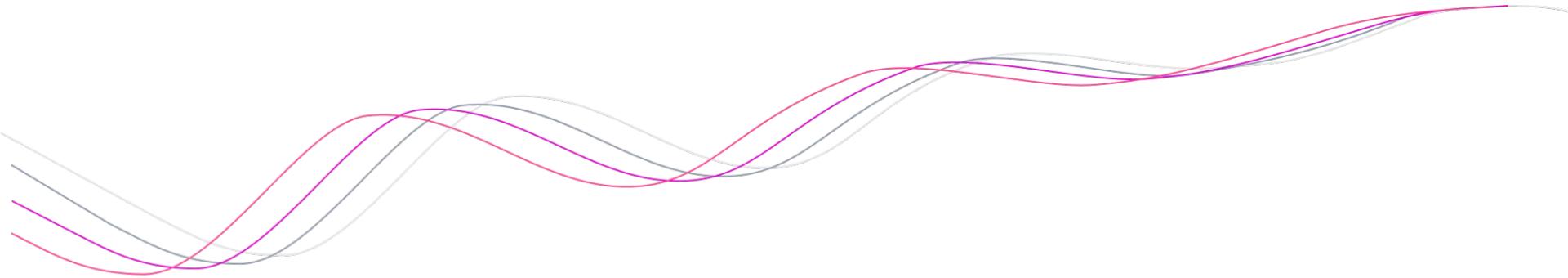


Github Activity - Insights & Impact on Token Price



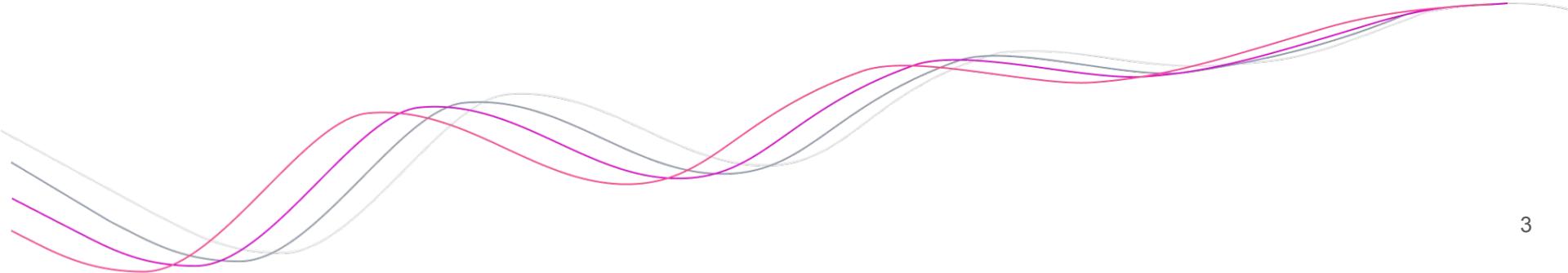
Anamaria Lozianu

Overview

1. [Data Preprocessing](#)
2. [Developer Activity](#)
3. [Projects Ranking](#)
4. [Developers Ranking](#)
5. [Repositories Ranking](#)
6. [Correlations](#)
7. [Time Lags](#)
8. [Additional Data](#)

Data Preprocessing

Target: Prepare the data



Data Preprocessing

Target: Prepare the data to be processed

1. Project Data Collection

- Downloaded data from AI projects including Ocean Protocol, SingularityNET, Fetch.AI, Numerai, Bittensor, and Oraichain.

2. Repositories Data Extraction:

- Extracted relevant fields from the repository JSON files and compiled them into a single CSV file.
- The extracted fields include: *id, name, description, language, archived, stargazers_count, default_branch, created_at, updated_at, pushed_at, open_issues_count, forks_count, size, watchers_count, project*

3. Commits Data Extraction and Processing:

- Processed and consolidated commit data from JSON files into a comprehensive CSV file. This task was particularly challenging due to the need for extensive data cleaning and normalization.
- The extracted fields include: *url, project, repository, author_name, author_id, author_login, author_avatar_url, author_email, author_date, committer_name, committer_email, committer_date, comment_count, normalized_author_name*

4. Issues Data Extraction and Processing:

- Extracted and processed issues data from JSON files, consolidating them into a unified CSV file.
- The extracted fields include: *id, project, repository, url, number, title, user_id, user_login, labels, state, assignees, comments, created_at, updated_at, closed_at, reactions, normalized_author_name*

5. Price Data Extraction and Processing:

- Extracted and processed prices data from JSON files, consolidating them into a unified CSV file.
- The fields included are: *Project, Date, Close, Volume*

6. Author Data Normalization:

- During data investigation, it was observed that the same individuals were using multiple email addresses. This required the creation of a mapping to normalize and consolidate author identities, ensuring each author is uniquely identified across different projects and contributions.

7. Tweet Data:

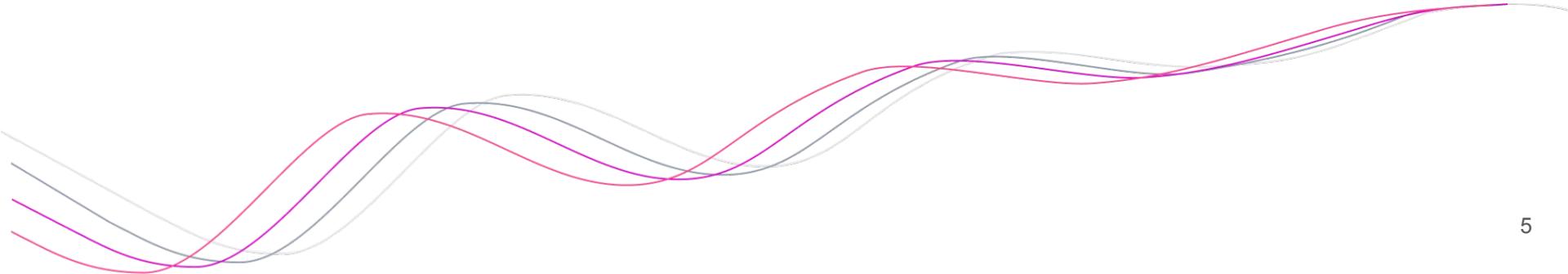
- Downloaded twitter data for each project and used the information to extract projects milestone and release.
- *Tweet_id, text, language, type, bookmark_count, favorite_count, retweet_count, reply_count, view_count, created_at, client, hashtags, urls, media_type, media_urls, Project*

Developer activity

Target: Analyze Developer Activity

Analyze trends in developer activity over time.

Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Insights (Commits & Issues & PRs):

1. Growth Trend:

There is a noticeable upward trend in both commits and issues over the years. This indicates increasing developer activity and engagement with AI projects over time.

2. Mature vs. Emerging Projects:

The initial years show lower activity, which corresponds to the early stages of project development. As projects mature and gain more users and contributors, the activity typically increases.

3. High Activity Year (2020):

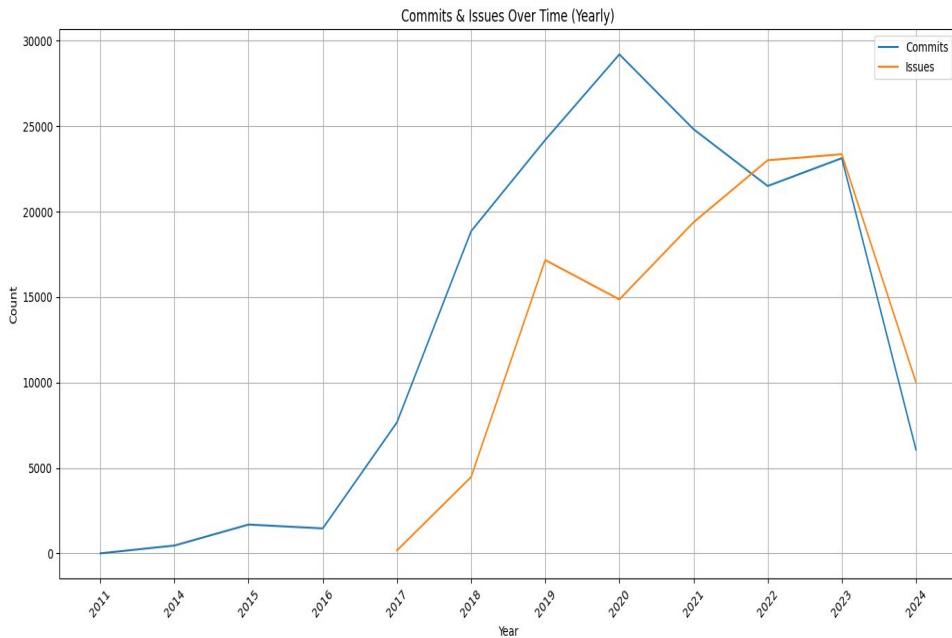
The year 2020 saw a significant spike in commits, indicating major updates and releases for several projects. This prompted extensive development and issue tracking, laying the groundwork for the subsequent bull market in 2021.

4. Consistent Growth Post-2018:

Post-2018, there is consistent growth in commits and issues, reflecting a sustained increase in developer engagement and project complexity.

5. Correlation Between Commits and Issues:

The trends of commits and issues appear to follow a similar pattern, suggesting that periods of active development (commits) often coincide with periods of increased issue reporting and resolution.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Insights (Repositories):

1. Initial Slow Growth (Pre-2017):

Before 2017, the creation of new repositories was relatively slow. This could indicate the early stages of AI development where fewer projects were initiated.

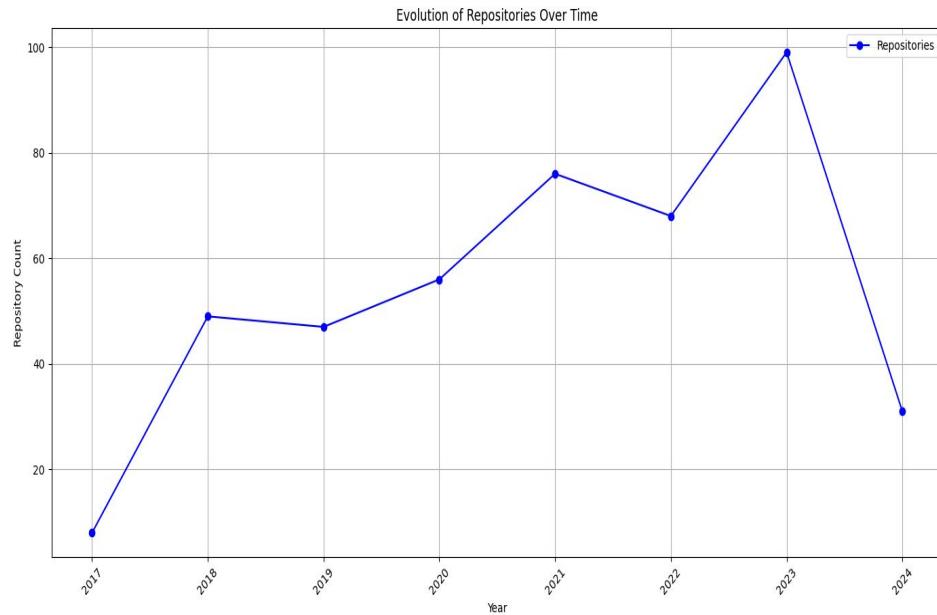
2. Sharp Increase in New Repositories (2020-2022):

There is a sharp increase in the number of new repositories from 2020 to 2022. This period reflects a wave of new interest in AI, possibly driven by advancements in AI technologies and increased funding.

3. Peak in Repository Creation (2023):

The year 2023 shows a peak in the creation of new repositories, suggesting a significant influx of new projects. This coincides with the surge in interest in AI, driven by the introduction of ChatGPT and other groundbreaking AI tools.

The overall upward trends in commits, issues, and repositories indicate a growing and active community around AI projects. This is a positive sign for the health and evolution of the AI field.



Developer activity

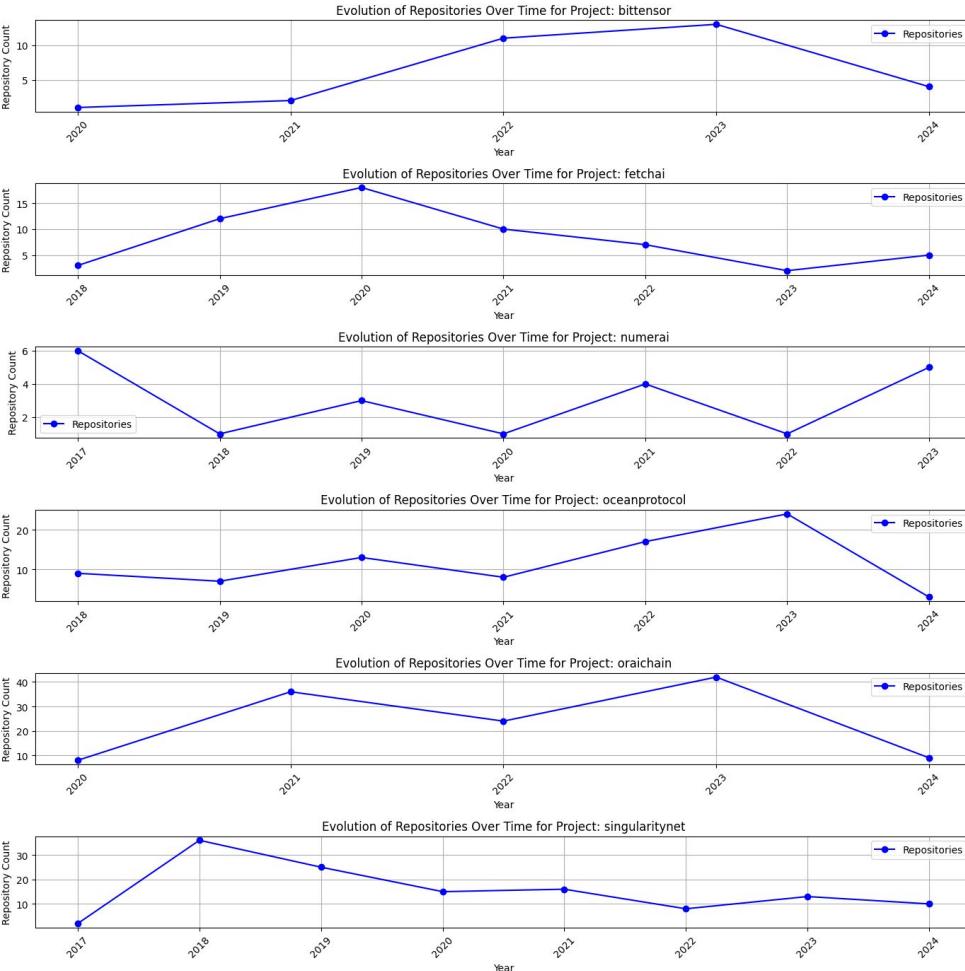
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Repositories trends

1. **General Growth Trend:** Most projects exhibit an overall increasing trend in repository creation, indicating a growing interest and investment in these AI projects over time.
2. **Peaks and Periods of Intense Activity:** Each project has specific years where repository creation peaks, often aligning with major updates, new features, or increased community engagement.
3. **Maturation and Stabilization:** Some projects show a decline in repository creation in recent years, suggesting a transition from rapid development to more stable maintenance phases.

Now, let's grab our magnifying glasses and dive into each project one by one for a detailed look at their activity!





NUMERAI

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

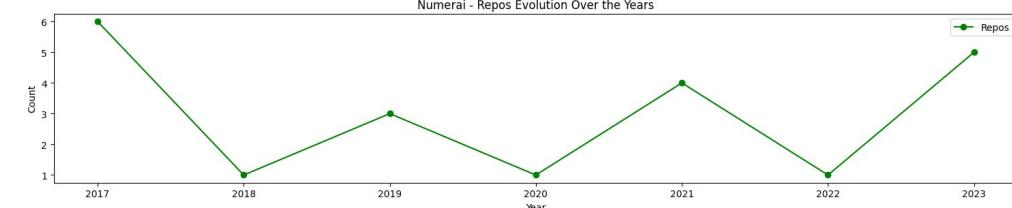
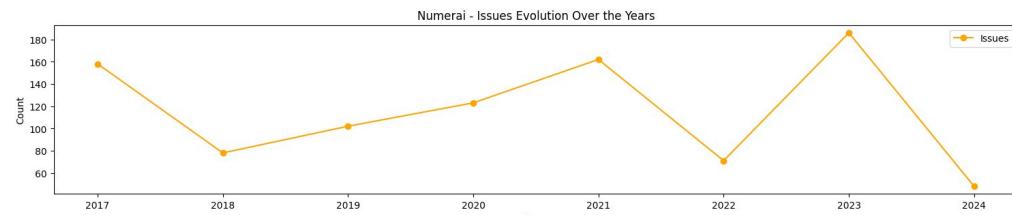
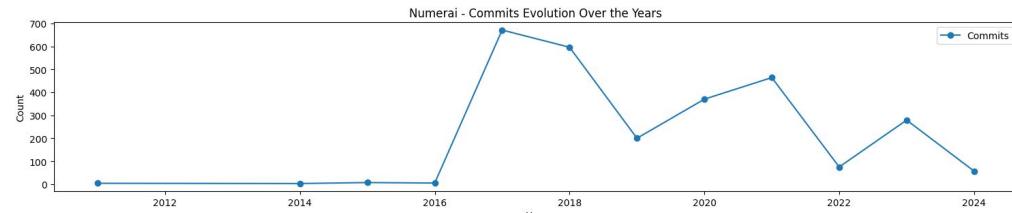
Evolution per project: Numerai

Project Overview

Numerai is a data science competition platform that aims to build the world's **open hedge fund** by enabling data scientists to submit their models based on encrypted data.

Commits Evolution Over the Years

1. **Significant Spike in 2017-2018:** A dramatic increase in commits in 2017, reaching a peak in 2018. This spike aligns with the ***initial model submissions*** and early project development efforts.
2. **Fluctuating Activity Post-2018:** After 2018, there is a decline followed by fluctuations in commit numbers. The activity picks up again in 2020, coinciding with the ***Super Massive Data Release***, and stabilizes at a lower level post-2021.





NUMERAI

Developer activity

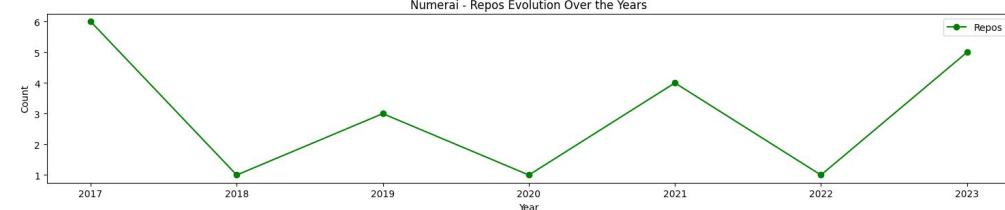
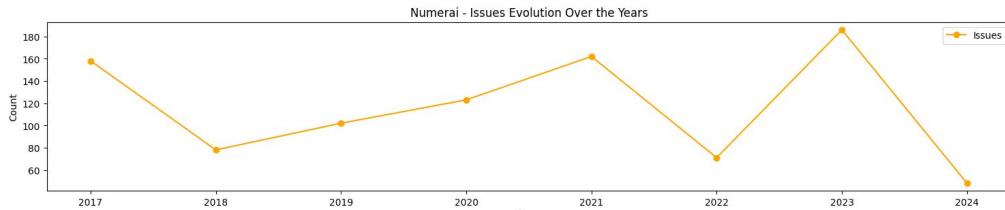
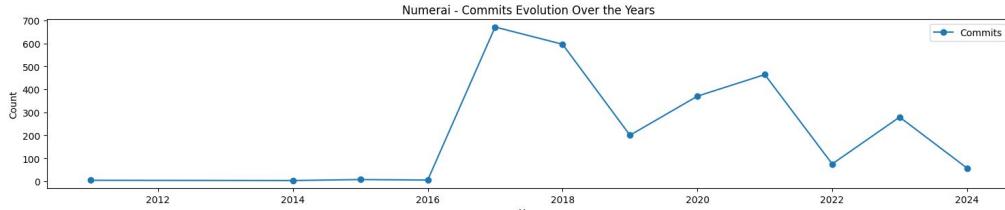
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Numerai

Issues & PRs Evolution Over the Years

1. **Initial High Activity in 2017:** The number of issues is highest in 2017, aligning with the peak in commits, indicating numerous challenges and bug reports during the initial development phase.
2. **Peaks and Troughs:** Another significant peak in issues is observed in 2023, followed by a sharp decline in 2024. This pattern correlates with major updates or changes, such as the **Rain Data Release** in September 2023, which likely introduced new complexities and challenges.



Repos Evolution Over the Years

1. **Initial Peak and Subsequent Fluctuations:** The number of repositories peaks initially in 2017, reflecting early expansion efforts. There is a decline in 2018, followed by fluctuations. The repository count picks up again in 2020, aligning with major releases.
2. **Renewed Growth in 2023:** The number of new repositories increases in 2023, indicating a potential new phase of expansion or new initiatives, possibly related to the **Rain Data Release**.



