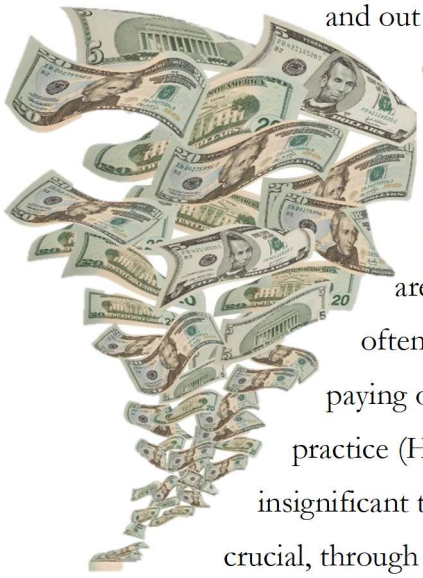
Financial Analysis

Ethan Johnsrud
September 26th, 2019

The flow of money is exceedingly intertwined throughout our lives. Flowing in one-hand on payday and out the other: in the form of bills, credit cards, or good old hard cash.

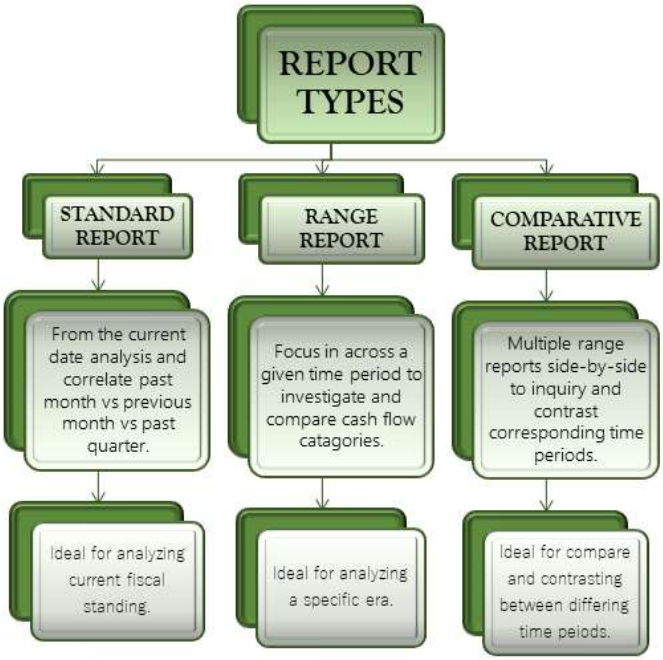


Cashflow, as it's coined in the business world, provides the greatest insight into financial activity. Analyzing cash flow can provide answers to several fiscal decisions. The greatest of these, may simply be recognizing positive or negative trends, major spending categories, and identifying appropriate areas to cut back or extravagant spending. In addition, tracking cash flow often initiates taking action in pursuing financial goals whether that may be paying off debt, establishing that investment, or realizing an unsustainable fiscal practice (Hamm, 2017). What may seem like decisive spending decisions can become insignificant through a macro-viewpoint or by diving deep can turn out to be extremely crucial, through the use of Financial Analysis.

(oneallawoffice.wordpress.com, 2012)

