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Gammath SPOT and gScore User's Guide

Version 10.8

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PURPOSE

The purpose of this document is to introduce Gammath SPOT (**S**tock **P**rice-**O**pining **T**oolset) software and explain how to use its stock analysis score along with its supporting subsystems.

OVERVIEW

Gammath SPOT (with patent-pending ingredient) is a free software for comprehensive technical analysis of stocks with a Graphical User Interface (GUI) and a Command Line Interface (CLI). SPOT can be run on a Mac, PC and Cloud. It consists of tools such as scraper, analyzer/scorer, estimator/projector, historian, backtester and screener that are packaged together and can be installed using Python's pip, or a CLI-only containerized version can be conveniently installed using Docker. SPOT software can also be obtained in source code form from GitHub.

For users who are not equipped to run the software (locally or in the Cloud), subscription services such as **_gScore_** *(the publication related to my stock analysis scores for my entire watchlist)*, *On The SPOT blog*, etc. are available via affordable plans from this website.

These tools are used to assist in smart, fast, and consistent decision-making (manual and/or automated). The intent is to identify stocks that meet the target return criterion for intended investment time horizon and then make buy/sell/hold decisions using a trading strategy that is back tested to preferably do better than the benchmark (e.g., S&P500) performance.

Each tool in this toolset has a specific purpose as described below:

- The scraper tool obtains the necessary information (from the Internet) for stock technical analysis. This is the only tool in the toolset that needs internet access. Rest of the tools can be run offline (unless you are running them in the Cloud).
- The analyzer/scorer tool analyzes the scraped data and computes a stock analysis score using my proprietary algorithm (as one of its ingredients) for each stock in the watch list to express its opinion on degree to which the stock is trading at a perceived premium or at a perceived discount.
- I'm calling this score gScore. The word "gScore" by itself has no meaning. I coined this word to mean Gammath Score to distinguish my stock analysis score in the marketplace. It is pronounced as "ga Score" (to reflect third consonant in Devanagari writing system that is transliterated here).
- The gScore is between -1 and +1. If the gScore is closer to -1 then it means that the algorithm perceives the stock to be trading at a premium. If the gScore is closer to +1 then it means that the algorithm perceives the stock to be trading at a discount.
- *Please note that gScore is NOT G-Score/G Score/g-score/GScore* as gScore differs in its usage, appearance, spelling, pronunciation, meaning and sits on top of totally different stock analysis and scoring system.

- The analyzer/scorer tool also generates charts to show the micro-gScores in one convenient file that help visualize and correlate micro-gScores with the stock price movement.
- The analyzer/scorer tool also has a feature that seeks to identify current moving estimated support and resistance levels for the stock's price. This can come in handy to determine current range of the stock price and how far the current price is from the current "top" and current "bottom".
- The analyzer/scorer tool also generates chart to help visualize current support and resistance level along with stock price.
- The analyzer/scorer tool also computes stock news headlines sentiment analysis score for each scraped news headline for the stock. This score is -1 and +1 reflecting the interpreted polarity (negative or positive) of the sentiment. This mean score for approximately last 100 news headlines is included in the summarized results in overall gScores and in the signals.txt file corresponding to the stock.
- Below is an example of gScores presented for a sample watchlist from the past (i.e., this is not current data):

sample_watchlist_overall_gscores

Ticker	sh_gscore	sci_gscore	final_gscore	newshl_sams	Note
GOOGL	-0.56	0.15	-0.41	0.09587	
AMZN	-0.4	0.0	-0.4	0.16608	
PEP	-0.43	0.03	-0.4	0.16335	
AAPL	-0.21	0.03	-0.18	0.14513	
AMD	-0.31	0.14	-0.17	0.09972	
MSFT	-0.25	0.08	-0.17	0.10123	
META	-0.25	0.12	-0.13	0.09989	
NVDA	-0.24	0.11	-0.13	0.13147	
BRK-B	-0.16	0.11	-0.05	0.13664	
TSLA	-0.07	0.16	0.09	0.12229	
CAT	0.28	-0.03	0.25	0.10304	
WMT	0.16	0.09	0.25	0.07228	
BAC	0.08	0.19	0.27	0.07381	
PFE	0.23	0.06	0.29	0.09751	
INTC	0.18	0.18	0.36	0.01944	
DE	0.22	0.16	0.38	0.03632	

