

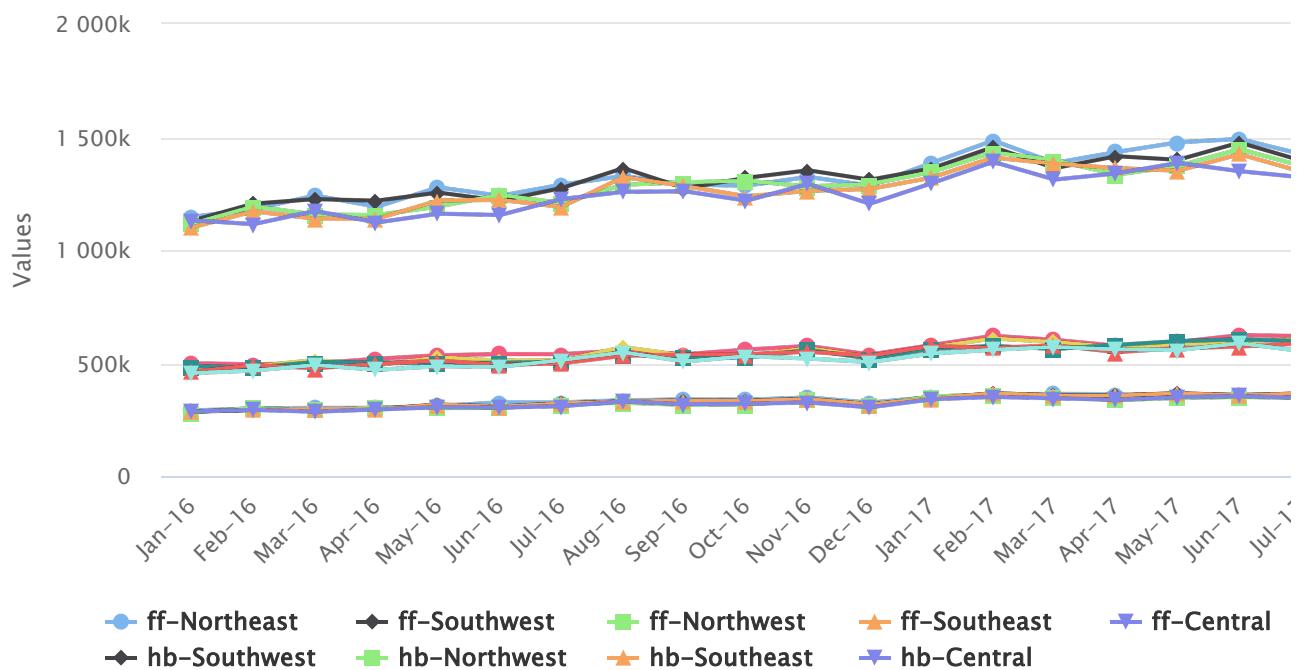
# McDonald's Report

Github link: <https://github.com/clairemhl/DSC106-hw2>

## Overall Trends

This report is sales data analysis for McDonald's under the impact of Impossible Burger and general customer interaction in micro and macro scenario

