

Intellicare-ICU

I started project with the implementation of simple btree that I customized to store all vitals in database. This btree was storing everything in RAM, later I made it store everything in hard drive, later on, I added indexing, now it will retrieve only that amount of data in memory which is required. This made a core of my project that is to access patients vitals in any given timestamp. Next, I needed to implement patient lookup using ID of each patient. So I used hashmaps for that as they are efficient for lookups in $O(1)$. I also used hashtable for medication lookup. I have then implemented priority queue by min Heap, Lowest priority is the most urgent (patient with critical condition). I have made an alert class which prioritize on basis of different alerts. I have tested each class separately, Then I connected it cloud. Basically, I push my code to git and then pull it on ec2 (aws). I made a server file, make server online. A simple frontend is implemented to show all this. Frontend is quite simple at this time, but I will make it look super cool once I complete all my backend features.

Next what I will do :

I will add graphs to check drug interaction. (Basically to check if its safe to give all these drugs together to a patient). Each node will be a medicine and edges will check interaction. For now, my plan is to do this using dfs run.

Next, I am planning to use kd-trees and get patients with similar vitals or conditions so that they can be grouped.

I will implement sliding window so that I can display last 100 readings of vitals, etc. I am planning to use this to display heartbeat and other vitals that should be displayed continuously for a fixed last N minutes using fixed sized buffer.

I will also apply a filter to check if there are any abnormal patterns in heart beat or bp etc so that we can give a signal for future threat or critical situation beforehand just by observing change in vitals.

I will polish it a bit so that it gives predictive analysis and recommendations. Calculating risk score (a simple function with if-else conditions for giving risk score would be enough).

Lastly, I will want it give a real feel so I will try to give real time data simulation and display.