ampOp

During our time at Microsoft Hacks, my team and I wanted to solve the problem of ambulance placement and routing. When ambulance drivers are not on their way to or from a call, they are told to station themselves wherever they like. While this may be beneficial to the drivers, it hurts response time.

The first step in our project was to find an algorithm that would collect previous pick up locations and find the centroid of these locations. However, after realizing that there are more than one ambulance in use for an area and the optimal solution does not include them stationed together, we decided to use a clustering algorithm that would establish n (number of ambulances) clusters. We decided upon K means algorithm.

Our project used the google maps API so that drivers could upload pickup locations and get a stationing location in real time. When a new pickup point was added to the collection, our algorithm returned routing to stationing points from the nearest hospital. Our intuition was that a driver would drive the patient to the nearest hospital and then follow the google maps route to the stationing location, allowing them to be in the optimal location for the next patient. Our project also included the ability of trailing data, where departments could choose to only include the previous x amount of time in the pickup points. The goal with this addition was to accommodate cities with varying locations based on time. Some cities may have violent crime in the eastern city at night, but heart attacks and strokes in the west during the day.

My team and I would like to add on to this project by making it more scalable and customizable. Some changes I would like to make are: routing to the hospital that can best suit the patient (burn victim hospitals, large ER departments, overdose specialists), incorporated routing to victims (a notification goes to the correct driver with the route), and override capability for the department.