Trading at a perceived premium

Trading at a perceived discount

Figure 1: Sample watchlist with gScores and micro-gScores

- It is important to note that the gScore by itself does NOT indicate a buy/sell/hold signal. It needs to be incorporated in a trading strategy to make buy/sell/hold decision on stocks.
- Example of an automated trading strategy (long-term and short-term) is provided in my back testing example source code that the user can use as a starting point. This can be customized to match your specific trading strategy.
- For manual decision-making, I describe how to use this system effectively in my On The SPOT blog where gScores and micro-gScores are discussed/explained with real examples (free samples of the blog are available here). Access to this blog and premium content is available for subscribers who purchase the Premium subscription plan from my website.
- Price Estimator/Projector tool is used to estimate and project moving future price/value of the stocks and S&P500. It also generates charts to visualize corresponding projections.
- Historian tool is used to generate the gScores' history for the respective stocks in the watchlist. This is used for correlation of price with different micro-gScores. Please note that the first time you run the historian tool for your watch list, it will take long time to run as it computes gScores for approximately last 5 years. Subsequent runs should take a lot less time as it reuses the existing gScores history. It is recommended to use a smaller watchlist (e.g., a list of closely watched stocks that the user wants to trade [buy/sell/hold]) for generated gScores history. The gScores' history is very helpful in formulating and verifying how a trading strategy.
- Backtester tool is used to test a trading strategy using historical gScores and micro-gScores. The user can check how the strategy did historically and then decide on whether to use the respective trading strategy for making concurrent buy/sell/hold decisions.
- The Screener tool is used to generate a list of stocks based on the micro-gScore-based filtering/screening criteria. This way, users can easily generate a list of stocks to focus on.

WHERE DO I FIND GENERAL INSTRUCTIONS?

For instructions on installation, obtaining source code, building, and running the scraper, scorer, pep, historian, backtester and screener tools, please refer to the link here. You can also find *introduction and instruction videos here.*

HOWTO USE THE GAMMATH SPOT GUI APP?

The Graphical User Interface of Gammath SPOT is self-explanatory. Enter the ticker symbols in the "Watchlist" table, save it using the "Watchlist" menu and you can start using the toolset. Note that when a tool is running, other tool buttons and operations such as updating of the watchlist are disabled. These are re-enabled when the tool completes its execution. This is also the case when a new watchlist is being created. Tools will be re-enabled after the new watchlist is saved. You can browse through the results using the Results menu item or you can choose to use your machine's native apps such as file explorer, web browser, PDF viewer, spreadsheet

program to directly view the detailed results. The GUI looks like the picture shown below (actual image might vary depending on user's OS).
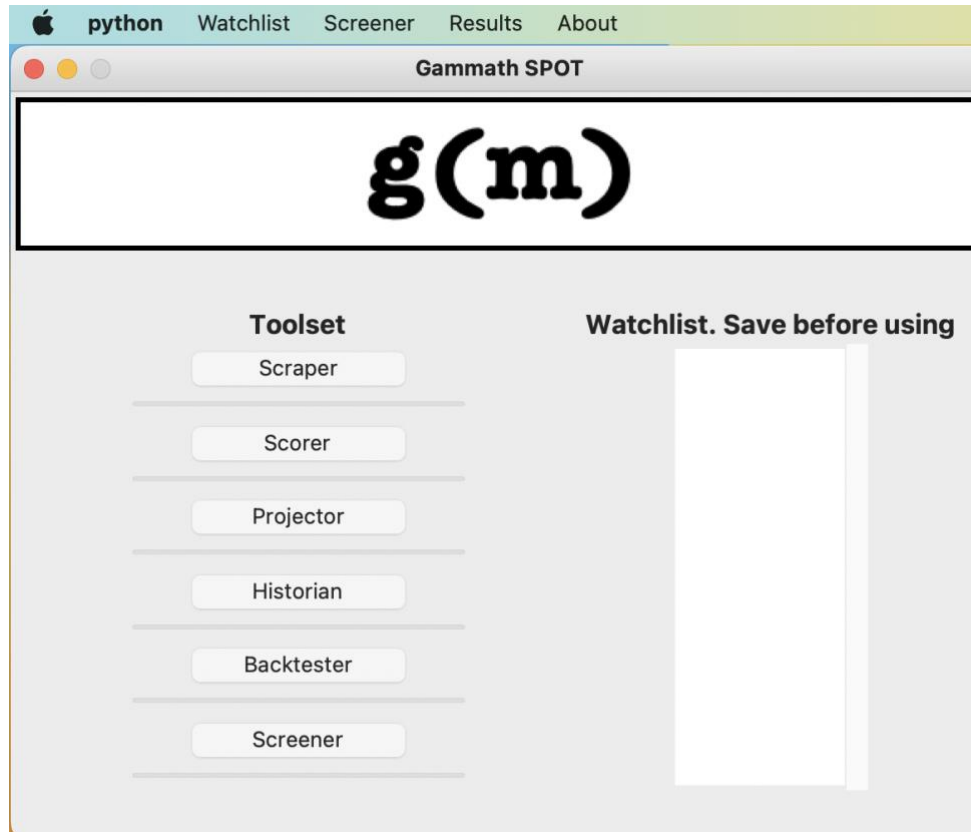
HOWTO USE GAMMATH SPOT TOOLSET?
The typical order of using these tools is as follow:

1) Run the Scraper tool to collect the data for analysis.
2) Run the Scorer tool to analyze information, to compute gScores/micro-gScores, to compute useful probabilities, to calculate support and resistance levels, to compute news headlines sentiment analysis score and to draw corresponding charts for the stock.
3) Run the Price estimator and projector tool to get future moving estimated price projection and corresponding chart for stocks (and S&P500). Pick the stocks that meet future return criteria and create a "closely watched" watchlist.
4) Run the Screener tool to filter out stocks based on micro-gScore-based filtering criteria. This should make it easier to create a "closely watched" watchlist.
5) Run the Historian tool to generate historical gScores/micro-gScores (approximately last 5 years) for "closely watched" watchlist created from step 3.

6) Run the Backtester tool to test your strategy for the "closely watched" watchlist created from step 3. Based on how the strategy did over historical intervals, one can decide whether to use it for contemporary trading (buy/sell/hold) decisions. An example of back testing for a short-term and long-term trading strategy is provided with the software. It also generates "Todays_Actions" that can be used as convenient summary of buy/sell recommendations of the day if one chooses to use the default strategy implemented for back testing.

7) This way the entire technical stock analysis and decision-making process is fully automated.
   Please remember to check the relevant news before trading to make informed decisions.

HOWTO USE THE GAMMATH SCORE (gScore)

I think that gScore is a clear, easy, and effective way of comprehending technical analysis of stocks. Following are some manual ways in which I have used gScores that has served me very well. For automated ways, please refer to the back testing source code example for more detail.

1. I use gScore for better dollar cost averaging i.e., Instead of buying my favorite stock (i.e., a stock I have researched and like the business and fundamentals of the company) on arbitrary days, I choose buying over a time interval after gScore is relatively higher (for example in above list, I would consider buying WMT after its gScore is 0.54 as opposed to when its gScore is -0.44).

2. I consider buying (meaning I add the stock to my closely watched list) when stock's gScore is more than 0.5 (higher the better unless I have strong reasons to buy at lower gScore). If you are using the historian tool, then the gScores' history can be examined to decide on a "buy zone" (back testing example in the software might help clarify).

3. I consider selling (meaning I add the stock on closely watched list) a stock when its gScore is less than -0.5 or when any of my sell criteria are met (back testing example in the software might help clarify for long-term and short-term criteria).

4. I diversify as much as possible i.e., if there are 10 stocks in my watchlist that have a gScore of more than 0.5 then I consider buying stock(s) of as many of those 10 companies that I like (starting with small quantity).

5. I tend not to buy when the stock price is falling. So, as mentioned in point 2 above, once the gScore is above 0.5, I put the stock on closer watch, and I prefer to buy only when the stock price starts rising. Similarly, when gScore is negative, I put the stock on closer watch, and I prefer to sell only when the stock price starts falling (and my sell criteria is met). The support and resistance level computed by this toolset for the stock could be helpful in this step.

6. I check the news of specific company and evaluate any positive or negative impact of the news before deciding to buy/sell/hold. The stock news headlines sentiment score could help in gauging the sentiment in most recent news.

7. I check the general news affecting the markets before deciding to buy/sell/hold.

8. If you run Gammath SPOT on your machine or in the cloud or have subscribed to a premium plan from my website, then the stock's signal.txt file and charts (for graphical visualization) can be checked for finer detail (described later in this document) before making buy/sell/hold decision. There are many criteria logged in it and can be used to match personal preference.

