Smart Personal Finance Advisor

UNIVARIANT VISUALIZATIONS

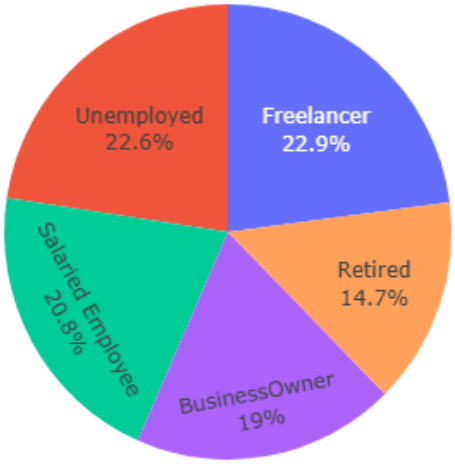

Figure 1: Distribution of Individuals by Occupation

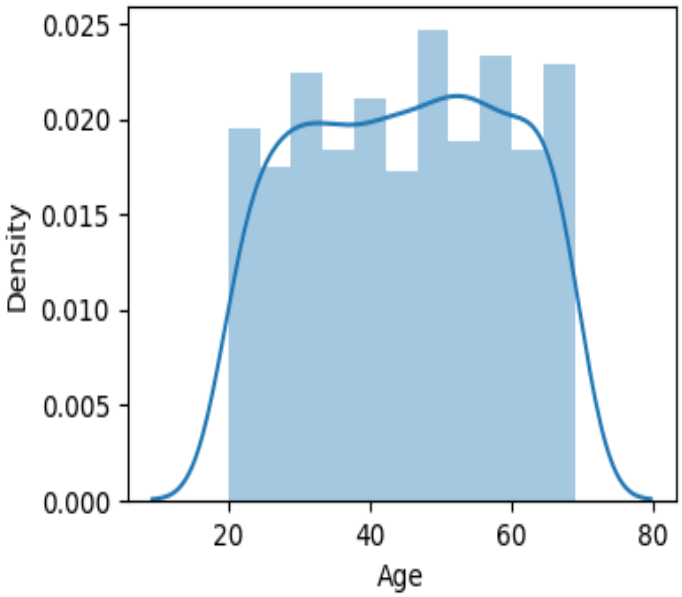

Figure 2: Age Distribution of Users

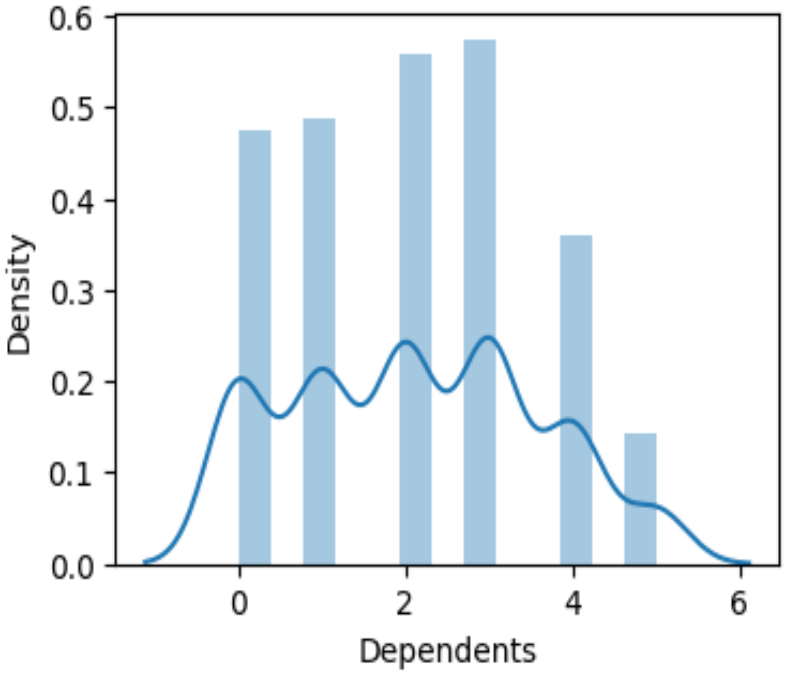

Figure 3: Distribution of Individuals by Dependents

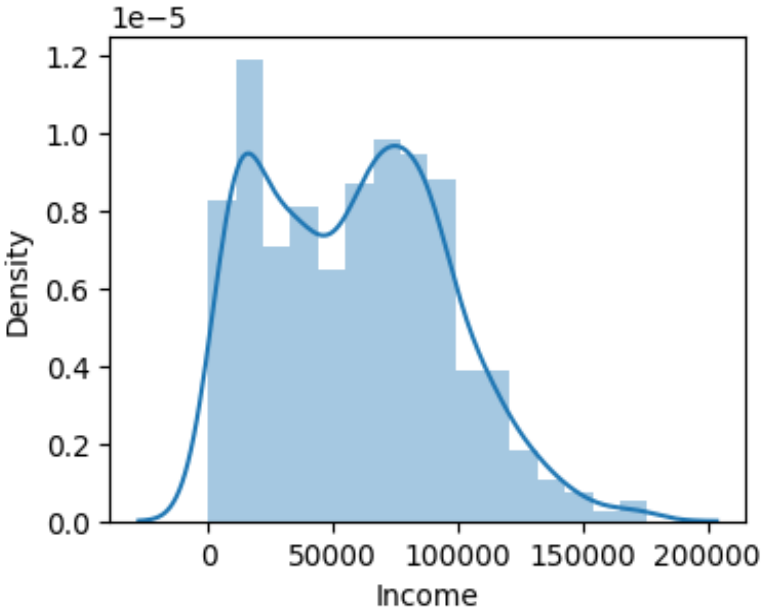

Figure 4: Distribution of Individuals by Income

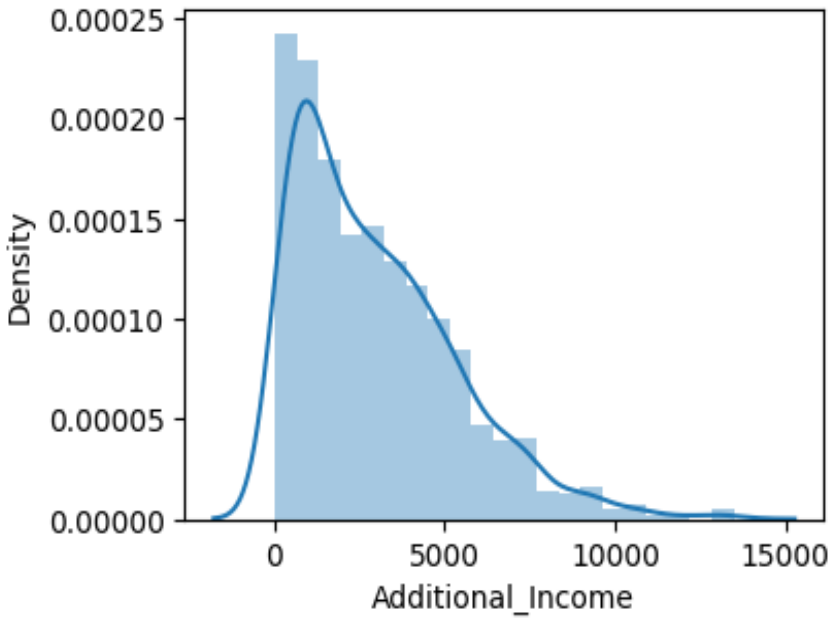

Figure 5: Distribution of Individuals by Additional_Income

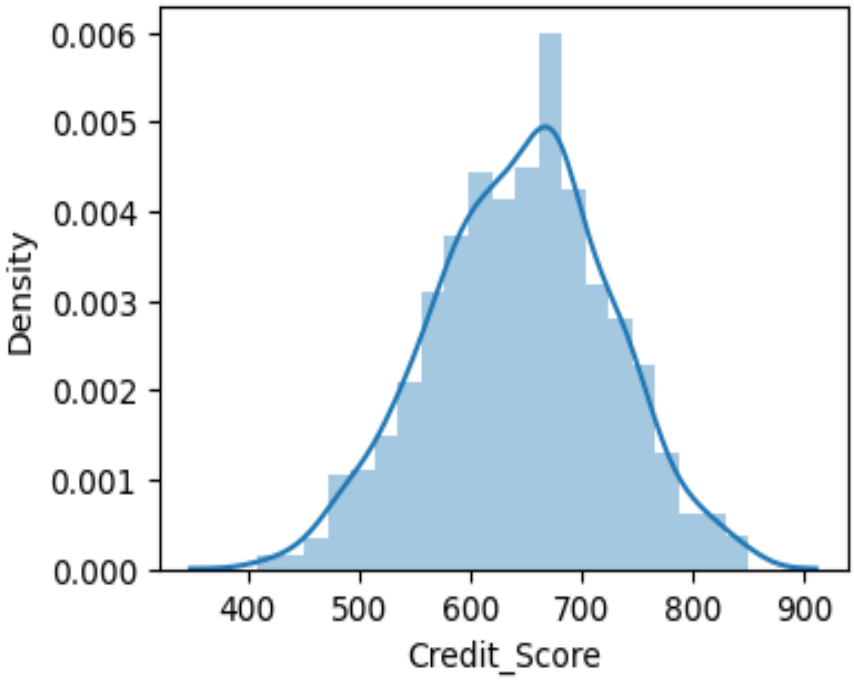

Figure 6: Credit Score Distribution Across Users

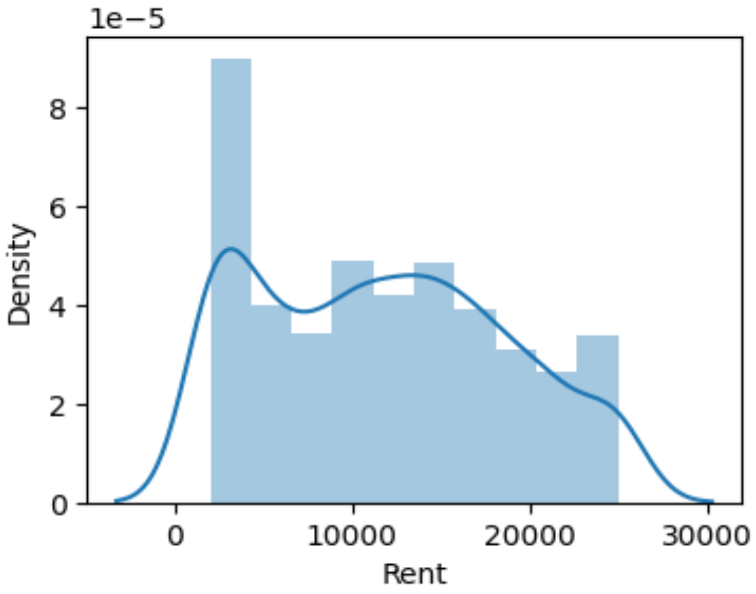

Figure 7: Distribution of Individuals by Rent

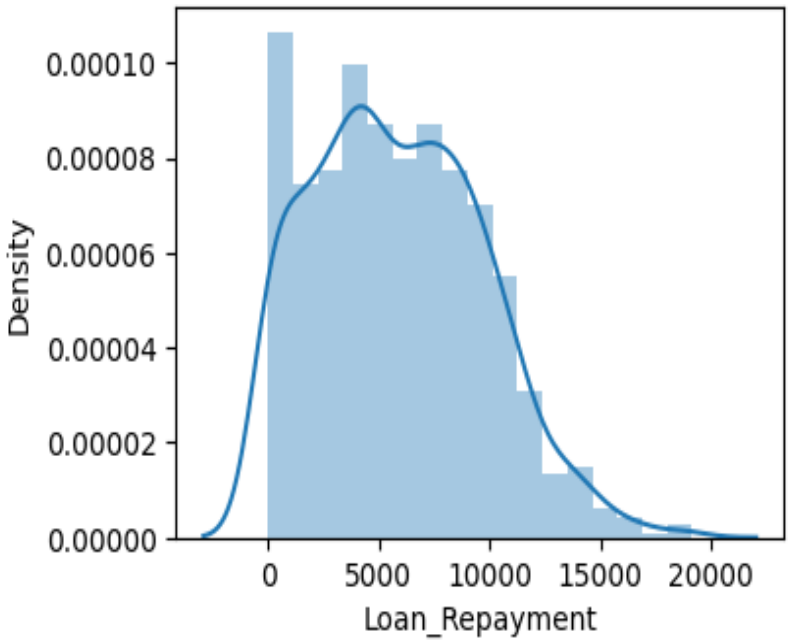

Figure 8: Distribution of Individuals by Loan_Repayment

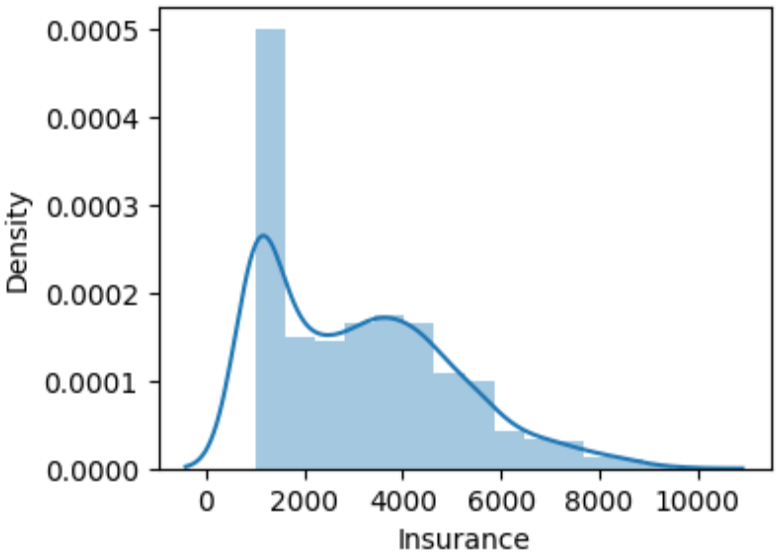

Figure 9: Distribution of Individuals by Insurance