NUMERAI

Developer activity

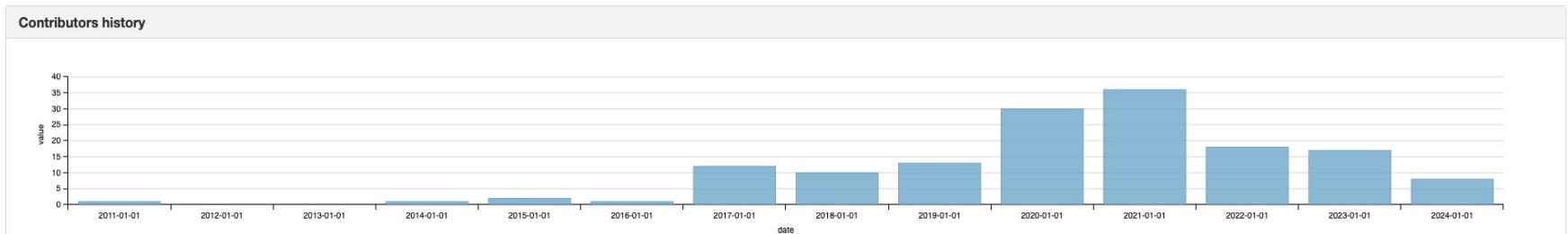
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Numerai

Contributors History

1. **Increase in Contributors in 2017 and 2018:** The number of contributors increases significantly in 2017 and 2018, aligning with the rise in commits. This indicates that more developers were involved in the project during this period, contributing to the surge in development activity.
2. **Stable Contributor Base 2019-2022:** From 2019-2022, the number of contributors remains relatively stable, with minor fluctuations. This suggests that **the project has maintained a consistent contributor base**, with periods of increased participation in 2020 and 2021.
3. **Contributor Activity in 2023 and 2024:** There is a noticeable **decrease** in the number of contributors in 2022, followed by a slight increase in 2023. The number of contributors in 2024 is **lower**, which might indicate a consolidation phase or reduced recruitment of new contributors.





NUMERAI

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Numerai

Insights

1. **Peak Development Periods (2017-2018, 2020-2021, 2023)**. The significant peaks in commits during these periods align with major releases and updates, such as new datasets and targets. These periods involve the *Super Massive Data Release (2017-2018)*, the *Sunshine and Midnight (released in 2021)* which added numerous new features and targets, aiming to enhance model performance. *The Rain Data Release (September 2023)* - This release introduced the "Rain" dataset, which includes 666 new features and 12 new targets, making it the most extensive dataset Numerai has released. It replaced older datasets (V2 and V3) and aimed to improve model performance significantly. 2023 also marks the moment of *Teager Target Release (November 2023)* The "Teager" target, along with related targets Agnes, Claudia, and Rowan, was introduced to improve model performance by handling risk in new ways.
2. **Fluctuating Contributor Activity** The number of contributors shows notable increases during major development phases (2017-2018, 2020-2021). This indicates that Numerai onboarded more developers to handle the increased workload associated with these releases.
3. **Stabilization and Maintenance Phases (2019, 2022, 2024)** The dips in commit activity during these years suggest phases where the focus shifted from active development to stabilization and maintenance. This is typical following major releases as the project works to resolve any issues and optimize the new features.
4. **Renewed Efforts and Expansion:** The renewed growth in commits, issues, and repositories in 2023 indicates a new wave of development and expansion, possibly driven by the introduction of new features, community initiatives, or strategic pivots.
5. **Community Engagement:** The trends in contributor history highlight key periods of community engagement and onboarding, particularly in 2017-2018 and 2020-2021.

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

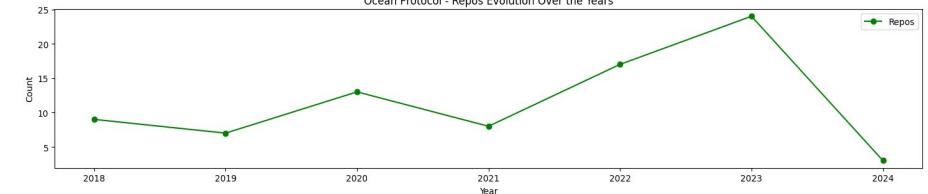
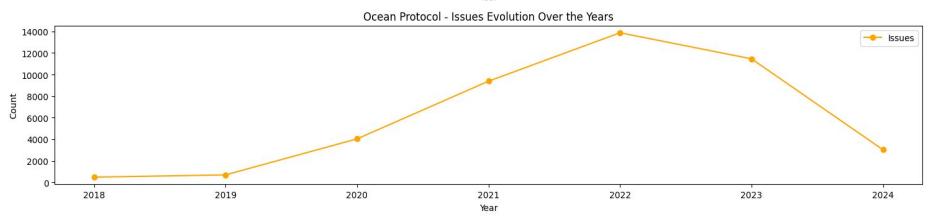
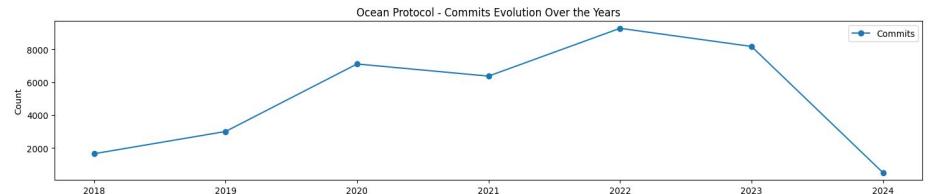
Evolution per project: Ocean Protocol

Project overview

Ocean Protocol is a decentralized data exchange protocol designed to unlock data for AI consumption while ensuring data privacy and sovereignty.

Commits Evolution Over the Years

1. **Steady Growth (2018-2020):** There is a consistent increase in the number of commits from 2018 to 2020, indicating an active development phase. This period coincides with significant milestones such as the **Mainnet Launch** in 2019 and the **V3 Upgrade**, which introduced enhanced protocol features, including **Compute-to-Data**.
2. **Peak in 2022:** The number of commits reaches its highest point in 2022. This peak aligns with major development efforts, including the **OceanONDA V4 Release** and the introduction of **Data Farming**.
3. **Decline in 2023 and 2024:** There is a noticeable decrease in the number of commits in 2023, followed by a sharp drop in 2024. This trend suggests a potential shift towards maintenance, stabilization, or the completion of major development phases.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

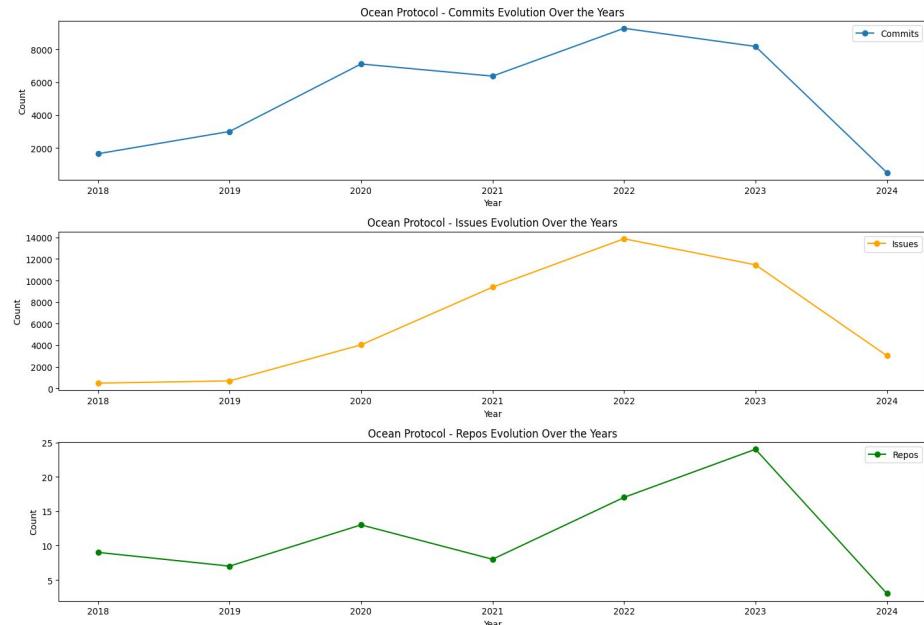
Evolution per project: Ocean Protocol

Issues & PRs Evolution Over the Years

1. **Rapid Increase (2019-2022):** The number of issues rises sharply from 2019 to 2022, with the highest count in 2022. This trend indicates increasing user engagement, more extensive testing, and more features being introduced that require debugging.
2. **Decline in 2023 and 2024:** The decline in issues in 2023 and 2024 could reflect a stabilization phase, with fewer new issues being reported as the project matures and initial bugs are resolved.

Repos Evolution Over the Years

1. **Fluctuating Growth (2018-2020):** The number of repositories fluctuates between 2018 and 2020, suggesting periods of project initiation followed by stabilization or consolidation.
2. **Steady Increase (2021-2023):** There is a steady increase in the number of repositories from 2021 to 2023, indicating ongoing expansion and the creation of new projects or modules within Ocean Protocol.



Developer activity

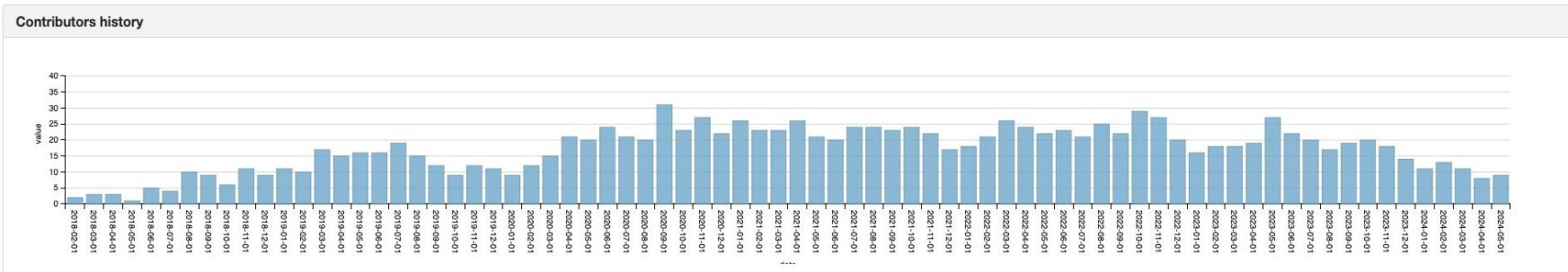
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Ocean Protocol

Contributors History

1. **Initial Growth Phase (2018-2019):** There is a gradual increase in the number of contributors starting from early 2018 through mid-2019. This period likely corresponds to the initial phases of development and the growing interest in the project.
2. **Stabilization and Peak Activity (2019-2021):** The number of contributors stabilizes and reaches a peak in 2020. This period includes the **launch of Ocean Protocol's mainnet** in 2019 and the **V3 upgrade** in 2020, which introduced data tokens and enhanced marketplace functionalities. The peak in contributor activity suggests a major phase of development and community engagement during these significant milestones.
3. **Slight Decline and Fluctuations (2021-2023):** Post-2021, there is a slight decline in the number of contributors, followed by fluctuations. This indicates a shift towards stabilization and maintenance, with intermittent phases of active development, likely related to the launch of new features such as **Compute-to-Data in 2021, OceanOnda V4 and Data Farming in 2022**.
4. **Renewed Engagement (Early 2023):** There is a notable increase in contributors in early 2023, which could be associated with new project initiatives or updates that reignited community interest and participation.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Ocean Protocol

Insights

1. **Peak Development Phase (2020-2022):** There was a significant increase in commits from 2018, peaking in 2021 and 2022. This corresponds with the introduction of major features such as the **Compute-to-Data feature in 2021. OceanOnda V4** and the **Data Farming incentives in 2022**. These periods of high development activity indicate major enhancements and expansions of the protocol.
2. **High Issue Reporting and Resolution (2019-2023):** The number of issues reported increased steadily from 2019, peaking in 2022. This suggests active use and testing of the protocol's features, with a focus on debugging and improving the user experience. The subsequent decline in 2023 indicates effective issue resolution and stabilization.
3. **Repository Growth and Fluctuations:** The number of repositories showed a general increase from 2018, peaking in 2023, reflecting the expansion of the project and the creation of new modules or components. The decline in 2024 suggests a consolidation phase where the focus might have shifted to refining and maintaining existing repositories.
4. **Steady Contributor Engagement (2019-2023):** Contributor activity was robust and consistent, with peaks in late 2020 and early 2023. This reflects ongoing community engagement and active participation in the project's development. The slight decline towards 2024 might indicate a phase of reduced recruitment or focus on maintaining the current contributor base.
5. **Milestones and Correlation with Activity:** Major releases such as the **Mainnet launch in 2019, the V3 upgrade in 2020, the introduction of Compute-to-Data and Data Farming features in 2021 and 2022 respectively, and the OceanONDA V4 release**, correlate with peaks in development activity. This highlights the impact of significant updates and features on overall project activity and community involvement.

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

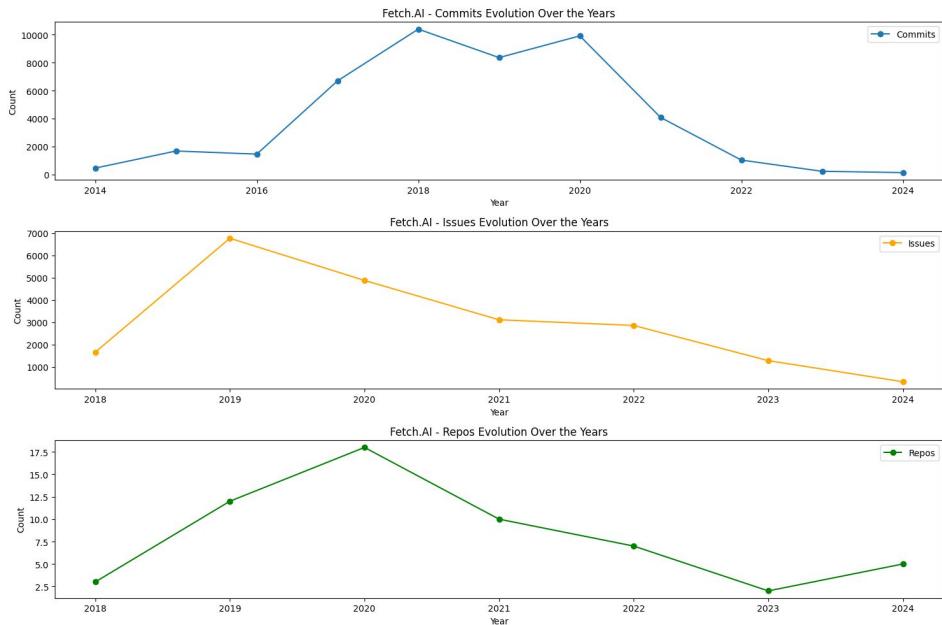
Evolution per project: Fetch.ai

Project Overview

Fetch.AI is a decentralized digital ecosystem where autonomous agents perform useful economic work on behalf of individuals, businesses, and organizations. It leverages artificial intelligence and blockchain technology to enable the creation of a decentralized digital economy.

Commits Evolution Over the Years

1. **Initial Growth (2014-2017):** Commits started increasing gradually, reflecting the early development phase.
2. **Peak Development (2018-2020):** A significant increase in commits, peaking in 2020. This period correlates with the ***mainnet launch*** and subsequent major releases.
3. **Decline and Stabilization (2021-2024):** A decline in commits post-2020, stabilizing at a lower level. This suggests a shift towards maintenance and incremental updates.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

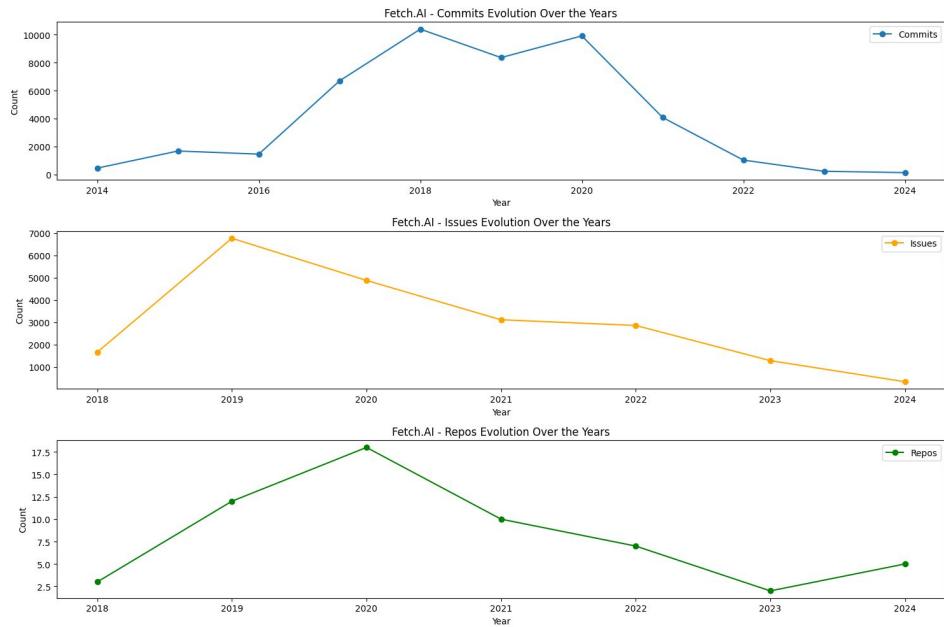
Evolution per project: Fetch.ai

Issues & PRs Evolution Over the Years

1. **Peak in 2019:** The number of issues peaks in 2019, which aligns with the peak in commits. This suggests that the intense development phase also brought about numerous challenges and bug reports.
2. **Steady Decline:** There is a steady decline in the number of issues reported from 2020 onwards, indicating fewer new issues as the project matures and stabilizes.

Repos Evolution Over the Years

1. **Growth and Peak in 2020:** The number of repositories increases steadily, peaking in 2020. This aligns with the mainnet launch and the introduction of new features and frameworks.
2. **Consolidation (2021-2024):** A decline in repository creation post-2020, indicating a phase of consolidation and focus on existing projects.
3. **Repository growth correlates with major project milestones, reflecting the expansion and subsequent consolidation phases.**



Developer activity

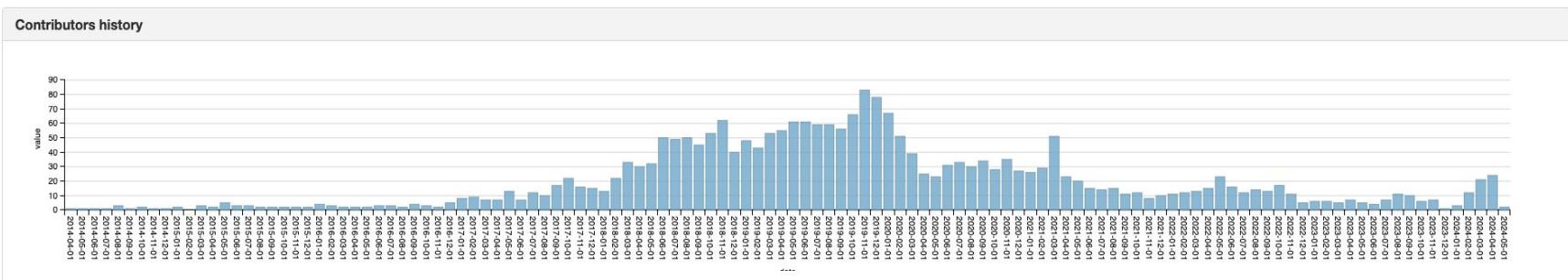
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Fetch.ai

Contributors History

- Engagement Driven by Major Releases:** Major milestones and releases, such as the **2020 mainnet launch** and the **2021 introduction of the OEF and AEA toolkit**, along with the Bosch collaboration, significantly impact contributor activity. These events attract new developers and increase community involvement.
- Fluctuating Contributor Base:** Post-2020, the number of contributors fluctuated, reflecting phases of active development and maintenance. These fluctuations highlight the dynamic nature of the project's development cycle.
- Need for Sustained Engagement:** The decline in contributor numbers towards 2023-2024 suggests **a need for strategies to sustain and increase community engagement**, such as regular updates, incentives, and community-building activities.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: **Fetch.ai**

Insights

1. **Major Releases Drive Development Activity.** Major releases such as the **2019 Mainnet Launch** and the **2020 Agent Framework Release** led to spikes in commits. **2021 introduction of the OEF and AEA toolkit** also corresponded with increased activity.
2. **Peak Development and Subsequent Stabilization:** Fetch.AI experienced peak development activity between 2018 and 2020, with the highest number of commits during this period. Post-2020, there was a decline in commits and issues, suggesting a transition from active development to stabilization and maintenance of existing features.
3. **Dynamic Contributor Engagement.** Contributor activity showed significant fluctuations, with peaks around major releases:

The decline in contributor numbers towards 2023-2024 indicates a need for strategies to sustain engagement and involvement in the project.