9. A significant component of this algorithmic analysis is the historical price data. As a result, I prefer to invest in stocks that have at least 5-years price history.

10. I prefer to invest in stocks that have a positive 5-years and 1-year return on investment.

11. I use micro-gScores and gScores history to fine tune my buy/sell/hold criteria.

12. It is much easier to explain how gScore-based dollar cost averaging would work from back testing example. I have provided a default back testing example (for short-term and long-term investment horizon) in the source code to show one way to do this.

13. I do not use a strategy unless I know that it has consistently worked at least historically.

14. I backtest my strategy on each stock on my closely watched list before deciding which strategy to use. Please refer to the backtester tool source code for an example.

15. I tend to use current-info-component (sci_gscore) of gScore as a filtering criterion and then on that filtered list, I use the stock-history-component (sh_gscore) of gScore for historical analysis and back testing.

16. Once I finalize a thoroughly back tested strategy to use, I simply use the "Todays_Actions.csv" (generated by backtester tool) to get a list of "today's" buy/sell actions. This saves me a lot of time.

17. Please note that if the strategy doesn't conclude "buy"/"sell" decision for any stock in your watchlist on the day then this list would be empty. There could be many days where there is no buy/sell activity. This is fine as it depends on the strategy chosen. One can verify strategy's prior recommendations in stock-specific back testing stats as described here.

Please note: *Past performance does not guarantee future performance*.

HOWTO BACKTEST MY STRATEGY?

A general strategy that uses gScores is provided in the source code as an example. The intent is to show a strategy for the short-term (less than 1 year intended holding time interval) and a strategy for the long-term (more than 1 year intended holding time interval) as an example to make buy/sell/hold decisions. You can check the results in the corresponding files (described in later section). You can use the historian-generated charts to correlate and come up with a different strategy that matches your investment style.

WHERE DO I FIND gScores?

If you are using the free version of Gammath SPOT software or have subscribed to one of my subscription plans (for my watchlist), then gScores (for entire watchlist) are saved in a file name

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'`<watchlist_name>_overall_gscores.csv`' (e.g.:
'`sample_watchlist_overall_gscores.csv`') in the '`tickers`' directory.

HOWTO INTERPRET OVERALL_GSCORES.CSV?

The six columns in this file are:

a) `ticker`: Stock ticker symbol of the company.

b) sh_gscore and sci_gscore show the two components that makeup the overall gScore. sh_gscore is stock history (sh) based gScore component and sci_gScore is stock current information (sci) based gScore component. Current information (sci) based gScore component can be used as a filtering criterion.

c) `final_gscore`: Overall gScore (between -1 and +1).

d) `newhl_sams`: Mean sentiment score for approximately last 100 news headlines (when available). Each news headline sentiment score is between -1 and +1.

e) `Note`: This field contains special notes. For e.g., '`NO_PRICE_DATA_FROM_TODAY`' indicates that stock history is not valid (data could be stale) so the gScore for that stock should NOT be used for concurrent decision-making.

WHERE FROM DO YOU OBTAIN FREE DATA FOR ANALYSIS?

Currently, Gammath SPOT uses free data available from the following sources:

1) FRED (Federal Reserve Bank of St. Louis)
2) Wikipedia
3) Yahoo Finance
4) Stocktwits
5) Google Finance

This list can change as some free data availability isn't always reliable.

WHERE DO I FIND DATA USED FOR ANALYSIS?

The stock-specific scraped data used and formatted by Gammath SPOT can be found in '`tickers/<ticker_symbol>`' directory. For example, data used for analysis of Apple, Inc's stock can be found in '`tickers/AAPL`' directory. S&P500-specific data can be found in the '`tickers`' directory. The first time you run the Scraper for a stock, it will obtain the entire history (up to 10 years if available) from the Internet. Subsequently, it will attempt to obtain the stock history date only from last scraped data date to most recent available data date and reuse the previously scraped data. If you want to always obtain all history from the Internet, then simply delete or rename the `<ticker_symbol>_history.csv` file in corresponding sub-directory.

WHAT TYPE OF DATA IS USED/SAVED FOR ANALYSIS/REFERENCE?