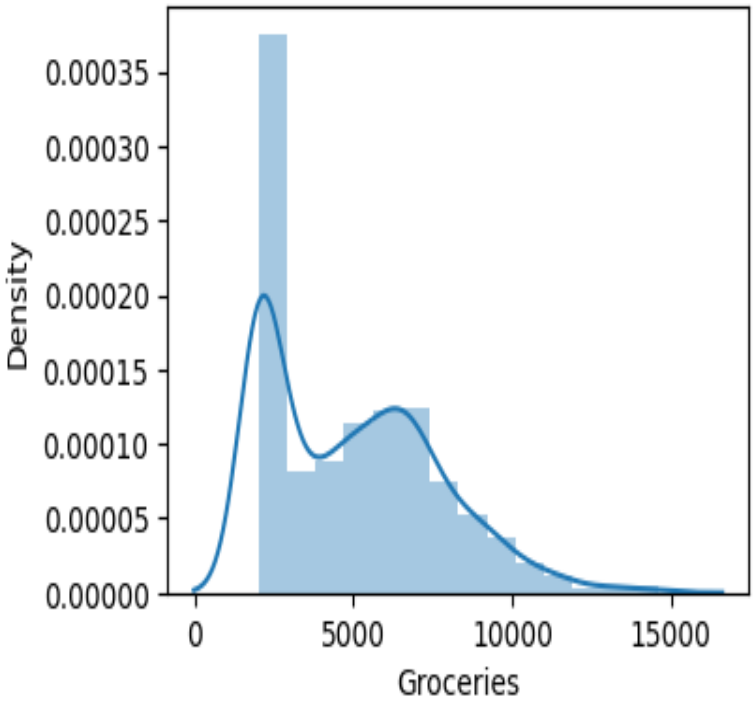

Figure 10: Distribution of Individuals by Groceries

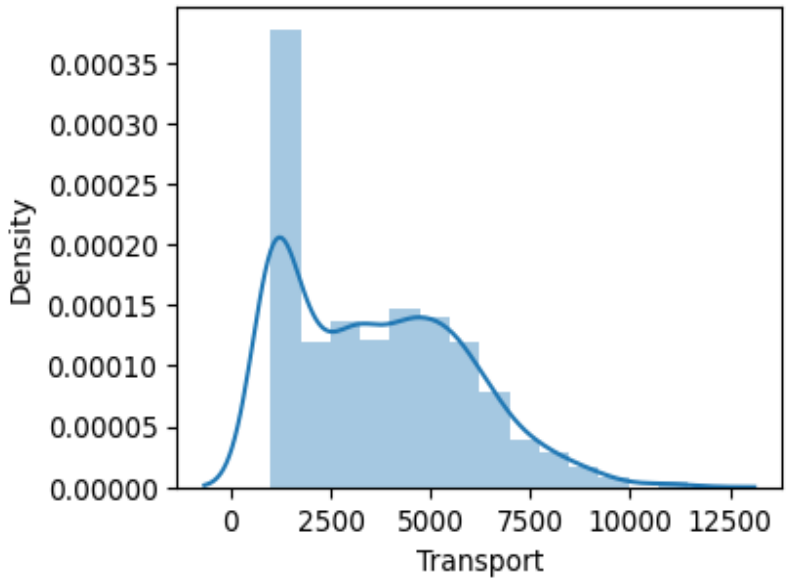

Figure 11: Distribution of Individuals by Transport

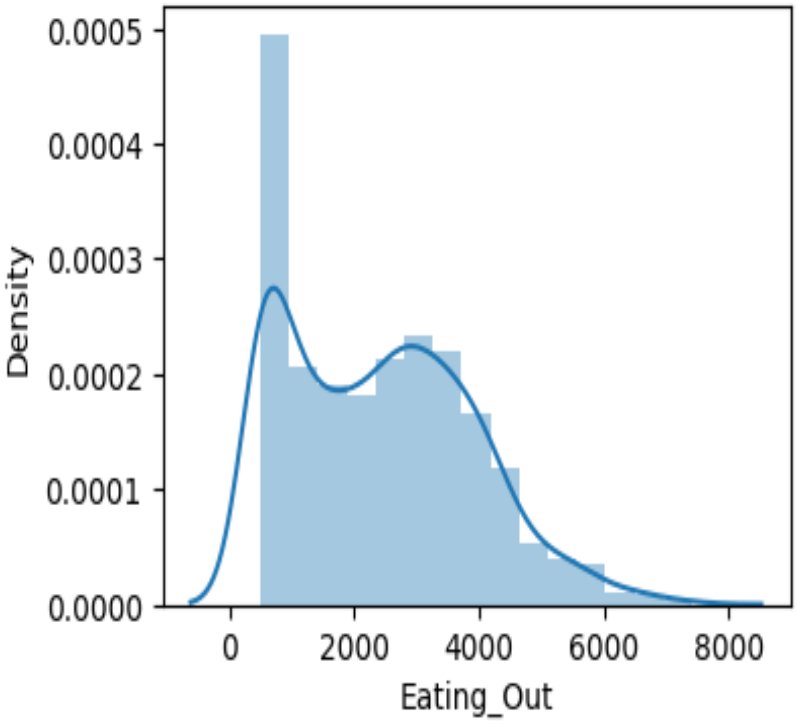

Figure 12: Distribution of Individuals by Eating_Out

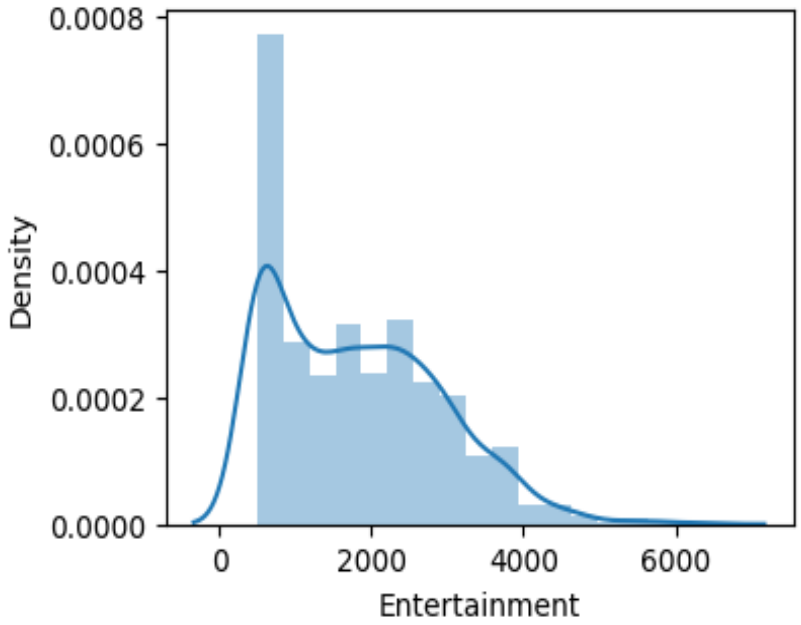

Figure 13: Distribution of Individuals by Entertainment

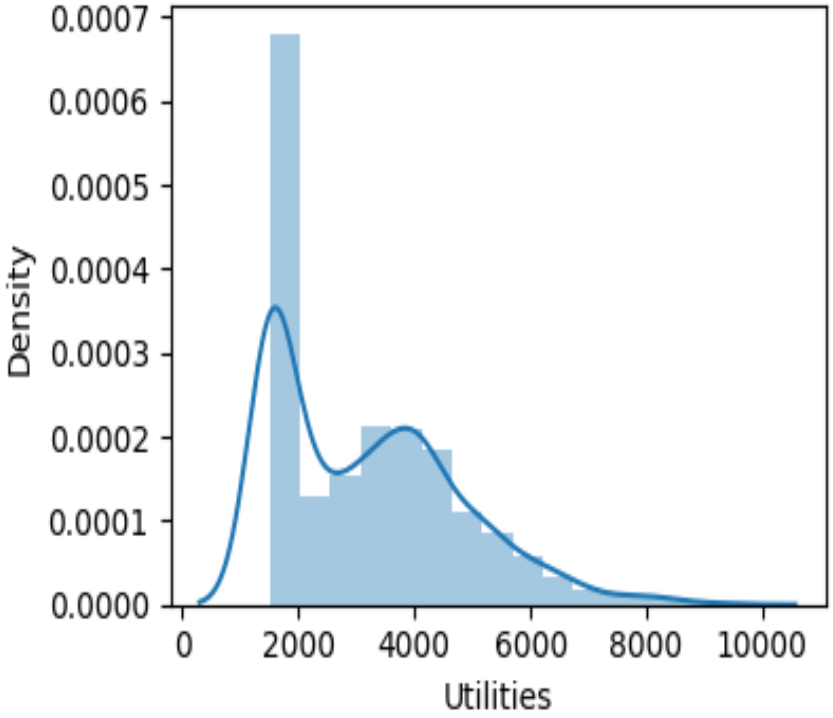

Figure 14: Distribution of Individuals by Utilities

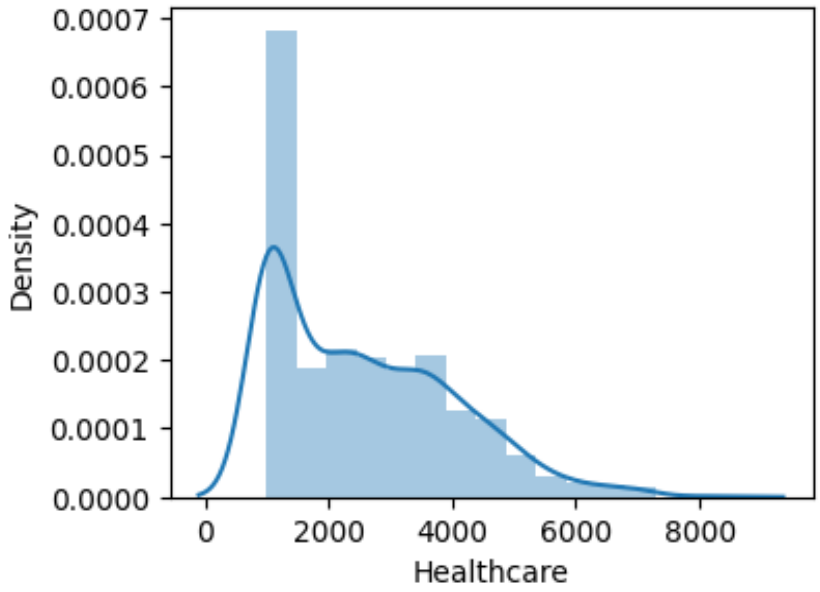

Figure 15: Distribution of Individuals by Healthcare

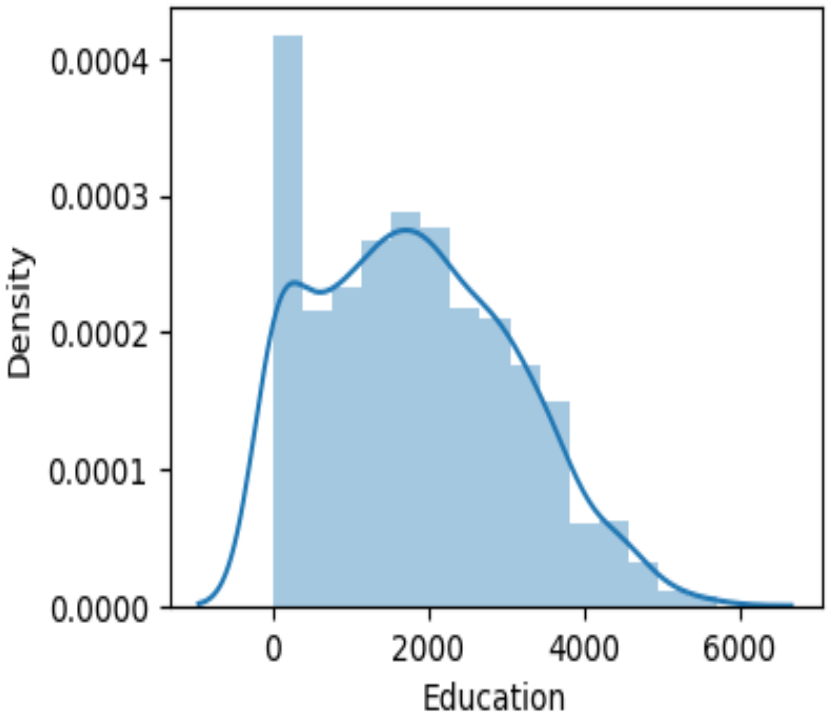

Figure 16: Distribution of Individuals by Education

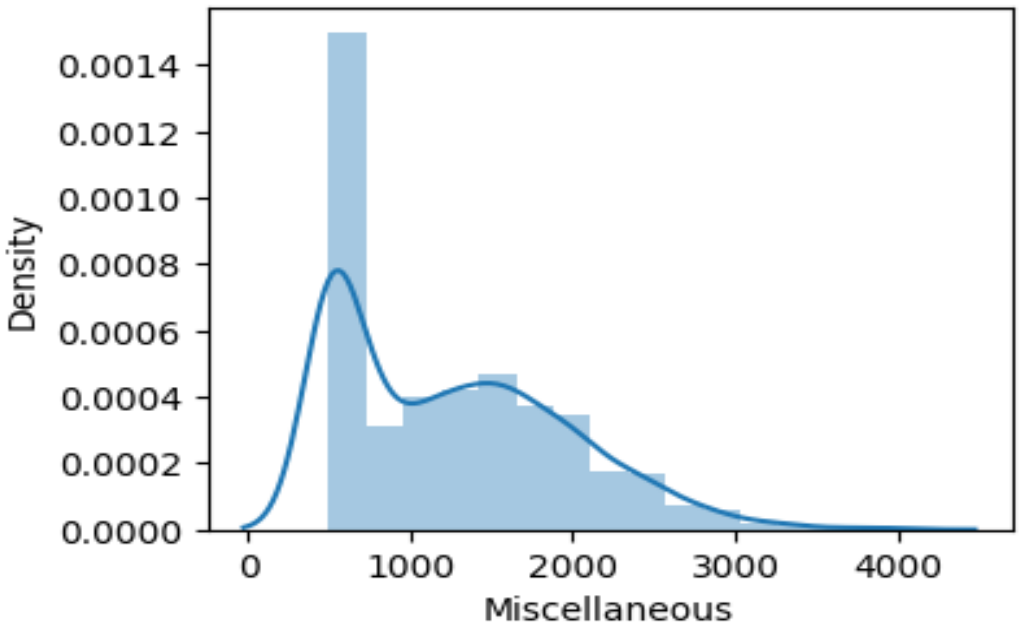

Figure 17: Distribution of Individuals by Miscellaneous

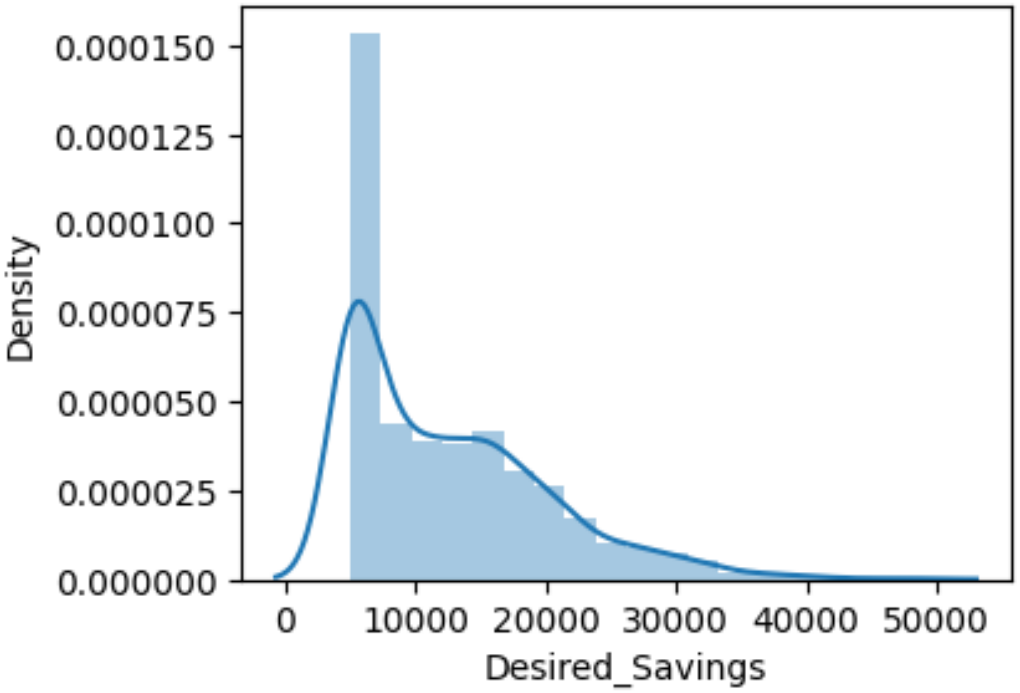

Figure 18: Distribution of Individuals by Desired_Savings

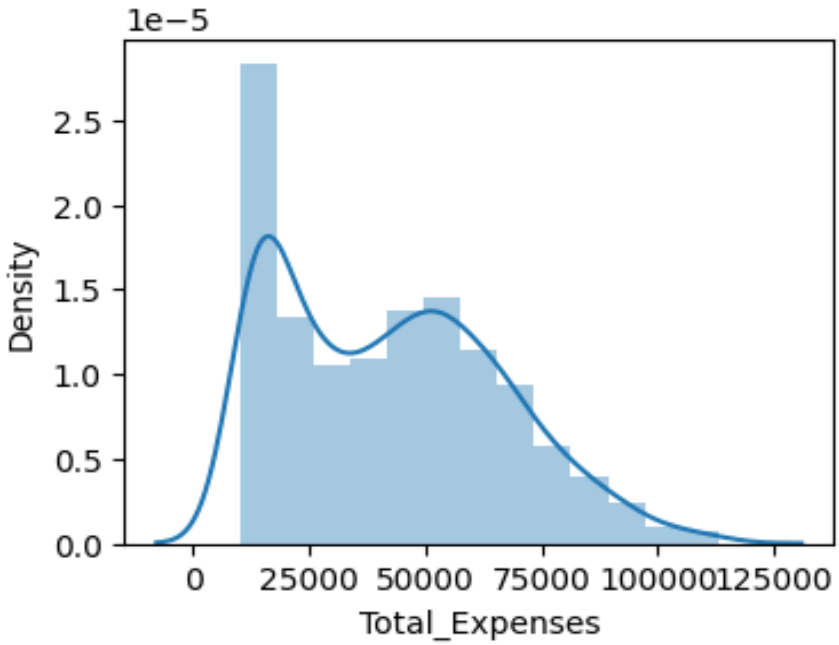

