

# iA Coding Challenge

## Assumptions

- Total number of central fill facilities in the coordinate system = 10
- The central fill facilities are placed at random places in the system
- User will always want the 3 closest facilities, not more or less
- No more than 1 facility per coordinate system node
- Coordinate system stretches from -10 to +10 in both X and Y
- There are only three types of medication (A, B, and C)
- Each facility has only one price for each medication
- The maximum medication price is \$200.00
- User is only interested in the Manhattan Distance, not other distance

## To support multiple fill stations at a single location...

- Would need to take the number of stations at a location into account when counting the closest stations. Currently, my program finds the three closest NODES, and then prints the data for those nodes' facilities. Would need to take into account that a node might have more than one facility on it.
- May want to consider returning the lowest medication cost of the whole node, not just at a given facility.

## If the coordinate system was much larger...

- I would need to adjust the constants I have for the X and Y bounds.
- Might want to implement some sort of quadrant scheme, where I divide the whole coordinate system into smaller quadrants. So when the user provides a point, I map it in a specific quadrant, and only return the Manhattan distance to any points in nearby quadrants. This would alleviate the need to calculate the distance between the provided point and potentially hundreds/thousands of other points.