Depending on the <u>availability of free data</u> (currently using `yfinance` Python package that at the time of writing obtains free data from `Yahoo Finance`), one can find all or some of the following data saved in ticker_symbol-specific sub-directory (e.g., '`tickers/AAPL`' directory):

1. `<ticker_symbol>_calendar.csv`: Information such as next earnings date (if available) can be found in this file.
2. `<ticker_symbol>_call_<date>.csv`: Information about calls (options data if available) can be found in this file.
3. `<ticker_symbol>_put_<date>.csv`: Information about puts (options data if available) can be found in this file.
4. `<ticker_symbol>_history.csv`: Information about Price history (if available) can be found in this file.
5. `<ticker_symbol>_qbs.csv`: Information about quarterly balance sheet (if available) can be found in this file.
6. `<ticker_symbol>_qcf.csv`: Information about quarterly cash flow (if available) can be found in this file.
7. `<ticker_symbol>_qe.csv`: Information about quarterly earnings flow (if available) can be found in this file.
8. `<ticker_symbol>_qf.csv`: Information about quarterly financials (if available) can be found in this file.
9. `<ticker_symbol>_reco.csv`: Information about Industry Analysts' recommendations (if available) can be found in this file.
10. `<ticker_symbol>_summary.csv`: Information about Stock summary (if available) can be found in this file.
11. `<ticker_symbol>_news_headlines.csv`: Approximately 100 latest news headlines for the stock. Each headline sentiment score is later appended to this CSV file when the analyzer/scorer tool is run.

Depending on the <u>availability of free data</u> from `stocktwits website,` one can find the following data:

12. `<ticker_symbol>_st_page.html`: HTML page referenced for sentiment score from `stocktwits` website (if available) can be found in this file.

WHERE DO I FIND GENERATED CHARTS?

1. The stock-specific charts generated by Gammath SPOT Analyzer/Scorer tool can be found in '`tickers/<ticker_symbol>/<ticker_symbol>_charts.pdf`'. For example, charts generated as part of analysis of Apple, Inc's stock can be found in '`tickers/AAPL/AAPL_charts.pdf`' file.
2. Trend lines to show current moving estimated support and resistance level lines can be found in '`tickers/<ticker_symbol>/<ticker_symbol>_tc.pdf`'.

3. The stock-specific current estimated price projection generated by PEP tool can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_pep.pdf' file.
4. Stock-specific gScore/micro-gScore history charts generated by the historian tool can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_gscores_charts.pdf' file.

WHERE DO I FIND PEP DATA FOR THE STOCK?

If you ran the PEP tool, then the stock-specific Price Estimator and Projector (PEP) data from Gammath SPOT can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_pp.csv' file. You can load its content into a Pandas series/dataframe.

WHERE DO I FIND SORTED LIST OF 5Y PEP?

A sorted (moving estimated projected 5Y return) list of 5Y PEP from Gammath SPOT can be found in 'tickers/MPEP.csv' file (if you ran the PEP tool). You can load its content into a Pandas series/dataframe.

WHERE DO I FIND MICRO-gScores FOR THE STOCK?

The stock-specific gScore and micro-gScores from Gammath SPOT can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_gscores.csv' file. For example, micro-gScores generated as part of analysis of Apple, Inc's stock can be found in 'tickers/AAPL/ AAPL_gscores.csv' file. You can load its content into a Pandas dataframe.

WHERE DO I FIND gScore-HISTORY FOR THE STOCK?

Please note that this is generated if the historian tool is run based on these instructions. The gScore consists of stock-history-specific component and current-info-specific component.
1. The gScores history is obviously available for the stock-history-specific component only. The historical gScores (along with micro-gScores) can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_micro_gscores.csv'. You can load the CSV file's content into a Pandas dataframe.
2. The 'tickers/<ticker_symbol>/<ticker_symbol>_gscores_charts.pdf' has the corresponding charts.

WHERE DO I FIND BACKTESTING STATS FOR THE STOCK?

Please note that this is generated if Gammath SPOT's backtester tool is run based on these instructions. Back testing stats of specific strategy used for a stock can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_gtrades_stats_<term>.csv' . Here, 'term' refers to "short-term" and "long-term".

WHERE DO I FIND TODAY'S ACTIONS?

Please note that this is generated if Gammath SPOT's backtester tool is run based on these instructions. If the default strategy finds buy/sell actions for "today" then those can be found in 'tickers/Todays_Actions.csv'. Please note that if the strategy doesn't conclude "buy"/"sell" decision for any stock in your watchlist then this list could be empty (on many days).

WHERE DO I FIND SCREENED WATCHLIST?