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

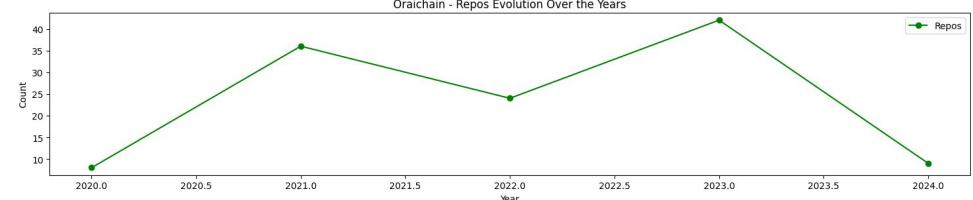
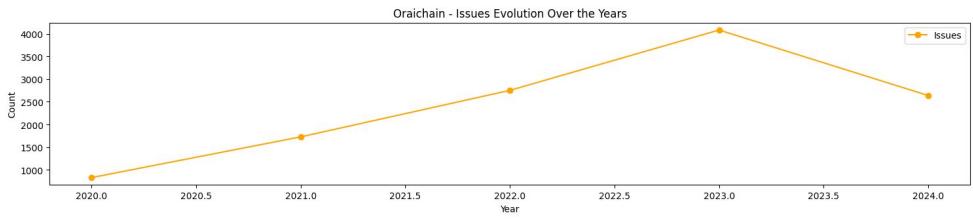
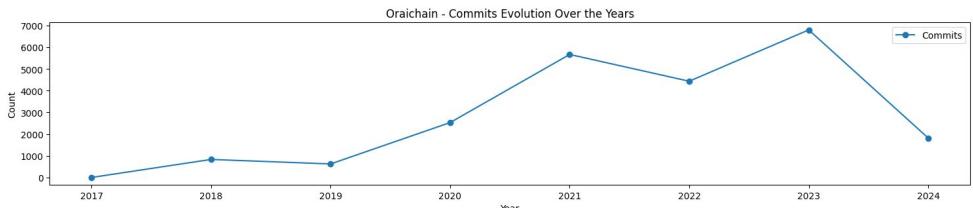
Evolution per project: Oraichain

Project Overview

Oraichain is a data oracle and blockchain platform that integrates artificial intelligence (AI) to provide verifiable and reliable data for smart contracts, enhancing their functionality with AI and data services.

Commits Evolution Over the Years

- Steady Growth (2017-2021):** There is a steady increase in commits from 2017 to 2021, indicating active development, especially around major milestones like the **Mainnet Launch** in 2020 and the **AI Marketplace** in 2021.
- Peak in 2023:** The number of commits peaks in 2023, correlating with the **V2 Release**, indicating significant development efforts.
- Decline in 2024:** There is a noticeable decline in commits in 2024, suggesting a shift towards maintenance and stabilization after the major developments



Developer activity

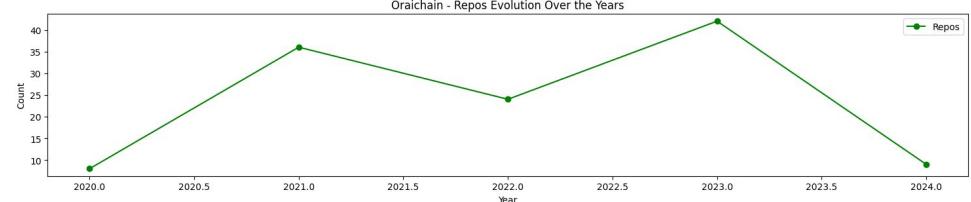
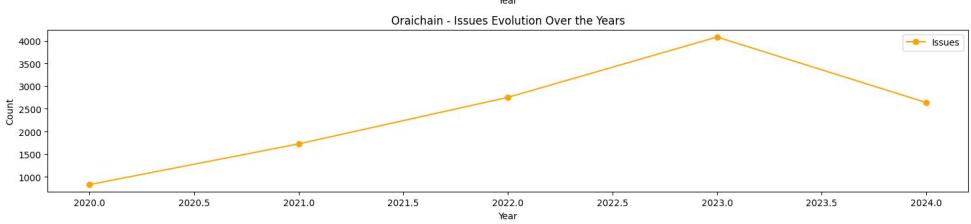
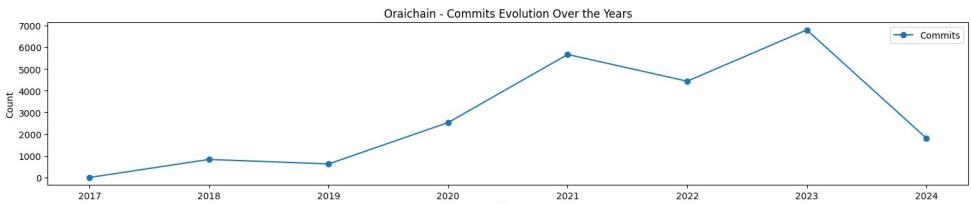
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Oraichain

Issues & PRs Evolution Over the Years

1. **Consistent Increase Leading to Peak in 2023:** Steady rise in issues, peaking in 2023, which indicates heightened activity and development challenges around the **V2 Release**.
2. **Decline Post-2023:** The decline in issues in 2024 suggests improved stability or a slowdown in development activity.



Repos Evolution Over the Years

1. **Fluctuating Growth with Peaks in 2021 and 2023:** Peaks in repository creation in 2021 (**AI Marketplace**) and 2023 (**V2 Release**) indicate expansion phases.
2. **Significant Decline in 2024:** Sharp decline in repositories in 2024, indicating a consolidation phase or reduced new project initiatives.

Developer activity

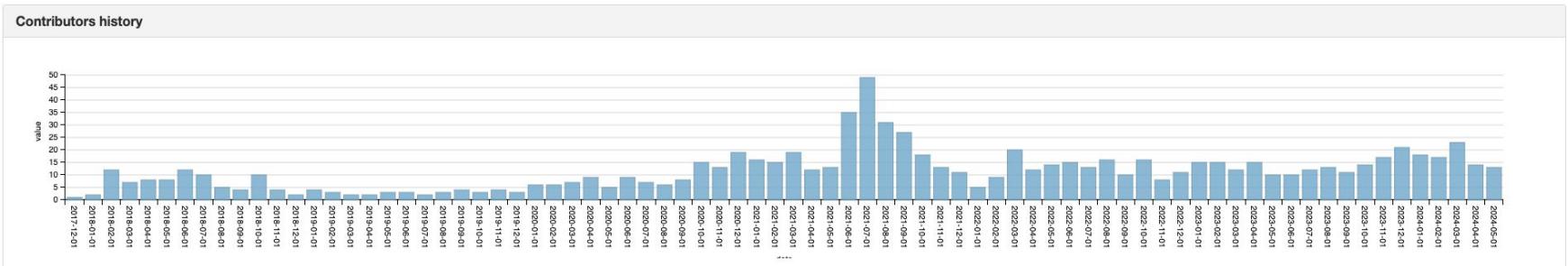
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Oraichain

Contributors History

- Increase in Contributors During Major Releases:** Significant increase in contributors aligns with major releases and peaks in commits, indicating more developers involved during these periods.
- Fluctuations of Contributor Base:** Post-2020, the number of contributors remains relatively stable with fluctuations, suggesting consistent community engagement.
- Impact of Major Milestones:** Clear correlation between major milestones and spikes in contributor activity, reflecting the influence of key releases on community participation.
- Contributor Activity Post-2020:** Increased activity in 2020 and 2021, aligning with the **Mainnet Launch and AI Marketplace**. Decline towards 2024, indicating a possible need for renewed engagement strategies.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Oraichain

Insights

1. **Major Releases Drive Development Activity:** Significant increases in commits and contributor activity align with key releases such as the *Mainnet Launch* in 2020, the *AI Marketplace* in 2021, and the *V2 Release* in 2023. These milestones are pivotal in engaging the community and driving development efforts.
2. **Peak Development Phase and Subsequent Stabilization:** The period between 2017 and 2023 marks the peak of development activity, with high numbers of commits and issues reported. Following 2023, there is a noticeable decline, indicating a shift towards stabilization and maintenance phases.
3. **Fluctuating Contributor Engagement:** Contributor activity shows peaks corresponding to major releases, followed by declines. This fluctuation underscores the need for continuous engagement strategies to maintain a stable contributor base.
4. **Improved Stability or Reduced Development Activity:** The decline in the number of issues reported from 2023 onwards suggests either improved project stability with fewer bugs or a reduction in usage and development activity.
5. **Continuous Innovation and Community Engagement Needed:** Ongoing innovation and active community engagement are crucial for sustaining development momentum. Regular updates, community events, and incentives are essential to keep developers interested and involved in the project.

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

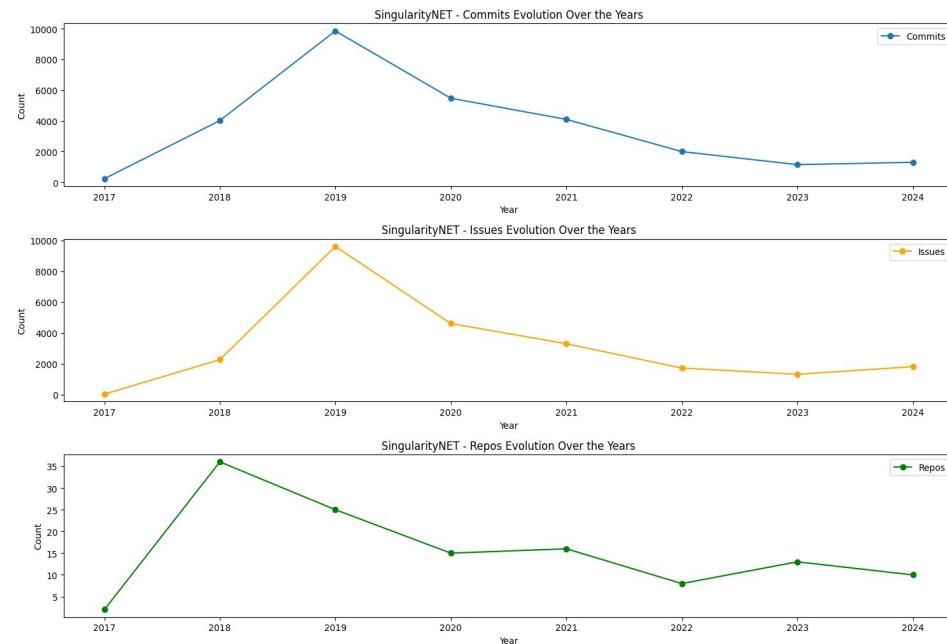
Evolution per project: SingularityNET

Project Overview

SingularityNET is a decentralized platform for AI services, enabling AI developers to create, share, and monetize AI technologies on a global scale. It aims to democratize AI by providing a decentralized marketplace where AI services can be accessed and utilized.

Commits Evolution Over the Years

1. **Rapid Growth (2017-2019):** Significant increase in commits from 2017 to 2019, reflecting the initial development phase and the **Mainnet Launch** in 2018.
2. **Peak in 2019:** Highest number of commits in 2019, coinciding with the **beta version release** and community expansion.
3. **Gradual Decline (2020-2024):** A steady decline in commits from 2020 onwards, indicating a transition to stabilization and maintenance phases.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

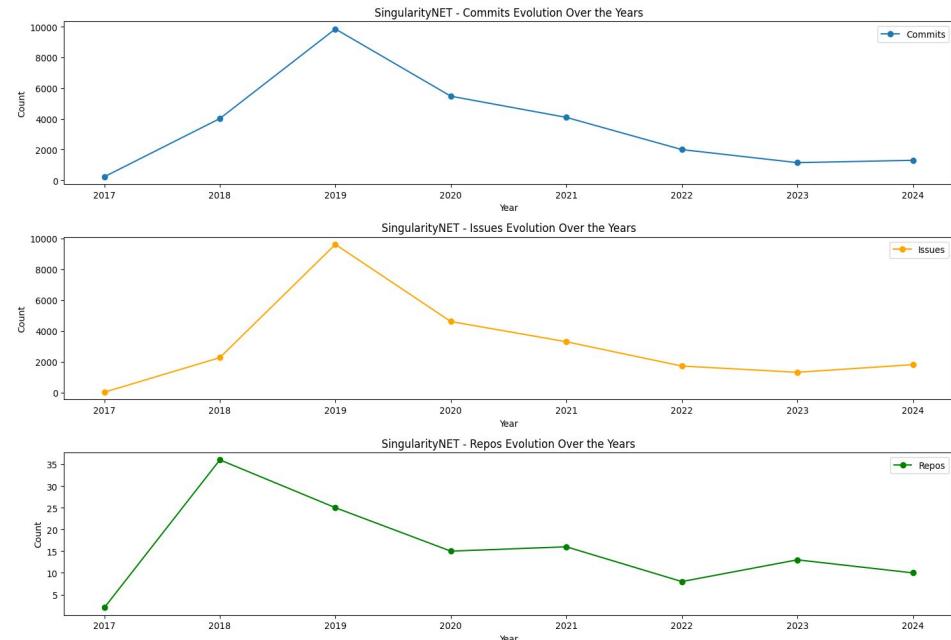
Evolution per project: SingularityNET

Issues & PRs Evolution Over the Years

1. **Peak in 2019:** The number of issues reported peaks in 2019, corresponding with the peak in commits. This alignment suggests that the rapid development phase introduced many new features, which subsequently required extensive testing and debugging.
2. **Steady Decline (2020-2023):** Similar to commits, the number of issues steadily declines after 2019, suggesting improved stability or reduced development activity.

Repos Evolution Over the Years

1. **Initial Growth and Peak in 2018:** The number of repositories grows rapidly, peaking in 2018. This correlates with the **Mainnet Launch** followed by a decline, indicating a phase of consolidation.
2. **Fluctuations with Downward Trend (2020-2024):** Fluctuations in repository creation with an overall downward trend, reflecting reduced new project initiatives.



Developer activity

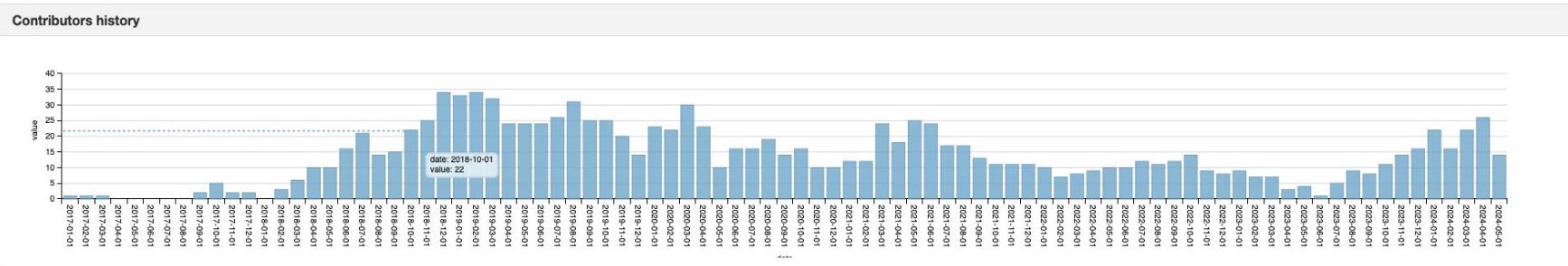
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: SingularityNET

Contributors History

- Noticeable Increase During Key Milestones:** There is a significant uptick in the number of contributors during major project milestones. For instance, the **Mainnet Launch** in 2018 saw a surge in contributor activity as the community rallied around the launch of the platform's core functionalities. Similarly, the **beta version** release in 2019 attracted a considerable number of new contributors, eager to participate in the testing and improvement of the platform.
- Fluctuating Contributor Base Post-2019:** Periods of Active Development and Stabilization: After the peak in 2019, the number of contributors began to fluctuate. These fluctuations are indicative of the natural cycle of development and stabilization in open-source projects. High contributor activity often corresponds to periods of intense development when new features are being added or major updates are being rolled out.
- Renewed Engagement in Late 2023 and 2024:** Increasing Contributor Numbers: Towards the end of 2023 and into 2024, there is a slight but noticeable increase in the number of contributors.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: SingularityNET

Insights

1. **Major Releases Drive Development Activity:** Significant increases in commits and contributor activity align with key releases such as the **Project Launch in 2017, the Mainnet Launch in 2018, and the beta version release in 2019**. These milestones are crucial in engaging the community and driving development efforts.
2. **Peak Development Phase and Subsequent Stabilization:** The period between 2017 and 2019 marks the peak of development activity, with high numbers of commits and issues reported. Following 2019, there is a noticeable decline, indicating a shift towards stabilization and maintenance phases.
3. **Fluctuating Contributor Engagement:** Contributor activity exhibits noticeable peaks during major releases, followed by periods of decline. This pattern highlights the importance of continuous engagement strategies to maintain a stable contributor base. The slight increase in contributors observed in late 2023 and 2024 suggests **a renewed interest**, possibly driven by new initiatives or updates, emphasizing the need for ongoing efforts to keep contributors engaged and active
4. **Decline in Issues Reflects Improved Stability or Reduced Development:** The decline in the number of issues reported from 2020 onwards suggests improved project stability with fewer bugs or a reduction in usage and development activity.

Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

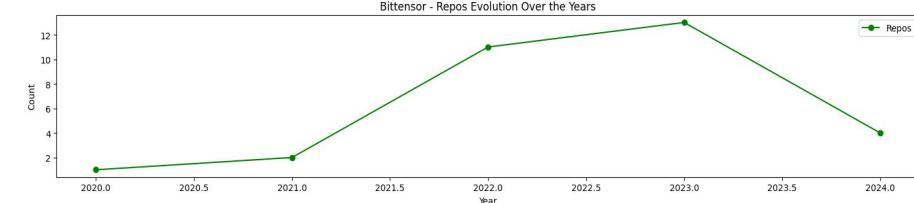
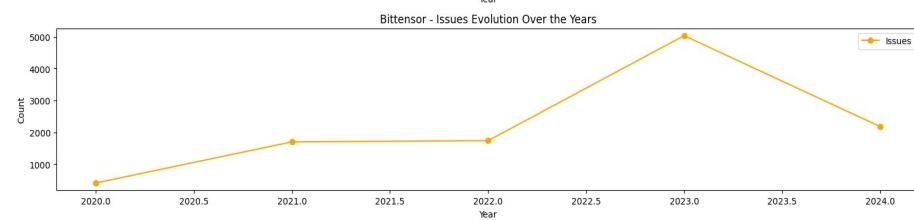
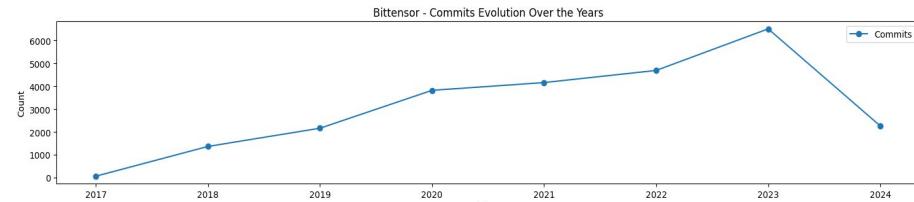
Evolution per project: Bittensor

Project Overview

Bittensor is an open-source protocol designed to incentivize and enable the creation of decentralized, scalable, and interoperable AI networks.

Commits Evolution Over the Years

1. **Continuous Development (2017-2022):** The steady increase in the number of commits from 2017 to 2022 indicates active and ongoing development, reflecting the growth and expansion of the Bittensor project. This period includes key releases like the **Mainnet Launch (2018)** and **Major Feature Update (2021)**.
2. **Peak Activity in 2023:** The number of commits peaks in 2023, suggesting a significant development push, likely due to a major update or the introduction of new features. This highlights the project's focus on extensive development efforts during this year.
3. **Decline in 2024:** While there is a noticeable decline in commits in the early part of 2024, this might be a reflection of the year still being ongoing. The decrease may indicate a shift towards maintenance and stabilization phases after completing major development milestones or the initial quarter having less activity due to the focus on consolidating the work done in 2023.



Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

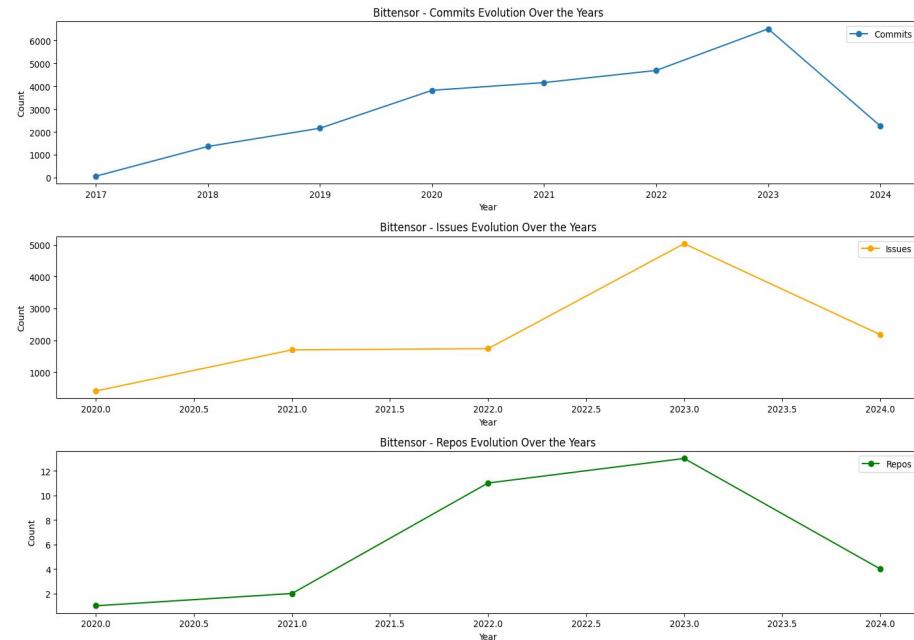
Evolution per project: Bittensor

Issues & PRs Evolution Over the Years

1. **Increased Issues Reporting (2018-2023):** The number of issues reported increases from 2018 to 2023, peaking in 2023. This trend suggests active user engagement and the discovery of bugs or challenges related to new features and updates, such as those in the **Mainnet Launch (2018) and Major Update (2023)**.
2. **Peak in 2023:** The peak in issues in 2023 correlates with the peak in commits, indicating that major development activities and feature releases often bring new issues that need resolution.

