

Part 1:

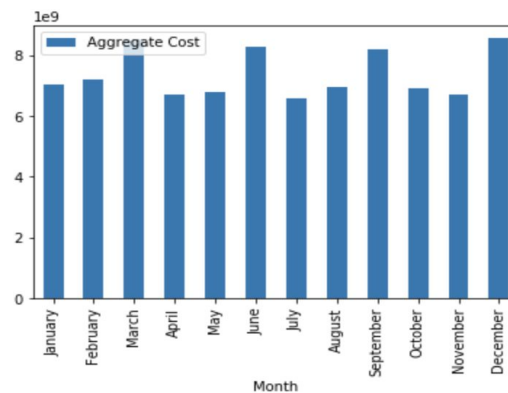
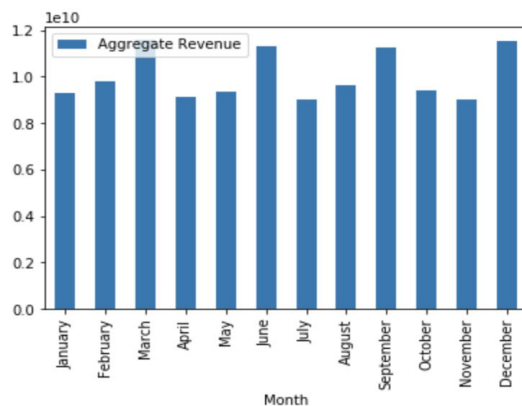
1. Mean annual profit margin = .2486323

Median annual profit margin = .2618493

The distribution of annual profit margins across locations is not normally distributed, but has a left (negative) skew. The distribution shows that there are more values to the right of the mean than to the left of the mean, which is consistent with the median annual profit margin having a larger value than the mean annual profit margin.



2. A breakdown of quarterly aggregate revenue across all locations shows similar outputs for each quarter, while the same graph broken into months shows a consistent uptick in revenue in the last month of each quarter. While this at first may appear to result in an increase in profit margin during these months, a side by side comparison of this graph with a graph of aggregate costs also broken into months shows corresponding spikes in costs during these months. The spikes and dips offset consistently, resulting in no statistically significant change in profit margin across months.



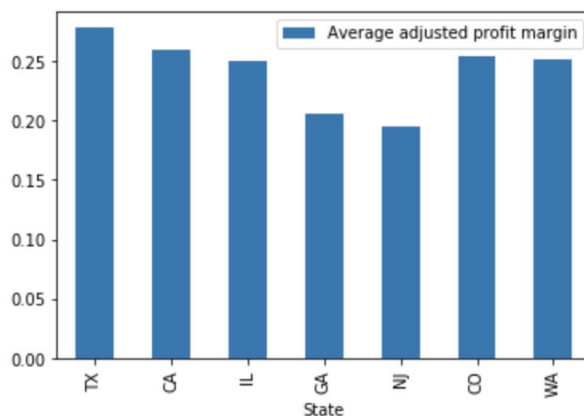
Part 2:

The rent adjusted annual profit margin distribution shows the annual profit margins across locations with an imputed rental cost for owned locations. This cost, for each owned location, is computed to be the average rental cost among leased locations in the owned location's state.

While accounting for the rental cost for owned locations creates a more accurate comparison, the distribution looks very similar, and there are a few factors contributing to this. First, only a small portion of the total locations are owned (36 out of 333), and these are the only locations affected by the rental cost adjustment. Second, the rental cost is only a small percentage of total cost and is very small in comparison to gross revenue for all locations. For these reasons, the adjustment does not have a massive impact on the distribution of annual profit margins across locations.

Part 3:

The data for this company across locations show many locations producing efficient profit margins while some locations prove very inefficient. There were two noteworthy drivers of success and failure. First, there was a discrepancy between owned and leased locations. Even when imputing a rental cost on owned locations, owned locations produced higher annual profit margins than leased locations -- an average .281 profit margin for owned locations compared to .244 for leased locations. This difference is statistically significant accounting for sample size, and rental costs are accounted for in these calculations. Second, there was a noticeable difference in profit margin across locations broken down by state. The graph shown below clearly shows a difference in the average annual profit margin among locations between the different states in which the company operates, with five of the seven states (TX, CA, IL, CO, WA) producing efficient average profit margins $> .25$. TX boasts the highest average annual profit margin, at nearly .28. However, there is a clear dropoff when looking at the average profit margins among locations in GA and NJ, with the figure for NJ falling below .2. This is especially significant considering the company operates 32 locations in NJ, which is more than twice the number of locations in WA where the average profit margin is significantly higher.



In conclusion, the data show that the company's owned locations operate more efficiently than those that are leased, and that there is a significant dropoff in production between locations in NJ and GA compared to those in all other states. As New Jersey claims a somewhat large number of the company's locations, it is definitely worth examining the viability of these locations. TX, on the other hand, is home to more locations than any other state and maintains a higher annual profit margin than any other state.