Release 1 Report

1. Introduction

1.1 Project Background

- This project looks closely at data on alumni donations to understand what drives people to give. We will use many types of information, such as past donations, measures of wealth, age, and where alumni live. We also consider how active they are with the university, including attending events, volunteering, or staying in touch. By looking at all these factors, we aim to build a complete picture of donor behavior.
- The study will also sort alumni into different groups, like long-term donors, those who stopped giving for a while, and those who support both the business school and the university as a whole. We will look at factors such as career background—like working at big accounting firms—and how long they have been donating. The goal is to find useful patterns that can help the university plan better ways to connect with its donors and boost future giving.

1.2 Client Requirements for This Semester

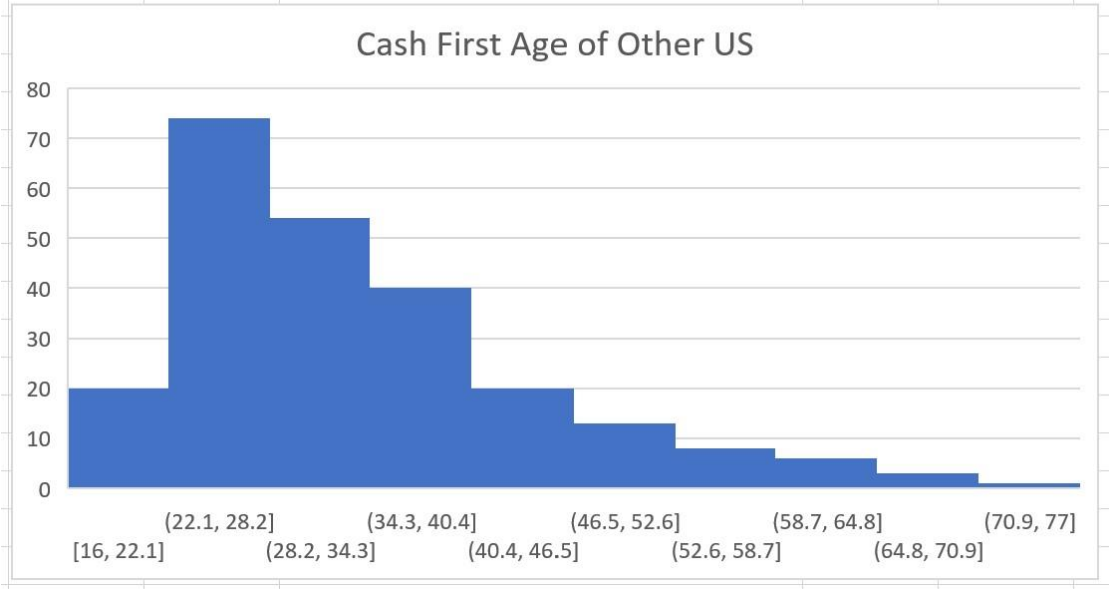
- This semester, the client wants a clear and simple plan to understand what makes alumni donate. They need us to explore how factors like past donations, wealth, and involvement with the university are linked to giving. The client is very interested in knowing if working at major accounting firms affects donation habits. They also want to see if there is a change in donation behavior around different age groups.
- The client also asks for the data to be broken down into smaller groups based on age, location, and donation amount. For example, special attention should be given to comparing the Chicago area with other regions like Florida, Arizona, and the Midwest. The analysis should cover all types of donors, from those who give a little to those who give a lot over many years. These insights will help the university improve its outreach and support for its alumni donors.