Please note that this is generated if Gammath SPOT's screener tool is run based on these instructions. The filtered/screened list can be found in the file 'tickers/screened_watchlist.csv'.

WHERE DO I FIND ANALYSIS/SIGNALS FOR THE STOCK?

The stock-specific analysis/signals from Gammath SPOT can be found in 'tickers/<ticker_symbol>/<ticker_symbol>_signal.txt'. For example, signals information generated as part of analysis of Apple, Inc's stock can be found in 'tickers/AAPL/ AAPL_signal.txt' file.

HOW DO I INTERPRET SIGNAL.TXT FILE FOR THE STOCK?

Following micro-gScores (when possible) can be found in <ticker_symbol>_signal.txt:

1	Price
2	RSI
3	Bollinger Bands
4	MACD
5	Kalman Filter
6	Ordinary Least Squares
7	MFI
8	Stochastic
9	Options data
10	Analysts' recommendations or Fundamental Analysis
11	Sentiments score

Table 1: micro-gScores

The stock-specific algorithmic analysis' output from Gammath SPOT is saved in `<ticker_symbol>_signal.txt` for reference. It can be used to get finer details on gScore to help make criterion-specific decision on respective stock.

These micro-gScores make up the overall gScore for the stock and can be used for more detailed selection criteria (manually or automated in your code). In the above table, items 1-8 make up the "stock history based gScore" and items 9-11 make up the "current information based gScore". Items 9-11 can be used as filtering. In case the information for sub-items in 9-11 is not available, then in most cases, the signal.txt will show a note indicating that data is missing. There is more information embedded for each of these micro-gScores in `<ticker_symbol>_signal.txt` as follows:

Price:
Price-micro-gScore (between -10 and +10) based on Price history data analysis.
[price direction (rising/falling)] [bottom/middle/top quantile for current rising/falling consecutive days count] [current price] [bottom/middle/top quantile in last 52-week range] [price gScore (10% weightage in overall gScore)] [note indicating if it is new 52-week low/high]

Relative Strength Index (RSI):
RSI-micro-gScore (between -10 and +10) based on RSI analysis.
[RSI level below average/average/above average] [oversold/overbought/normal] [rising/falling/unclear] [bottom/middle/top quantile for consecutive days if oversold/overbought] [RSI gScore (10% weightage in overall gScore)]

Bollinger bands:
Bollinger-bands-micro-gScore (between -10 and +10) based on Bollinger bands analysis.
[Price is below/above average compared to middle Bollinger band] [Price is closer to lower/middle/upper Bollinger band] [Bollinger band gScore (10% weightage in overall gScore)]

Moving Average Convergence/Divergence (MACD):
MACD-micro-gScore (between -10 and +10) based on MACD analysis.
[Trend is positive/negative] [Price when buy/sell signaled] [bottom/middle/top quantile for days in current trend] [bottom/middle/top quantile for current difference] [MACD gScore (10% weightage in overall gScore)]

Kalman Filter (KF):
KF-micro-gScore (between -10 and +10) based on "digital filtering" (Intent of using the Kalman Filter to "smoothen/filter out spikes" and check if current price is above or below "filtered" average).
[negative/positive days i.e., price is below or above "filtered average" respectively] [bottom/middle/top quantile for days in this trend] [bottom/middle/top quantile for current

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difference compared to "filtered average"] [KF_IC. Information Coefficient] [KF gScore (10% weightage in overall gScore)]

Ordinary Least Square (OLS):

OLS-micro-gScore (between -10 and +10) to determine if price is above or below "expected" average and if 5Y and 1Y slopes of Least Squares line is positive. This is used to determine if dollar cost averaging is risky for a given stock trend (e.g., if slopes are negative then it could be risky to double-down).

[fit score indicating how well stock price chart fits OLS model. Fit score >= 0.9 is considered a great fit] [1Y slope: positive/negative] [5Y slope: positive/negative] [positive/negative difference compared to Least Squares line ("expected average")] [bottom/middle/top quantile for current difference compared to "expected average"] [OLS_IC. Information Coefficient] [OLS gScore (10% weightage in overall gScore)]

Money Flow Index (MFI):

MFI-micro-gScore (between -10 and +10]) based on MFI analysis.

[MFI level: below average/average/above average] [rising/falling/unclear] [oversold/overbought/blank] [MFI gScore (10% weightage in overall gScore)] [Indicator for possible price reversal: price could start rising or falling]

Stochastic Indicator (stochs):

Stochastic-micro-gScore (between -5 to +5) based on Stochastic analysis.

