VINUNIVERSITY

COMP4010: Data Visualization

Group Project 2 - **Bitcoin ETF Dashboard -** Final Report
Word Counter: 1035
Instructor: Le Duy Dung
College of Engineering & Computer Science
VinUniversity

Group F

Group Members:

Nguyen Minh Tuan - V202000254

I. Introduction

1. Overview:

This report details a data visualization dashboard created to analyze Spot Bitcoin ETF participation since its approval in January 2024. The dashboard utilizes a dataset containing metrics related to Bitcoin ETFs, including total Bitcoin supply, net flow since launch, total on-chain holdings, past week flows, and individual ETF holdings with market share.

2. Dataset Explanation

While the ultimate goal is to visualize the on-chain activities of Bitcoin ETFs, directly working with raw blockchain data presents significant challenges. Due to the blockchain's structure, data is stored sequentially, resembling a linked list. Locating specific information within a particular timeframe requires iterating through the entire chain starting from the genesis block in 2009, which can be computationally expensive and time-consuming.

To overcome this hurdle, this project leverages Dune Analytics. This online platform and IDE act as a bridge, transforming the raw blockchain data into a relational database format. This transformation allows us to utilize SQL queries, a familiar and efficient language for data retrieval and analysis. By harnessing Dune's pre-processed data, we can efficiently access and extract relevant information for visualization purposes. This includes metrics like total Bitcoin supply, net flow, on-chain holdings, recent transactions, and individual ETF holdings – all crucial elements for constructing an informative dashboard.

3. Questions

The primary goal of this dashboard is to address the following question:

- Metrics of Bitcoin & Bitcoin ETFs, including: Total Supply, Total Holdings, Netflows.
- How has participation in Spot Bitcoin ETFs evolved since their approval?
    + Which big whales have sold their Bitcoin and left the game? Which big whales have gained more Bitcoin?
    + The investment trend of Bitcoin ETF. Are whales selling or buying Bitcoin? From there, we can make our investment decision: Should we sell or buy more?

Existing solutions for visualizing Bitcoin ETF data typically focus on price charts or market capitalization. This dashboard offers a more comprehensive perspective by incorporating a variety of metrics to create a data-driven narrative around Spot Bitcoin ETF participation.

II. Justification of Approach

An interactive dashboard was chosen as the primary method for visualizing the data because it allows users to explore the information from multiple angles. The dashboard utilizes a combination of charts and graphs to effectively represent the various data points.

- A stacked bar chart depicts the total Bitcoin supply alongside the portion currently held by ETFs, providing a visual representation of market penetration by ETFs.
- Line charts track net flow since launch and past week flows, enabling users to identify periods of significant investment or divestment.
- A pie chart illustrates the market share of individual ETFs, revealing the dominance of specific providers within the Spot Bitcoin ETF landscape.

This combination of visualizations allows users to gain a holistic understanding of Spot Bitcoin ETF participation and make informed inferences about market trends.

