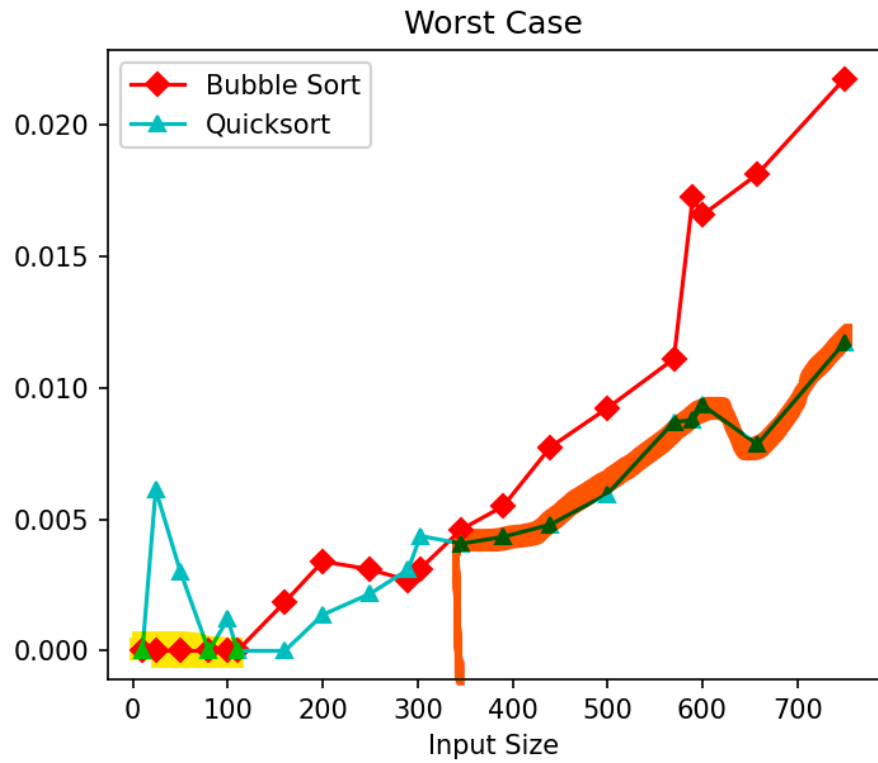


EXERCISE 2

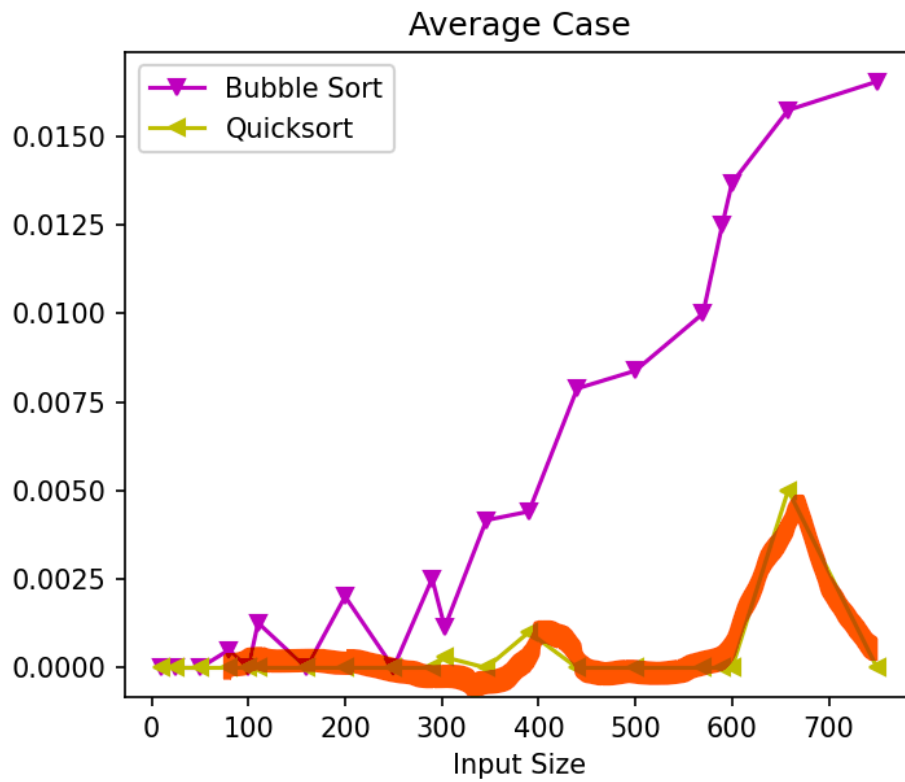
Question 3



In the best case scenario, for input sizes between 10 and 250, both algorithms performed similarly, with runtimes close to zero. However, after 250, it becomes noticeable that quicksort outperforms bubble sort.



In the worst-case scenario, for input sizes between 10 and 100, bubble sort surpasses quicksort. Beyond an input size of 340 quicksort outperforms the bubble sort algorithm.



In the average case scenario, for input sizes between 10 and 100, both algorithms performed similarly, with runtimes close to zero. Beyond an input size of 100, quicksort excels over the bubble sort algorithm.

Question 4

To choose a threshold for the input size, we implemented a function to determine when to use bubble sort or quick sort according to each case. After comparing the time taken by both algorithms and analyzing the three plots, we concluded to use bubble sort when the input size is lower than 100, as in most of the instances, the runtime for bubble sort was zero in the three cases. However, the reliability of selecting 100 as the threshold is compromised, due to the random values used to generate the dataset.