**The Case:**

In the provided file “[Bank.csv](https://q.utoronto.ca/courses/323171/files/26355545?wrap=1)[Download Bank.csv](https://q.utoronto.ca/courses/323171/files/26355545/download?download_frd=1)” we are presented with a sample of 4499 customers of a large Canadian bank that currently has a surplus of liability customers, i.e., depositors. The bank would like to grow their asset customer base, i.e., borrowers, through a targeted marketing campaign. Previous marketing efforts were able to garner a roughly 10% conversion rate, where a conversion was considered to be a sale of a personal loan product to an existing liability customer.

From this campaign, which was held in Toronto, a data set was established and to be used to improve the efficiency of this year’s marketing campaign. This efficiency boost will stem from designing a segmentation strategy to identify clients that are most likely to convert on the personal loan, and then focus marketing on this group.

All sampled customers have a financial advisor/planner with this bank. The financial planners are mobile and can come to the customers if they wish so, however, listed in the data set are the branches that they most often serve. Financial advisors earn commission if they can advise customers to buy a personal loan product.

**How to:**

Please work out of the provided jupyter notebook [file](https://q.utoronto.ca/courses/323171/files/26355510/download) for this project. The items in the notebook are grouped into three sections:

1. Basic Data Cleaning
2. Visual Data Exploration
3. Business Analytics

All sections A, B and C have guiding questions that can help you complete the project. Section B covers "matplotlib" library for plotting. Since it was not covered in the modules, incomplete codes are provided to guiding texts to complete the codes. The project also contains some qualitative question that you are expected to provide answers to on the notebook itself. Either user markdown cell type or comment out your answers for these questions.

**Item to submit:**

* The jupyter notebook file with all three sections completed with required codes and answers

**Data Dictionary:**

|  |  |
| --- | --- |
| **Column Name** | **Description** |
| Age | Customer's age in completed years |
| Experience | Number of years of professional experience  Negative value refers to numbers of years before graduation |
| Income | Annual income of the customer ($000) |
| Branch Address | Address of customer’s home branch |
| Family | Family size of the customer |
| CCAvg | Avg. spending on credit cards per month ($000) |
| Mortgage | Value of house mortgage if any ($000) |
| Personal Loan | Did this customer accept the personal loan offered in the last campaign? |
| Brokerage Account | Does the customer have a brokerage account with this bank? |
| GIC Account | Does the customer have a Guaranteed Investment Certificate (GIC) account with this bank? |
| Online | Does the customer use internet banking facilities? |
| CreditCard | Does the customer use a credit card issued by this bank? |
| Advisor Name | Customer’s financial advisor/planner with this bank |
| Advisor Designation | Financial advisor’s designation |
| Advisor Branch Addresses | The list of branch addresses that a particular advisor most often serves, separated by semicolon. |

**Brief “Financial Glossary”:**

* Designations:
  + PFP: Personal Financial Planner
  + CFP: Certified Financial Planner
  + For a discussion on the designations see, for example, [https://www.theglobeandmail.com/globe-investor/personal-finance/financial-advisers-a-tale-of-two-certificates/article4083578/Links to an external site.](https://www.theglobeandmail.com/globe-investor/personal-finance/financial-advisers-a-tale-of-two-certificates/article4083578/)
    - “The problem with the PFP is that it's redundant. The Certified Financial Planner, or CFP, is bigger, better and an ideal designation on which to build a single accreditation for the professional adviser.”
    - “To keep things super simple, look for the CFP if you're seeking true financial planning and not someone to sell you mutual funds. The PFP is okay, but it's the No. 2 brand.”
* A brokerage account allows customers to access more complex investments, such as stocks and bonds.
* A guaranteed investment certificate (GIC, French: certificat de placement garanti, CPG) is a Canadian investment that offers a guaranteed rate of return over a fixed period of time, most commonly issued by trust companies or banks.[1] Due to its low risk profile, the return is generally less than other investments such as stocks, bonds, or mutual funds. It is similar to a time or term deposit as known in other countries.[2]”
* [https://en.wikipedia.org/wiki/Guaranteed\_investment\_certificateLinks to an external site.](https://en.wikipedia.org/wiki/Guaranteed_investment_certificate)