III. Code

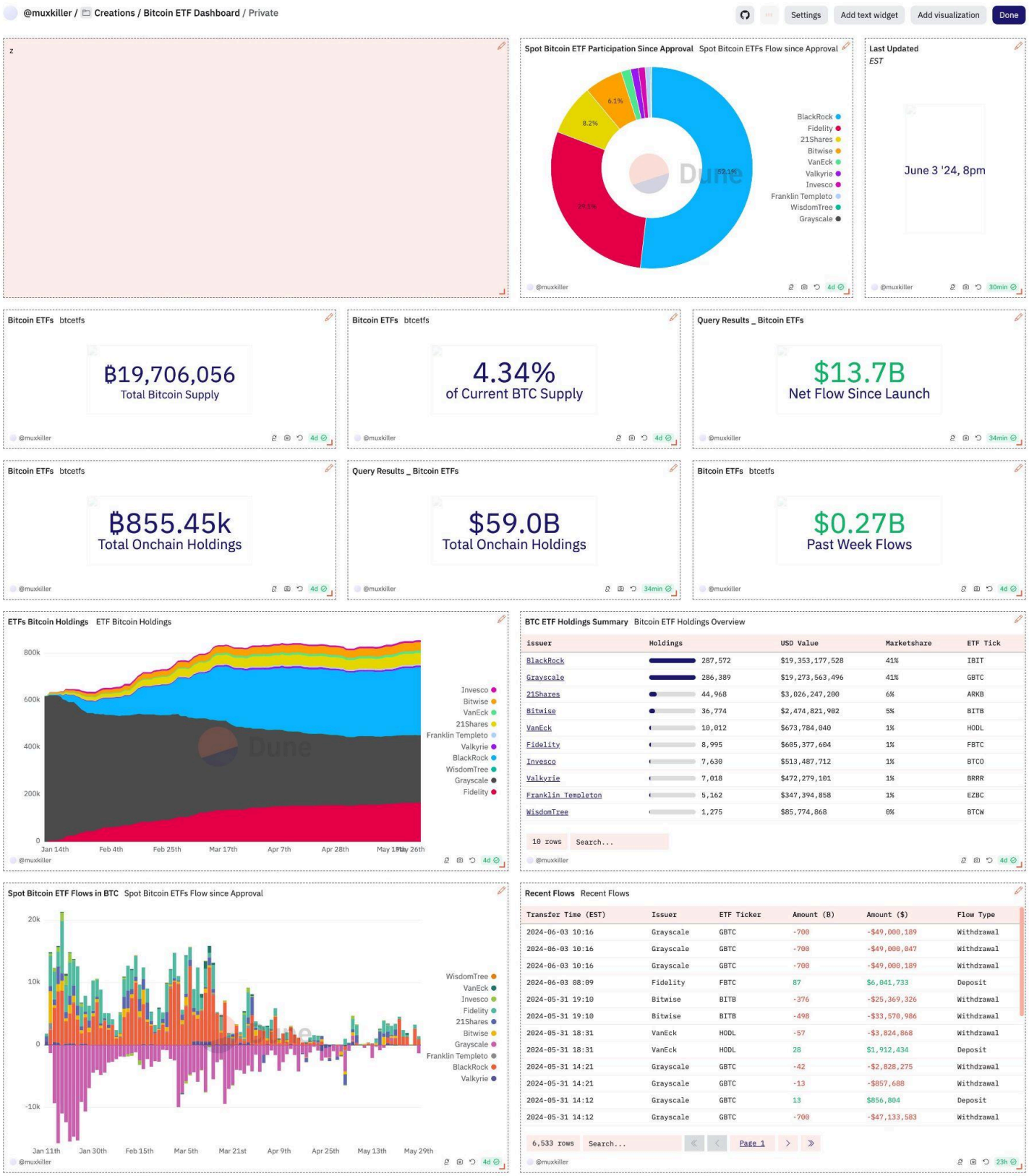
Due to the nature of the project & tech stack, the code used to generate the dashboard cannot be directly included in Github. However, in the report, I will attach the link to the Dune Analytics Platform. From there, you can access the platform & verify the code.

Personal Workspace on Dune:

https://dune.com/muxkiller/bitcoin-etf-dashboard/a96c06ca-d3de-44fa-af7d-b1e16c11ed92

IV. Final Product

The final product is a single-page web application designed to be user-friendly and informative.



- **Components:** The dashboard leverages the following core components:

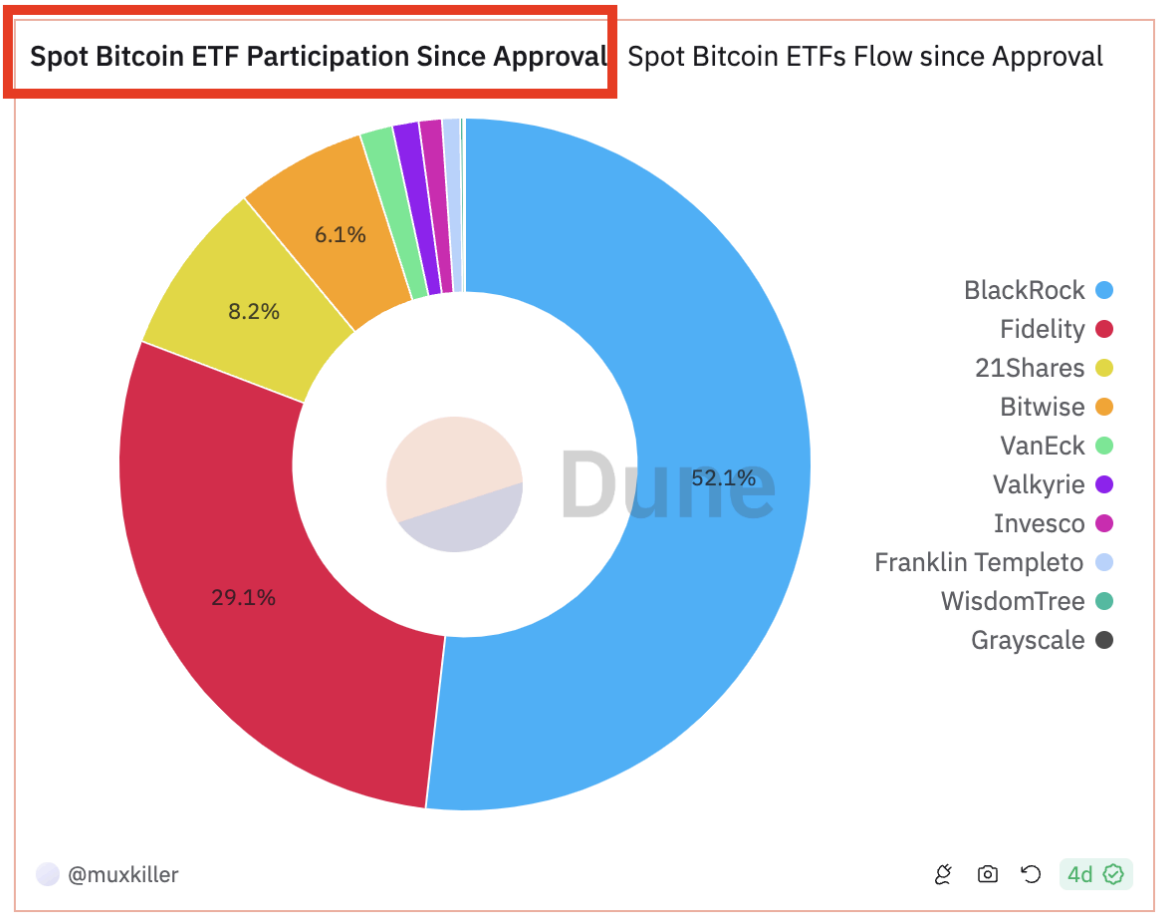
    - **Libraries:** Data manipulation libraries (e.g., Pandas), visualization libraries (e.g., Matplotlib, Seaborn), and a web framework (e.g., Streamlit, Dash).
    - **Visualization Techniques:** Stacked bar chart, line charts, pie chart.
- **Features:** The dashboard offers the following functionalities:
    - Interactive exploration of the data through charts and graphs.
    - Tooltips that reveal additional details on hover.
    - Users can filter the data by specific timeframes or ETF providers (depending on the chosen web framework's capabilities).

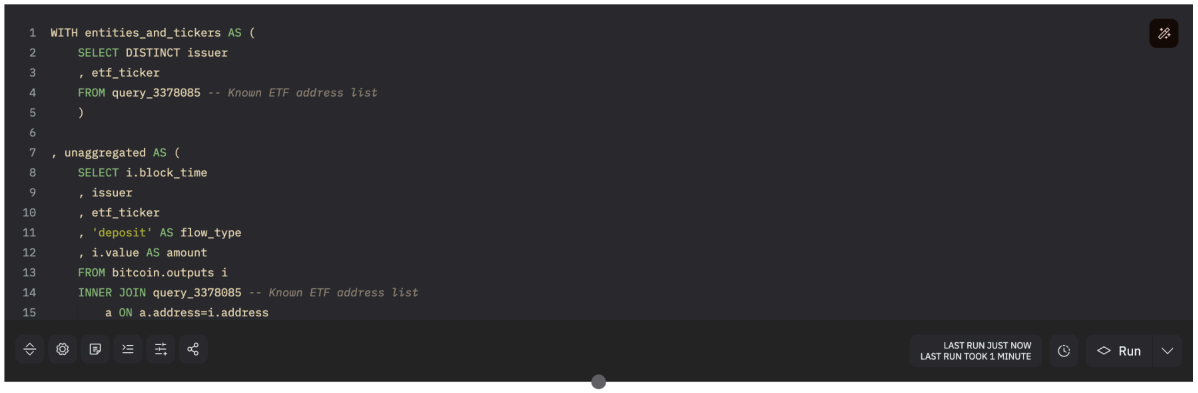
This interactivity allows users to tailor the dashboard to their specific interests and uncover trends or patterns that might not be readily apparent from a static report.

