

## DATSCI 203 Sec 03 - Team 5 - Team KPM Lab 2 Proposal

**Research Question:** How does the level of alcohol content (ABV) in beer influence its overall consumer review scores?

**Actors:** Breweries are the primary actors as they have direct control on the ABV. Consumers are the secondary actors driving the influence on sales by contributing through review scores.

- **Brewery (Primary Actor)** - Brewmaster, Product Teams, Marketing, Sales Teams, and etc.
- **Consumer (Secondary Actor)**

**Data Source and X,Y:** The dataset for this study will be sourced from Kaggle, specifically the "Beer Tasting Profiles Dataset" available at <https://www.kaggle.com/datasets/ruthgn/beer-profile-and-ratings-data-set/>. This data is as of September 2021.

- **Operationalizing X (Independent Variable):** Alcohol by volume (ABV) is our X which will be in flexible function form (at least quadratic).
- **Operationalizing Y (Dependent Variable):** Overall beer rating, which serves as a comprehensive measure of a beer's quality based on consumer evaluations.

The unit of observation is an individual beer entry in the dataset. Each row represents a specific beer from a brewery, along with information on its attributes, tasting profiles, and mean overall ratings.

### Methodology:

- **Exploratory Data Analysis (EDA):** Initial exploration of the dataset to identify patterns, trends, and correlations among the variables.
  - Examine the distribution of ABV and review scores.
  - Perform correlation analysis to identify relationships between ABV, potential confounding variables, and review scores.
  - Use visualization to understand the relationship dynamics and guide model specification.
- **Regression Analysis:** Utilize regression models to assess the relationship between independent variables (tasting profiles) and the dependent variable (overall rating).
  - A simple linear regression model with ABV as the sole predictor of review scores.
  - A multiple linear regression that includes ABV and other confounding variables like beer style, beer body, and etc.
- **Path Diagram:**  
ABV → Overall Reviews ← epsilon

**Conclusion:** This research aims to contribute valuable insights into the dynamics of beer tasting profiles and their impact on overall beer ratings. By understanding consumer preferences, this study can guide breweries in enhancing their products and enable consumers to make more informed choices based on their preferences.