Abstract

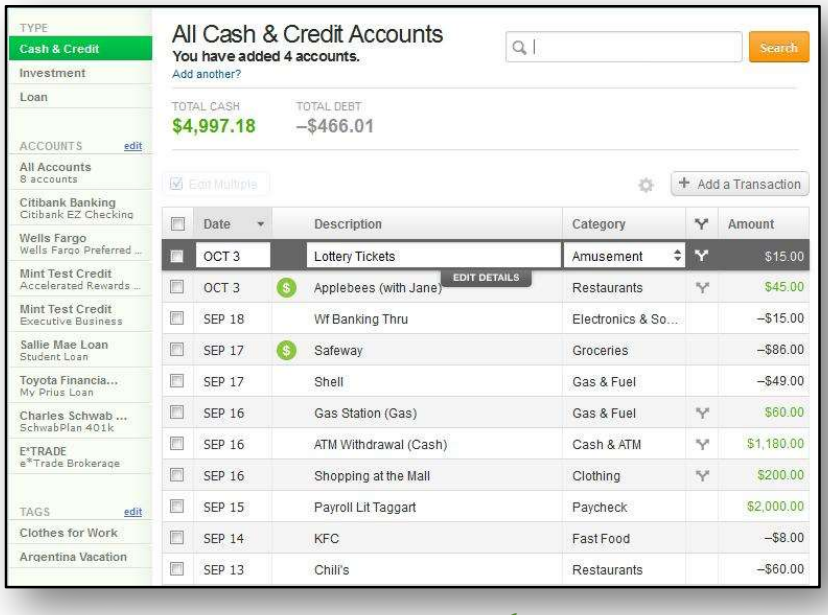
Financial Analysis is a new JavaFX desktop platform for the compiling of banking transactions to produce an understandable representation of an individual cash flow over a given time period. As an extension to Mint, an already prevalent money managing software. Users can import their banking and credit card transactions, as well as manually entering cash transactions. Through the categorizing of transactions, a wide array of possibilities can be selected or disregarded, to formulate a truly tailored report. Through the analysis, graphic representations show trends over varying periods of time. For greater detail, leading categories and greatest transactions are displayed allowing deeper insight into a person's spending habits. This custom report adapts to the individual and allows them to obtain a holistic viewpoint of their financial endeavors.



A variety of fiscal report types can be generated from Financial Analysis. Following the application' initial launch, a window appears where the downloaded CSV file is entered, and a report type is selected. The three available reports include a Standard Report, a Range Report, and a Comparing Report. All three reports differ in structure, while including the essential sections of analysis: trends and net transactions, gross expenses, spending expenses, gross income, gift expenses, and excluded expenses are listed. The Standard Report presents the individual's current financial situation. Incorporating preset aspects that show cash flow over the past month, previous month, and past quarter. Each report type encompasses a dynamic graph representation, leading categories, and dominant transactions. The Range Report is similar to the Standard Report but spans over a specified date range. Narrowing in on a particular financial time period allows better detail to be included in the report. The Range Report also contains an all-inclusive graph showing the fluctuations in money flow. This report encompasses the top 15 categories affected, up to 5 sources of income and 15 expenses. Lastly, the Comparative Report is essentially multiple Range Reports viewed side by side. The ability to see summaries of money over contrasting periods of time and identify the differences is certainly helpful for personal finance.

Acquiring Transactions

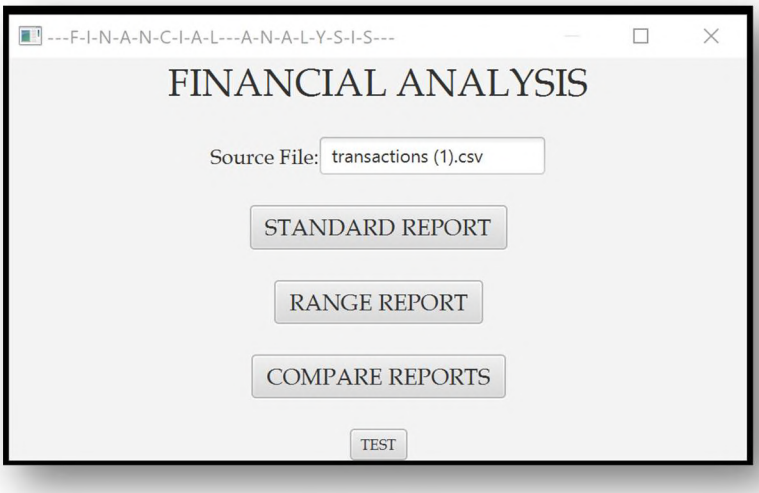
Mint by Intuit Inc. is a finance aggregation application; that syncs user bank accounts, credit cards, loans, and other accounts to help track incoming and outgoing money (Sraders, 2018). The service supports over 16 thousand US financial institutions, while retaining 20 million users (Prince, 2016). Mint's ability to access financial data enables an abundant number of users already on the platform to extend their fiscal inquiry to Financial Analysis. Additionally, setting up the application for a future add-on agreement or merger. As each alike, they share in their purpose of expanding the users fiscal realization resembled in Mint's moto: "When you're on top of your money, life is good," (Prince, 2016).