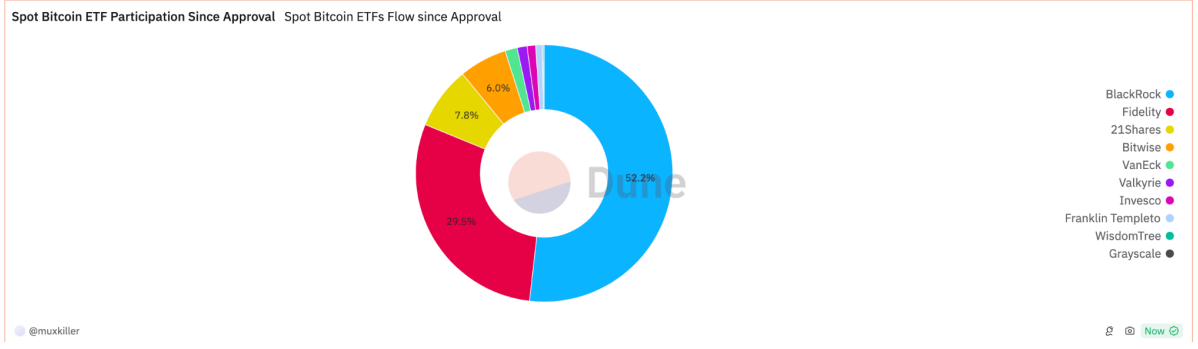
- **User Manual:**

Here's a breakdown of how to access and interact with the dashboard:

- **Checking the code:** Clicking into the title of each chart as shown in the image below. Then, a new tab will appear, and you can see the code to render that chart


Spot Bitcoin ETF Participation Since Approval
Spot Bitcoin ETFs Flow since Approval
52.1%
29.1%
8.2%
6.1%
BlackRock
Fidelity
21Shares
Bitwise
VanEck
Valkyrie
Invesco
Franklin Templeto
WisdomTree
Grayscale
Dune
@muxkiller
4d


WITH entities_and_tickers AS (
SELECT DISTINCT issuer
, etf_ticker
FROM query_3378085 -- Known ETF address list
)
, unaggregated AS (
SELECT i.block_time
, issuer
, etf_ticker
, 'deposit' AS flow_type
, i.value AS amount
FROM bitcoin.outputs i
INNER JOIN query_3378085 -- Known ETF address list
a ON a.address=i.address
LAST RUN JUST NOW
LAST RUN TOOK 1 MINUTE
Run
Query results
Spot Bitcoin ETF Flows in BTC
Spot Bitcoin ETF Participat...
Spot Bitcoin ETF Flows in U...
New visualization
Materialize
API
Share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21Shares
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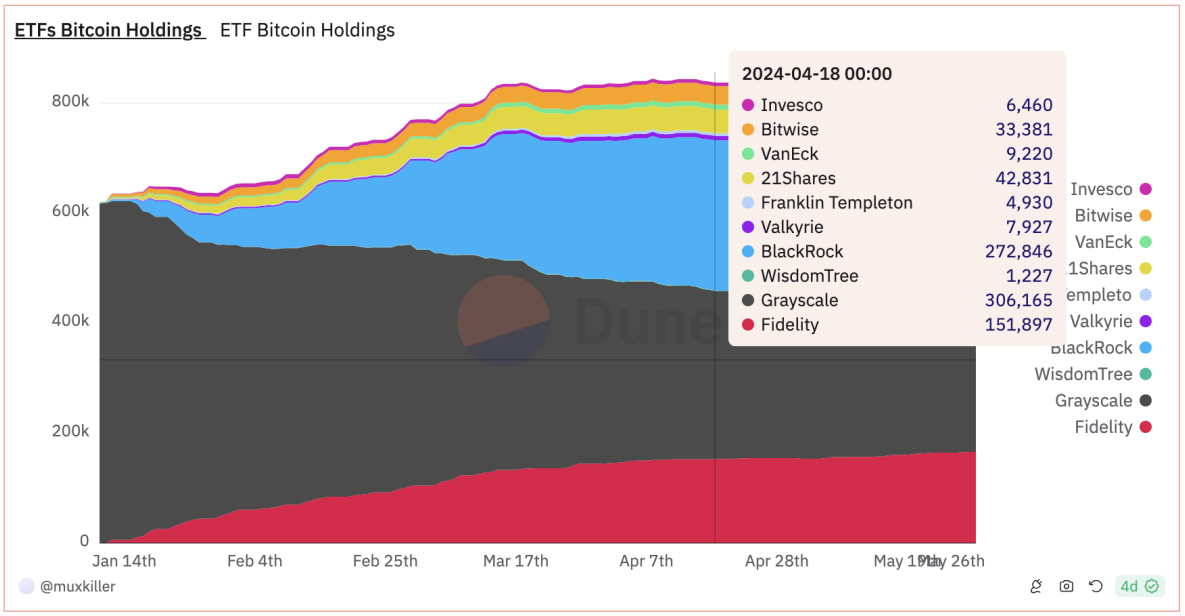
VanEck
Valkyrie
Invesco
Franklin Templeto
WisdomTree
Grayscale
@muxkiller
Now

