Problem Statement

Group E

Nowadays, people own more and spend more on daily necessities and on various other items, making it difficult for them to have a control over their personal finance. After a brief survey, we found that very few people know where their money goes, and even few actually take actions to better manage their money. Thus, our team plan to design a **personal finance planning application** to help users manage their personal finance.

The application does the following:

1. **Allows for data entry, and categorizes spending into subcategories**

   The program will prompt user for their name, monthly income and budget for each subcategory of expense(ie: Food, Utility/Bills, Clothing, Other etc..). A hash table will then be developed with active budget numbers for each subcategory. The program will be able to parse inputs to determine what sub-category the expense should be assigned to. As users enter their expenses, the application will inform the user about how close they are to exceeding their budget for each sub-category. Data-structures will be pivotal to this program; particularly the use of dictionaries, tuples, and lists.

   Our team will also explore what other user data will be beneficial to collect; this is largely required in order to make the application more personalized, and provide insightful money-managing recommendations – such data may include occupation, number of dependants(kids), location, favorite brands, running subscriptions to services.

   The program will alert the user about overspending, and ask if the user would like to increase their budget. However increasing budgets will cause the user's 'fidelity score' to be lowered, because they aren't adhering to the strict rules of the financial planning tool. A high monthly 'fidelity score' makes the user eligible for different prizes and discounts. This way our tool is able to incentivize the user to save money. The fidelity score will be displayed after every daily entry of expenses. The user's 'fidelity score' starts at 100, and is reduces by 2 every time the user is $1 over-budget in any subcategory of expenses.

2. **Constructs periodic graphs of spending habits**

   After users input their data of spending, the application would calculate the amount by all categories, and generate a few fundamental charts by request (e.g. a command line or clickable button) such as pie charts for viewing spending percentage and bar charts for comparing or analyzing the differences among selected expenses. For the expense periods, we would start with basic daily, weekly ones, and if possible, functions of selected periods by users will also be under our consideration.

   In addition, for the income, users could have some fixed-term income and need no duplicate inputs such as monthly salaries. Other random income will also be available to include in personal income. After then, the savings could be calculated, and further suggestions could be made.

3. **Provides more fancy graphs**

   Aside from some basic summarizing graphs that users can generate to get an overview of their income and spendings according to types/time, we plan to offer some more fancy graphs/ visualizations for our users to better understand and control their spendings.

Firstly, we plan to design some personal well-being indicators for our users with which they can have a better understanding of their income. Also, we will add some functions that will show our users where their money has gone. For example, we plan to add an function that calculates users' personal **Engel's Coefficient**, which can give users an idea of whether their lives have been improved overtime.

In addition, our application will calculate several ratios which can indicate users' spending behavior/ preferences. And if possible, our application will conduct a spending behavior analysis for each user and return a particular type (shopaholic, thrifty, gourmet, etc.).

Likewise, we plan to show our users what are the average spendings of each spending type for the entire user-population, and, if possible, compare the data with national averages. In this way, users will know their position when it comes to spending in a national scope.

4. **Generates suggestions**

The function would calculate income/budget and expense to provide appropriate suggestions or recommendations for user in the following weeks or months.

There are two kinds of situations: surplus and deficiency.

If there is a **surplus**, the program will pull on data entered by user to generate personalized suggestions. These suggestions may include, but are not limited to; stock purchasing recommendations, news about promotions being run by the user's favorite brands. It will also let them know if they can move budgets for subcategories around if there are excess funds that can be allocated to sub-categories.

If there is a **deficiency**, according to the proportion of every expense categories, it would point out the possible overspending category to lower the expense in future days.