2. Progress in the Last Three Weeks

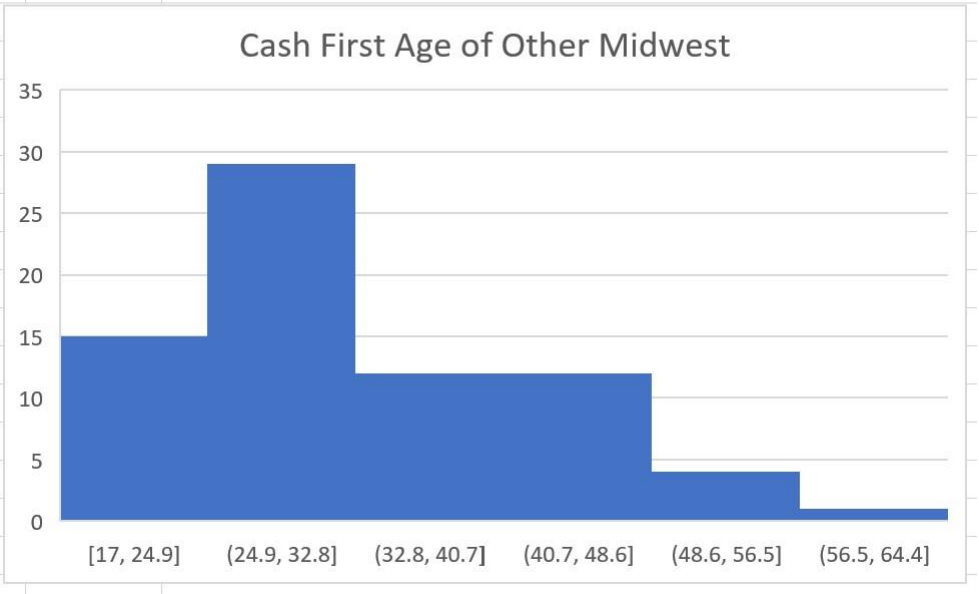
2.1 Data Analysis Conducted

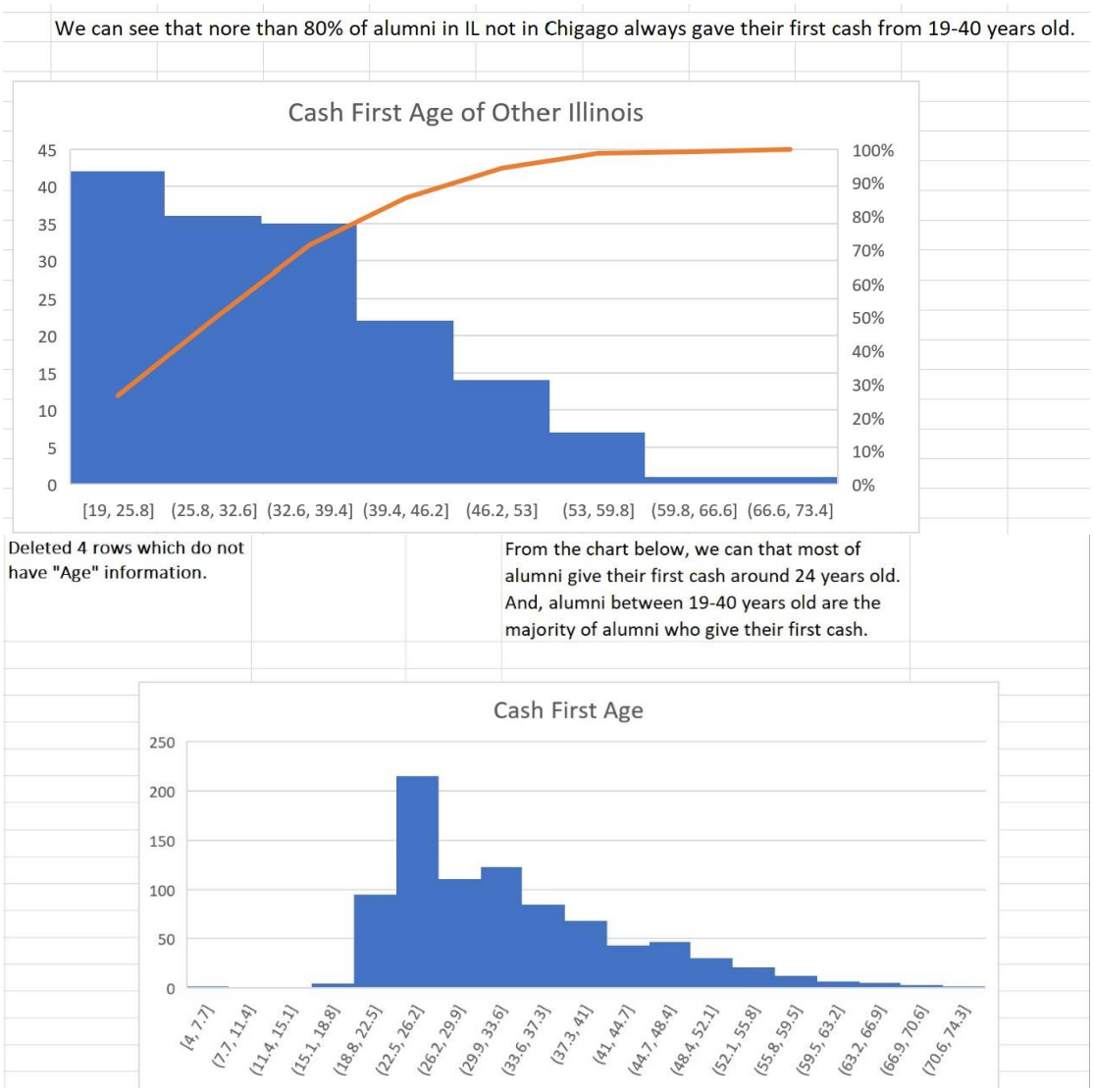
- Preliminary Exploration of the Lapsed but Returned Group.