Repos Evolution Over the Years

3. **Steady Growth (2017-2023):** The number of repositories grows steadily from 2017 to 2023, reflecting the addition of new projects, features, and expansions within the Bittensor ecosystem. This period includes significant milestones such as the **Mainnet Launch (2018) and Major Feature Update (2021)**.
4. **Peak in 2023:** The peak in the number of repositories in 2023 aligns with the peak in commits and issues, indicating a period of extensive development and the introduction of new components or sub-projects within the Bittensor network.



Developer activity

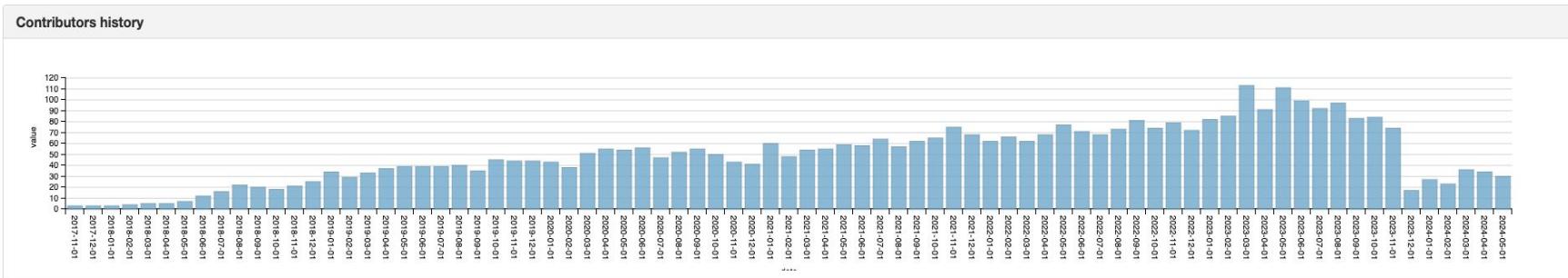
Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: Bittensor

Contributors History

- Gradual Increase (2017-2019):** Contributor engagement shows a gradual increase from 2017 to 2019, reflecting growing interest and involvement in the early stages of the project. This period aligns with initial development efforts and the build-up to the **Mainnet Launch** in 2018.
- Significant Increase During Major Releases (2020-2021):** There is a noticeable spike in contributor activity around 2020 and 2021, coinciding with major milestones like the **Major Feature Update (2021)**. This suggests that new features and updates attract more contributors to the project.
- Sustained Engagement Post-2021:** Contributor activity remains relatively high and stable post-2021, indicating a **well-established contributor base**. This sustained engagement can be attributed to ongoing development and improvements within the Bittensor ecosystem.
- Renewed Engagement in Late 2023 and Early 2024:** A slight increase in contributors is observed towards the end of 2023 and into early 2024, suggesting renewed interest or new initiatives. This could be due to upcoming features or a new phase of development.





Developer activity

Target: Analyze Developer Activity

- Analyze trends in developer activity over time.
- Look for patterns, spikes, or dips that might correlate with events or milestones in the project's development.

Evolution per project: **Bittensor**

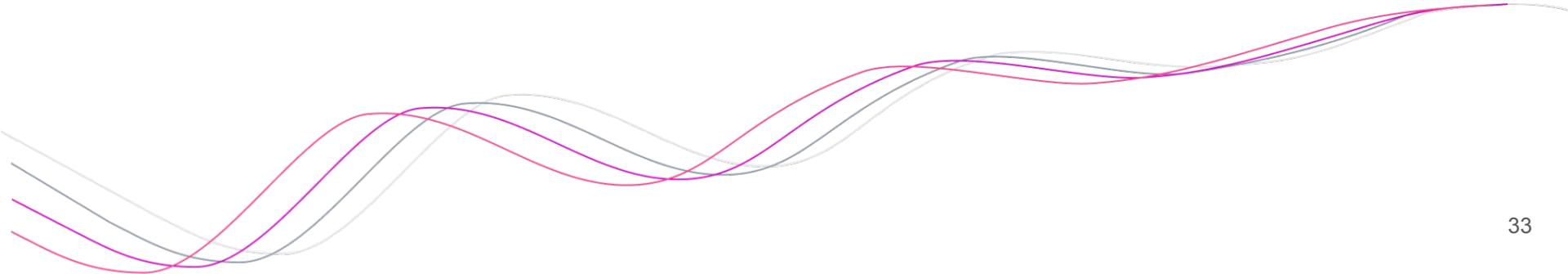
Insights

1. **Correlation Between Major Releases and Development Activity:** Major releases such as the *Mainnet Launch* in 2018, the *Major Feature Update* in 2021, and significant updates in 2023 correlate with peaks in development activity. These milestones drive spikes in commits, issues, and contributor engagement, indicating intensive development periods.
2. **Sustained Contributor Engagement Post-Major Updates:** Contributor activity tends to stabilize and sustain at higher levels following major updates, reflecting ongoing interest and involvement from the developer community. The peaks during major releases followed by stable engagement highlight the project's ability to retain contributors.
3. **Fluctuating Activity with a Trend Towards Stabilization:** While there are fluctuations in commits, issues, and repositories, a general trend towards stabilization/stagnation is evident post-2021. This suggests that after significant development phases, the project focuses on maintenance, bug fixing, and optimization.
4. **Renewed Interest in Late 2023 and Early 2024:** The renewed growth in contributors and development activity towards the end of 2023 and into early 2024 suggests new initiatives or features that re-engage the community. This indicates the project's ongoing evolution and its ability to attract contributors with new developments.

Projects Ranking

Target: Rank Projects by Activity

Collect data on the number of commits and repositories created for each crypto project.
Rank the projects based on these metrics and graph the evolution of this ranking over time.



Projects Ranking

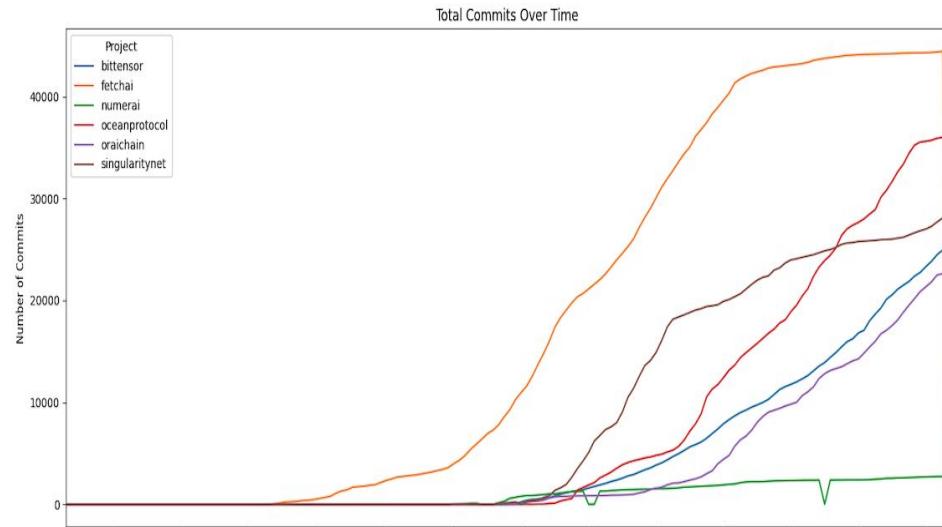
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Number of Commits per Project

Ranking:

1.	Fetch.ai	44432 commits
2.	Ocean Protocol	36042 commits
3.	SingularityNET	28134 commits
4.	Bittensor	25005 commits
5.	Oraichain	22681 commits
6.	Numerai	2731 commits



Projects Ranking

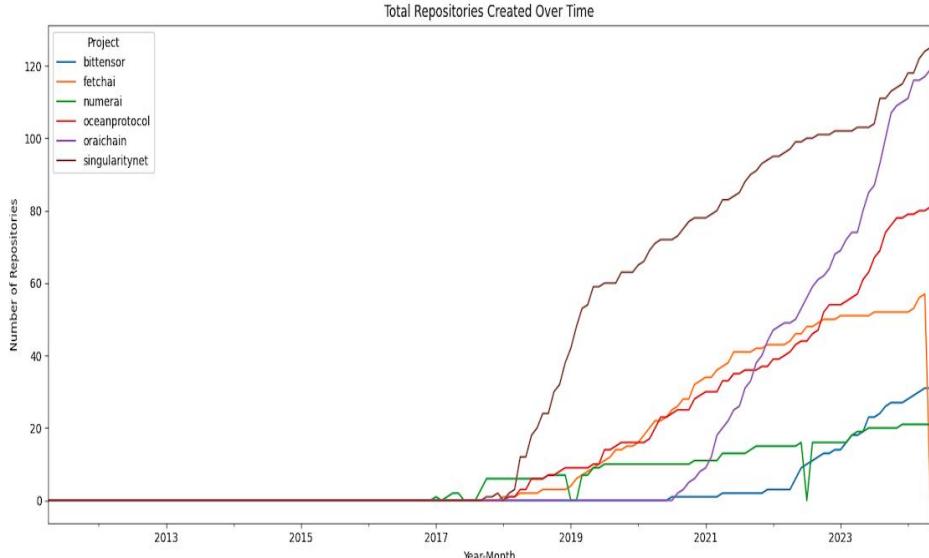
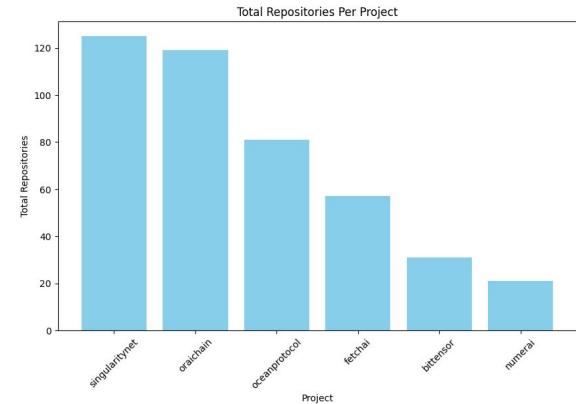
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Number of Repos per Project

Ranking:

1. SingularityNET **125** repositories
2. Oraichain **119** repositories
3. Ocean Protocol **81** repositories
4. Fetch.ai **57** repositories
5. Bittensor **31** repositories
6. Numerai **17** repositories



Projects Ranking

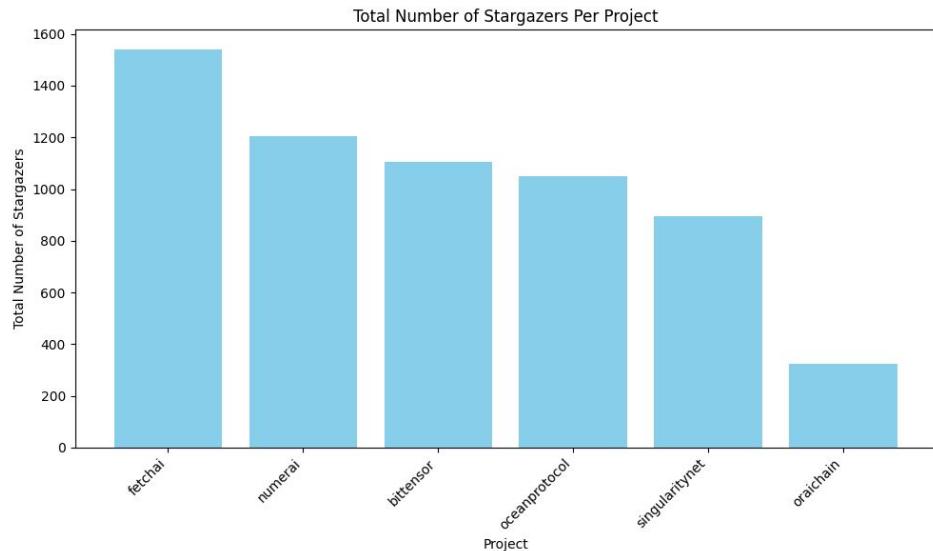
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Number of Stargazers per Project

Ranking:

1.	Fetch.ai	1539 stargazers
2.	Numerai	1205 stargazers
3.	Bittensor	1106 stargazers
4.	Ocean Protocol	1049 stargazers
5.	SingularityNET	894 stargazers
6.	Oraichain	323 stargazers



Projects Ranking

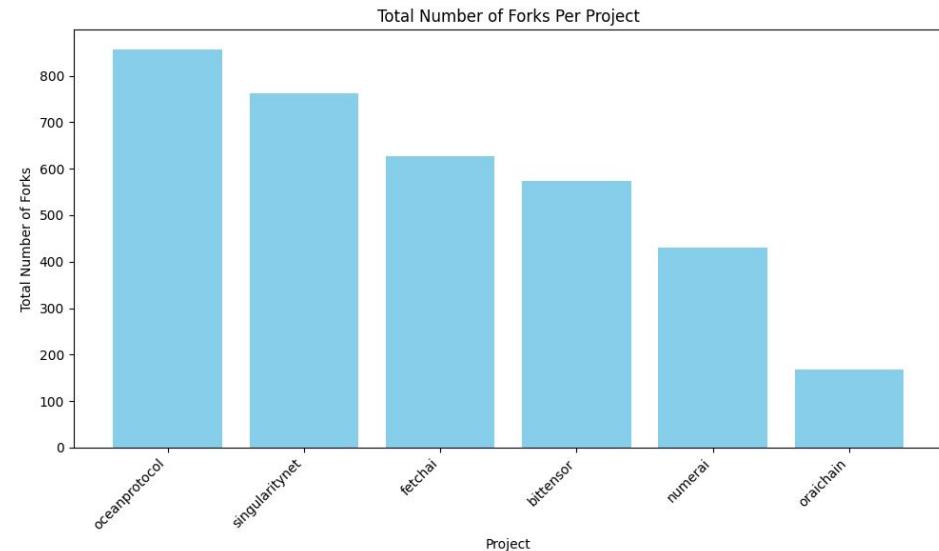
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Number of Forks per Project

Ranking:

1.	Ocean Protocol	856 forks
2.	SingularityNET	762 forks
3.	Fetch.AI	626 forks
4.	Bittensor	573 forks
5.	Numerai	431 forks
6.	Oraichain	168 forks



Projects Ranking

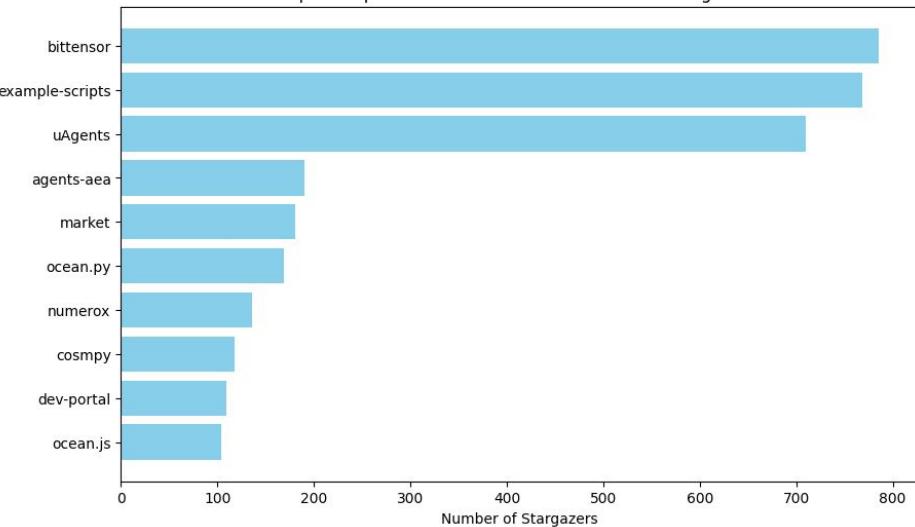
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Top 10 Repos - Based on the stargazers count

1.	bittensor (Bittensor)	786 stargazers
2.	example-scripts (Numerai)	768 stargazers
3.	uAgents (Fetch.AI)	710 stargazers
4.	agents-aea (Fetch.AI)	190 stargazers
5.	market (Ocean Protocol)	181 stargazers
6.	ocean.py (Ocean Protocol)	169 stargazers
7.	Numerox (numerai)	136 stargazers
8.	Cosmpy (Fetch.ai)	118 stargazers
9.	Dev-portal (SingularityNET)	109 stargazers
10.	ocean.js (Ocean Protocol)	104 stargazers

Top 10 Repositories Based on the Number of Stargazers



Projects Ranking

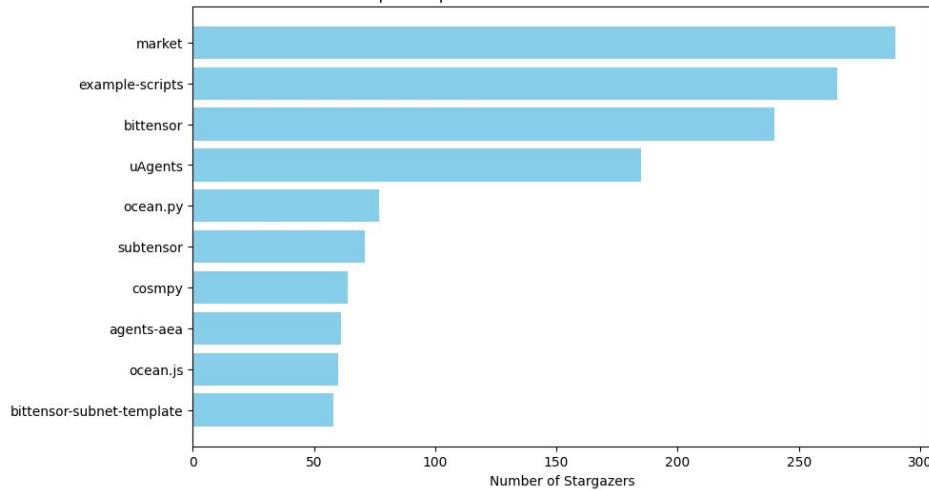
Target: Rank Projects by Activity

- Collect data on the number of commits and repositories created for each crypto project.
- Rank the projects based on these metrics and graph the evolution of this ranking over time.

Top 10 Repos - Based on the forks count

1.	Market (Ocean Protocol)	290 forks
2.	Example-scripts (Numerai)	266 forks
3.	Bittensor (Bittensor)	240 forks
4.	uAgents (Fetch.ai)	185 forks
5.	ocean.py (Ocean Protocol)	77 forks
6.	Subtensor (Bittensor)	71 forks
7.	Cosmpy (Fetch.ai)	64 forks
8.	Agents-aea (Fetch.ai)	61 forks
9.	ocean.js (Ocean Protocol)	60 forks
10.	Bittensor-subnet-template (Bittensor)	58 forks

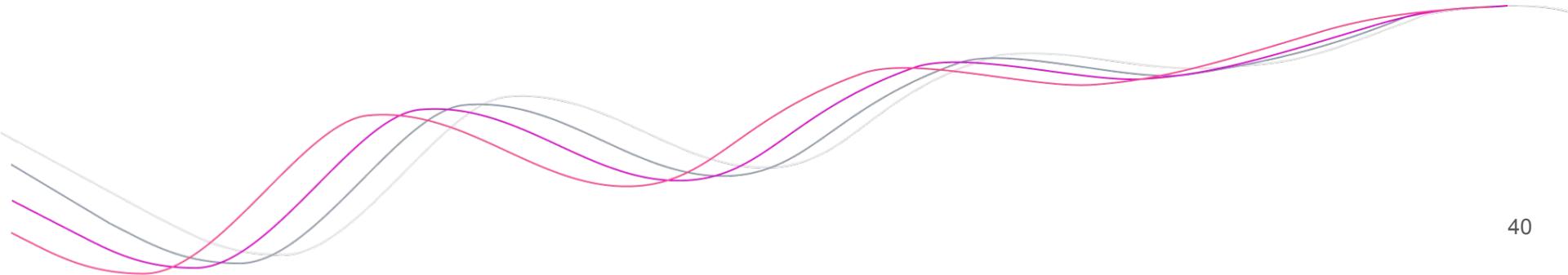
Top 10 Repositories Based on the Number of Forks



Developers Ranking

Target: Rank the Most Active Developers

Analyze developer activity within each project and identify the most active contributors.
Graph the evolution of this ranking over time to track changes in developer involvement.



