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Final Project Summary

Here is our graph (With 2 doctors and 2 nurses):

This graph notes that there is a point where the doctors and nurses cannot deal with the incoming patient load and the wait times skyrocket. This is expected because doctors and nurses can only handle so many patients per hour (Nurses average 10-12 patients per hour, doctors average 5-6). This means that the first breaking point should be about 30 and the second should be about 40 when there are 2 doctors and 2 nurses. When the number of patients going into the high priority queue is more than the doctors can handle (about 12 per hour, which occurs at 40 because 30% of patients go into the high priority queue), the wait time increases at an alarming rate. With more doctors and nurses, I feel that the breaking point would be much higher. The first breaking point at 30 is when the nurses cannot handle the low priority queue, which is a bit less devastating on the overall wait time because doctors can still treat low priority patients up until 40.

When discussing the average patient wait time for each of the situations mentioned, We found it interesting that 1 doctor and 2 nurses has a longer wait time than 1 doctor and 1 nurse until you reach about 15 patients per hour. 1 doctor and 1 nurse reaches its breaking point much earlier than either 2 nurses and 1 doctor or 2 doctors and 1 nurse. Up until about 15, the numbers are pretty randomized due to the limited number of patients. At 15 is when the number of patients entering the high priority queue is at the doctor’s limit in both situations with 1 doctor. This is what we noted when we tested all the situations with a low number and then again with a higher number of patients per hour.

Between our initial design and our final implementation, a lot of information was added to the project. Not a lot was removed, and a lot of functions were added to make the program work. Most of the changes were to our UML format. Much of the challenges with our implementation came with the priority queues. It took a while to get them to work properly and take the priority number to arrange the patients. Our end result makes me pleased though, as it uses a lot of things that we learned this semester, including maps for the hospital record, two priority queues for patients, and polymorphism for doctors and nurses.