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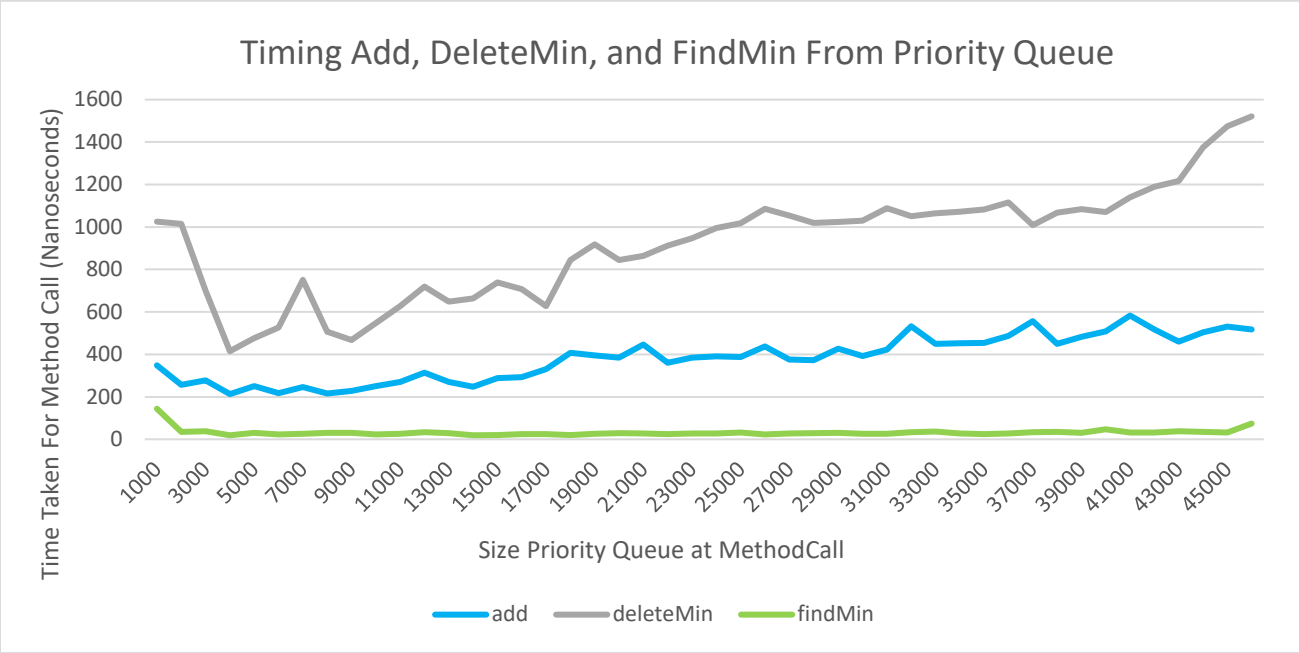
Assignment 11 Analysis

1. For my timing experiment, I built a priority queue of type String. From priority queue sizes of 1000 to 10000 stepping in increments of 200, I first filled the priority queue with randomly generated Strings. After I had the correct amount of Strings with the queue, I then added another String, Deleted the min, and found the min. For each method call, I started timer, ran the method, and then stored the time taken in nanoseconds. To get a good average, I did this 1000 times for each size. The results of the timing are shown below.



2. The methods ran as expected. FindMin appears, on the graph above, as being O(1). Which it should be due to just returning what is in array[0] and this should only take O(1). For add and deleteMin the timing appears to be O(1) but they are actually slightly increasing which is O(LogN). The behavior should be O(LogN) since while array is being searched each iteration is being cut in half. Like below for the deleteMin method if we constantly had to go left. This took four steps for an array of size 9 versus searching all 9 spots which would be O(N). Therefore, we see the O(LogN) performance.

	Start Here	Left	Right							
	0	1	2	3	4	5	6	7	8	9

		Next		Left	Right					
	0	1	2	3	4	5	6	7	8	9

				Next				Left	Right	
	0	1	2	3	4	5	6	7	8	9

								Next		
	0	1	2	3	4	5	6	7	8	9

3. One important use for a priority queue that easily comes to mind is anything having to do with task scheduling, were the top item is the most important for example. I think a lot of people schedule tasks at work. You might have a list of things that need to be done, and your boss comes in with a new task and says, “this is top priority”. If you were using an application, you would add the new task to the top of the queue. Or if you call a service company, they may have something like a priority queue to handle their calls. An electric company may choose to talk to the person reporting a downed powerline over the person inquiring about a charge on their bill.

4. I spent around 10 hours on this assignment.