# Analytics Engineer Task

## Objective:

Measure price improvement for CoW Swap compared to the average market and make the results available on a daily basis. Price improvement is defined as the difference in outcome token between the baseline and the achieved amounts.

## Task

1. Collect Historical Data:
    - Gather historical data for completed trades on Ethereum-based interfaces for CoW Protocol on WETH/USDC token pair for the latest available day.
    - Use Dune Analytics for data collection. Refer to the following query as a template: Dune Analytics Query.

2. Simulate Baseline Trades:
    - Use an open-source API to establish the baseline trades with the same token pairs and input amounts as the actual trades.
    - Recommended APIs: Coingecko API, CryptoCompare API.

3. Calculate Price Improvement:
    - Compare the realized prices of actual trades with the baseline prices from the external API.
        i. Create a joined dataset using both inputs.
        ii. Add a new column to compute the price improvement between the datasets.
        iii. Determine the average price improvement.

4. Automate the Process:
    - Develop a Python pipeline that performs the following steps daily at 9 AM UTC (e.g. Airflow, cron job, etc.) :
        i. Fetch input data from Dune Analytics and Coingecko API.
        ii. Join the data and calculate price improvement.
        iii. Store the results in a Postgres database.

5. Bonus

- Ensure the code is idempotent to handle potential backfills, ideally using a tool like Airflow for scheduling and orchestration.

## Delivery

- We encourage performing the task using SQL and Python with any processing framework of choice (i.e. Pandas, Pyspark, Polars, etc).
- Submit all all files as a zip to the recruiter. We kindly ask not to share the solution publicly (i.e. public git repository).
- Attach a README containing instructions for how to run your application, why you chose certain technologies/ tools, and things you could improve on if you had more time.

## Questions

Feel free to contact us!