Figure 19: Distribution of Individuals by Total_Expenses

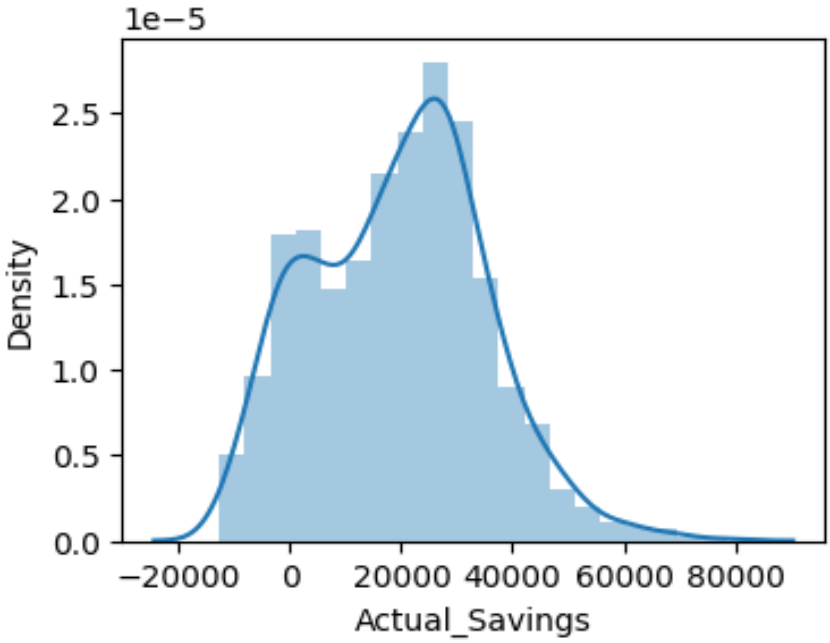

Figure 20: Distribution of Individuals by Actual_Savings

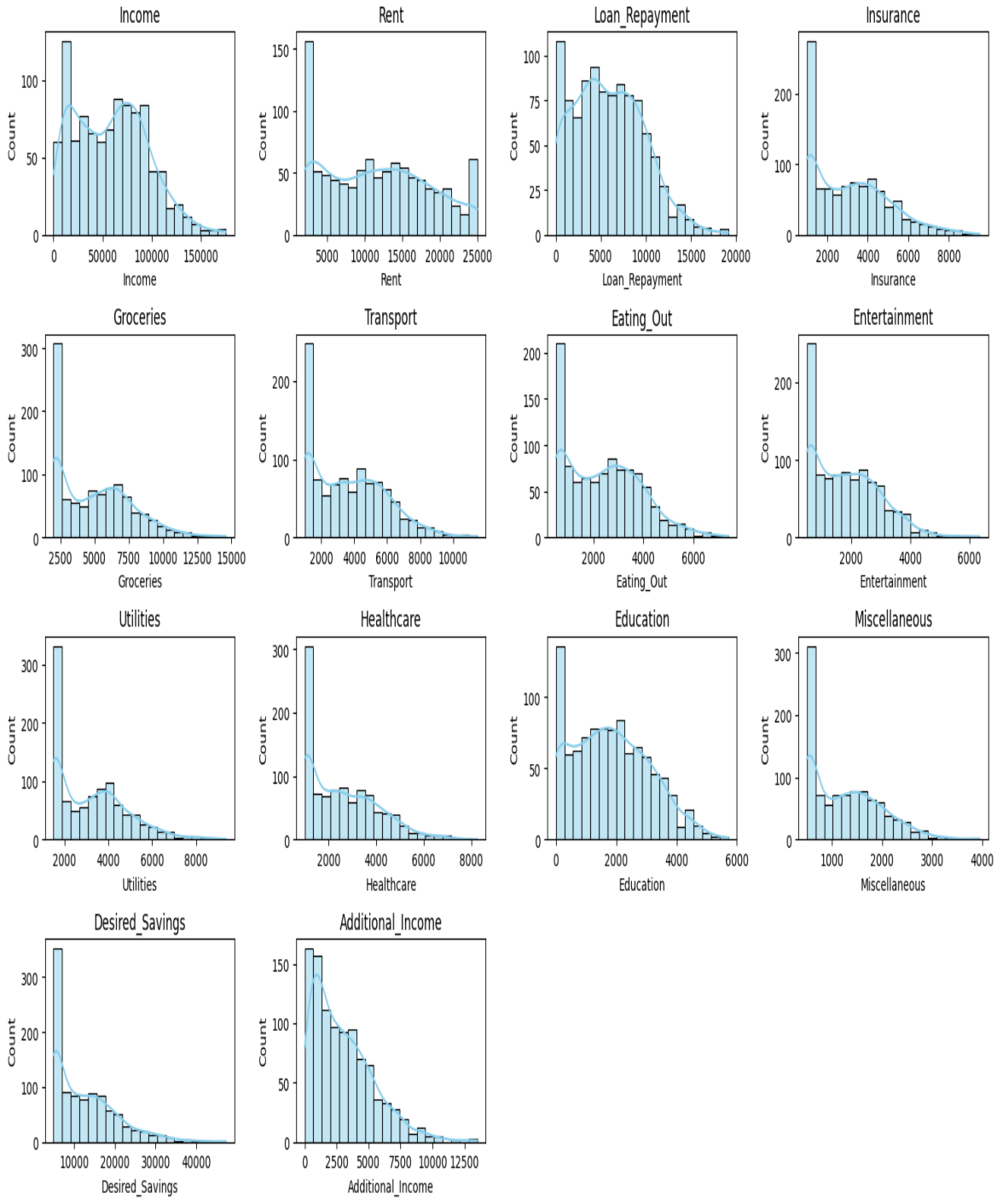

Figure 21: Comparison of Average Spending per Category

Univariant Insights

- Most users earn less than the average income, so financial products should focus on middle-income groups.
- Spending on groceries, transport, eating out, and entertainment varies a lot, a few users spend significantly more than others. This highlights potential for personalized budgeting recommendations.
- Rent payments differ greatly among users, with some paying very high amounts. Tailored housing-related financial advice could help these users.
- Most users have little or no loan repayment, but a few have very high loans. These users may need special attention for debt management.
- Insurance spending is uneven, indicating an opportunity to offer customized insurance plans for those who spend more.
- Total expenses differ widely, and some users spend more than they earn, showing the need for budgeting and saving guidance.
- While the average savings is around ₹15,961 per month, some users have negative savings, meaning they are overspending. Personalized saving tips could help them improve.
- Savings rates vary, and some users save very little. This highlights opportunities to promote saving habits.
- Most users have low debt compared to income, but a small group has high debt, so debt reduction advice would be valuable.
- Overall financial health is moderate, but some users are at risk, so tailored recommendations can improve their situation.
- Most users have a credit score around 576, which is considered near-prime or sub-prime. This shows a need for financial literacy programs and credit improvement guidance.