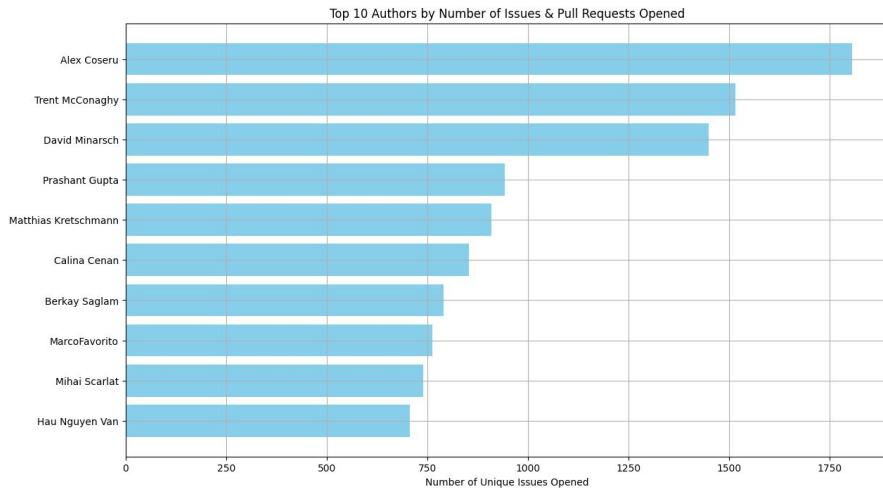
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (New Issues & Pull Requests) - Across All Projects

1.	Alex Coseru (Ocean Protocol)	1806 issues & PRs	1	😎
2.	Trent McConaghy (Ocean Protocol)	1516 issues & PRs	2	🎉
3.	David Minarsch (Fetch.AI)	1450 issues & PRs	3	🙌
4.	Prashant Gupta (SingularityNET)	942 issues & PRs		
5.	Matthias Kretschmann (Ocean Protocol)	910 issues & PRs		
6.	Calina Cenan (Ocean Protocol)	853 issues & PRs		
7.	Berkay Saglam (Ocean Protocol)	790 issues & PRs		
8.	MarcoFavorito (Fetch.AI)	762 issues & PRs		
9.	Mihai Scarlat (Ocean Protocol)	739 issues & PRs		
10.	Hau Nguyen Van (Oraichain)	706 issues & PRs		



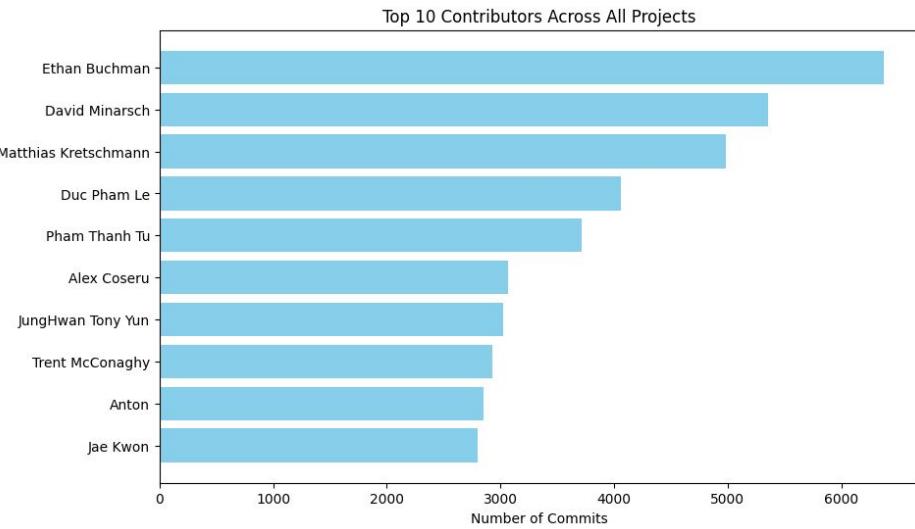
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors(Commits) - Across All Projects

1.	Ethan Buchman (Fetch.AI)	6372 commits	1 😎
2.	David Minarsch (Fetch.AI)	5357 commits	2 🎉
3.	Matthias Kretschmann (Ocean Protocol)	4981 commits	3 🙌
4.	Duc Pham Le (Oraichain)	4060 commits	
5.	Pham Thanh Tu (Oraichain)	3718 commits	
6.	Alex Coseru (Ocean Protocol)	3067 commits	
7.	JungHwan Tony Yun (Oraichain)	3020 commits	
8.	Trent McConaghy (Ocean Protocol)	2925 commits	
9.	Anton (Bittensor)	2849 commits	
10.	Jae Kwon (Fetch.AI)	2798 commits	



Developers Ranking

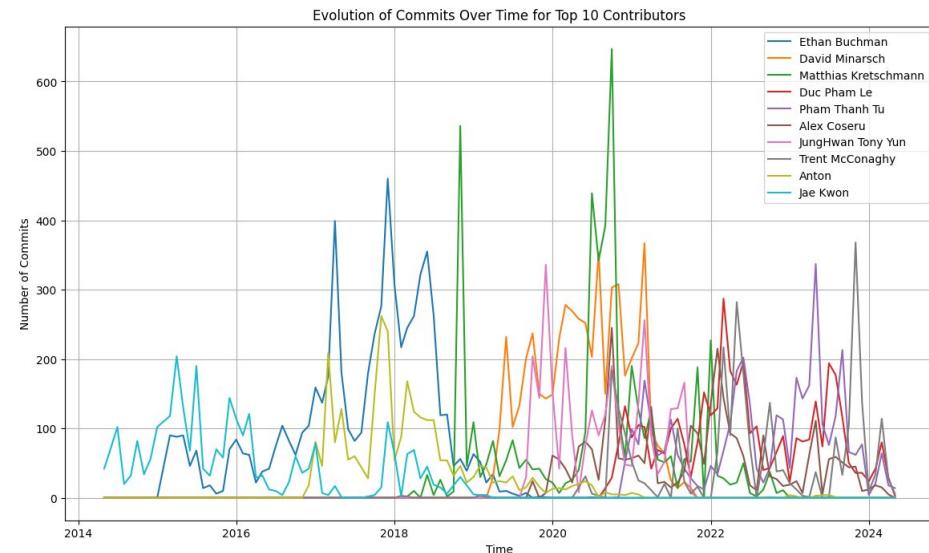
Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Across All Projects - Time evolution

Ever wondered what kind of characters make up the wild world 🦁 of software development? Well, look no further! Developer behaviors are as varied as the projects they work on. Let's take a peek at the top 10 contributors across various projects and uncover the quirky patterns and unique species of developers we find in the coding jungle. 🐾

1. **Consistent Key Maintainers:** Ethan Buchman and David Minarsch are the **marathon runners** of the development world, steadily committing code like clockwork. Almost every project has these steadfast contributors who, like your favorite reliable coffee machine, keep things brewing smoothly year after year. ☕🏃‍♂️🏃‍♀️
2. **Milestone Contributions:** Then we have the **high-pressure heroes**, Matthias Kretschmann and Duc Pham Le, who spring into action when the stakes are high. These developers are like firefighters, jumping into the fray during critical project phases to extinguish bugs and launch features with dramatic spikes in activity. 🚒🔥



Developers Ranking

Target: Rank the Most Active Developers

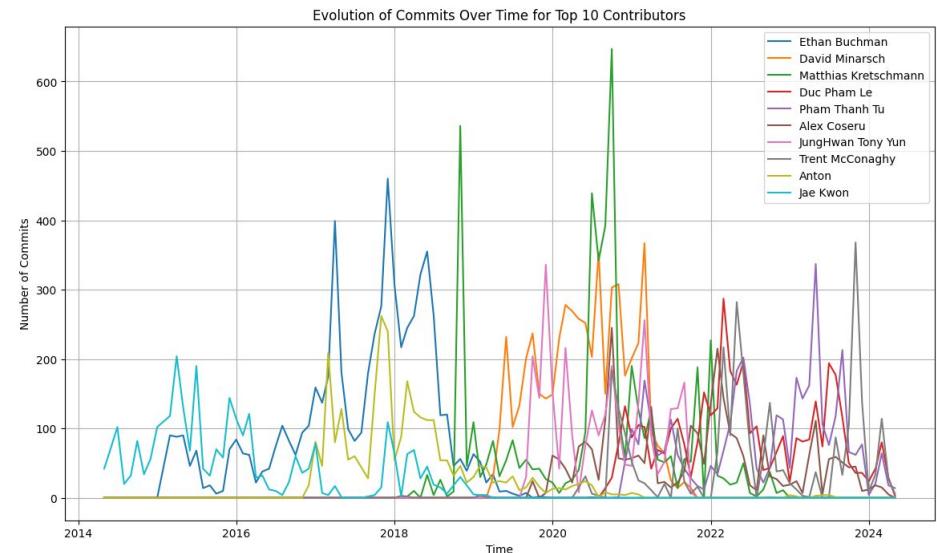
- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Across All Projects - Time evolution

3. Recent Increased Involvement: Pham Thanh Tu's recent surge in activity suggests either a fresh recruit eager to prove themselves or someone who's taken on new responsibilities. Think of them as the new kid on the block or the office worker who suddenly got a major promotion and is now everywhere. 😊📈

4. Initial Major Contributions: Alex Coseru, on the other hand, is the trailblazer, the one who laid down the foundation of the project with a flurry of early contributions. This species of developer sets the tone and direction, much like a pioneer charting unknown territory and leaving a legacy for others to build upon. 🚀🚀

5. Collaborative Peaks: And finally, we see the power of teamwork in the overlapping peaks of commit activity among multiple top contributors, like Ethan Buchman and David Minarsch. These periods of synchronized coding are reminiscent of a well-oiled jazz band, where each player's contribution harmonizes to create something greater than the sum of its parts. 🎶🎸🎹



Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Alrighty, it's time to put on our investigative hats, grab our magnifying glasses , and dive into each project one by one. Let's uncover their top committers and contributors!  

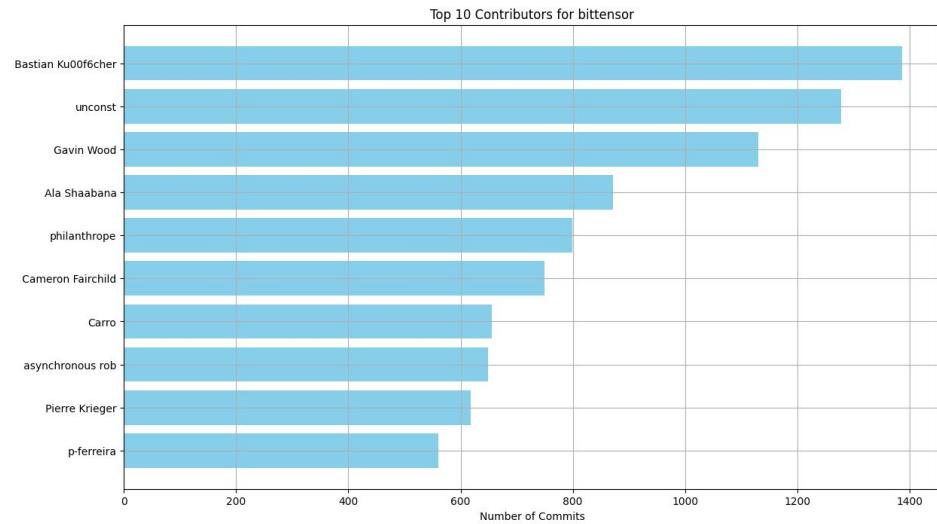
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Bittensor

1.	Bastian Ku00f6cher	1386 commits
2.	unconst	1278 commits
3.	Gavin Wood	1131 commits
4.	Ala Shaabana	871 commits
5.	philanthrope	799 commits
6.	Cameron Fairchild	750 commits
7.	Carro	656 commits
8.	asynchronous rob	649 commits
9.	Pierre Krieger	618 commits
10.	p-ferreira	561 commits



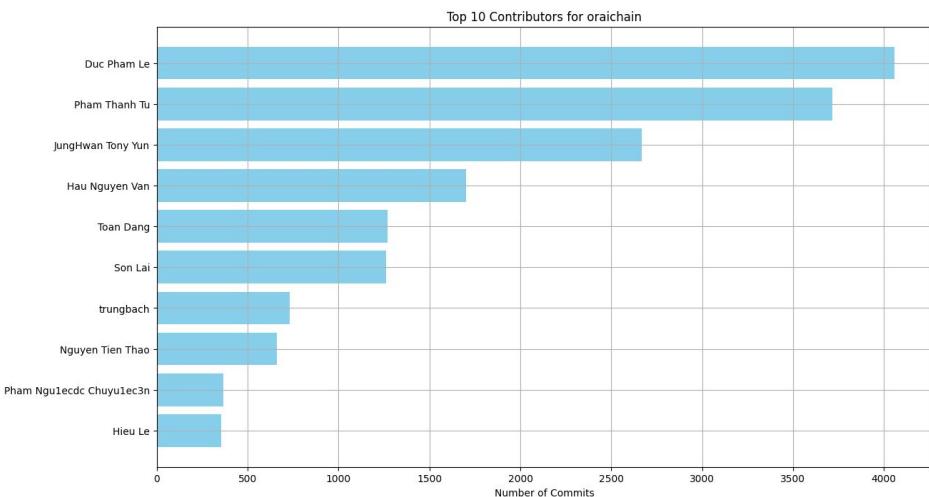
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Oraichain

1.	Duc Pham Le	4060 commits
2.	Pham Thanh Tu	3718 commits
3.	JungHwan Tony Yun	2669 commits
4.	Hau Nguyen Van	1700 commits
5.	Toan Dang	1269 commits
6.	Son Lai	1260 commits
7.	trungbach	730 commits
8.	Nguyen Tien Thao	659 commits
9.	Pham Ngu1ecdc Chuyu1ec3n	364 commits
10.	Hieu Le	354 commits



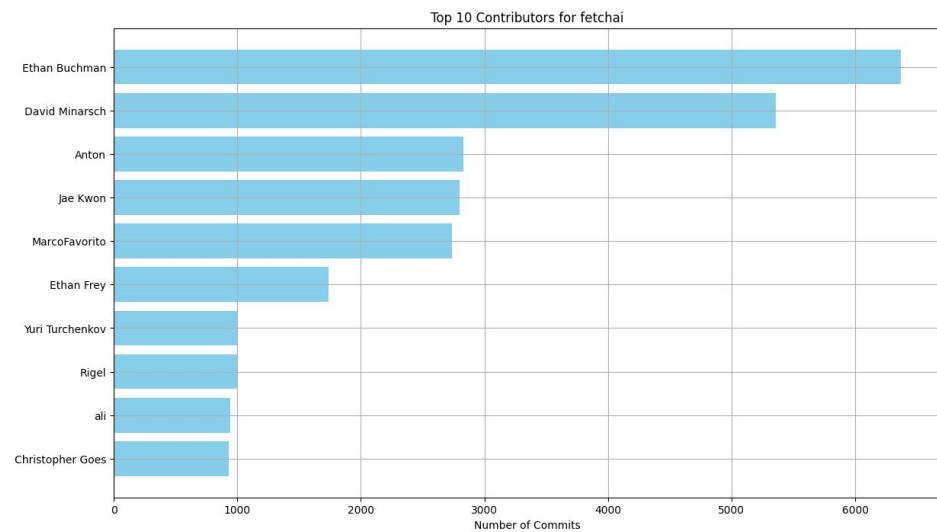
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Fetch.AI

1.	Ethan Buchman	6372 commits
2.	David Minarsch	5357 commits
3.	Anton	2831 commits
4.	Jae Kwon	2798 commits
5.	MarcoFavorito	2736 commits
6.	Ethan Frey	1737 commits
7.	Yuri Turchenkov	1005 commits
8.	Rigel	996 commits
9.	ali	943 commits
10.	Christopher Goes	932 commits





NUMERAI

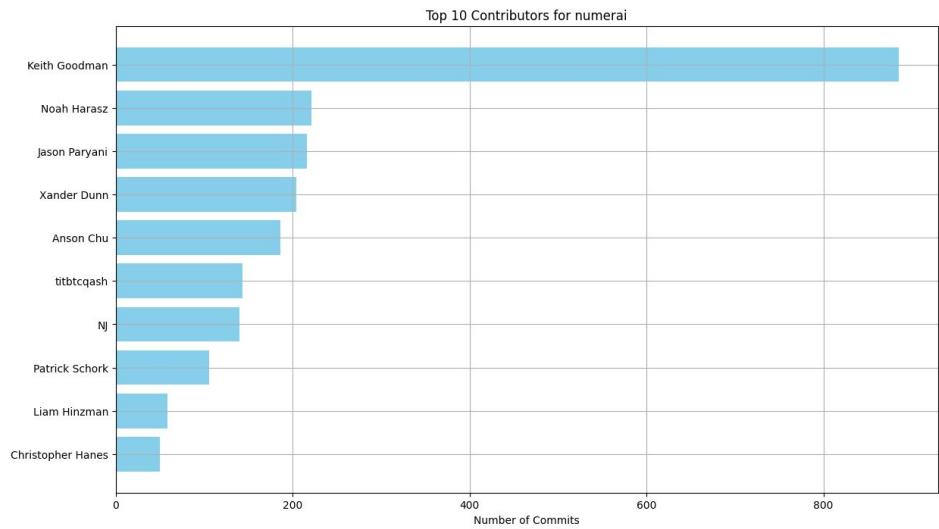
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Numerai

1.	Keith Goodman	885 commits
2.	Noah Harasz	221 commits
3.	Jason Paryani	216 commits
4.	Xander Dunn	204 commits
5.	Anson Chu	186 commits
6.	titbtcqash	143 commits
7.	NJ	140 commits
8.	Patrick Schork	106 commits
9.	Liam Hinzman	59 commits
10.	Christopher Hanes	50 commits



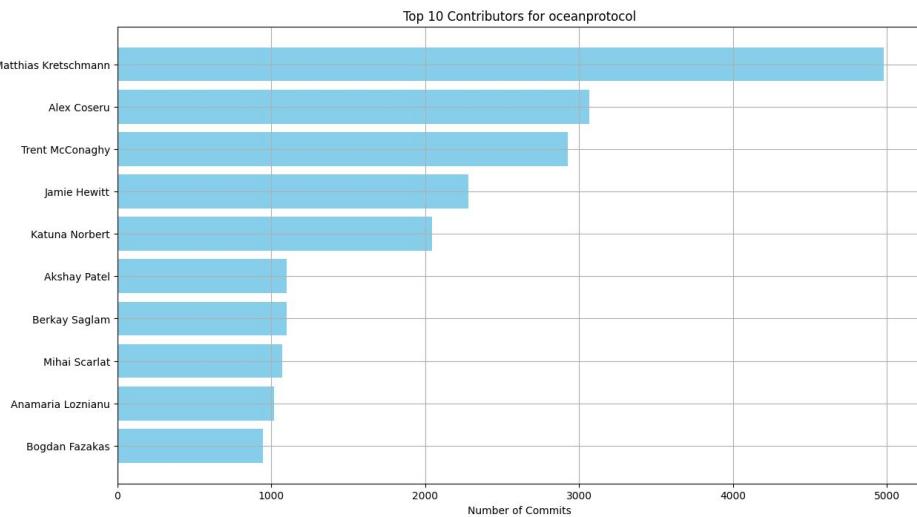
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - Ocean Protocol

1.	Matthias Kretschmann	4981 commits
2.	Alex Coseru	3067 commits
3.	Trent McConaghy	2925 commits
4.	Jamie Hewitt	2280 commits
5.	Katuna Norbert	2044 commits
6.	Akshay Patel	1101 commits
7.	Berkay Saglam	1101 commits
8.	Mihai Scarlat	1071 commits
9.	Anamaria Lozianu	1019 commits
10.	Bogdan Fazakas	947 commits



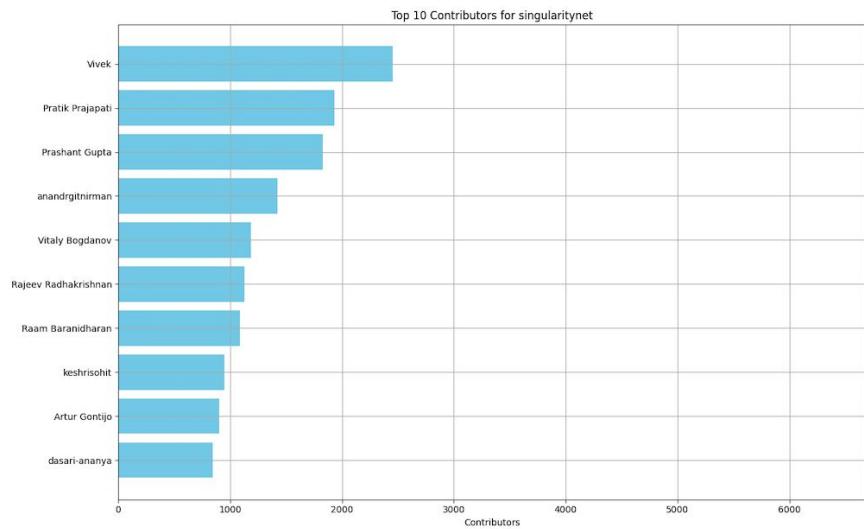
Developers Ranking

Target: Rank the Most Active Developers

- Analyze developer activity within each project and identify the most active contributors.
- Graph the evolution of this ranking over time to track changes in developer involvement.

