

## Business Case: Aerofit - Descriptive Statistics & Probability

1. Checking the structure & characteristics of the dataset - [Structure and Characteristics](#)
2. Detect Outliers - [Detect Outliers](#)
3. Check if features like marital status, age have any effect on the product purchased - [Answer](#)
4. Representing the marginal probability, Customer Profiling, conditional probability - [Representing the marginal probability](#)
5. Check correlation among different factors using heat maps or pair plots. - [Correlation](#)
6. General Data Inspection - [Answer](#)
7. Univariate Analysis - [Answer](#)
8. Bivariate Analysis - [Bivariate](#)
9. Multivariate Analysis - [Answer](#)

### Problem Statement

The market research team at AeroFit wants to create a customer profile for each type of treadmill offered by the company to provide better recommendations to new customers. The goal is to investigate whether there are differences across the products with respect to customer characteristics. To achieve this, the team aims to perform descriptive analytics and develop appropriate tables and charts for each AeroFit treadmill product.

### Assumptions and modifications done

1. New category bins have introduced in the data set to segment customers in a better way such as Income category, age category , mileage category etc

2. In probability calculations, the sample size plays a crucial role in making reliable predictions and drawing accurate inferences about the population. A larger sample size generally tends to provide more precise estimates and better represents the characteristics of the entire population, here 180 is sample size and is assumed to good enough to conduct the analysis

### **Observations:**

1. No Missing Values: The dataset contains complete information for all data points; there are no missing values.
2. KP281 is the most common product in the dataset, appearing in the data points more frequently than other products.
3. There are more males in the data than females.
4. More Partnered persons are there in the data

### **Business Insights**

1. The boxplots reveal the following patterns regarding outliers in customer attributes:
  - Age, Education, and Usage: These attributes have very few outliers, indicating that the majority of customers fall within similar ranges for these characteristics. There is less variability in these attributes among the customer base.
  - Income and Miles: These attributes exhibit more outliers, suggesting a wider range of values. There is greater diversity in income levels and treadmill usage distances among the customers.
  - This understanding can help AeroFit's market research team in tailoring their marketing strategies and product recommendations to different customer segments based on their unique characteristics and preferences.
2. Based on the observation that partnered millennials, both females and males, who are bachelor's degree holders represent a demographic with high sales, it is essential to gather additional insights to capitalize on this finding for business improvement
3. KP281 and KP481 have high market share and the constitution of male customers is high

4. KP281 and KP481 have almost equal number of female and male customers, but KP781 customers are clearly males( partnered
5. Looking at income data, as income category rises, male and female are more prone to buy KP481 and KP781 , conditional probability confirms this
6. Above trend is seen in females who are married also.
7. Looking at age category data, Genz and millennial females are buying KP281 and KP481, very few females from the middle age category are presently the customers.
8. Genz males are more prone to buy KP281 and middle age category males is clearly showing interest in KP781 and equal distribution among millennials
9. Usage and educational category data shows the customers interest in more expensive product is directly proportional
10. High fitness individuals are preferring expensive treadmill

### **Recommendations:**

1. To improve business, AeroFit should focus on targeted marketing, personalized offers, product enhancement, customer engagement, and exceptional customer support for the high-sales demographic of partnered millennials with bachelor's degrees. Pushing a lifestyle and fitness campaign for the low-sales demographic customers can be a spark among the customers
2. To improve sales, AeroFit should encourage male customers, especially those with medium income and above, to consider purchasing KP481 and above treadmills. For females, the focus should be on targeting partnered females to buy KP781 and KP481, while other female categories are better suited for KP281. The primary goal for females is to increase their market share and reduce the disparity in customer volume compared to males.
3. To increase female treadmill sales, conducting customer surveys to understand female preferences better and align product features accordingly
4. To boost treadmill sales, AeroFit should focus on marketing to demographics where there are limited public grounds or environments for physical activities. Emphasize the convenience, safety (this point will strike among female customers) , and versatility of treadmills for indoor fitness routines.

5. For more revenue, KP781 should be suggested to males( age between 25- 30) , married female with high income and well educated , people with more usage and fitness mark
6. Goal should be always offering customer the latest and the best, so suggesting a treadmill which offers more features to customer will retain the customers through trust building and awareness of the product and what it can offer