[stochs-slowd level: below average/average/above average] [oversold/overbought/blank] [Last slowk/slowd crossover date] [stoch gScore (5% weightage in overall gScore)]

Options data (options):

Options-micro-gScore (between -10 and +10) based on Options data (short ratio, calls, puts info) analysis. This can be useful to estimate what options traders are betting on stock.

[short ratio] [Bullish/Bearish] [options gScore (10% weightage in overall gScore)]

Analysts' recommendations (reco):

Analysts'-recommendations-micro-gScore (between -10 and +10) based on Industry analysts' recommendations data (i.e., publicly available upgrades/downgrades, positive/negative rating data from industry analysts). This is particularly useful when making decisions on stock that one has no expertise in.

[reco gScore (10% weightage in overall gScore)]

Fundamental data:

Note: If Analysts' recommendations data is available then following data (if available) is just logged and not factored into the gScore. In the absence of Analysts' recommendations data, following data (if available) is factored into the gScore:

PE:
[Trailing PE (TPE] [Average TPE of sector if stock is in S&P500 list] [Forward PE (FPE)]
[Average FPE of sector if stock is in S&P500 list] [PE gScore]

PEG:
[PEG value] [PEG gScore]

Beta:
[Beta value] [Beta gScore]

Institutional holding:
[Institutional holding percentage value] [IHP gScore]

Insider holding:
Note: This is for reference only and not using in scoring
[Insider holding percentage value] [INSHP gScore]

QBS:
[Debt to capital ratio value] [Current ratio] [Quick ratio] [QBS gScore]

PBR:
[Price to Book ratio value] [PBR gScore]

Total of fundamental analysis data:
[Fundamental analysis gScore]

Sentiments and message volume Score (st_sv):

Sentiments-micro-gScore (between -5 and +5) based on analysis of social media website such as stocktwits.
[st_sv on stocktwits gScore (5% weightage in overall gScore)]

News Headlines sentiments score (mean):

The mean news headlines sentiments analysis score (between -1 and +1) based on analysis of approximately 100 latest news headlines.
[Stock new sentiment (mean). Note this is NOT a micro-gScore]

Probabilities:

Overall Price Direction Probability:
I use this to determine overall up/down price direction probability.

Next Day Price Direction Probability:

I use this to determine the price direction (up/down) probability with respect to entire sample. The intent is to use it to buy when price rises after multi-day decline. This data is also saved in the micro-gscores history. I demonstrate how I use this data in my default back testing example as it has a very specific purpose.

Next Week, Month Price Direction Probability:

I generate price direction (up/down) probability for "after a week" and "after a month" by using Logistic Regression. The intent is to use it in making buy/sell decisions. This data is also saved in the micro-gscores history.

Moving Technical Conjecture of Price in 5Y:

This is a dynamic/moving 5-year price conjecture. Price prediction doesn't make sense to me without accurate information on how the business is doing. In the absence of that, I am approximating price based on past performance and adapting to price changes dynamically. As a result, I call it a calculated, moving price conjecture. This is a quick solution for the sake of approximate analysis. I demonstrate how I use it for a basic long-term strategy in my back testing source code. When possible, this price conjecture is also included in `tickers/<ticker_symbol>/<ticker_symbol>_micro_gscores.csv`.
Note: A more serious price projection is supported via my PEP tool.

Moving Technical Price Projection:

This is a dynamic/moving technical estimated price projection for approximately 3months, 1 year and 5 years. As mentioned in previous section, I don't do constant price prediction in the absence of up-to-date business-specific information. Instead, I use a linear model (Stochastic Gradient Descent) to make estimated price projection for the future timeline. This is a more serious estimate that I use to check for projected rate of return over different intervals for future times. If you run the Gammath PEP tool, then entire price projection is saved in `tickers/<ticker_symbol>/<ticker_symbol>_pp.csv`. This tool includes 5Y moving estimated projection for S&P500 value as well. A sorted list of moving estimated 5Y projected returns can be found in `tickers/MPEP.csv` (corresponding to the watchlist that was passed to pep tool and includes the corresponding value for S&P500).