Top 10 Contributors (Commits) - SingularityNET

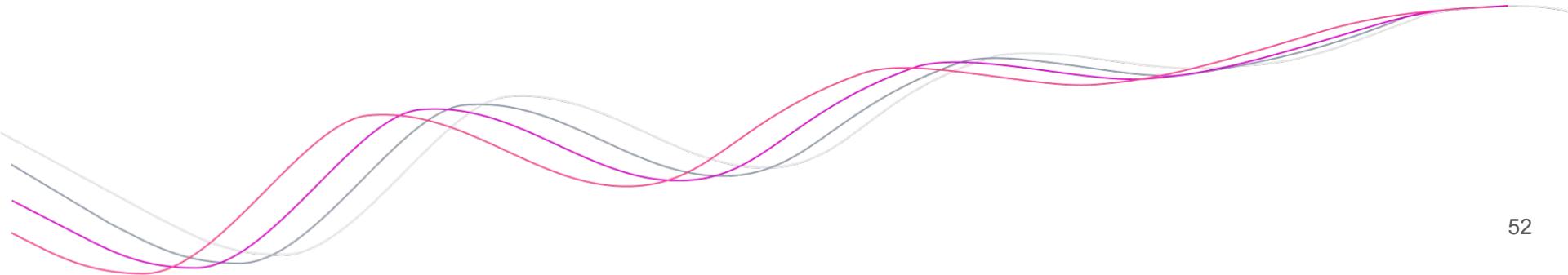
1.	Vivek	2452 commits
2.	Pratik Prajapati	1931 commits
3.	Prashant Gupta	1831 commits
4.	anandrgitnirman	1425 commits
5.	Vitaly Bogdanov	1188 commits
6.	Rajeev Radhakrishnan	1126 commits
7.	Raam Baranidharan	1091 commits
8.	keshrisohit	951 commits
9.	Artur Gontijo	901 commits
10.	dasari-ananya	847 commits



Repositories Ranking

Target: Rank Repositories by Activity

For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.



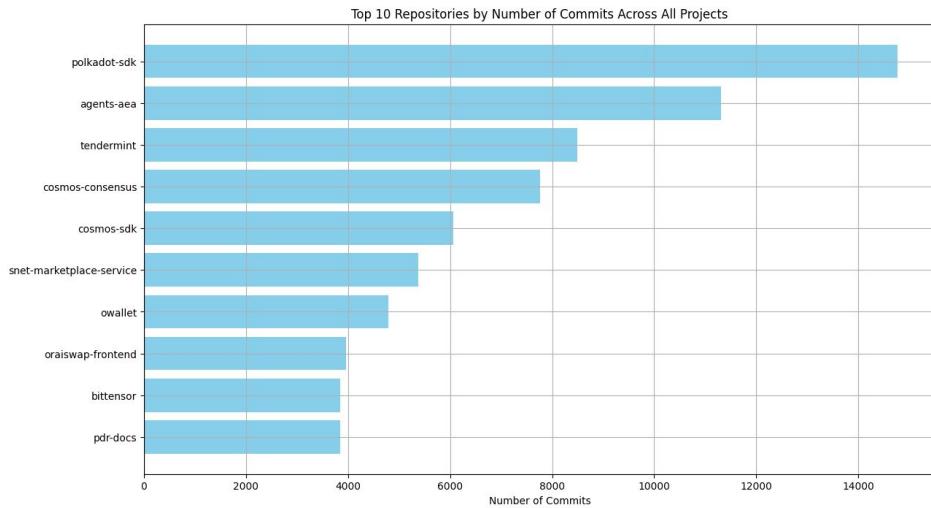
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits Across All Projects:

1.	polkadot-sdk (Bittensor)	14774 commits
2.	agents-aea (Fetch.AI)	11311 commits
3.	tendermint (Fetch.AI)	8496 commits
4.	cosmos-consensus (Fetch.AI)	7768 commits
5.	cosmos-sdk (Fetch.AI)	6062 commits
6.	snet-marketplace-service (SingularityNET)	5378 commits
7.	owallet (Oraichain)	4796 commits
8.	oraiswap-frontend (Oraichain)	3955 commits
9.	bittensor (Bittensor)	3853 commits
10.	pdr-docs (Ocean Protocol)	3852 commits



Repositories Ranking

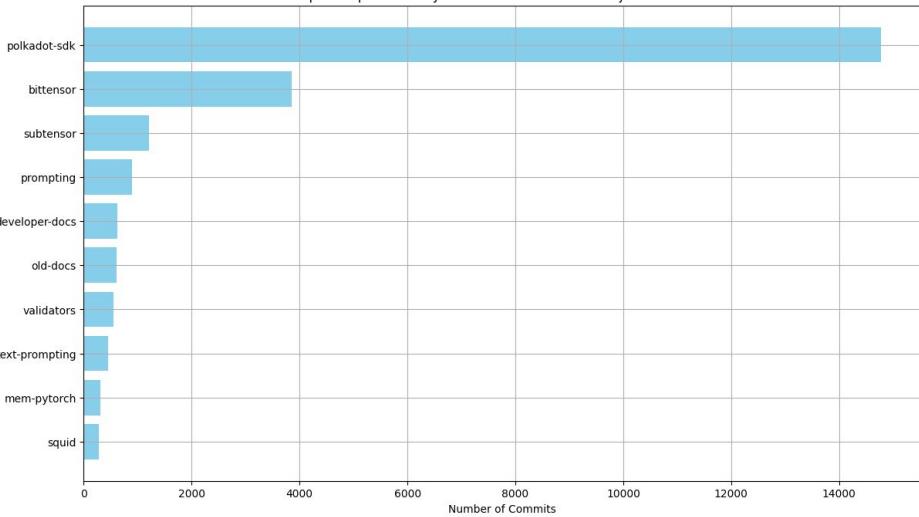
Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: Bittensor

1.	polkadot-sdk	14774 commits
2.	bittensor	3853 commits
3.	subtensor	1211 commits
4.	Prompting	899 commits
5.	developer-docs	621 commits
6.	old-docs	602 commits
7.	validators	555 commits
8.	text-prompting	448 commits
9.	mem-pytorch	313 commits
10.	squid	276 commits

Top 10 Repositories by Number of Commits for Project: bittensor



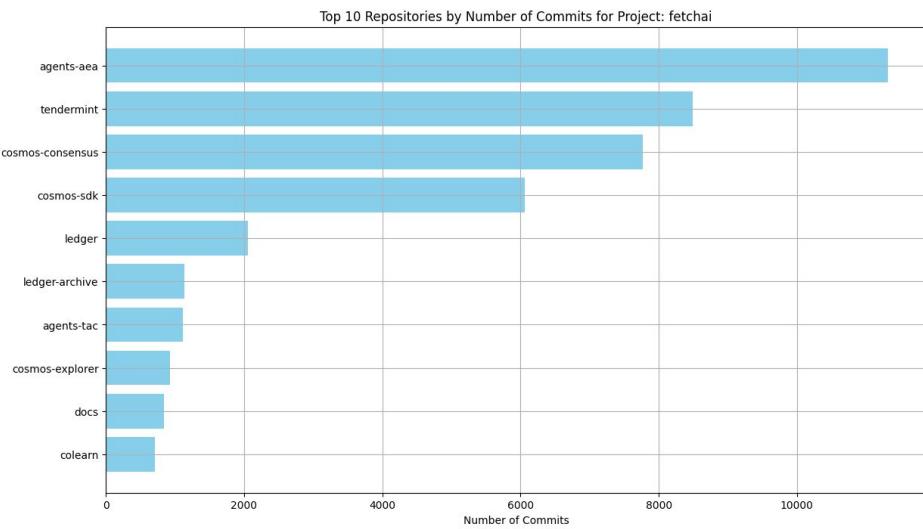
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: Fetch.AI

1.	agents-aea	11311 commits
2.	tendermint	8496 commits
3.	cosmos-consensus	7768 commits
4.	cosmos-sdk	6062 commits
5.	ledger	2056 commits
6.	ledger-archive	1131 commits
7.	agents-tac	1112 commits
8.	cosmos-explorer	930 commits
9.	docs	836 commits
10.	colearn	707 commits





NUMERAI

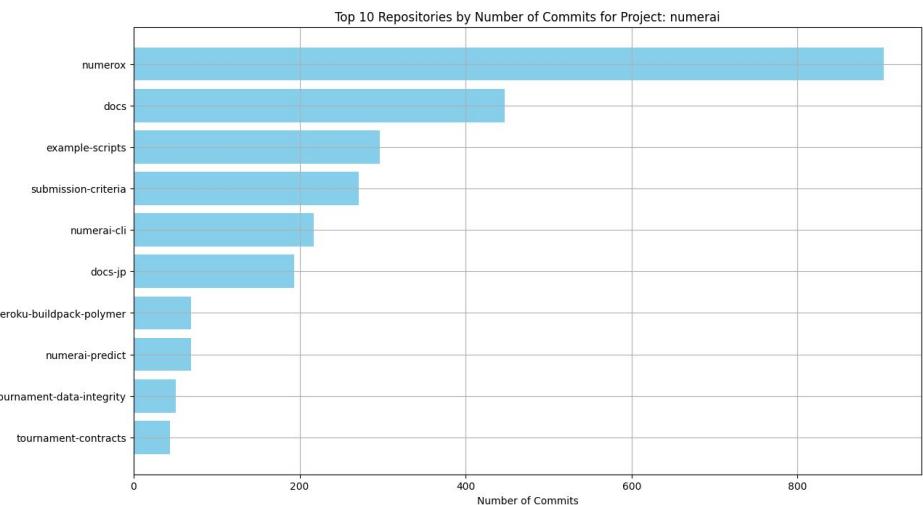
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: Numerai

1.	numerox	904 commits
2.	docs	447 commits
3.	example-scripts	297 commits
4.	submission-criteria	271 commits
5.	numerai-cli	217 commits
6.	docs-jp	193 commits
7.	heroku-buildpack-polymer	69 commits
8.	numerai-predict	69 commits
9.	tournament-data-integrity	51 commits
10.	tournament-contracts	44 commits



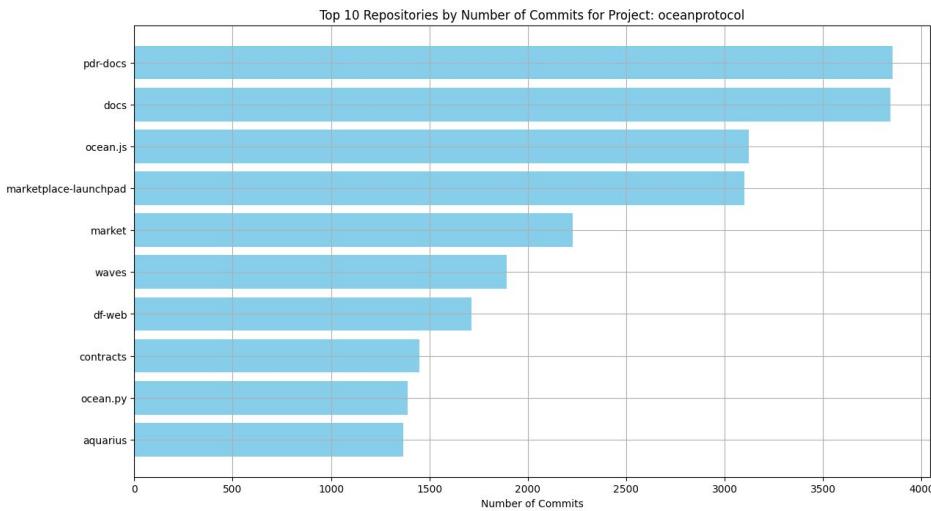
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: Ocean Protocol

1.	pdr-docs	3852 commits
2.	docs	3843 commits
3.	ocean.js	3124 commits
4.	marketplace-launchpad	3101 commits
5.	market	2228 commits
6.	waves	1894 commits
7.	df-web	1713 commits
8.	contracts	1448 commits
9.	ocean.py	1390 commits
10.	aquarius	1366 commits



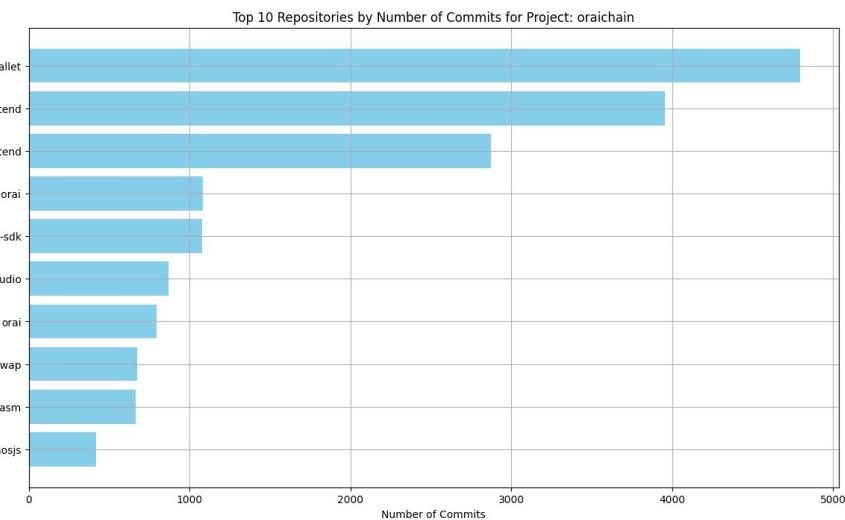
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: Oraichain

1.	owallet	4796 commits
2.	oraiswap-frontend	3955 commits
3.	oraiscan-frontend	2872 commits
4.	keplr-extension-orai	1081 commits
5.	oradex-sdk	1077 commits
6.	smart-studio	871 commits
7.	orai	797 commits
8.	oraiswap	673 commits
9.	oraiwasm	663 commits
10.	cosmosjs	421 commits



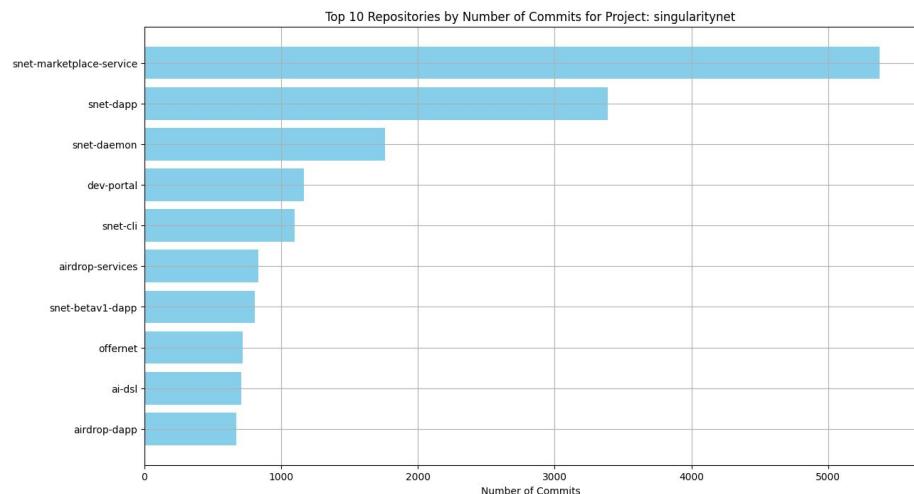
Repositories Ranking

Target: Rank Repositories by Activity

- For each project, rank repositories by the number of commits. This will help identify which parts of the project are seeing the most development activity.

Top 10 Repositories by Number of Commits for Project: SingularityNET

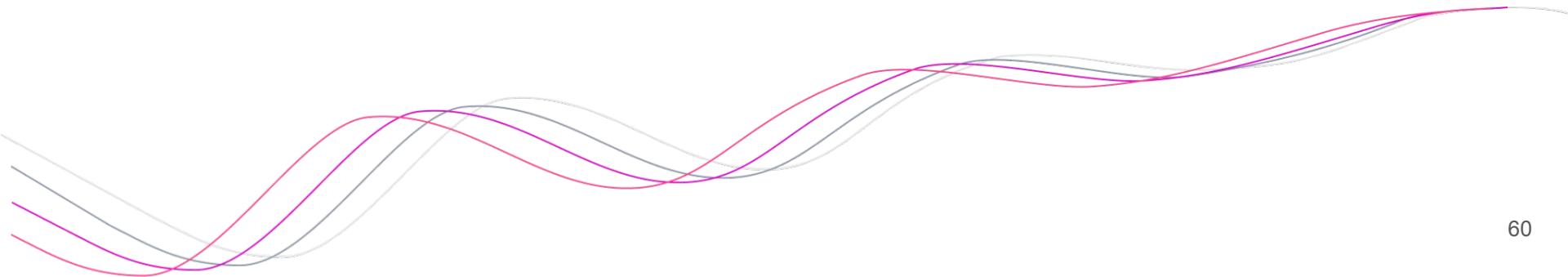
1.	snet-marketplace-service	5378 commits
2.	snet-dapp	3389 commits
3.	snet-daemon	1759 commits
4.	dev-portal	1165 commits
5.	snet-cli	1097 commits
6.	airdrop-services	834 commits
7.	snet-betav1-dapp	807 commits
8.	offernet	716 commits
9.	ai-dsl	707 commits
10.	airdrop-dapp	671 commits



Correlations

Target: Correlations

Use statistical methods to determine the correlation between developer activity and project token price.
Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.



Correlations

Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Correlation matrix

Correlation	Description
1	Perfect positive correlation
0.7 to 0.9	Strong positive correlation
0.4 to 0.6	Moderate positive correlation
0.1 to 0.3	Weak positive correlation
0	No correlation
-0.1 to -0.3	Weak negative correlation
-0.4 to -0.6	Moderate negative correlation
-0.7 to -0.9	Strong negative correlation
-1	Perfect negative correlation

Correlations

Target: Correlations

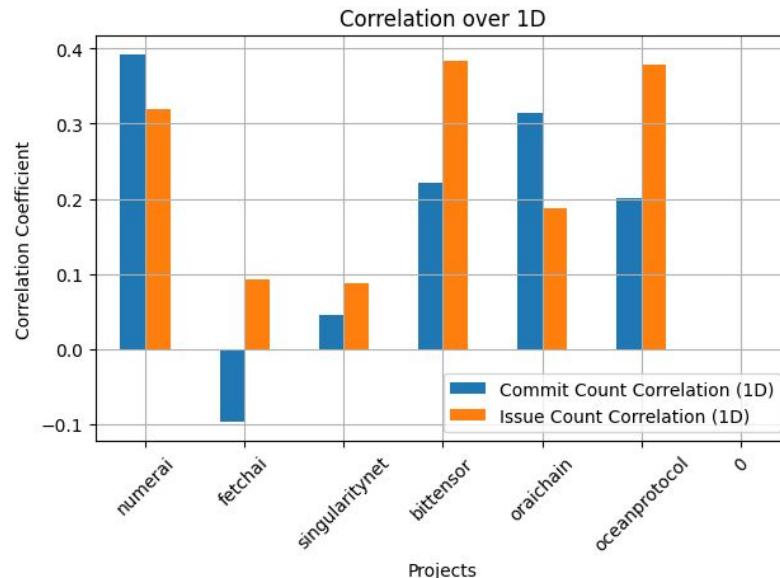
- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs -> Price Correlation - 1 day impact

	Commit Count Correlation (1D)	Issue Count Correlation (1D)
numeral	0.392258	0.319504
fetchai	-0.097499	0.092578
singularitynet	0.044985	0.086725
bittensor	0.220415	0.383431
oracchain	0.313697	0.187064
oceanprotocol	0.201330	0.377909

As anticipated, the correlations for a 1-day interval are very low.

1. **Numerai**: Weak positive correlation for both commits and issues.
2. **Fetch.AI**: Moderate negative correlation for commits, weak positive correlation for issues.
3. **SingularityNET**: Weak positive correlation for both commits and issues.
4. **Bittensor**: Moderate positive correlation for both commits and issues.
5. **Oracchain**: Weak positive correlation for both commits and issues.
6. **Ocean Protocol**: Weak positive correlation for commits, moderate positive correlation for issues.