Mint's Transaction Recording Interface

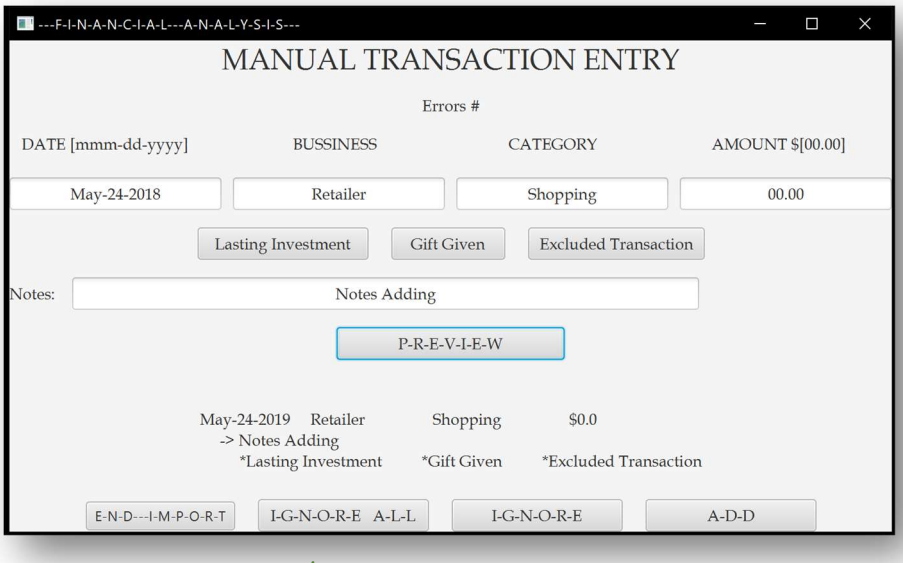
(createmyindependence.com, 2013)

Importing Transactions



Financial Analysis Opening Menu Display

When Financial Analysis is launched the first window requests the file to import the transaction details and the type of report to be generated. Following are two pop-up windows reminding the user of specific syntax that is not allowed such as additional commas or new lines in the transaction notes section. The second window asks, "Would you like to continue with Default Settings;" confirming would then allow the application to run quicker by skipping the analytic reporting, print formatting options, and using default level of detail in the report, to name a few. Directly following, Financial Analysis immediately begins reading in the transactions and temporarily storing them in the database. Since a user may have many years of transactions that could take a long time to record, the upload pauses at every calendar year, asking to continue. This drastically improves the efficiency of the process and diminishes the chance of an error by limiting the data to only that being used in the report. Errors, specifically in the importing process, do arise in the formatting variation. This is due to the wide variety of sources that the trasactions were collected. In the event of a glitch, a Manual Transaction Entry window appears; displaying the information gathered and allowing for it to be corrected before committing to the database. Furthermore, once all the transactions have been recorded from the file, the Manual Transaction Entry window appears again, allowing other transactions to be recorded that weren't on the books yet.

