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Summary
HW3

Part 1C:

The trend is O (n^3) time. I can tell that when the size increases the interval, it slowly starts getting faded too. I have made the tangent line with poly degree 3 that way it looks very close to what it needs to be.

Part 2:

a. Worse case is when all the elements are in the opposite order that the sorted array. The number of rates are increasing at the same time when the index of the element is increasing as well as. This will only happen until the last element with the length of the complete array.

e. I have done the best fitting part with polynomial degree 3 for my charts. This gives a good idea. The O (n^2) time. So I have done everything that doesn't have random data plotted because I do that separately in main 2F. As far as the graph is concerned. The tread line and the curve are exactly the same size and shape so its hard for someone to see it.

f. This one is random, the code is very similar to what I have in main but just the change that I had to do is, the points are random. As you can see it on my graph it is a bit different than for the main. Using polynomial degree 2 for this one as well.

Part 3:

a. If it's sorted than that's the worst case of this case. Because it still checks every single element in the array while breaking. The second worse case if needed would be if the array is in reverse order.

e. The best-fit line for the data follows very closely the line of n^2 the reason behind this is no matter what the size of an array is.

f. For this particular case, I did very similar to what I did in part 2F, I just randomized in this part and that's the reason why I have separate class for the random. It appears more to be linear in my case; this could be only on my computer since I didn't try to run it in different computer. The average run time is better than because the amount of time does not increase at as high as rate. For insertion sort the points are very close to each other, which makes sense to me.

Part 3 StackOverFlow Error:

I'm getting an error where it says StackOverFlow error, but when I try to debug it it runs there clearly fine. I spent a lot of time figuring that out and was still not able to figure it out. But after debugging, it looks like the reason it's doing that is because, I am doing it recursively and its making multiple threads and its hard for the complier to run but when I debug its taking one particular thread which then results in the output.