Correlations

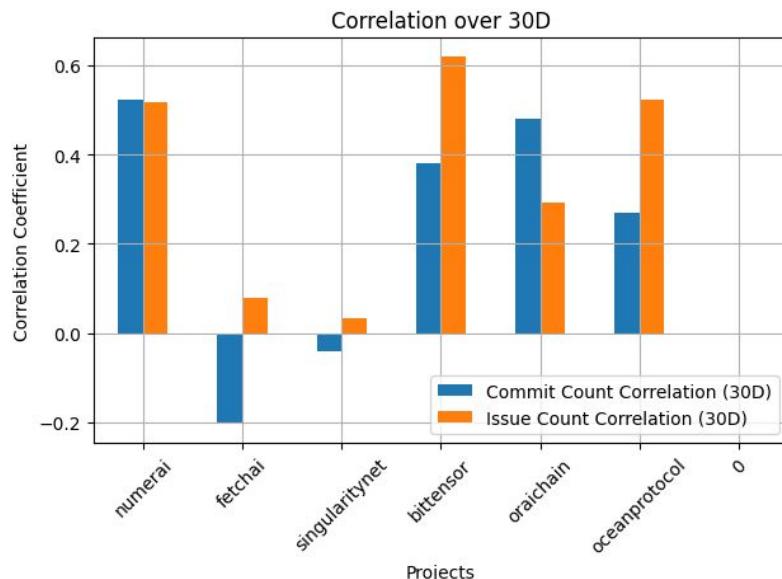
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs - Price Correlation Short-term: 1 month (30 days)

	Commit Count Correlation (30D)	Issue Count Correlation (30D)
numeral	0.522900	0.516003
fetchai	-0.204451	0.078986
singularitynet	-0.040948	0.033583
bittensor	0.379376	0.620375
orachain	0.479816	0.292727
oceanprotocol	0.270960	0.522285

1. **Fetch.AI:** Weak negative correlation for commit count, suggesting that short-term developer activity does not have a strong immediate impact on token price.
2. **Numerai:** Moderate correlations for both commit and issue counts, indicating that short-term developer activity has some influence on the token price.
3. **Bittensor:** Moderate positive correlation for issue count, implying that increased short-term issue activity might be associated with price increases.



Correlations

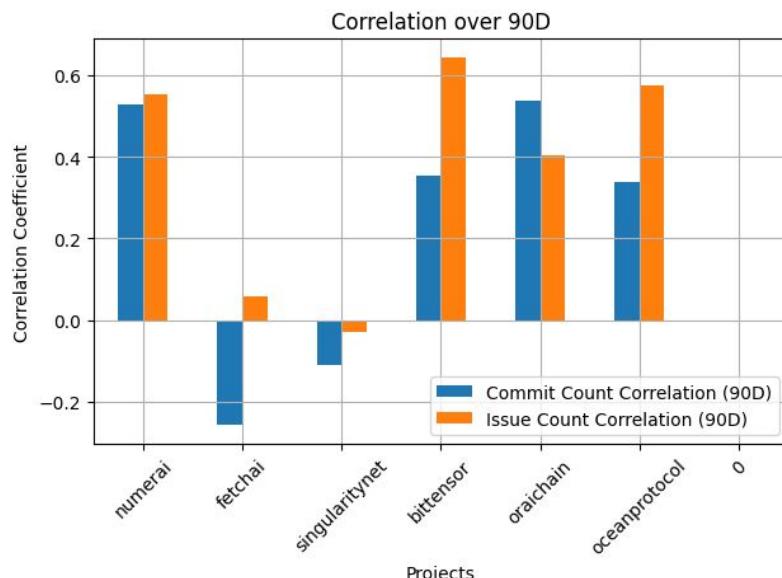
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs -> Price Correlation Medium-term: 3 months
(90 days)

	Commit Count Correlation (90D)	Issue Count Correlation (90D)
numeral	0.529612	0.552793
fetchai	-0.258388	0.056982
singularitynet	-0.111808	-0.031062
bittensor	0.354315	0.644007
oraichain	0.536497	0.403543
oceanprotocol	0.337871	0.576254

1. **Bittensor:** Moderate positive correlation for commits (0.354) and strong positive correlation for issues (0.644), showing that developer activity, particularly issue & PR's resolution, significantly boosts token prices over a three-month period.
2. **Oraichain:** Moderate positive correlations for both commits (0.536) and issues (0.404), indicating that developer activity positively impacts token prices over three months.
3. **Ocean Protocol:** Moderate positive correlations for both commits (0.338) and issues (0.576), suggesting that developer activity positively influences token prices over a three-month period.



Correlations

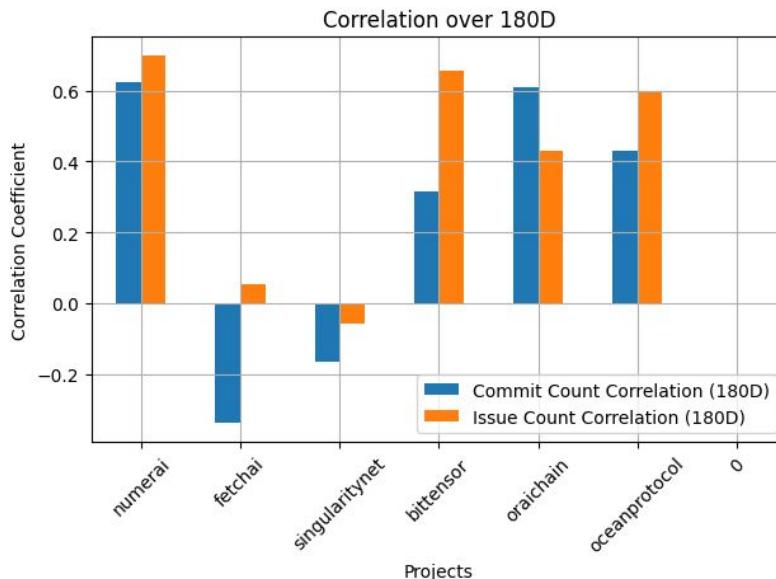
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs -> Price Correlation - Long-term: 6 months
(180 days)

	Commit Count Correlation (180D)	Issue Count Correlation (180D)
numerai	0.625503	0.699750
fetchai	-0.339686	0.051950
singularitynet	-0.166825	-0.058384
bittensor	0.314909	0.655541
oraichain	0.610741	0.428421
oceanprotocol	0.429715	0.596669

1. **Numerai:** Shows **moderate positive** correlations for both commits and issues, indicating a noticeable positive impact on token prices over six months.
2. **Bittensor:** **Moderate positive** correlation for commits and strong positive correlation for issues, showing significant positive impact on token prices, especially through issue resolution.
3. **Oraichain:** **Moderate to strong positive correlations** for both commits and issues, indicating a positive impact on token prices.
4. **Ocean Protocol:** **Moderate positive** correlations for both commits and issues, suggesting a positive influence on token prices over six months.



Correlations

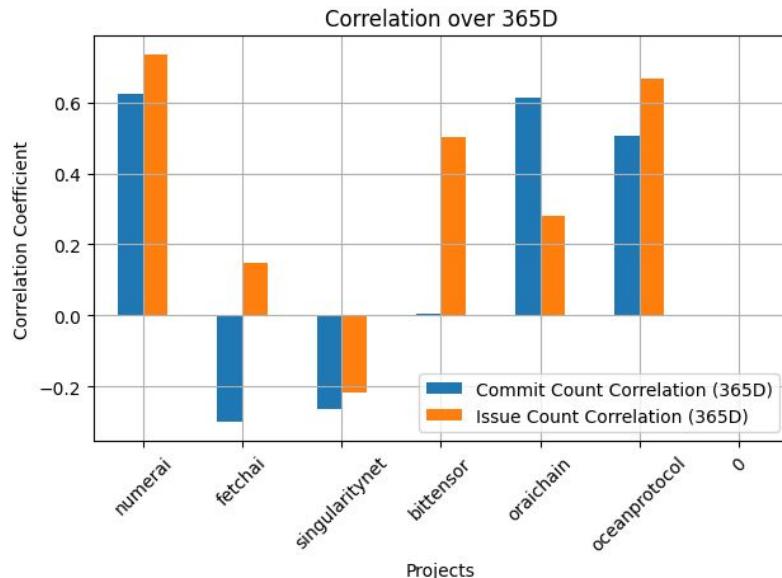
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs -> Price Correlation - Longer-term: 1 year (365 days)

	Commit Count Correlation (365D)	Issue Count Correlation (365D)
numeral	0.624160	0.735366
fetchai	-0.301098	0.147396
singularitynet	-0.263210	-0.217178
bittensor	0.006275	0.501624
oracchain	0.612111	0.280169
oceanprotocol	0.507329	0.667742

1. **Fetch.AI keeps the negative trend:** Weak negative correlation for commits (-0.301) and weak positive correlation for issues (0.147), suggesting minimal to slightly positive impact of developer activity on token prices over a year.
2. **SingularityNET:** Weak negative correlations for both commits (-0.263) and issues (-0.217), indicating that increased developer activity and issue resolution slightly negatively impact token prices over a year.



Correlations

Target: Correlations

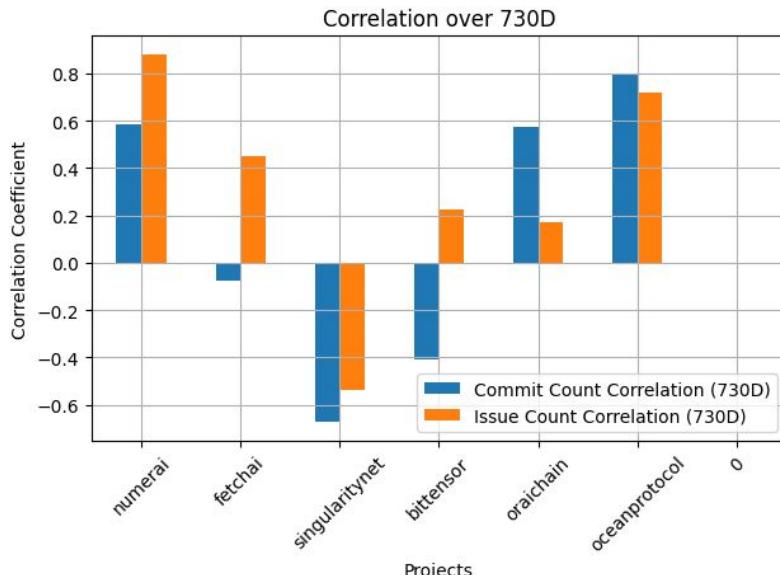
- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs -> Price Correlation - Even Longer-term:

2 years (730 days)

	Commit Count Correlation (730D)	Issue Count Correlation (730D)
numeral	0.586515	0.880574
fetchai	-0.078111	0.452037
singularitynet	-0.673927	-0.539665
bittensor	-0.411201	0.223197
oraichain	0.571624	0.170328
oceanprotocol	0.796228	0.721019

1. **Numerai:** Moderate positive correlation for commits (0.587) and strong positive correlation for issues (0.881), indicating that developer activity over two years significantly impacts token prices positively.
2. **Oraichain:** Moderate positive correlation for commits (0.572) and weak positive correlation for issues (0.170), indicating that developer activity positively impacts token prices over two years.
3. **Ocean Protocol:** Strong positive correlations for both commits (0.796) and issues (0.721), suggesting that sustained developer activity significantly influences token prices positively over two years.



Correlations

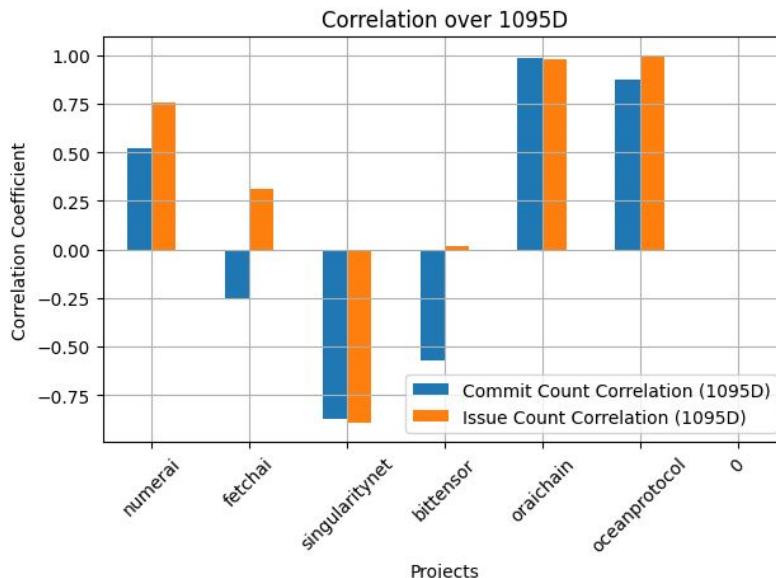
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs - Price Correlation - Longest-term: 3 years
(1095 days)

	Commit Count Correlation (1095D)	Issue Count Correlation (1095D)
numeral	0.517401	0.753704
fetchai	-0.255271	0.313987
singularitynet	-0.870393	-0.895771
bittensor	-0.574906	0.014304
oraichain	0.987140	0.976114
oceanprotocol	0.875866	0.999447

1. **Bittensor:** The negative impact of commit counts increases, and the weak positive impact of issue resolution diminishes to nearly zero, suggesting that long-term development activity, especially commits, negatively impacts token prices.
2. **Oraichain:** Both commit and issue correlations strengthen significantly, indicating that **sustained developer activity over 3 years has a very strong positive impact on token prices.**
3. **Ocean Protocol:** Both commit and issue correlations increase, with issue count correlation nearing a **perfect positive correlation, suggesting that long-term developer activity has a very strong positive impact on token prices over 3 years.**



Correlations

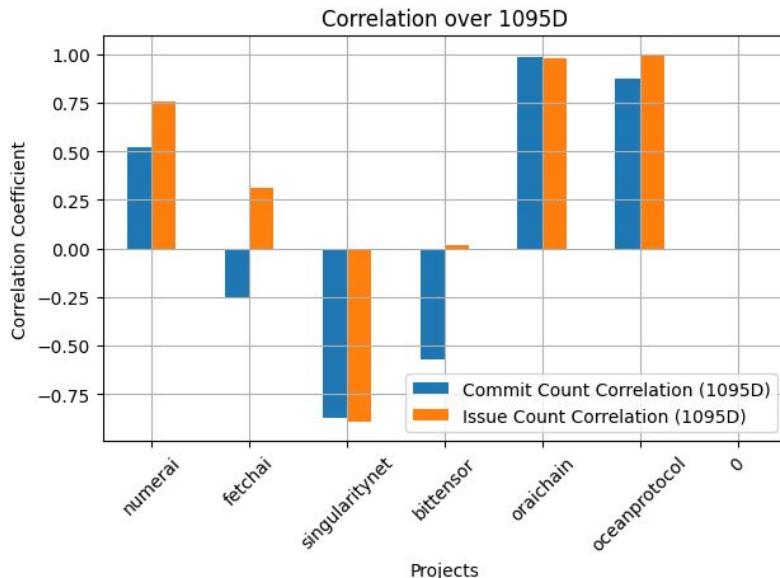
Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits, Issues & PRs - Price Correlation - Longest-term: 3 years
(1095 days)

	Commit Count Correlation (1095D)	Issue Count Correlation (1095D)
numeral	0.517401	0.753704
fetchai	-0.255271	0.313987
singularitynet	-0.870393	-0.895771
bittensor	-0.574906	0.014304
orachain	0.987140	0.976114
oceanprotocol	0.875866	0.999447

1. **Numerai:** The positive correlations for both commits and issues slightly decrease from 2 years to 3 years, indicating a slightly reduced but still significant positive impact of developer activity on token prices.
2. **Fetch.AI:** Commit count correlation becomes more negative, while issue count correlation weakens. This suggests that long-term developer activity has a slightly more negative impact on token prices, with the influence of issue resolution becoming less positive.
3. **SingularityNET:** Both commit and issue correlations become more strongly negative over 3 years, indicating an increasing negative impact of sustained developer activity and issue resolution on token prices.



Correlations

Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Commits > Token Price Correlation

1. Numerai: Shows **moderate positive correlations** across all periods, with slightly **decreasing** strength from 2 to 3 years.
2. Fetch.AI: Consistently **weak negative correlations**, indicating minimal negative impact.
3. SingularityNET: **Increasingly strong negative correlations** over longer periods, indicating long-term developer activity negatively impacts token prices.
4. Bittensor: Positive correlation in shorter terms (30, 90, 180 days) but turns **negative over longer periods** (2 and 3 years).
5. Oraichain: **Strong positive correlations**, especially over 3 years.
6. Ocean Protocol: **Positive correlations strengthening over longer periods**.

Project	30D	90D	180D	365D	730D	1095D
Numerai	0.523	0.530	0.626	0.624	0.587	0.517
Fetch.AI	-0.204	-0.258	-0.340	-0.301	-0.078	-0.255
SingularityNET	-0.041	-0.112	-0.167	-0.263	-0.674	-0.870
Bittensor	0.379	0.354	0.315	0.006	-0.411	-0.575
Oraichain	0.480	0.536	0.611	0.612	0.572	0.987
Ocean Protocol	0.271	0.338	0.430	0.507	0.796	0.876

Correlations

Target: Correlations

- Use statistical methods to determine the correlation between developer activity and project token price.
- Analyze the correlation in different timeframes (short-term, medium-term, long-term) to understand if phases of high or low activity impact token price.

Issues & PRs Count -> Token Price Correlation

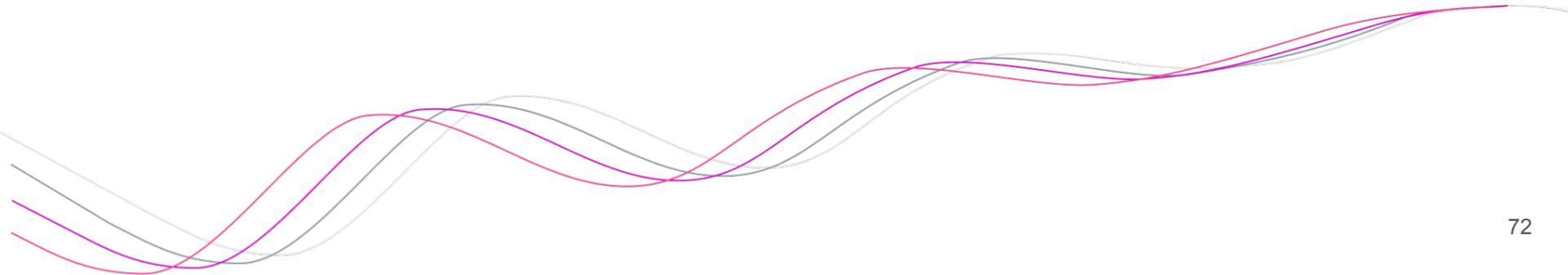
1. Numerai: Shows strong positive correlations across all periods, peaking at 2 years.
2. Fetch.AI: Weak to moderate positive correlations, indicating a slight positive impact.
3. SingularityNET: Increasingly strong negative correlations over longer periods.
4. Bittensor: Strong positive correlation in shorter terms, diminishing over longer periods.
5. Oraichain: Positive correlations, peaking at 3 years.
6. Ocean Protocol: Very strong positive correlations, nearing perfect correlation at 3 years.

Project	30D	90D	180D	365D	730D	1095D
Numerai	0.516	0.553	0.700	0.735	0.881	0.754
Fetch.AI	0.079	0.057	0.052	0.147	0.452	0.314
SingularityNET	0.034	-0.031	-0.058	-0.217	-0.540	-0.896
Bittensor	0.620	0.644	0.656	0.502	0.223	0.014
Oraichain	0.293	0.404	0.428	0.280	0.170	0.976
Ocean Protocol	0.523	0.576	0.597	0.668	0.721	0.999

Time Lags for Maximum Correlations

Target: Determine Time Lags for Maximum Correlations

Analyze different time lags between developer activity and token price to find the ones that maximize correlation. This will help identify any lagged effects between developer activity and token price movements.



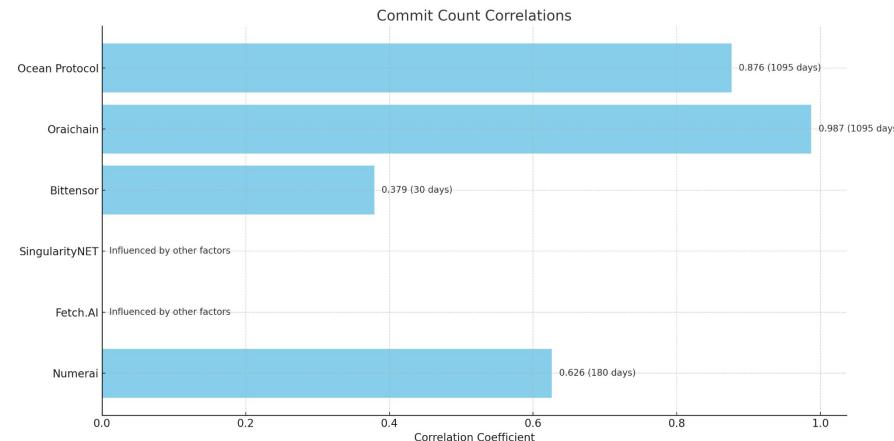
Time Lags for Maximum Correlations

Target: Determine Time Lags for Maximum Correlations

- Analyze different time lags between developer activity and token price to find the ones that maximize correlation. This will help identify any lagged effects between developer activity and token price movements.

Maximum Correlations - Commits Count

- Numerai:** Maximum correlation (**0.626**) at **180 days**, indicating medium-term developer activity has the highest positive impact on token prices.
- Fetch.AI:** Token price for this project is influenced by other factors, not by the active development of it (Maximum negative correlation **-0.204** at **30 days**).
- SingularityNET:** Token price for this project is influenced by other factors, not by the active development of it (Maximum negative correlation **-0.041** at **30 days**).
- Bittensor:** Maximum correlation (**0.379**) at **30 days**, indicating short-term developer activity positively impacts token prices.
- Oraichain:** Maximum correlation (**0.987**) at **1095 days**, suggesting long-term developer activity significantly impacts token prices positively.
- Ocean Protocol:** Maximum correlation (**0.876**) at **1095 days**, indicating long-term developer activity has a strong positive impact.