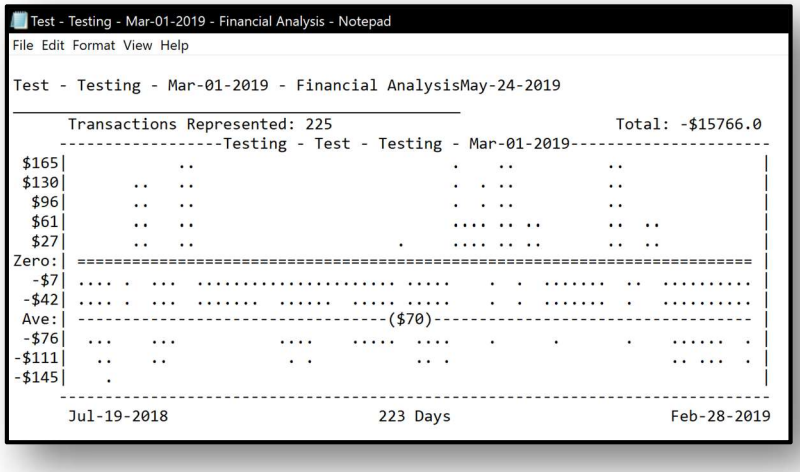


Manual Transaction Entry Window

Report Specifications

Before the report can be generated, or even the calculations configured; several settings and options need to be specified. The first requirement is entering a filename and depending on the report type the start date or range of dates to parameterize the computations. The first dilemma is to decide whether to use a median or an average in calculations, a considerable crisis in the field of statistics. For most cases of financial calculations, outliers are few and weak. The next inquiry is determining the outlier factor, a number between one and five stating how strong a transaction amount can differ from the median or mean before it is restricted. Another settings feature is the ability to override income in operations. This allows positive transactions or debits to not be limited by the outlier rules, since for most circumstances the median of the over-all transactions will fall as a negative expense. The most intuitive feature is recognizing lasting transactions, these may be considered an investment or significant purchase, that it would be unfair to skew the data on that single date. The solution is to split lasting transaction in thirds, dating one transaction a month earlier, and the other transaction for the month following; hence reducing the total amount and its individual impact on the collective analysis. Selecting 'Default Settings' at the beginning of the report, would allow the client to disregard any stipulations and advances to the report.

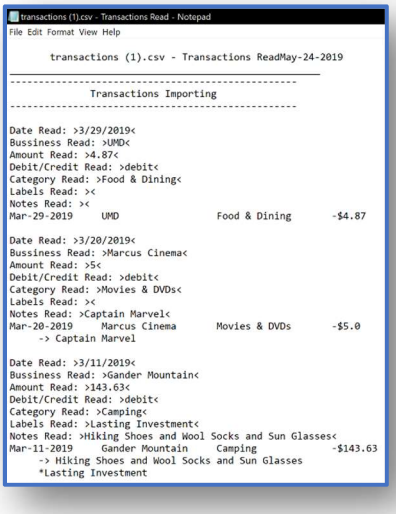
Lastly, the opportunity to manipulate the graphical appearance is available. Assuming the user didn't continue with 'Default Settings' and select a 'Custom Report' a few additional preferences are available. For example, the default layout is page formatted so it can be disabled to allow larger trend graphs and transaction lists. Many of the inclinations are typesetting various aspects of the graphs that show cash flow trends as a function of time in a histogram representation. Selections include: the fill symbol of the graph, the white-space character, and the mean or median line. While any of the 137,928 Unicode characters may be used, popular selections revolve around the asterisk and dash. This versatility for those users who wish to customize their report to the character, is a unique feature to Financial Analysis.



Graphical Representation or Cash Flow Trends

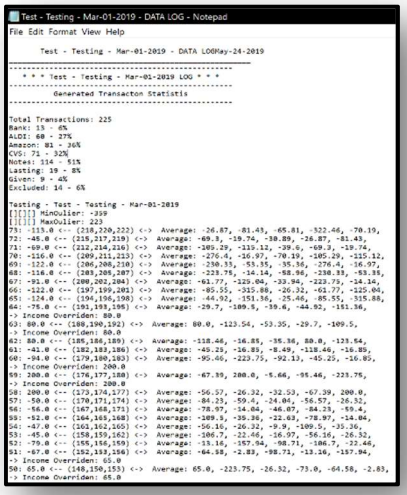
Finally, it is time for the report to be generated. It is important to note, continuing with 'Default Settings' will allow the client to directly produce the Financial Report. There is no user input during this stage, in fact the application self terminates after the report has successfully completed and exported to a text file. The file may then be opened and viewed, revealing the truth behind the cash flow.

Documentation



Importing Transactions

In addition to the Financial Report, a few supplementary reports are created. Two logs are constructed to track the operations performed by Financial Analysis. While the transactions are imported, a log is generated; recording the data read from the CSV file and how the data was then interpreted into the database. Also, any errors or exceptions that occurred during the import process are included. The second log is assembled to incorporate all calculations performed in generating the report. This may include outlier values of data sets and average calculations for each column in the graph. These reporting logs may be skipped for quicker processing through the setting details. This data is helpful in identifying logic errors or if the issue initiated with poor data, the matter can be traced and resolved effectively.

