Where to Build Food Banks: A Machine Learning Approach

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Across the United States, 34 million people suffer from food insecurity. Many of those in need do not qualify for federal nutrition aid programs, and as such must rely on their local food banks as a reliable source of food. However, many of these banks are not optimally placed, and are usually directed away from rural areas, where food insecurity is an especially large problem. In this project, a new program is created that is able to place food banks near both large clusters of locations, such as houses, in need, and is closest to those with the highest levels of food insecurity. The end goal was to achieve locations that minimized the total distance between houses and their respective food banks. Using a dataset of California houses from the 1990 census, 20 food bank locations generated by the program was compared to a set of 20 real food banks in California, including all banks affiliated with the Feeding America organization. With two final points each representing the mean x and y coordinate values of each food bank set, the final total distance of all houses in the dataset to the point representing the food banks generated by the program was lower than that of the point representing the real food banks, showing that the AI generated food banks were closer overall to the geometric median of each of the set of houses that they were servicing. A similar result was achieved with an Indiana dataset, with ~3 miles saved per house, although this was without factoring in median income and solely location.

Awards Won:

Central Intelligence Agency: Second Award: $300