The age range of 22 to 40 is still the best time to inspire alumni to make their first donation.



We can see that the proportion of individuals making their first donation is very high between the ages of 25 and 33. This may suggest that younger individuals or recent graduates are more likely to make their first donation.



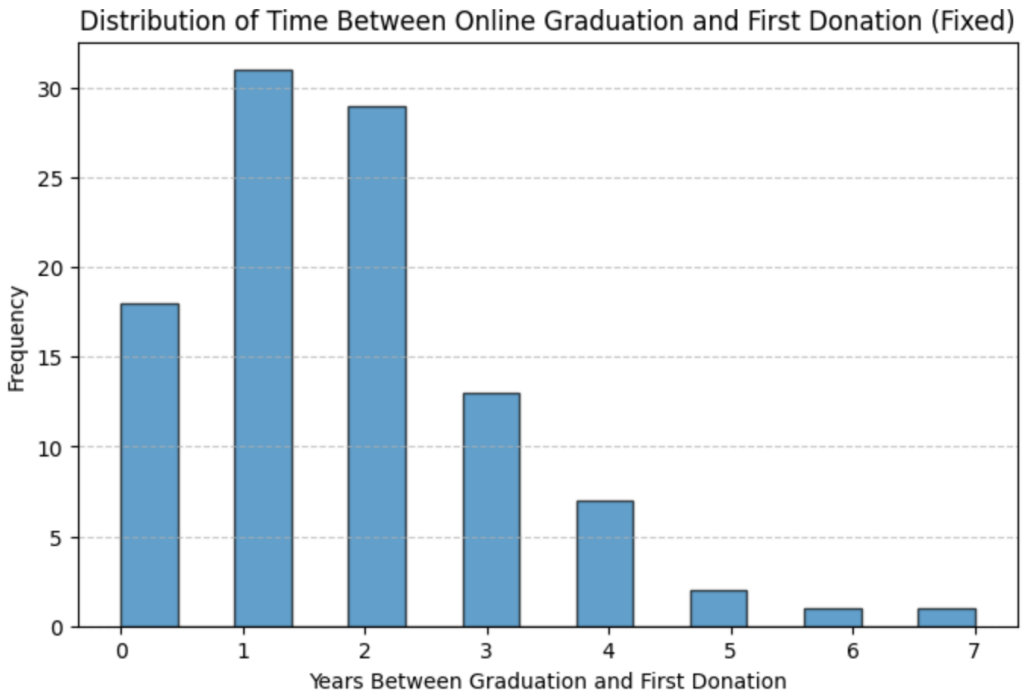


- Analysis of Donation Characteristics of OLP Alumni vs. Non-OLP Alumni.