BIVARIANT VISUALIZATION

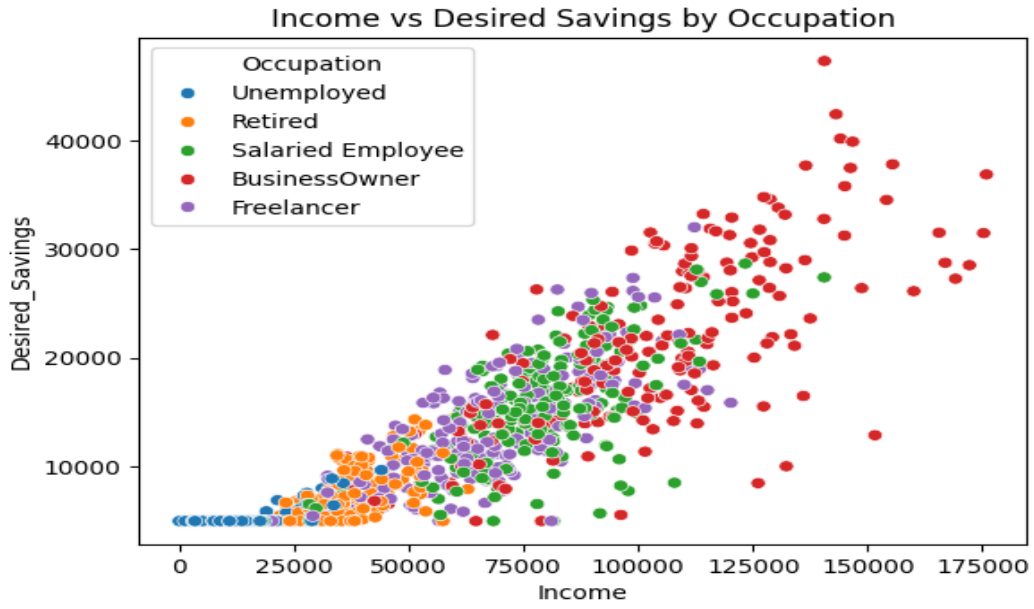

Figure 22: Income vs. Savings Relationship

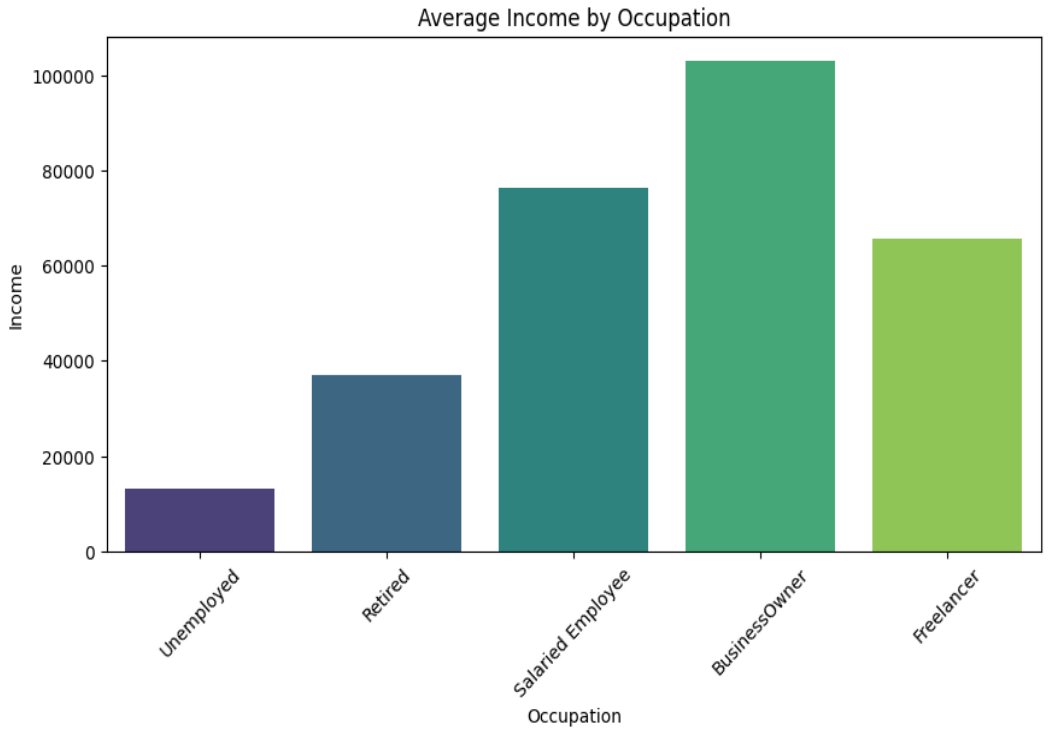

Figure 23: Bar plot visualization of Average income by occupation

Figure 24: Credit card Distribution by Occupation

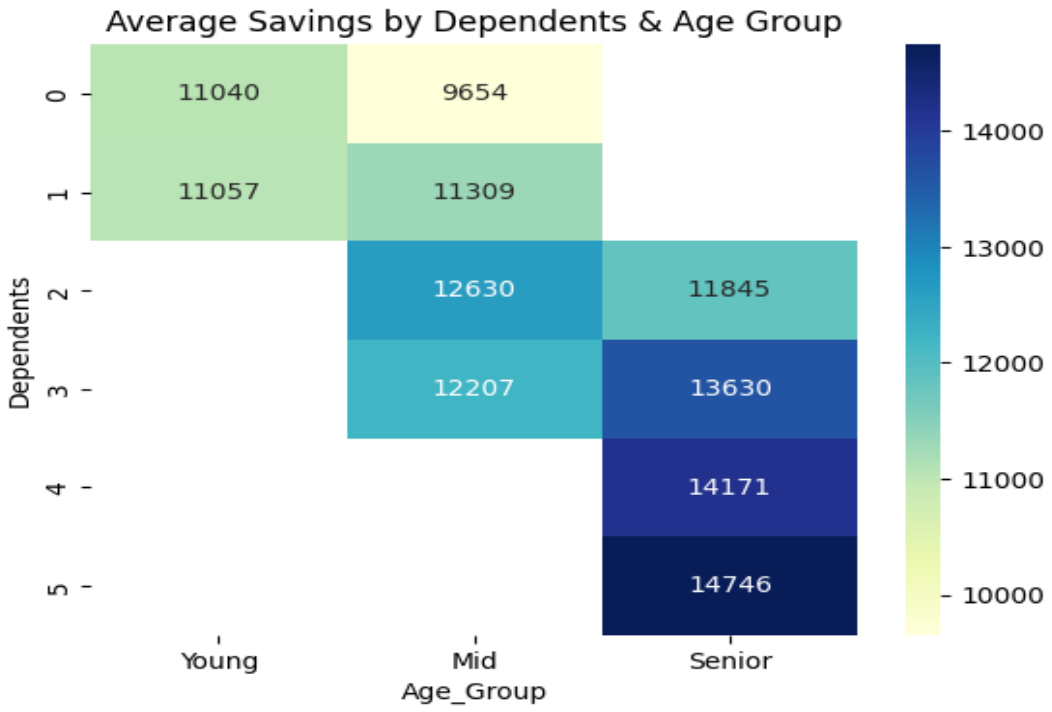

Figure 25: Heatmap representation of average saving by dependents and age group

Bivariate Insights

- There is a positive correlation between income and savings, showing that individuals with higher income generally save more.
- The rate of savings increase slows for high-income earners, indicating that lifestyle and discretionary spending rise with income.
- Occupation strongly influences income levels, with IT, finance, and business professionals earning the highest averages.
- Students and freelancers display lower and more variable incomes, reflecting less financial stability.
- Credit score distribution varies across occupations, where permanent employees in stable jobs maintain stronger credit histories.
- Freelancers and contractual workers show greater fluctuation in credit scores, due to irregular income and repayment patterns.
- Middle-aged users (30–45 years) with fewer dependents achieve the highest savings rates, balancing income and responsibility effectively.
- Both younger (below 25) and older (above 50) individuals tend to save less, influenced by career stage and family commitments.