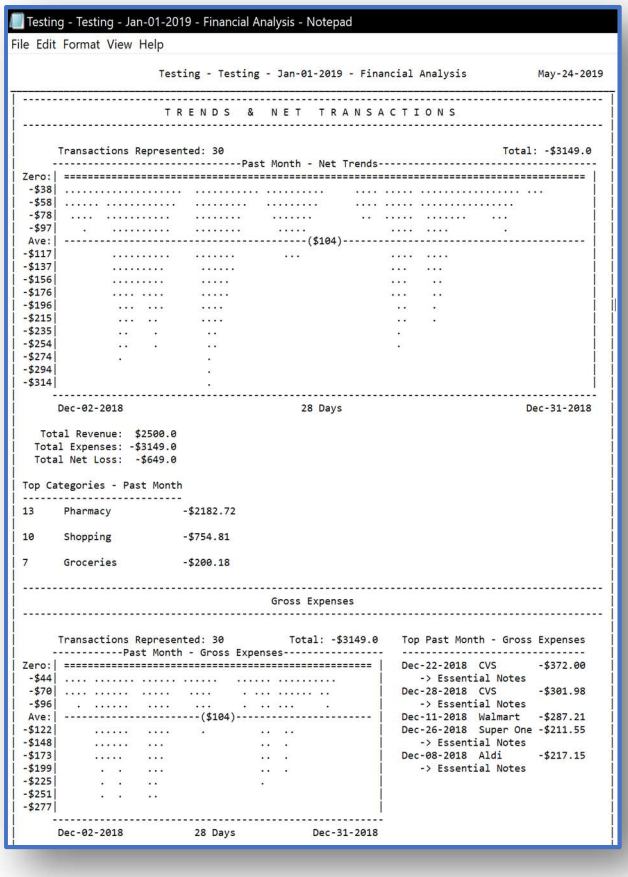


Calculations

Financial Report Design

The Financial Report is laid out in sections with similar, yet varying aspects. The 'Trends and Net Transactions' region displays a full graph spanning the encompassing era. Next is a listing of leading categories; first is primary five sources of income and then proceeding fifteen dominant expense classifications. This section provides an overarching view of the cash flow for the comprised duration of time.

The following sections are identical in design, still differing in nature by transactions displayed. Collectively each category is comprised of a section header with a graph taking up two-thirds of the area on the left side and a ranked list of five leading transactions to the right. Then this section is repeated for the past month, previous month, and past quarter. The display of the past quarter finances includes a bit more detail, usually displaying a full graph and fifteen leading transactions. Concluding the report is an exhaustive list of excluded expenses from calculations. These may have been removed for a variety of reasons often for an identified opposite matching transaction, such as a reimbursement. Sometimes a transaction is explicitly set aside, such as a substantial rare purchase, and the results are more representative with this exclusion.



Example of First Page of Standard Report

Variations to the design above results from the fluctuation in report types. The Standard Report shows fiscal cash flow over time, from the current starting date. While, the Ranged or Comparing Reports encapsulate the entirety of the span; hence, only including a single representative graph and corresponding list of fifteen leading transactions. Still, all the sections are presented, simply focusing on the interval at hand.

Financial Analysis extends the opportunity to pursue understanding into their users' financial endeavors. Importing the transaction history from Mint to include all fiscal activities enabling opportunities to log processes for individual detail analysis. This also allows it all to be bypassed for the sake of efficiency. In performing calculations on data, numerous options are presented to manipulate in order to meet the situation. Also, the Financial Analysis application specifies the report details of the layout, down to the characters used in graphical presentations to be tailored. Three varieties of Financial Reports, Standard Report, Ranged Report, and Comparative Report, differ to match the given locality. Ultimately, the completed report is conveniently exported to a universal text file to be viewed and shared effortlessly. All this functionality converges to provide the greatest financial insight to enable progress in cash flow related decisions.

References

Hamm, T. (2017). Personal Cash Flow and You. *Personal Cash Flow And You*, Retrieved from https://www.*thesimpledollar.com*/personal-cash-flow-and-you/

How to Manage Transactions (Including Cash Transactions) in Mint. (n.d.). *Learning New Things*, Retrieved from https://www.*createmyindependence.com*/2013/09/18/manage-transactions-including-cash-transactions-mint/

JTONEAL7, (2012). Cash and Carry? Should You Be Wary?. *Law and Life Blog*, Retrieved from https://*oneallawoffice.wordpress.com*/2012/09/21/cash-and-carry-should-you-be-wary/

Prince, K. T. (2016). Mint by the Numbers: Which User Are You?. *MintLife Blog*, Retrieved from https://*blog.mint.com*/credit/mint-by-the-numbers-which-user-are-you-040616/

Sraders, A. (2018). Is Mint Safe? What to Know About the Budgeting App in 2019. *TheStreet Personal Finance*, Retrieved from https://www.*thestreet.com*/personal-finance/is-mint-safe-14814998