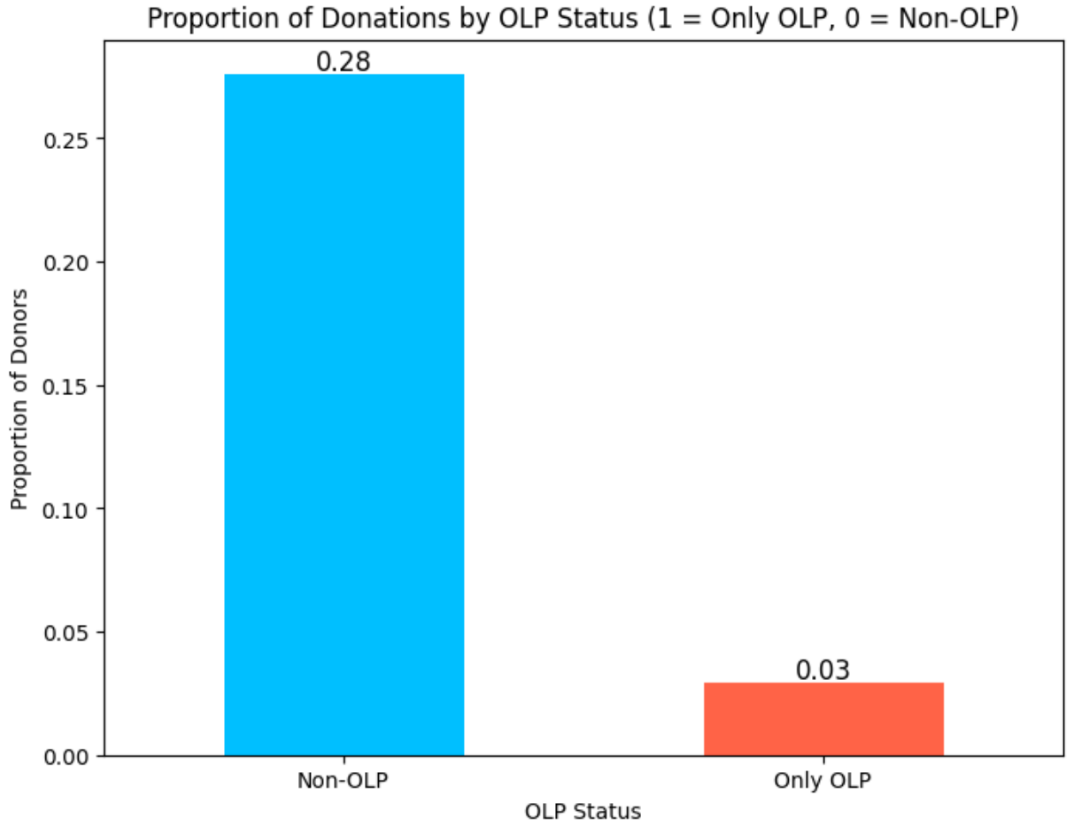
  For individuals who are only in the online program, analyze the relationship between donation frequency and whether OLP=1 across different age groups.
  For example, in age group 1 (25-34), divide the population into two groups:
  1. Alumni who are only in the OLP program (OLP=1 and only has one degree).
  2. Alumni who are not in the OLP program (OLP=0).
  Compare the donation frequency between these two groups using a histogram.

  1. Compare the time difference between the online graduation year

and first donation year (for donors) and plot the distribution.