MULTIVARIANT VISUALIZATION

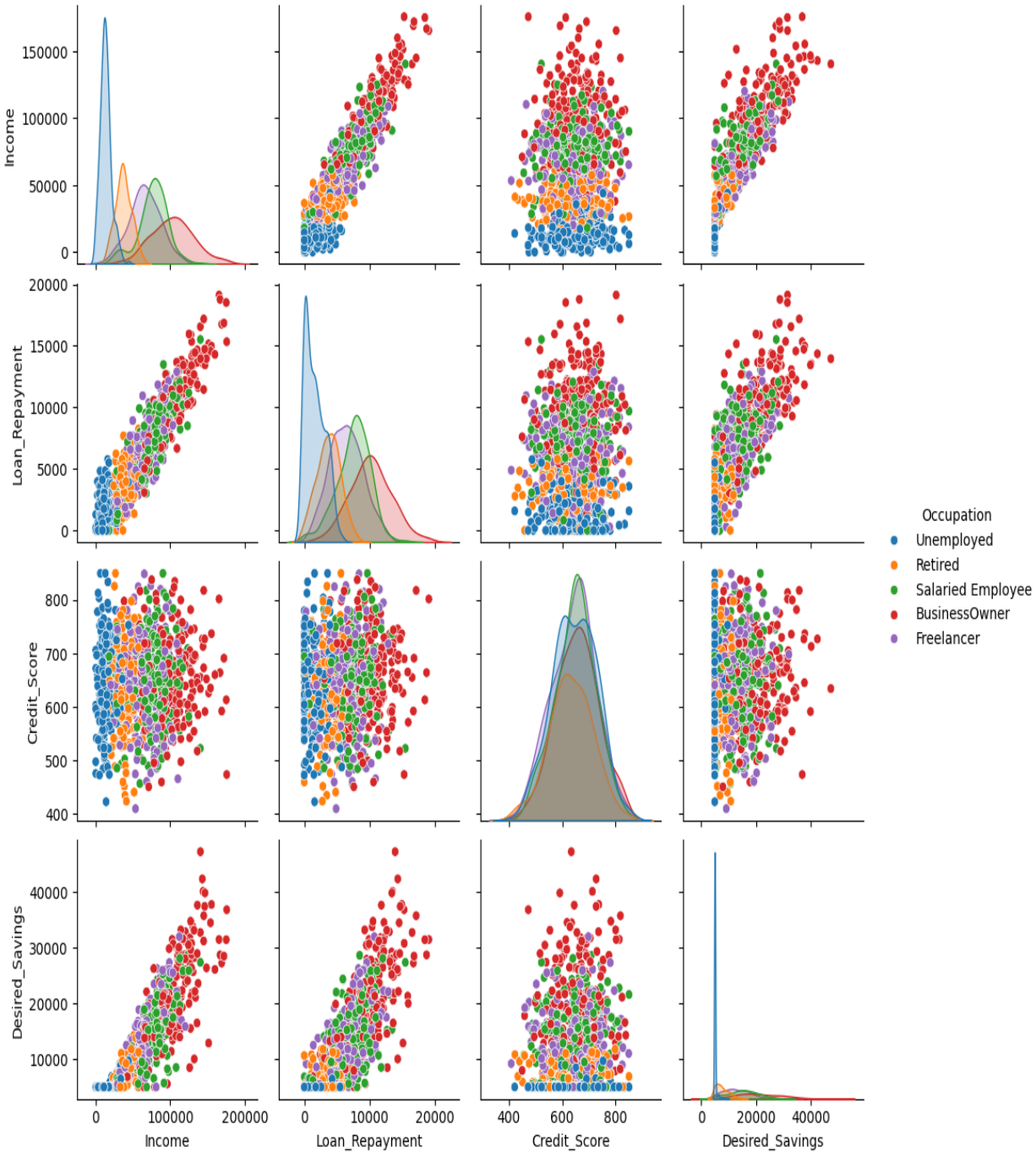

Figure 26: Pair plot Visualization of Expenses of user based on occupation

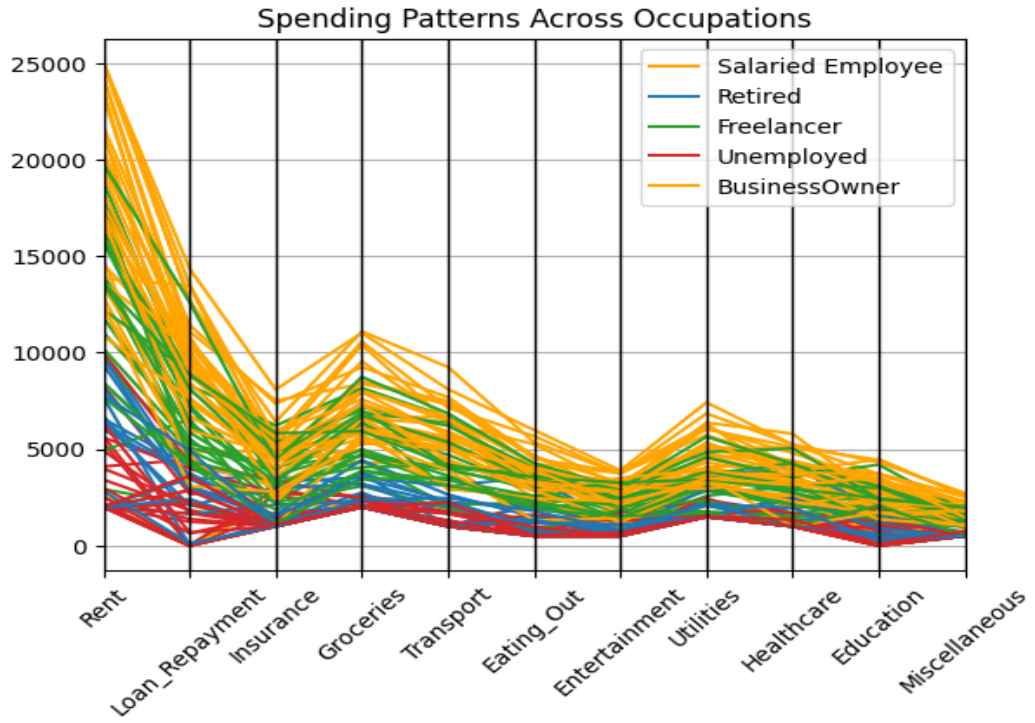

Figure 27: Spending patterns across occupations of expenses

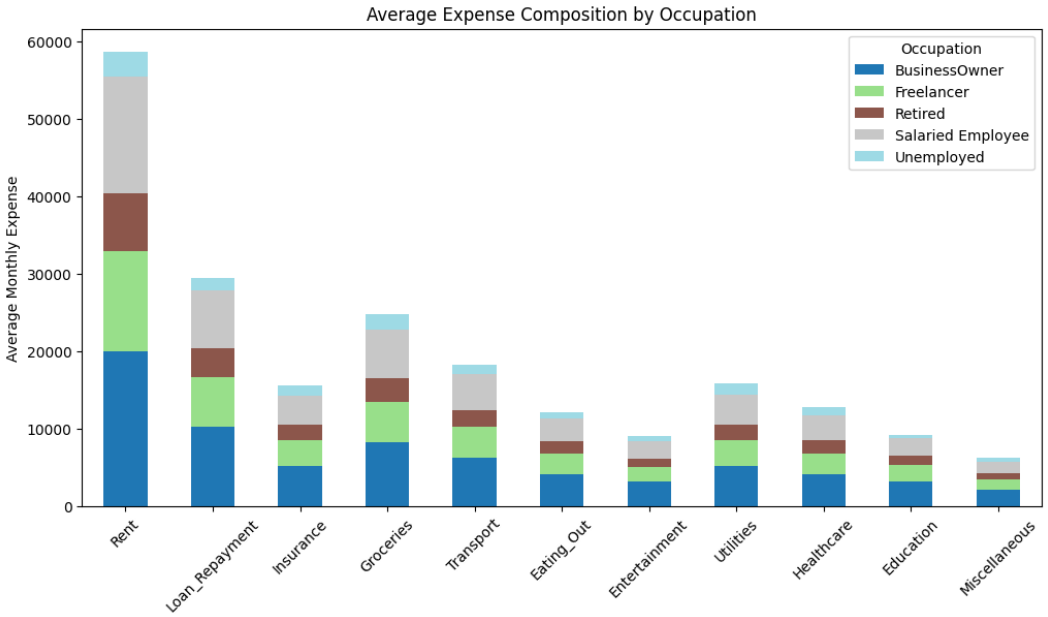

Figure 28: Average Monthly Expense by Occupation

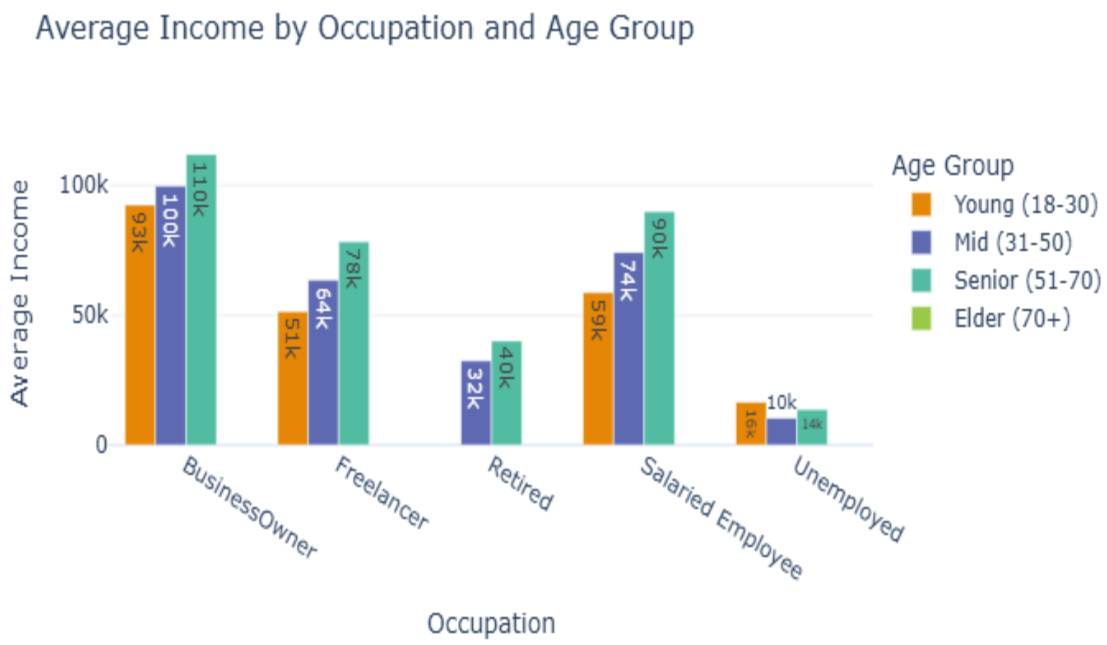

Figure 29: Average Income by Occupation and Age Group

Figure 30: Average Credit Score by Dependents and Occupation

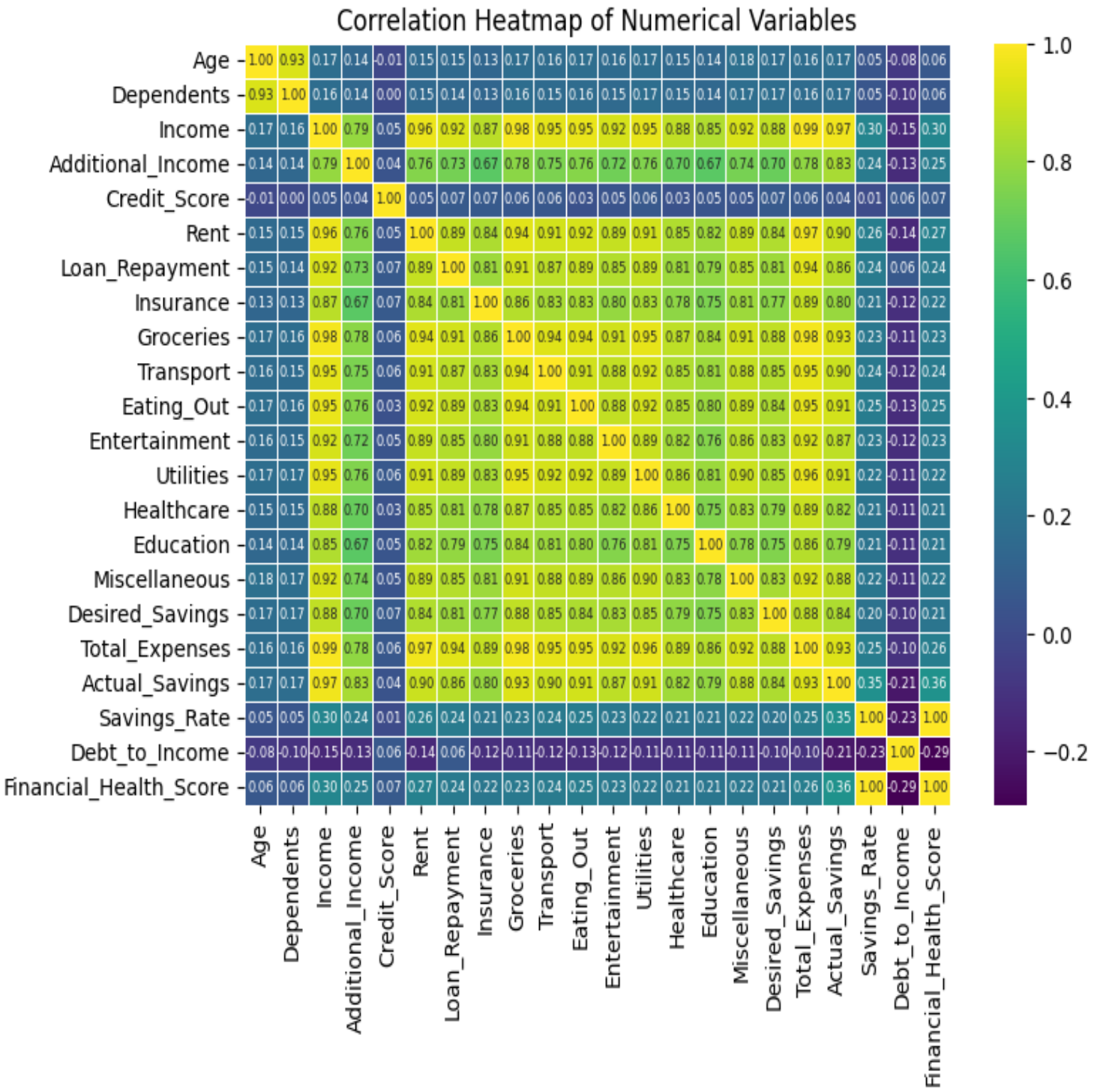

Figure 31: Correlation Heatmap of all Expenses

Multivariate Insights

- The pair plot reveals distinct spending clusters by occupation — business and IT professionals show higher expenses across most categories, while students and homemakers cluster around lower overall spending.
- Spending patterns across occupations indicate that lifestyle-based expenses (entertainment, eating out, transport) vary more with occupation than with income alone.
- Essential expenses such as groceries, utilities, and rent remain relatively stable across groups, but discretionary expenses differ sharply between corporate and non-corporate roles.
- Average monthly expense by occupation confirms that salaried employees have predictable, moderate spending, while self-employed and business users exhibit irregular peaks and valleys in monthly outlay.
- Combining occupation, age group, and income) shows that mid-career professionals in the 30–45 age range achieve the highest income levels, while younger workers earn less but spend proportionally more.
- Older professionals (>45 years) demonstrate higher income stability yet allocate greater proportions toward healthcare and insurance, affecting overall savings.
- Average credit score by dependents and occupation highlights that creditworthiness declines slightly as dependents increase, even within the same job category—reflecting higher financial load.
- The correlation heatmap of expenses reveals strong positive relationships between entertainment, eating-out, and transport costs—indicating a common lifestyle-driven spending pattern.
- Weak or negative correlations between savings-oriented categories and discretionary spending suggest that increased lifestyle expenses directly reduce potential savings, emphasizing the need for balance in financial planning.

