Machine Learning:

➢ **Objective**:
  - To find out if the Cross-Sell promotion of Apprentice chef's "Halfway There" would diversify the revenue stream.

➢ **Business question**:
  - Will the Customers make use of the promotion? As the executives at Apprentice Chef believe this endeavour will create a competitive advantage based on its unique product offering of hard to find local wines.

➢ **Feature engineering:**
  - Used Logit function to see how the model works with the existing variables
  - There were 47 null values in the family name
  - Splitting the email into useful variables
  - Assigning them individual groups
  - Making a boxplot to see how many variables fall in each segment
  - Defined the outliers by using threshold High and Low
  - Used (text_split_feature) to split the name in numbers
  - Using Correlation function found the most correlated variable

➢ **Model**:
  - Decision Tree as it provides the highest AUC as well as Test scores

➢ **Model Selection & Validation:**
  - Tested several models that increased which gave high values, however the tree model provided decision making for HALFWAY THERE's value as to why more people would us this promotion.
  - The tree model provided insights about the factor before noon and after noon order behavior

➢ **BUSINESS INSIGHT:**
  - **Revenue:**
    1. Personal generated more revenue with respect to Cross-sell promotion
    2. Professional generated less revenue in comparison to junk and personal
  - **Cross-sell success:**
    1. Closely related to percentage of the time the customer followed meal recommendation by 46%.
    2. Second correlation is with professional emails with 19%
    3. Third relation is with number of names.
    4. Only 963 customers used the promotion out of 1946

Recommendation:

- ➢ Attract more millennials, as the purchasing power is with the millennials
- ➢ Use smart watch to order the half bottle as it might be fancy for a few millennials
- ➢ Use delivery drones for "halfway there" only
- ➢ Have augmented reality in the video which are being watched by the customers for mostly training