GROUP WORK PROJECT #1 M5
GROUP NUMBER: 5159

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Remember: Any group members who did **not contribute to the project should be given all zero (0) points for the collaboration grade on the GWP submission page.*

Statement of integrity: By typing the names of all group members in the text boxes below, you confirm that the assignment submitted is original work produced by the group (excluding any Non-contributing members identified with an "X" above).

Team member 1	Mehedi Hasan
Team member 2	Tu Minh Tran
Team member 3	

Use the box below to explain any attempts to reach out to a Non-contributing member. Type (N/A) if all members contributed.
Note: You may be required to provide proof of your outreach to Non-contributing members upon request.

Task 1: Collect and compute relevant statistics and make a conclusion about the result

- Tu Minh Tran: Portfolio 1
- Mehedi Hasan: Portfolio 3

Portfolio 1: Income stock contains AAPL, Alphabet (Google), Meta which are collect from google finance function in google sheet by weekly price from 01 Sep 2023 to 31 Dec 2023 at NASDAQ.

	APPL	GOOG	META
Average	-0.012	0.003	0.013
Standard Deviation	0.035	0.037	0.022
Skewness	0.151	-0.371	1.987
Kurtosis	1.155	2.024	4.226

Table 1: Statistical Summary

	Correlation Matrix		
	APPL	GOOG	META
APPL	1.000	0.348	0.706
GOOG	0.348	1.000	0.862
META	0.706	0.862	1.000

Table 2: Correlation among stocks

	Covariance Matrix		
	APPL	GOOG	META
APPL	0.001	0.001	0.001
GOOG	0.001	0.001	0.001
META	0.001	0.001	0.000

Table 3: Covariance among stocks

Meta has high correlation to Google and Meta because they are big tech category, and their platform is depended to Apple and Google meanwhile Google and Apple have lower correlation because they are in tech category but many of their sections are compete to each other's.

Apple has a negative average daily return because their product was launched in this period then make consumer disappointed, hence there is a big reduction make average

weekly return negative. Vice versa, Meta and Google have positive average weekly return, but not high because 2023 was a economics declination and they had to face with many challenges.

Portfolio 3: Cryptocurrency contains three assets such as Binance BNB, Bitcoin BTC, Ethereum ETH. Yahoo Finance used as a data source where pull data in daily basis of last two year by python. The data is updated till date 12th Feb '24.

crypto	Mean	Standard Deviation STD	skew	kurt
BNB-USD	0.000157	0.030156	-0.56156	5.772561
BTC-USD	0.000603	0.028352	-0.14956	4.936774
ETH-USD	0.000499	0.035562	-0.01663	4.625533

Table 1: Statistical Summary

	Correlation Matrix		
	BNB-USD	**BTC-USD**	**ETH-USD**
BNB-USD	1.000000	0.750828	0.767531
BTC-USD	0.750828	1.000000	0.863948
ETH-USD	0.767531	0.863948	1.000000

Table 2: Correlation among individual currency

	Covariance Matrix		
	BNB-USD	**BTC-USD**	**ETH-USD**
BNB-USD	0.000908	0.000641	0.000822
BTC-USD	0.000641	0.000803	0.00087
ETH-USD	0.000822	0.00087	0.001263

