Dynamic Fee Adjustment in Response to Order Toxicity: An Innovation at ETH London Hackathon

I am are thrilled to announce our significant achievement at the recent ETH London Hackathon. We showcased a revolutionary solution to address the issue of 'toxic flow' in decentralized finance (DeFi) –Mayk.

<https://github.com/AkashWarlocks/orderflow-dynamic-hook>

**Understanding Toxic Flow:**

In the realm of DeFi, liquidity providers (LPs) play an indispensable role by facilitating trades and earning fees. However, the landscape is plagued by what is known as 'toxic flow.' In simple terms, this represents a situation where market makers unwittingly provide liquidity at a loss, primarily due to cex-dex arbitrage bots. These bots exploit the decentralized exchange's liquidity and trade it against up-to-date centralized venues like Binance. While it may seem benign as LPs earn fees, the reality is that the price differential often surpasses the fee generated, leading to a net loss for the LPs.

**Introducing Mayk - Our Uniswap v4 Hook:**

Addressing this challenge, we introduced *'Mayk'*, a Uniswap v4 hook termed `*OrderflowDiscriminator*`. It is designed to dynamically adjust swap fees based on indicators of order toxicity. Drawing inspiration from comprehensive research on toxic flow discrimination, Mayk integrates Flare's FTSO price feed. With every swap, the `*beforeSwap*` callback employs this oracle data to compute price deviations, subsequently identifying and mitigating toxic transactions.

* Key Features:

1. Dynamic Fee Adjustment: The hook reacts in real-time, increasing the fee when the projected transaction loss exceeds the fee generated. It aims not to eliminate all toxic flow but to curtail the losses experienced by LPs, ensuring a more efficient liquidity provision.
2. User Monitoring Across Pools: Mayk doesn't operate in isolation. It monitors users' trades across multiple pools, tracking the ratio of toxic to non-toxic trades. Users with a high frequency of toxic trades will experience an increased fee on top of the default pool fee of 0.3%. In contrast, those contributing positively will benefit from lowered fees.
3. Enhancing Organic Order Flow: Emphasizing the importance of organic order flow, Mayk draws inspiration from collaborations like Balancer partnering with CowSwap to offer reduced fees for genuine users. This focus on genuine transactions ensures a balanced and sustainable ecosystem.

Mayk was encapsulated with comprehensive tests to showcase toxic and positive trade reactions. Our implementation also considered the bytecode size limit, resulting in the deployment of a minimal version of the pool manager while retaining core functionality.

* Deployed Addresses:
* **Pool Manager**: [0x22b8142D0BFfc5Ff3b9976dc3eb44e44866F00e4](https://coston2-explorer.flare.network/address/0x22b8142D0BFfc5Ff3b9976dc3eb44e44866F00e4)
* **OrderDiscriminator Hook**: [0x8ced766b88384EA3001D9744A0bcEFFb10B8159e](https://coston2-explorer.flare.network/address/0x8ced766b88384EA3001D9744A0bcEFFb10B8159e)

We believe that Mayk's introduction to the DeFi ecosystem will play a pivotal role in fostering a balanced and efficient environment for both liquidity providers and traders. Our success at the ETH London Hackathon stands as a testament to our commitment to driving innovation in the blockchain space.

* My Learnings

Throughout this rewarding journey at the ETH London Hackathon, not only did I manage to develop a solution to address a pressing issue in the DeFi space, but I also learned invaluable insights and expanded my knowledge horizons:

1. **Mastery over Foundry**: One of the primary tools that empowered me to bring 'Mayk' to life was Foundry. Delving deep into its complexities, I improved my skills in developing using this robust environment. It's been a revelation understanding the capabilities and potential of Foundry, further enriching my developer toolkit.
2. **Deeper Dive into DeFi**: While I had a foundational understanding of DeFi, this venture necessitated a more profound grasp. Immersing myself in this domain, I unraveled its nuances, challenges, and the vast opportunities it holds. This project has undoubtedly augmented my perspective and knowledge of decentralized finance.