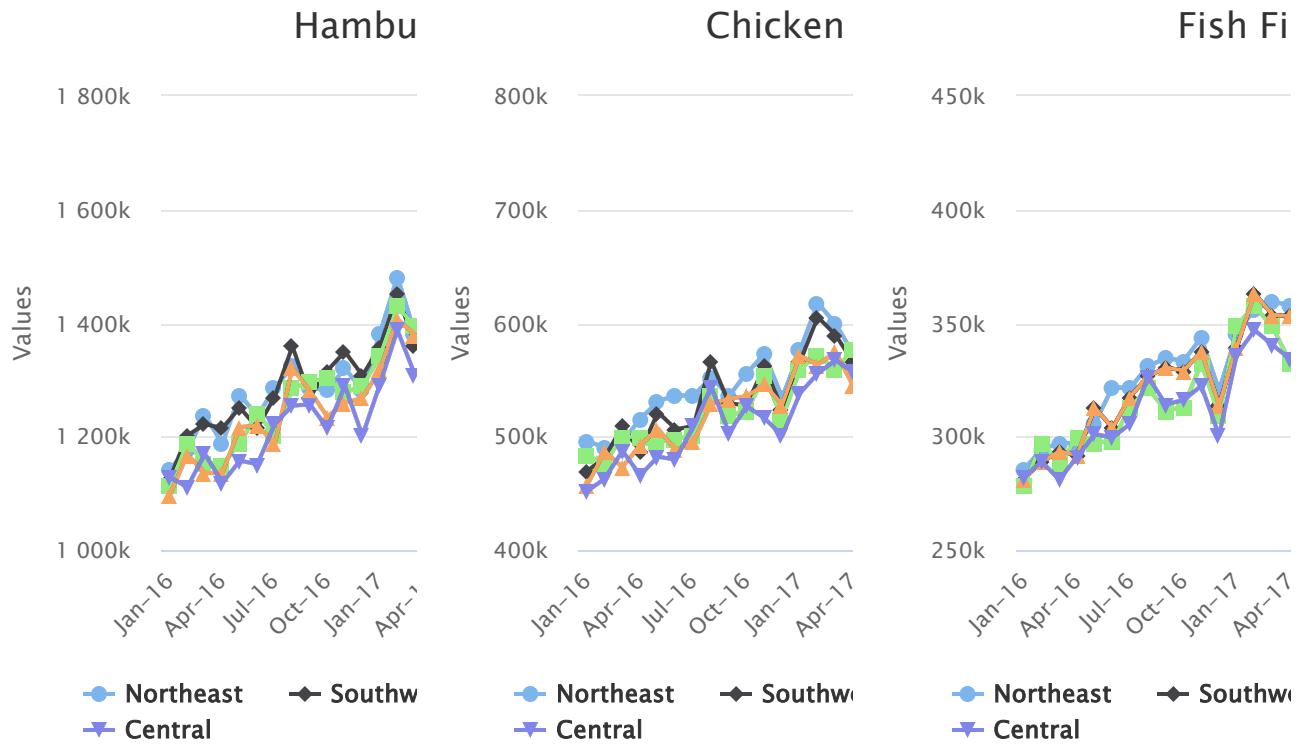
The overall sales data from 2016 to present. It contains the sales data for Hamburger, Chicken Fillet and Fish Fillet in each region



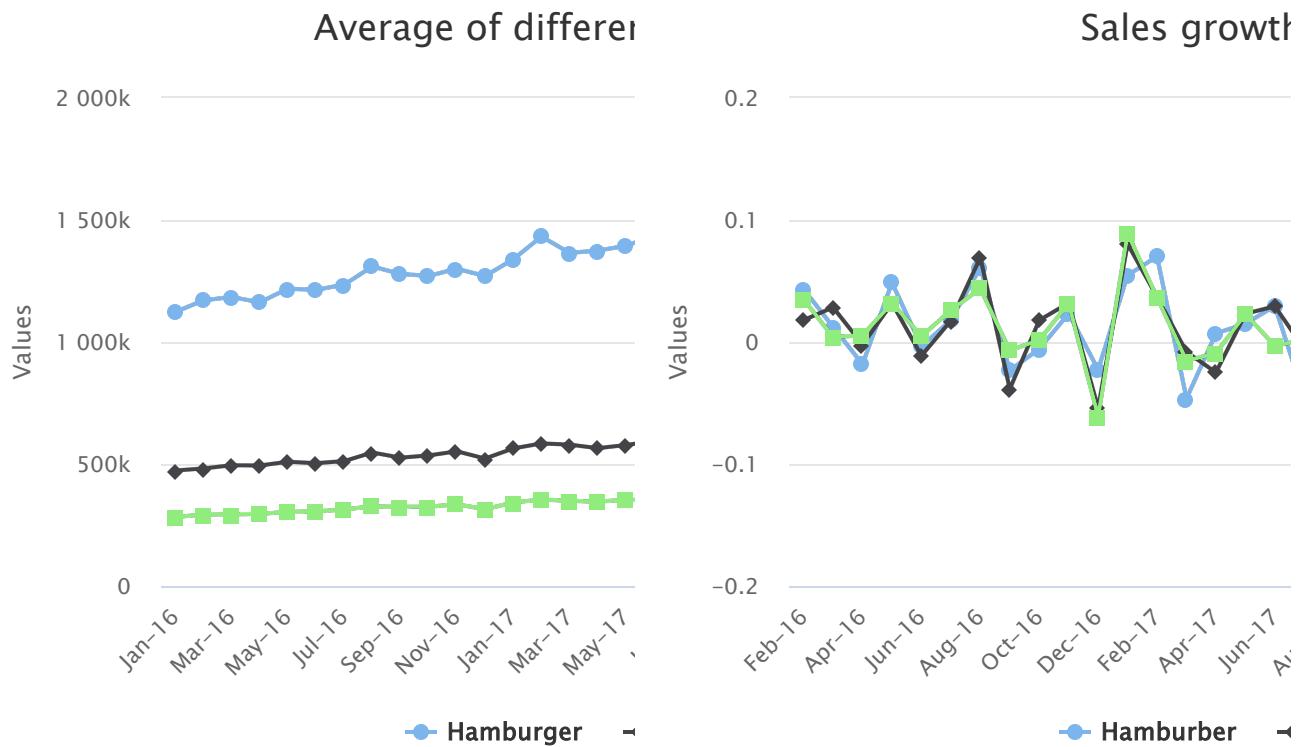
From the chart, the sales for all three products steadily increase overtime. Among them, the hamburger has the highest sales, almost twice much as the chicken fillet sales. Fish fillet has the lowest sales, but it is the most steady. On the October 2018, we can see a significant drop in all three sales. We will investigate more into the impact of Impossible Burger in the following reports.