- **Interacting with chart:** Hover on the chart to see more information



- **Paging:** You can select pages to see older information or search for specific content

Transfer Time (EST)	Issuer	ETF Ticker	Amount (Ƀ)	Amount ($)	Flow Type
2024-05-31 03:25	Fidelity	FBTC	650	$44,458,622	Deposit
2024-05-30 18:22	Grayscale	GBTC	147	$10,065,570	Deposit
2024-05-30 18:22	Grayscale	GBTC	-700	-$47,805,919	Withdrawal
2024-05-30 18:22	Grayscale	GBTC	553	$37,740,273	Deposit
2024-05-30 17:07	Bitwise	BITB	-1498	-$102,601,474	Withdrawal
2024-05-30 17:07	Bitwise	BITB	1000	$68,506,430	Deposit
2024-05-30 17:07	Bitwise	BITB	498	$34,095,070	Deposit
2024-05-30 14:33	BlackRock	IBIT	364	$25,252,190	Deposit
2024-05-30 12:02	Bitwise	BITB	-164	-$11,211,665	Withdrawal
2024-05-30 12:02	Bitwise	BITB	-1192	-$81,758,090	Withdrawal
2024-05-30 12:02	Bitwise	BITB	-93	-$6,353,318	Withdrawal
2024-05-30 12:02	Bitwise	BITB	-49	-$3,363,511	Withdrawal

V. Discussion

The dashboard offers valuable insights into Spot Bitcoin ETF participation. The stacked bar chart reveals that while the total Bitcoin supply has grown, the portion held by ETFs has plateaued in recent months, suggesting a slowdown in investment. The line charts depict periods of significant net flow, potentially corresponding to major news events or market fluctuations. The pie chart highlights the dominance of particular ETF providers, indicating potential consolidation within the Spot Bitcoin ETF market.

VI. Limitations

- **Limited Timeframe:** The dashboard currently focuses on a specific timeframe and may not capture the entire history of Spot Bitcoin ETFs, particularly activity before they were recorded on-chain. This could potentially miss valuable insights into early adoption and market trends.
- **Data Delay:** While the dashboard showcases on-chain activity, it's important to acknowledge the inherent delay in blockchain data. There is a time lag between when a transaction occurs and when it's reflected on the blockchain and ultimately within Dune Analytics. This delay might not provide a completely real-time picture of Spot Bitcoin ETF activity.

VII. Future Directions

Future iterations of the dashboard could incorporate additional features such as:

- **Historical Data Integration:** Expanding the data scope to include historical information on Bitcoin holdings before on-chain recording can be explored. This might involve incorporating data from reputable sources that track off-chain activity or estimated holdings during the early stages of Spot Bitcoin ETFs.
- **Real-time Data Integration:** Investigating potential integrations with real-time blockchain data feeds could significantly reduce the time lag between

on-chain activity and its reflection on the dashboard. This would provide a more up-to-the-minute view of Spot Bitcoin ETF participation.

By incorporating these enhancements, the dashboard can provide an even more comprehensive picture of Spot Bitcoin ETF participation and aid users in making informed investment decisions.