**Gross Profit Analysis**

One of the metrics used to determine profitability for a company is the Gross Profit margin. According to [Investopedia](https://www.investopedia.com/ask/answers/101314/what-are-differences-between-gross-profit-and-net-income.asp), Gross profit represents the income or profit remaining after the production costs have been subtracted from revenue. Revenue is the amount of income generated from the sale of a company’s goods and service, while cost of goods sold is the direct cost incurred in the production of the goods or in rendering services by the company.

Here, we will show how to generate the gross profit of a Company using Python. First, the journal entries and chart of accounts for the period will be obtained. Then both files will be merged, and unwanted columns will be removed. Journal entries relating to revenue from contract to customers and cost of sales will be filtered and arranged in a chronological manner (from January to December). Finally, we will determine our gross profit and plot a graph showing the revenue, cost of sales and gross profit.

Let’s start by importing the pandas and matplotlib library, and reading the journal entries and chart of accounts into a dataframe

XXX Code for import XXX

XXX Picture of output XXX

The journal entry dataframe contains a lot of information, however we will focus on the information needed (which is the GL Code, Source, Effective Date and Functional Amount). A new column was included showing the month when the journal entry was effective. This was done using the *panda’s series datetime function.* The effective date of the journal entry was selected over the entry date because it shows when the transaction is expected to be effective and this is more reliable than the entry date.

XXX Code XXX

XXX Picture of output XXX

The chart of account and the journal entry dataframe was then merged and other unwanted columns was deleted (dropped). After this, we were left with the Source, Functional Amount, Month, Account type and Class columns.

XXX Code XXX

XXX Picture of output XXX

Next, the journal entries relating to revenue from contract with customers and cost of sales was filtered, arranged in a chronological manner, and rounded up in millions for easy presentation. Owing to the fact that the figures for revenue from contract with customers has a negative connotation in the trial balance, the amount was multiplied by -1 to convert it to positive numbers.

XXX Code XXX

XXX Picture of output XXX

The graph below shows the monthly revenue from contract with customers and cost of sales. As an auditor, and depending on the nature of the business, there are various questions to be asked here. For example, why is the revenue from contract with customers peaking at certain times during the year (January, February, June, September, October)? Are they booking more profit at the end of each quarter to report more profit quarterly? Why is the cost of sales so high in December when compared to other months? Is the Company trying to reduce it’s earnings this period because it surpassed its budget so as to report more profit next year? *Let’s leave this for the process owners to answer.*

Finally, the gross profit can be calculated. To do this, we first merge the revenue and cost of sales dataframe into one according to the month. Remember, our gross profit is the Revenue less Cost of Sales.

XXX Code XXX

XXX Picture of output XXX

We then plotted a graph showing how the revenue, cost of sales and gross profit.

XXX Code XXX

XXX Picture of output XXX

Thanks for reading.