## Line charts for sales of each product

By separating each product, we can see the fluctuation more easily for each product.

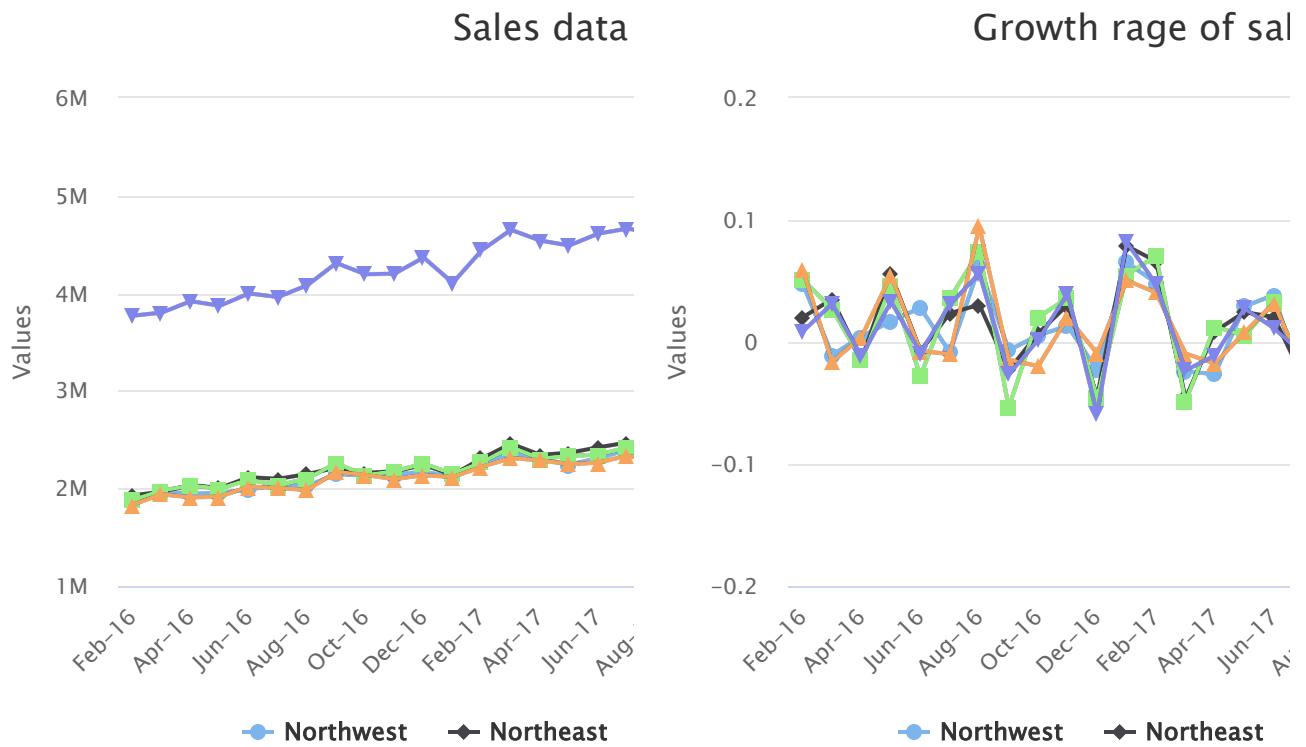


For each product, taking the average to simplify the line we get the left chart. Then we transform the sales data to the growth rate for each month, we get the right chart. From the left chart we can see that the hamburger's sale fluctuate the most, but also the highest. At october 2018, all three products have a significant big drop. From the left chart, we can see this drop is the largest drop over this two years period, indicating the impact of the impossible burger. Also, from the growth rate chart, there is a periodical rise and fall in the overall sales. All three products have growth rate larger than 0 or smaller than 0 at the same time. Every two or three months, the growth rate would peak periodically. On September 2018, the sales decreased compare to the August, and on October 2018 it decreases even more because of the market competition between Impossible Burger. However, it seems the sales is on the decreasing track based on the periodicity, so the impossible burger's impact can be exaggerated by overlapping with the decreasing part of the period. The sales for November bounces back reflecting the return of customers to Mcdonald. However, it is important to note that comparing to the previous increasing trend in sales, the months after the release of impossible burger lose the increasing tendency. It means the impossible burger do has a long-term and vital impact on the Mcdonald's sales. The months after October 2018 only has sales data fluctuate around 4,750,000, and haven't come across a significant rise. It is recommended for Mcdonald to come up with new appealing product to fight back the Impossible burger.