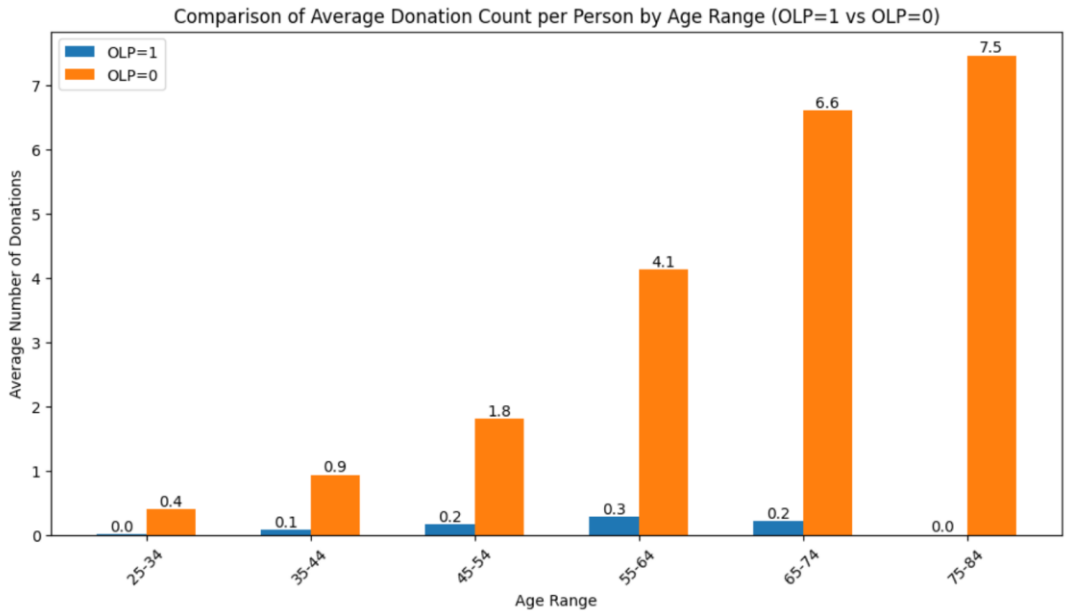


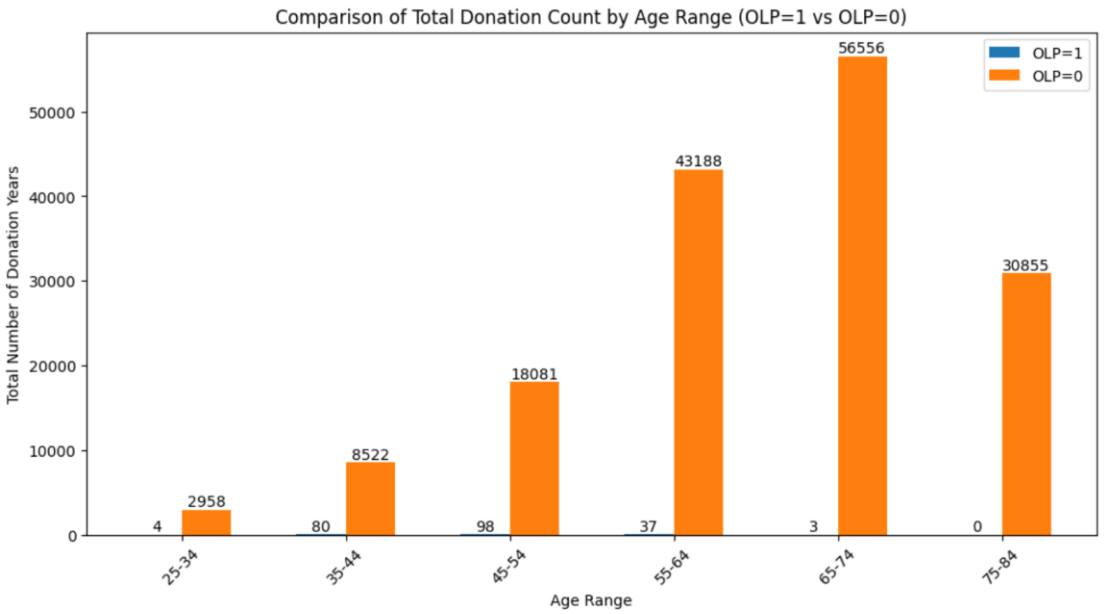
2. Analyze the correlation between OLP status (0 or 1) and donation likelihood for online program participants using correlation analysis and logistic regression.