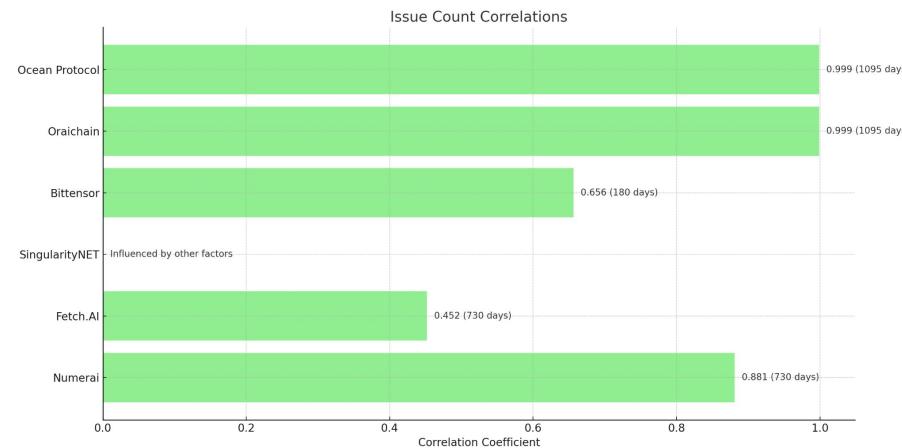
Time Lags for Maximum Correlations

Target: Determine Time Lags for Maximum Correlations

- Analyze different time lags between developer activity and token price to find the ones that maximize correlation. This will help identify any lagged effects between developer activity and token price movements.

Maximum Correlations - Issues & PRs Count

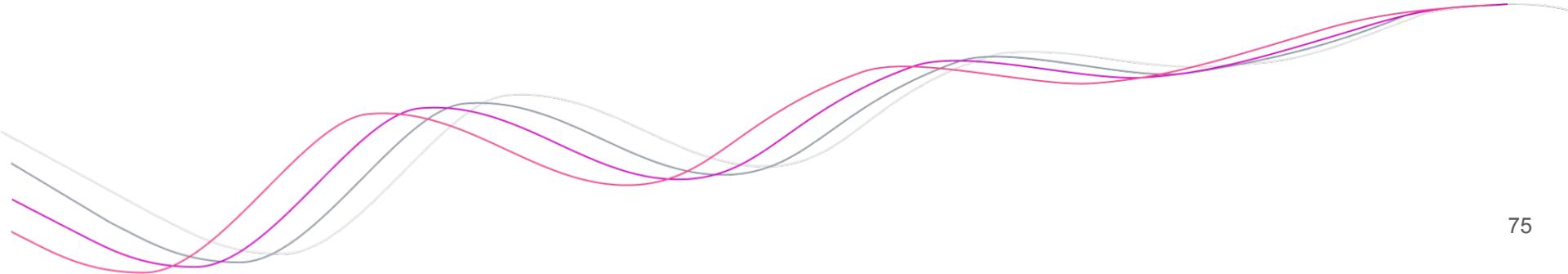
- Numerai:** Maximum correlation (**0.881**) at **2 years**, indicating long-term issue resolution significantly impacts token prices. The correlation increases over time, peaking at 730 days.
- Fetch.AI:** Maximum correlation (**0.452**) at **2 years**, suggesting long-term issue resolution has the highest positive impact. The correlation shows a positive trend over time, with the maximum at 2 years.
- SingularityNET:** Token price for this project is influenced by other factors, not by the active development of it (Maximum correlation 0.034 at 30 days).
- Bittensor:** Maximum correlation (**0.656**) at **180 days**, indicating medium-term issue resolution has a strong positive impact. The correlation is strongest in the medium term.
- Oraichain:** Maximum correlation (**0.999**) at **3 years**, suggesting long-term issue resolution has a very strong positive impact. The correlation keeps increasing over time with the maximum observed at 1095 days.
- Ocean Protocol:** Maximum correlation (**0.999**) at **3 years**, indicating long-term issue resolution has an almost perfect positive impact on token prices. The correlation shows a continuous positive trend, peaking at 1095 days.



Additional Data

Target: Additional Data to Improve Analysis

Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.



Additional Data

Target: Additional Data to Improve Analysis

Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.

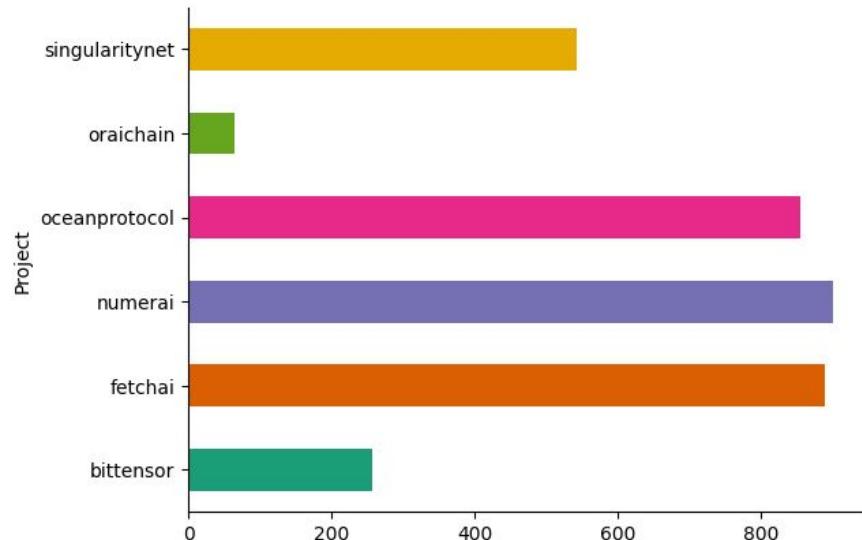
📊 Some of [Twitter](#) data was downloaded for all the projects. This data provided relevant information about the releases, which were used to correlate the number of commits with project milestones. 🚀 Additionally, in the following slides, you'll find the 7 days correlation between tweets and project prices. 📈

Here is the data that was taken into consideration:

- `tweet_id, text, language, type, bookmark_count, favorite_count, retweet_count, reply_count, view_count, created_at, client, hashtags, urls, media_type, media_urls, Project`

I want to note that the correlation between social media activity and token prices is a vast subject. 🌊 Here, we're just dipping our toes in the water. 🤪💦

💡 This could be the topic for a future challenge to explore the intricacies of the impact of some social media channels.



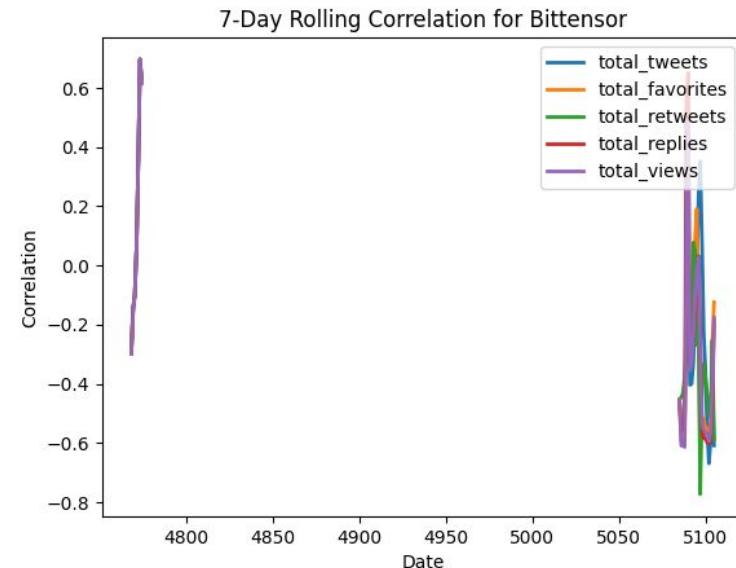
Additional Data

Target: Additional Data to Improve Analysis

Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.

Tweets -> Token Price correlation for project: **Bittensor**

1. **Total Tweets:** There are **periods** where the correlation between tweet volume and price is high, suggesting that **increased tweet activity can predict price changes.**
2. **Favorites:** The correlation with favorites shows significant spikes, indicating that popular tweets might influence or reflect market sentiment.
3. **Retweets:** Retweet counts show varying correlation with price, with some periods of strong positive correlation, suggesting that widely shared content can impact price trends.
4. **Replies:** The correlation with replies is generally lower, implying that replies have a minimal direct impact on price changes.
5. **Views:** Views show a fluctuating correlation, suggesting that tweet visibility alone doesn't consistently affect the price.



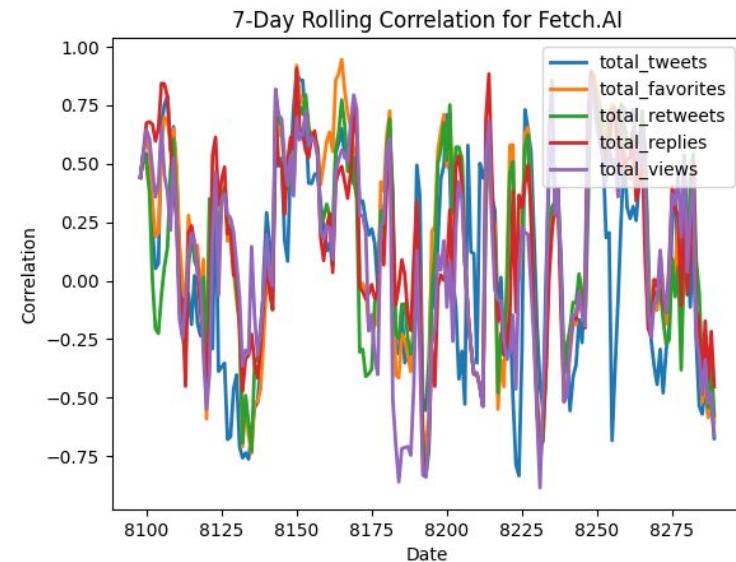
Additional Data

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Tweets -> Token Price correlation for project: **Fetch.AI**

1. **Total Tweets:** The correlation between tweet activity and price shows periods of both high and low correlation, indicating that tweet volume **can sometimes predict price movements**.
2. **Favorites:** There are significant spikes in the correlation between favorites and price, suggesting that the **popularity of tweets can impact market sentiment**.
3. **Retweets:** Retweets show periods of high correlation with price, indicating that **viral tweets can significantly influence price trends**.
4. **Replies:** Replies generally show a lower correlation, suggesting limited direct impact on price changes.
5. **Views:** The correlation between views and price fluctuates, indicating that while tweet visibility is sometimes important, its impact on price is not consistent.





NUMERAI

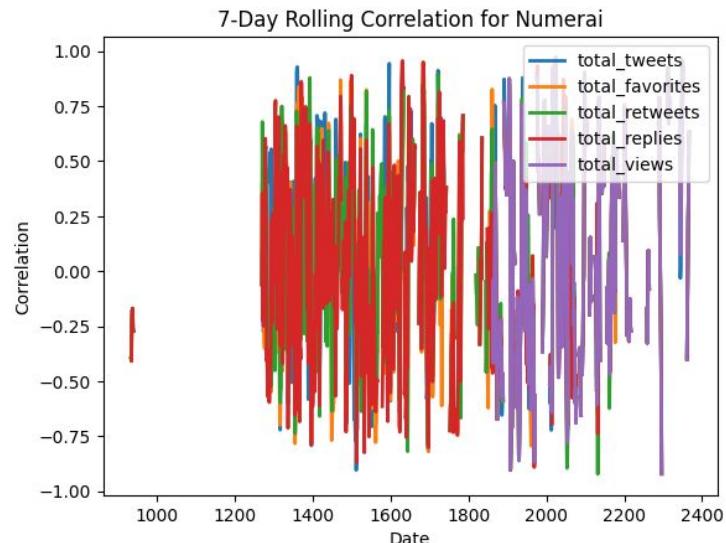
Additional Data

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Tweets -> Token Price correlation for project: **Numerai**

1. **Total Tweets:** The correlation between tweet volume and price shows significant variation, suggesting that spikes in tweet activity can **sometimes** be linked to price movements.
2. **Favorites:** There are periods of **high correlation** between favorites and the closing price, indicating that popular tweets might influence or reflect market sentiment.
3. **Retweets:** Retweet counts show varying correlation, with occasional high spikes suggesting that viral tweets can impact or reflect price trends.
4. **Replies:** Similar to other projects, replies show a generally **lower correlation**, implying minimal direct price impact.
5. **Views:** Views have a fluctuating correlation with price, sometimes showing significant positive or negative values, indicating that the sheer number of views might occasionally impact or reflect price changes.



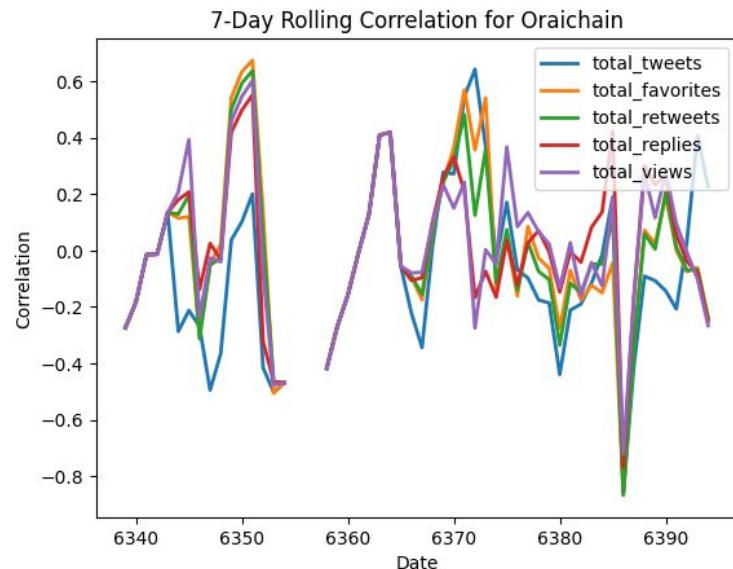
Additional Data

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Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.

Tweets -> Token Price correlation for project: **Oraichain**

1. **Total Tweets:** There are noticeable periods where the **correlation between total tweets and the closing price is high**, indicating that tweet activity can be a leading indicator of price changes.
2. **Favorites:** Correlation with favorites varies but shows significant spikes, suggesting that highly favored tweets could be linked to price movements.
3. **Retweets:** Retweet counts often show **strong correlation** with price, indicating that widely shared content might have a notable impact on market behavior.
4. **Replies:** The correlation between replies and price is generally low, similar to other projects, indicating that replies are less impactful on price.
5. **Views:** Views show a fluctuating correlation, suggesting that while tweet visibility is important, it doesn't consistently affect the price.



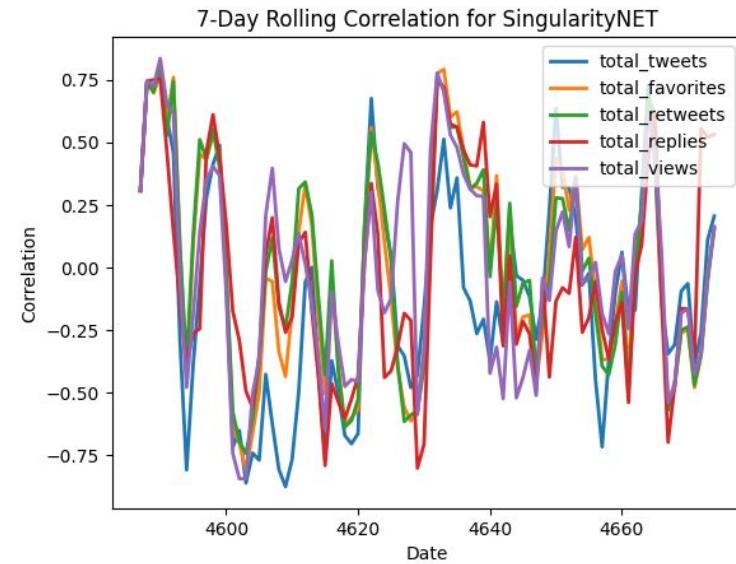
Additional Data

Target: Additional Data to Improve Analysis

Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.

Tweets -> Token Price correlation for project: **SingularityNET**

1. **Total Tweets:** The correlation between tweet volume and price shows periods of **high correlation**, indicating that tweet activity can be a leading indicator of price changes.
2. **Favorites:** There are significant spikes in the correlation with favorites, suggesting that popular tweets might influence or reflect market sentiment.
3. **Retweets:** Retweets show strong correlation at times, indicating that viral tweets can significantly impact price trends.
4. **Replies:** Replies show a generally lower correlation, similar to other projects, suggesting limited direct impact on price changes.
5. **Views:** The correlation between views and price fluctuates, indicating that tweet visibility is sometimes important but not consistently impactful on price.



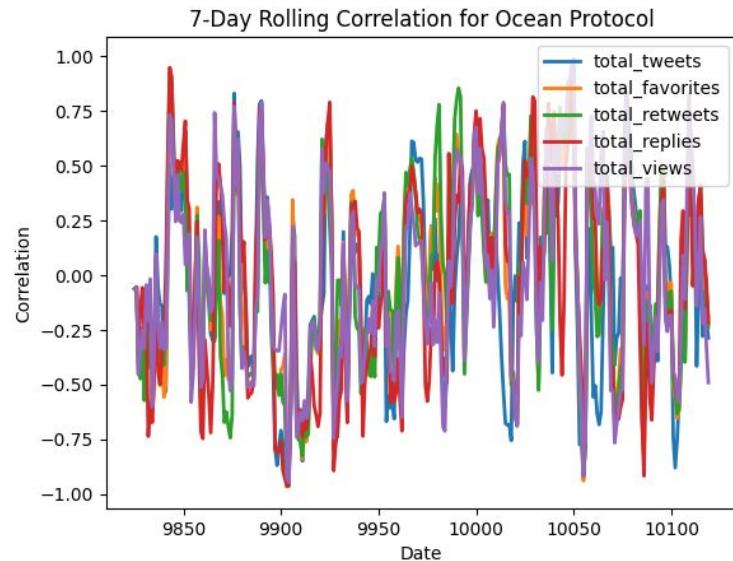
Additional Data

Target: Additional Data to Improve Analysis

Find and incorporate data on social media activity related to the project, or data on partnerships and collaborations to add another layer of insights to your analysis.

Tweets -> Token Price correlation for project: **Ocean Protocol**

1. **Total Tweets:** There is a noticeable spike in the correlation between total tweets and the closing price at certain points, suggesting that **increased tweet activity might precede changes in price**.
2. **Favorites:** The correlation between total favorites and the closing price fluctuates, indicating that the popularity of tweets (as measured by favorites) might have an **inconsistent impact** on price.
3. **Retweets:** The retweet count **shows periods of both positive and negative correlation with the closing price**, which might imply that retweeted content occasionally influences market sentiment.
4. **Replies:** Correlation with replies tends to be lower and more stable, indicating that engagement through replies has a minimal direct impact on price changes.
5. **Views:** Tweet view counts generally show low to moderate correlation, suggesting that while many people might see the tweets, this visibility alone doesn't strongly impact the price.



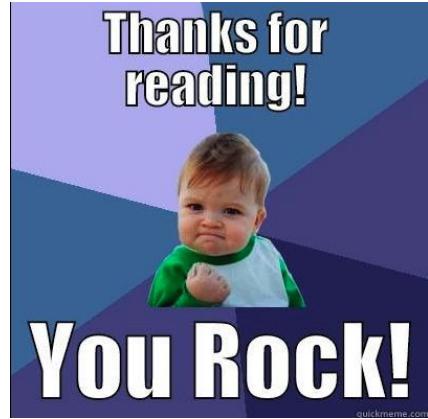
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Insights

1. **Tweet Activity and Price Movement** 📈🐦: It seems like the more people tweet, the more the coin prices move. So, if you see a lot of tweeting, hold onto your hats (and your coins)! It's like a tweetstorm brewing a price storm. 💰📈
2. **Popularity Metrics as Indicators** ❤️📊: If a tweet is getting lots of love and shares, the coin might be getting ready to party. Think of it as the coin saying, "I'm popular, so I'm going up!" But remember, not all popular kids stay on top forever. 🎉📊
3. **Engagement through Replies** 💬🤔: Replies are like the nerdy kid in the corner – full of information but **not really moving the needle** on popularity. So, while people might be talking, it's not shaking up the prices much. 📈🤔
4. **Tweet Visibility and Market Influence** 👀💰💻: Just because a lot of people see a tweet doesn't mean the coin is going to the moon. 🌙 Sometimes it's just a lot of noise with no action. So, views are like window shoppers – looking but not necessarily buying. 💼🛍️
5. **Inconsistency Across Projects** 🎨🔮: Each coin project is like its own quirky character with different reactions to social media hype. Some are social butterflies, others are more reclusive. So, always remember: what works for one might not work for another. It's like herding cats, each with its own agenda. 😺👓💼



For the code and additional resources, head over to the [GitHub](#) repository. If you have any uncertainties or questions, please reach out via Discord (white_rider_) or [Twitter](#)!