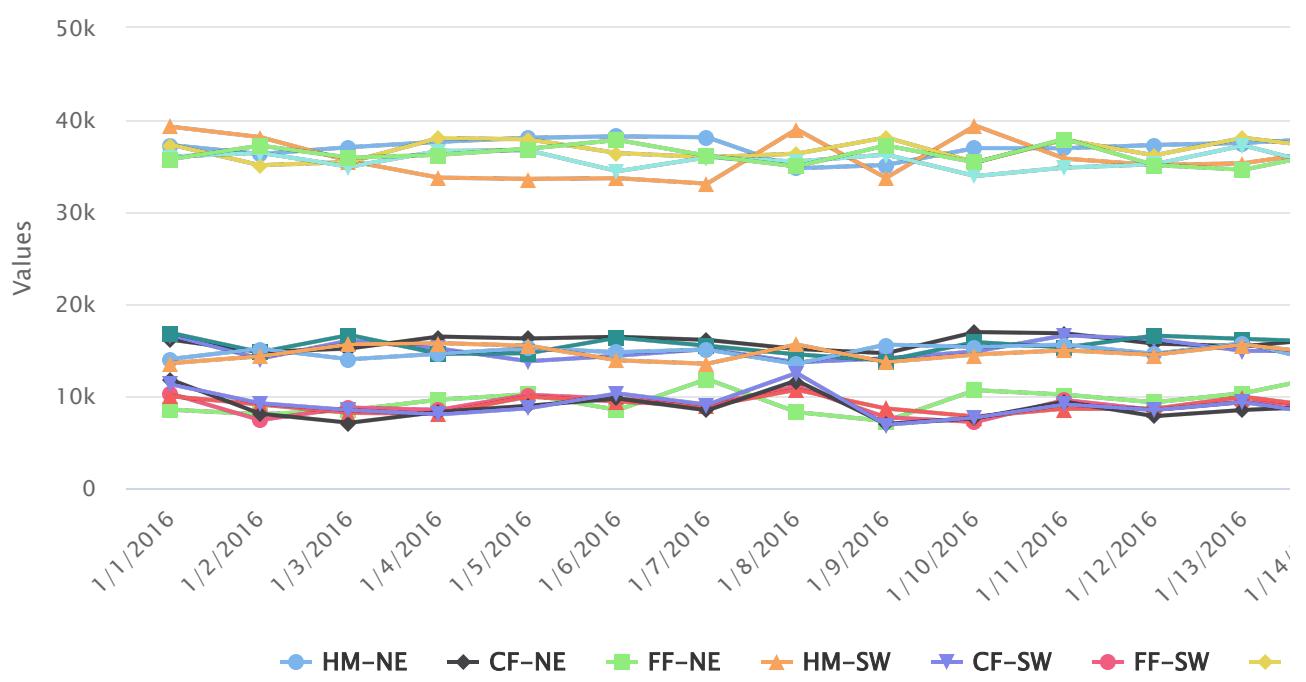


## Line charts for sales in each region

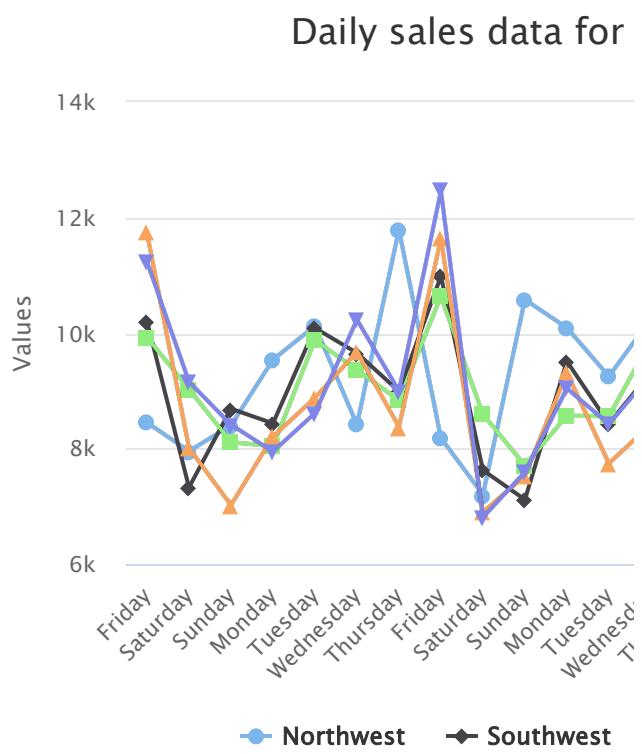
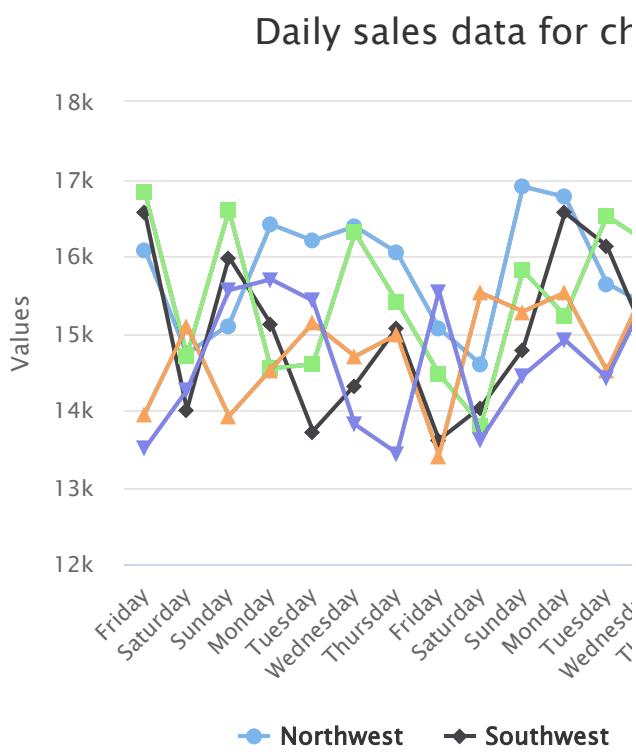
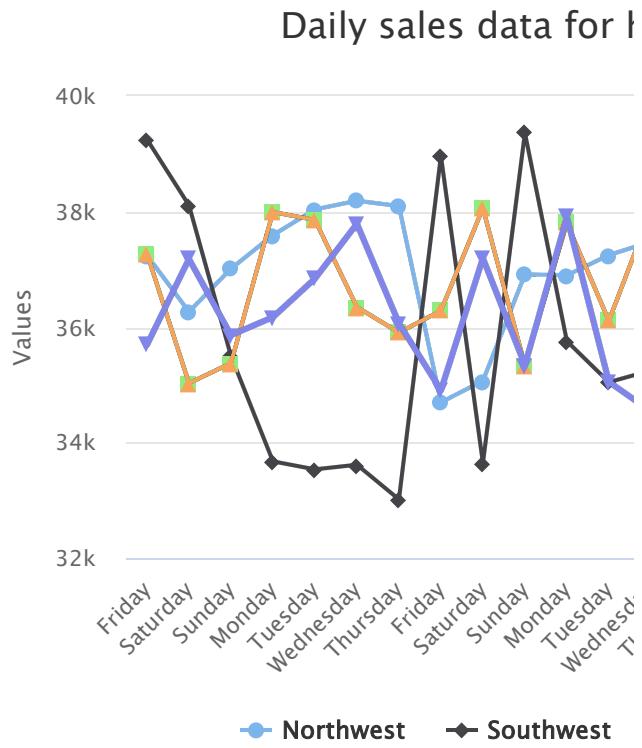
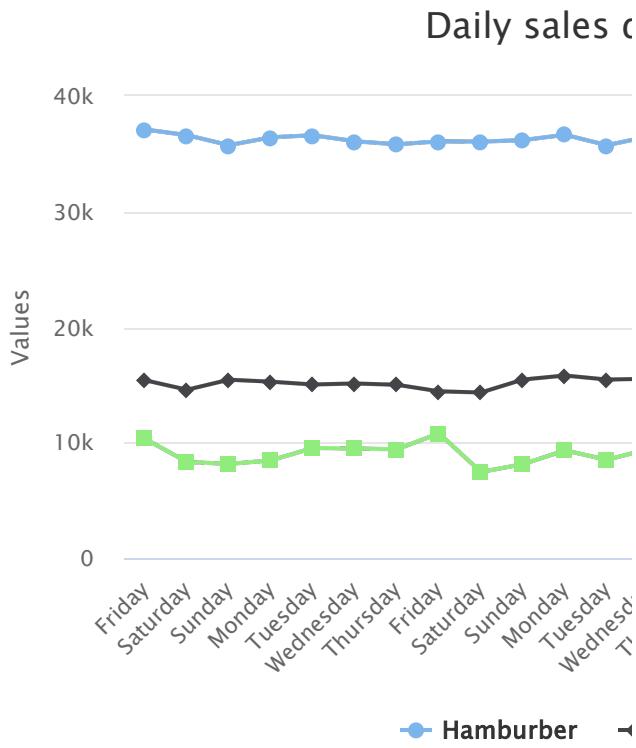
The sales data for each region did not vary much, except for Central region, whose sales are almost twice high as the other region. If we transform the data to the growth rate, the lines for each region are highly overlapping, and also has a pattern of periodic. It means different regions share the same periodicity. Customers in different region over the whole country tend to be attracted to Mcdonald in the same month.



## Daily sales data analysis for 2016 January



From the chart of daily sales, it is hard to see some overlapping lines from different region in different products. We can tell that hamburger is the top seller, generating almost twice the revenue. But the ups and down does not show a explicit pattern.



From the separated sales data for each product, it can be seen that the daily sales fluctuate drastically, and have peak and vally every other day. The fish fillet has a overlapping trend in different region, and the periodicity is pretty obvious in weekly basis. However for hamburgers and chicken fillet, the periodicity cannot be easily spotted. It means the sales for hamburger and chicken fillet does not influenced much by weekday or weekend, but fish fillet is greatly influenced by the day. In respect to the region, Northwest usually have the highest sales, indicating the loyalty and passion of customers.

## Conclusion

From all above, Mcdonald need urgent action to keep its increasing sales interrupted by Impossible burger. Probably come up with some products as similarly healthy. From our analysis of month sales, we can spot the periodicity in all three products and the overlapping of peaks and valleys in different region. In daily sales data, however, the periodicity can only be observed in fishfillet, meaning hamburgers and chicken fillet are resistant to the weekend and weekday cycle. The regions differ a lot in daily sales, but Northwest region is usaully the highest, and peaks can often be identified from this region.