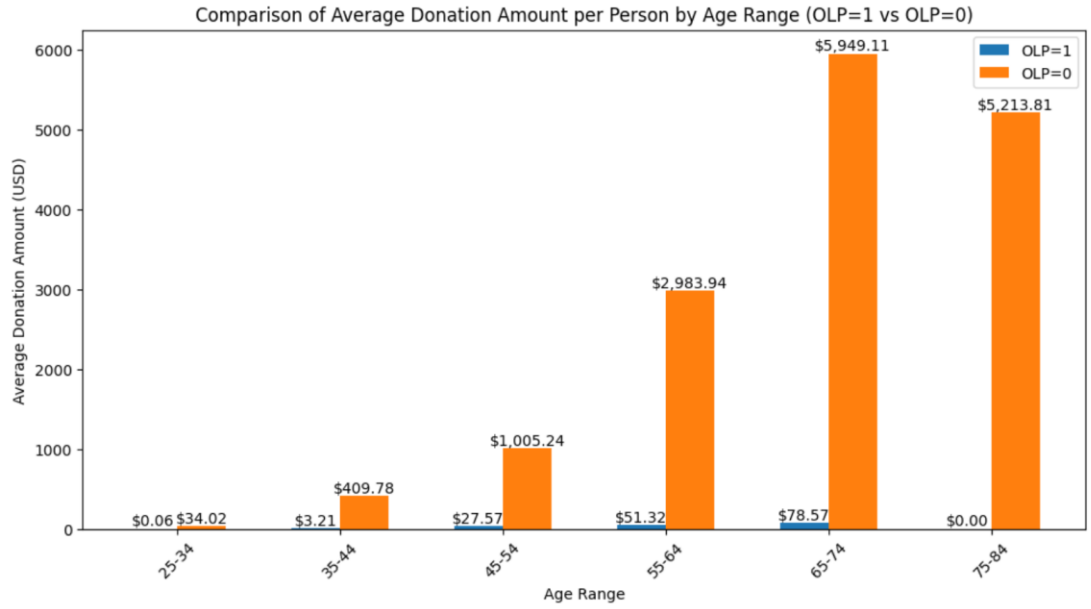
```
Optimization terminated successfully.
         Current function value: 0.570006
         Iterations 7
                           Logit Regression Results
==============================================================================
Dep. Variable:                Donated   No. Observations:                51879
Model:                          Logit   Df Residuals:                    51877
Method:                           MLE   Df Model:                            1
Date:                Wed, 12 Feb 2025   Pseudo R-squ.:                0.01548
Time:                        22:44:25   Log-Likelihood:                -29571.
converged:                       True   LL-Null:                       -30036.
Covariance Type:            nonrobust   LLR p-value:                2.933e-204
==============================================================================
                 coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------
const         -0.9636      0.010    -96.027      0.000      -0.983      -0.944
OLP Grad (Y/N)  -2.5259      0.126    -19.997      0.000      -2.773      -2.278
==============================================================================
```

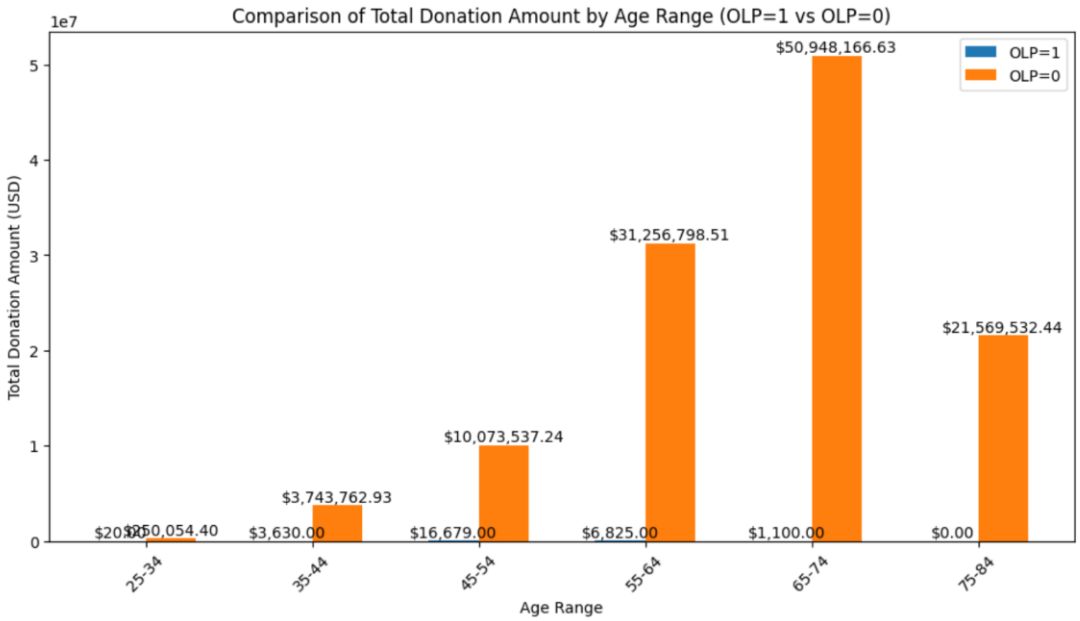
3. Compare the number of donations by OLP status across age groups (e.g., 25-34), using a histogram.





