ASSIGNMENT 2:

Case Analysis: "APPRENTIC CHEF INC"

**MSBA 5: Machine Learning – Prediction Models**

Professor: Chase Kusterer

Student: Sunlong Ngouv

Date: March 15th, 2020

Insight one:

There was a short-term success for cross sale of the 'Halfway There' subscription program for revenue growth. From the **scatterplot** (left side) below, more than 50% of the customers subscribed the program, since there are more '1' than '0'; however, with our prediction in the **confusion matrix** (right side) below, 56% of the customers (= 269) won't accept the program, in addition to 13% of unsatisfied customers (= 62) with the program. Furthermore, only 32% of the customers (= 156; Specificity calculation) thought the program was beneficial.
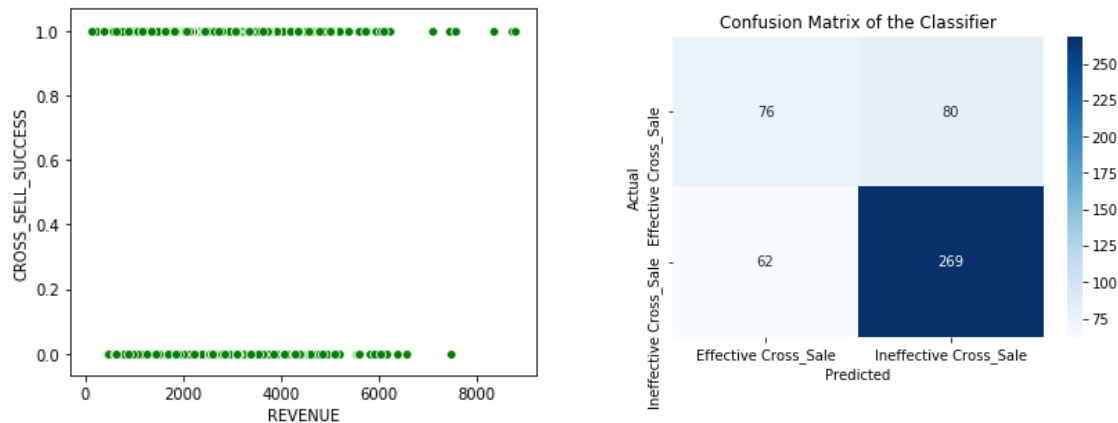
Insight Two:

The level of success of the 'Halfway There' program was elevated mainly by percentage of following recommendation by the customers. According to the bar graph below (from Random Forest's feature-importance prediction), it, FOLLOWED_RECOMMENDATIONS_PCT, stood out from the group, followed by AVG_PREP_VID_TIME. Therefore, how many customers followed the recommendation? In fact, there were 92% (or 1791) of the total customers did.
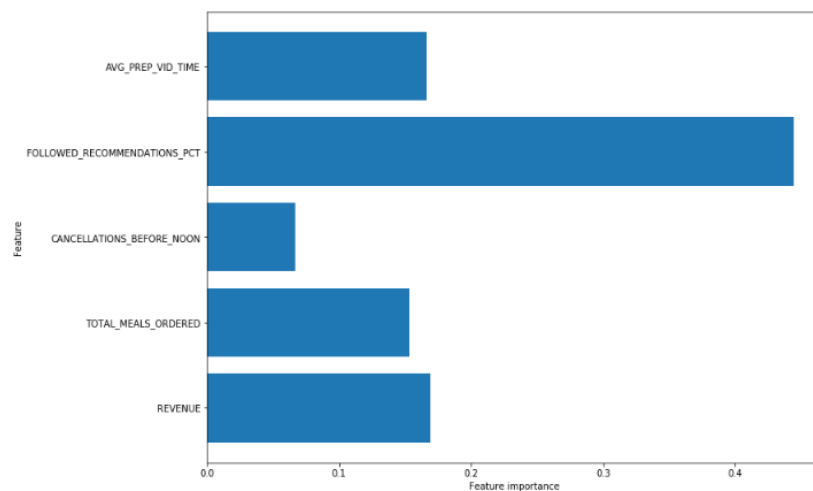
One Actionable Recommendation:

Since the 'Halfway There' program is not productive as expected, the company should change its cross sales strategy by offering daily fresh juice to the subscribers during the workdays due to multi-benefits. Initially, because majority of the millennial customers nowadays are health consciousness with hectic lives, the suggested program is highly practical as the fresh juices from extracted fruits or vegetables are soothing, revitalizing, and stress recover. Moreover, it benefits to the company's revenue as well by reducing waste or spoilage of inventory, since it minimizes unused fruits and vegetable in the fridge, and reduce ordering wait time and costs because the chefs can prepare and deliver them to the customers at the same time. In order to execute the new program, the company should approach the 92% of the customers who followed the recommendation. Marketing team should send advertising videos and menu of the provided juices in each day of the week, subscription fee and benefits, and pre-order time and amount by emails and calls. They should also use product recommendation with AI function for juices when the customers scroll on website or phones to order their foods, which is able to attract new customers to the subscription pool. By following this recommendation, the company will have a fruitful business growth within a year.

Highest AUC score = 80%

Model	Train Score	Test Score	'AUC Score'
Logistic_Regression	0.6895	0.7084	0.6499
K_Nearest_Neighbors	0.7971	0.7413	0.7232
Decision_Tree	0.7868	0.7967	0.8064
Random_Forest	0.7556	0.7556	0.7321
Gradient_Boosting	0.7992	0.7659	0.76