Stratified Sampling: A Comprehensive Analysis

Stratified sampling is a probability sampling method where the population is divided into subgroups (strata) based on shared characteristics, and samples are then taken from each stratum. This method ensures representation from all relevant subgroups of the population, making it particularly valuable for heterogeneous populations.

Types of Stratified Sampling

Key Requirement

Case Study: Customer Satisfaction Analysis in a National Retail Chain

Overview:   
We Need to analyse customer satisfaction levels, of a Retail chain with 500 stores across the country, having Limited budget for survey administration and Diverse customer base across different regions.

Implementation:  
In this code, we conducted a stratified sampling analysis by dividing the population into distinct strata based on region. Each region was assigned a weight proportional to its size in the population to ensure accurate representation. Satisfaction scores for customers were generated using normal distributions specific to each region. A survey design object was created, incorporating these strata and weights, allowing us to compute regional satisfaction means while accounting for the sampling design. Finally, we performed statistical analysis, including calculating regional satisfaction means and conducting an ANOVA test to determine significant differences in satisfaction across regions, visualizing the results with a boxplot.

Github repository: <https://github.com/ushiecodes/Stratified-sampling-method-report>  
  
Conclusion:  
Stratified sampling proves to be an invaluable tool for researchers and analysts when dealing with heterogeneous populations. Its ability to ensure representation across different subgroups while potentially reducing sample size requirements makes it particularly useful for large-scale studies with diverse populations. The case study demonstrates its practical application in business settings, while the statistical considerations provide a solid foundation for implementation.

Contributors: Utkarsh Kamat