4. Compare the distribution of total donation amounts by OLP status across age groups.





2.2Key Findings and Insights

- Donation Patterns by Age and Region in the Lapsed but Returned Group:

  In this group, analyzing the age distribution of donations across different regions reveals that most alumni made their first donation between the ages of 20 and 30, particularly right after graduation. During this period, when donation invitations are extended, most alumni tend to make their first contribution.
  Additionally, it is noteworthy that alumni from regions in Illinois outside of Chicago exhibit a significantly higher enthusiasm for donating at a younger age. Compared to other states, the highest proportion of first-time donors falls between the ages of 19 and 25.

  Objective:
  Based on this data analysis, although this is only one alumni group, it reinforces our confidence that younger alumni are more likely to make their first donation. In the future, we can enhance outreach efforts to encourage first-time donations from young alumni who have not yet contributed.

- Donation Patterns by Age and Region in the Lapsed but Returned Group:
  First, when comparing alumni who only participated in OLS with those who did not, the donation rate among non-OLS alumni is

significantly higher.
Second, the average total donation amount per person across different age groups is also notably lower for OLS-only alumni compared to those who graduated from in-person programs.
Third, within the OLS-only alumni group, most alumni made their first donation within three years after graduation.

Objective:
From this, we can conclude that while OLS alumni generally have a lower donation capacity compared to most in-person graduates, every contribution still adds value. Moreover, we should enhance donation reminders around the first year after OLS alumni graduate, as this period presents the highest likelihood of their first donation.

2.3 Challenges and Solutions

- Discuss any challenges faced and how they were addressed.

  First, identifying alumni who have only participated in online programs is a challenging task due to limited information. We addressed this by selecting individuals who hold only one degree and have participated in an online program, ensuring that these alumni exclusively attended the university's online program.

  Second, while donation frequency and average donation amount vary across different age groups, it is important to consider that economic and cultural environments change over generations. Therefore, the impact of age groups on donations may need to be analyzed within the context of the social environment of their respective time periods.

3. Future Plans

3.1 Next Steps

- To enhance the understanding of the different patterns of different groups among alumni, we will implement a structured comparative

analysis between different donor groups.

- Comparing the General and Specific Characteristics of Lapsed-but-Returned Groups vs. Long-Term Groups
    - Calculate the distribution of key features within the Lapsed group and compare them against those in the Long-Term group.
    - Identify significant differences in demographics, giving patterns, and engagement levels.
    - Apply statistical methods such as t-tests for continuous variables and chi-square tests for categorical variables to assess the significance of differences.
- Comparing the General and Specific Characteristics of Long-Term Donors vs. Non-Long-Term donors
    - Perform a similar comparative analysis as done for the Lapsed-but-Returned group.
    - Examine long-term trends in giving behavior, including patterns of engagement and sustained contributions over time.
    - If applicable, leverage time-series analysis to track how donation frequency and amounts evolve.
- Categorized Feature Comparison and Visual Presentation
    - Given the extensive list of variables, we will adopt a stepwise approach to analysis, focusing on one subset of variables at a time.
    - Visual comparisons will be used to make results more intuitive and digestible, ensuring that findings are presented in a meaningful way.
    - For each category of variables, suitable visualizations should be selected:
        - Demographic Variables: Stacked bar charts, mosaic plots
        - Giving Capacity and Propensity Variables: Density plots, boxplots, ECDF curves
        - Historical Giving Data: Time series plots, cumulative distributions
        - Engagement and Communication: Heatmaps, parallel coordinate chart

3.2 Additional Improvements and Adjustments

- Refinement of Key Comparisons

Based on preliminary results, further breakdowns may be needed. For example, instead of grouping all non-donors together, we could segment them into different engagement levels or demographic categories.

Subgroup analyses may provide additional insights, such as whether certain age groups or alumni from specific programs show higher retention in giving.

- Clustering Analysis Feasibility Study

  To explore whether there are naturally occurring donor segments, we may conduct exploratory clustering analysis.

  This would help determine if Lapsed-but-Returned donors, Long-Term donors, and other alumni groups exhibit distinct clusterable patterns in their characteristics.

  Potential clustering methods(current):

  - K-Means or hierarchical clustering for numeric features
  - Latent class analysis for categorical engagement patterns