Table 3: Covariance among individual currency

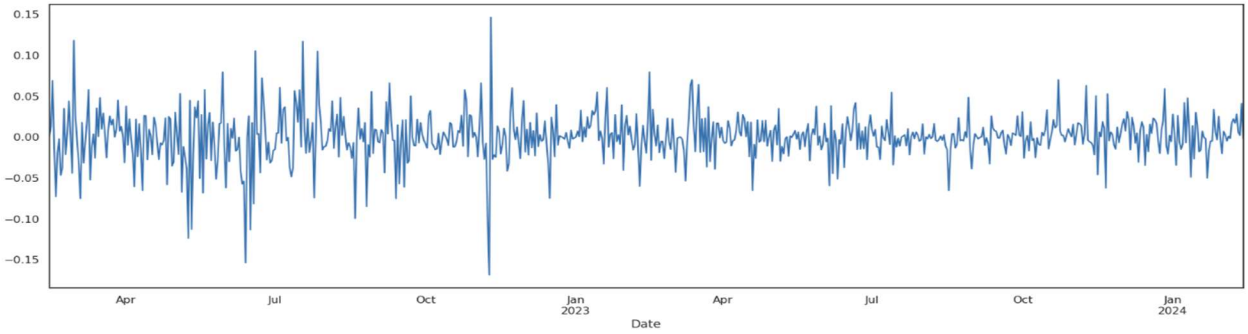

Figure 1: Daily trend of Portfolio Return

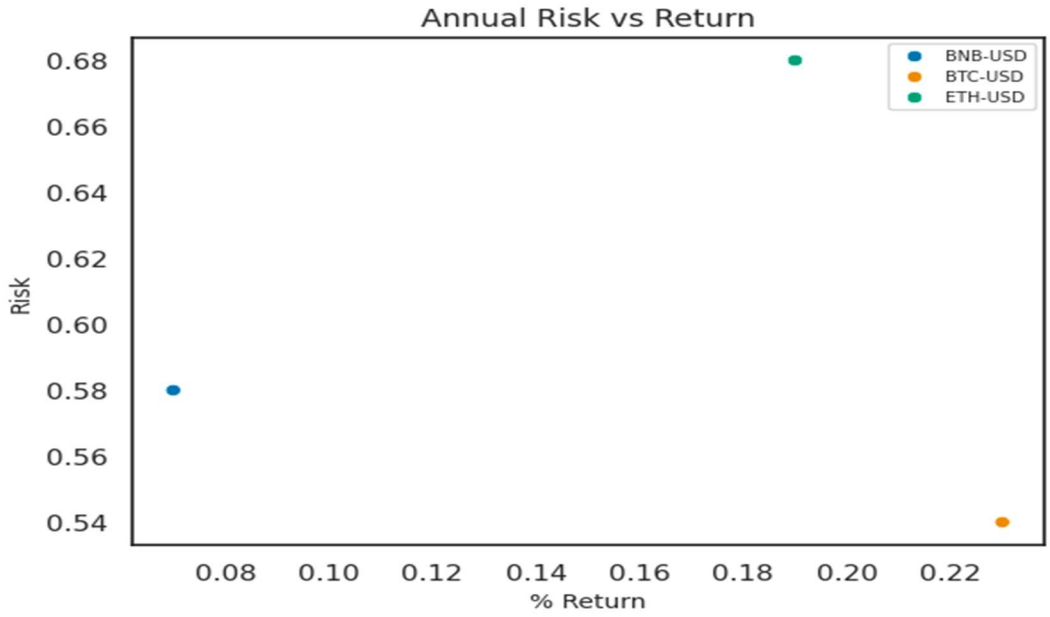

Figure 2: Annual risk vs return of each currency

BTC holds the largest capitalization among cryptocurrencies and ETH follows closely. So their returns influence the whole crypto market with their price movements as well as their high correlation. At the same time, ETH has high volatility as it is young over the market. But it exhibits decreased volatility in recent years.

For the portfolio return, here we consider weights such as 0.3, 0.3. 0.4.

From figure 2, we can consider Bitcoin as the highest return and risk free cryptocurrency where ethereum shows the highest risk among three currencies.

Task 2:
Distribute the following roles among your team members:

- Tran Minh Tu: play technical and non-technical interviewee.
- Mehedi Hasan: play journalist

Journalist: Welcome, everyone, to today's discussion on the future of cryptocurrency regulation. In light of the recent FTX collapse, there's a lot to unpack about what went wrong and how future regulations could prevent similar incidents. Can you explain the leverage mechanisms that were in place at FTX and how they contributed to its collapse?

Technical Interviewee: Certainly. FTX's downfall was significantly influenced by excessive leverage. In simple terms, leverage in the crypto market, much like in traditional finance, allows traders to borrow funds to increase their trading position beyond what their capital would normally permit. FTX engaged in highly leveraged trades without sufficient liquidity or risk management strategies. When the market moved against their positions, they couldn't cover their losses, leading to a liquidity crisis. The situation was further exacerbated by the centralization of decision-making power in the hands of Sam Bankman-Fried, which created a moral hazard and a lack of accountability.

Journalist: That's a comprehensive overview, thank you. What about you, what do you think about it from a non-technical point of view?

Non-Technical Interviewee: The FTX collapse illustrates what can happen when too much power is vested in one individual without adequate oversight. In the former's case, there was FTX in the past, Charitable Corporation. In traditional finance, regulations often mandate strict governance structures, transparency, and risk management practices to

prevent such occurrences. In the crypto domain, however, these safeguards were lacking and there is no regulation in some countries. Ethical governance and oversight, not just for preventing fraud but also for ensuring the company's health, are essential. These measures protect investors, customers, and the broader financial system.

Journalist: It seems like a systemic issue rather than an isolated incident. On that note, how could regulation have preemptively addressed these risks, particularly regarding leverage and liquidity?

Technical Interviewee: Preemptive regulation could impose caps on leverage ratios, require regular audits, and enforce transparent risk management policies. Additionally, regulations could mandate that exchanges hold a certain percentage of funds in reserve to manage withdrawals during times of market stress. Implementing these measures in the crypto market would mirror practices in traditional financial markets, aiming to stabilize the system and protect investors.

Journalist: Those are insightful suggestions. Now, thinking about the broader picture, how do you believe ethical training and governance could have prevented the kind of collapse we saw with FTX?

Non-Technical Interviewee: Ethical training is good, but I don’t think it’s enough because the attraction ò the money is very big for everyone. The more important is robust governance structures instill a culture of accountability and transparency. In FTX's case, the concentration of power and lack of ethical oversight led to risky decisions without proper checks. Implementing structured governance frameworks, where decisions are scrutinized and risk is managed collectively, could prevent such collapses. It's about creating a culture where ethical considerations guide decision-making, potentially averting the greed and mismanagement we've observed.

Technical Interviewee: To adapt to the current situation, there are some ideas using blockchain to allow everyone who is holding tokens have right to vote for the important decision. Hence some big holders will have power to accept or decline for big decisions. I know that it’s not enough for this mess yet but it’s will robust with the government’s regulation.

Journalist: It's clear that both technical safeguards and ethical governance play crucial roles. As we look towards future regulations, what do you both see as the primary challenge in balancing regulation with innovation in the cryptocurrency market?

Technical Interviewee: The primary challenge lies in implementing regulations that are stringent enough to protect consumers and the financial system but flexible enough not to stifle innovation. Cryptocurrency and blockchain technology are rapidly evolving, and regulations need to be adaptive to accommodate new developments without hindering growth.

Non-Technical Interviewee: I agree. The key is to foster an environment where innovation can thrive within a framework that ensures safety, stability, and trust. This means continuous dialogue between regulators, industry players, and the tech community to understand the nuances of the technology and its applications.
Journalist: Thank you both for your insights today. Let's hope the lessons learned from FTX can guide us towards a safer and more innovative future in finance.