Current Moving Estimated Support and Resistance level:

This is a dynamic/moving estimated current support and resistance level for the stock price as generated by my Analyzer/Scorer tool. This is useful in making buy/sell/hold decision. The file `tickers/<ticker_symbol>/<ticker_symbol>_tc.pdf` contains stock-specific support and resistance lines chart. In addition, following data is logged in signal.txt file and is included with gScore and micro-gScore history:

[current support level][support line slope][current price diff %]

[current resistance level][resistance line slope][current price diff %]

HOW DO I INTERPRET BACKTESTING STATS FOR THE STOCK?

The location of stock-specific back testing stats from Gammath SPOT are described here.
The twelve columns in these files are:

a) `Date`: Date when action was taken.

b) `Price`: Share price when action was taken.

c) `Action`: BUY or SELL.

d) `Quantity`: Number of shares corresponding to `Action` field (Bought or Sold).
   Note: The buy-quantity used by default back testing strategy is arbitrary but relative in the sense that its first buy is small quantity and subsequent purchases are bigger quantity (any ascending series e.g., Fibonacci series could be used to derive buy quantity). There are many ways to decide on a buy-quantity that I have avoided to list here for the sake of brevity. Gist of it is that I decide on buy-quantity based on how many attempts it takes to breakeven (historically) for a given strategy, available funds to allocate for that stock in my portfolio, news, macroeconomic conditions, risk tolerance etc.

e) `Avg_Price`: Average Price per share for total shares held.

f) `Profit`: Amount of profit [Only reported for "SELL" Action].

g) `Return_Pct`: Profit in terms of percentage of total purchase price [Only reported for "SELL" Action or for summary of currently held shares on the last row].

h) `SP500_Pct`: Percentage change in value of S&P500 for same time interval for which this security was held [Only reported for "SELL" Action].

i) `Days_Held`: Number of days this security was held (since first share was purchased). [Only reported for "SELL" Action or for summary of currently held shares on the last row].

j) `Last_Price`: Closing price of this stock when tool was last executed [Only reported on the last row as a summary].

k) `Stage`: Currently perceived cycle based on gScore i.e., Buy cycle/Hold cycle/Sell cycle [Only reported on the last row as a summary].

l) `Notes`: Useful notes that can help in better decision-making for daily action [Only reported on the last row as a summary]. This includes:
   [Current_info_data sentiment: positive/negative][Price projection: approximately 3 months, 1 year, 5 years][Strategy worked or not historically (in approximately 5 years)][Reason if strategy is concluded to not have worked related to cash management and/or number of attempts to break even]

Note: Back testing does not directly account for macroeconomic conditions and news. Notes on the last row could help in making a more informed decision. Irrespective of that, it is recommended that user should always check news before buying or selling a stock. Doing so could help perform better than back testing performance.

HOW DO I USE GAMMATH SPOT FOR INTERNATIONAL STOCKS?

Please see the sample watchlist for examples of stocks listed outside the US. Note that some data points may or may not be available for stocks listed outside the US. I have done very limited testing for stocks listed outside the US so if you happen to test it thoroughly in a different geographic area then please let me know the results.

WHAT IS INCLUDED IN YOUR SUBSCRIPTION PLANS?

1) ***Premium subscription plan*** includes benefits of basic subscription plan and provides access to:
   a) *Daily micro-gScores* for my entire watchlist
   b) *Daily On the SPOT* blog
2) ***Basic subscription plan*** provides access to my publication called **gScore** that includes the following:
   a) Gammath Works' entire watchlist of US-listed stocks (currently 580+ ticker symbols) that gets updated multiple times in a year
   b) Daily gScore for each ticker symbol in my watchlist
   c) Split between stock-history-based component and current information-based component (used for current info-based decision making)
   d) Special Note(s) related to conditions such as unavailability of free data that can result in incomplete final scores. This is important to note as free data is sometimes unavailable
   e) Notes specific to a ticker symbol (e.g. if stock price data is stale)

CONCLUDING REMARKS

Gammath SPOT provides a dynamic system intended to account for changes in the investment parameters as they happen. When the facts change, so should the conclusions (much like how a vehicle navigation system estimates arrival time and changes it if parameters change). A gScore-based dollar cost averaging strategy along with SPOT's estimator/projector, historian, backtester, screener tools give me a "pragmatic" way of investing. It has helped me immensely especially because I have no privileged information. I wish you find it helpful too. For brevity, a lot of detail is not described in this document. If you have any questions/concerns/comments, then please don't hesitate to let me know via this form on my website.

Happy SPOTing!