MACHINE LEARNING MODELS VISUALIZATION

Figure 32: Actual vs Predicted Savings (Regression Model)

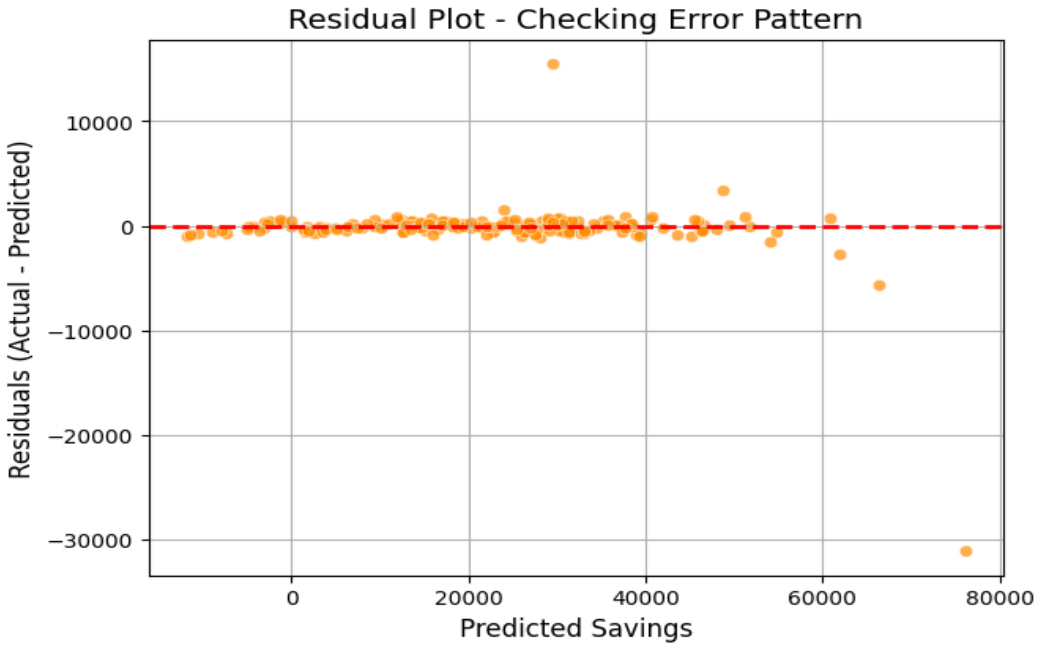

Figure 33: Residual Plot - Checking Error Pattern

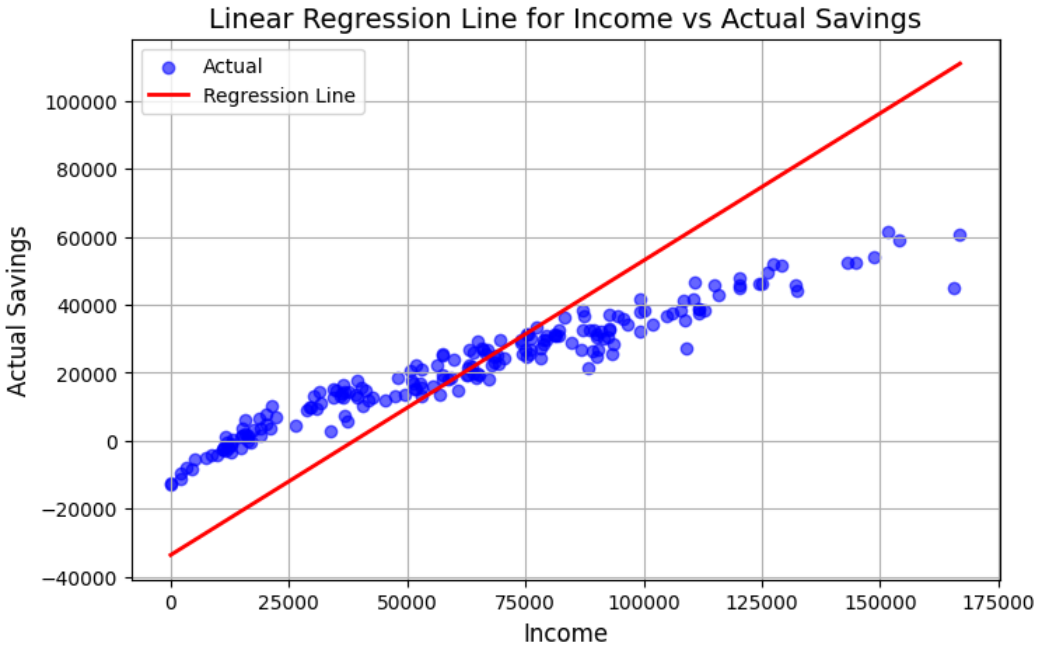

Figure 34: Linear Regression Line for Income vs Actual Savings

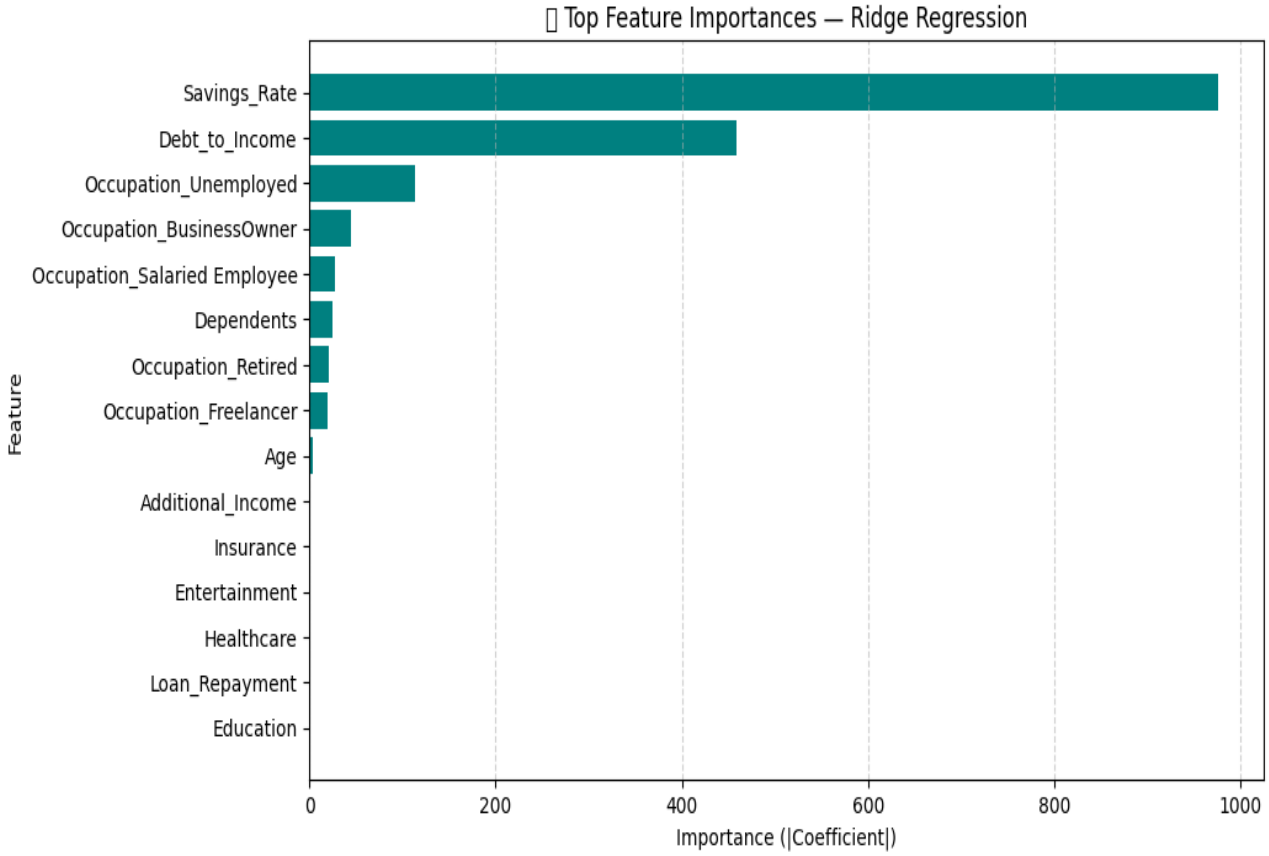

Figure 35: Ridge Regression of Expenses