Use NYC Taxi Trip Record Data To Calculate Performance KPIs

Practical Exam

Goal

NYC.gov provides monthly exports of NYC yellow taxi trip records:

- https://www1.nyc.gov/site/tlc/about/tlc-trip-record-data.page
- Latest Full Dumps:
  - *https://d37ci6vzurychx.cloudfront.net/trip-data/yellow_tripdata_2022-01.parquet*
  - *https://d37ci6vzurychx.cloudfront.net/trip-data/yellow_tripdata_2022-02.parquet*
  - *https://d37ci6vzurychx.cloudfront.net/trip-data/yellow_tripdata_2022-03.parquet*
  - …

```
     VendorID tpep_pickup_datetime tpep_dropoff_datetime  passenger_count  trip_distance  RatecodeID store_and_fwd_flag  ...  mta_tax  tip_amount  tolls_amount  improvement_surcharge  total_amount  congestion_surcharge  airport_fee
0           1  2022-01-01 00:35:40   2022-01-01 00:53:29              2.0           3.80         1.0                  N  ...      0.5        3.65           0.0                    0.3         21.95                   2.5          0.0
1           1  2022-01-01 00:33:43   2022-01-01 00:42:07              1.0           2.10         1.0                  N  ...      0.5        4.00           0.0                    0.3         13.30                   0.0          0.0
2           2  2022-01-01 00:53:21   2022-01-01 01:02:19              1.0           0.97         1.0                  N  ...      0.5        1.76           0.0                    0.3         10.56                   0.0          0.0
3           2  2022-01-01 00:25:21   2022-01-01 00:35:23              1.0           1.09         1.0                  N  ...      0.5        0.00           0.0                    0.3         11.80                   2.5          0.0
4           2  2022-01-01 00:36:48   2022-01-01 01:14:20              1.0           4.30         1.0                  N  ...      0.5        3.00           0.0                    0.3         30.30                   2.5          0.0
...       ...                  ...                  ...              ...            ...         ...                ...  ...      ...         ...           ...                    ...          ...                   ...          ...
2463926     2  2022-01-31 23:36:53   2022-01-31 23:42:51              NaN           1.32         NaN               None  ...      0.5        2.39           0.0                    0.3         13.69                   NaN          NaN
2463927     2  2022-01-31 23:44:22   2022-01-31 23:55:01              NaN           4.19         NaN               None  ...      0.5        4.35           0.0                    0.3         24.45                   NaN          NaN
2463928     2  2022-01-31 23:39:00   2022-01-31 23:50:00              NaN           2.10         NaN               None  ...      0.5        2.00           0.0                    0.3         16.52                   NaN          NaN
2463929     2  2022-01-31 23:36:42   2022-01-31 23:48:45              NaN           2.92         NaN               None  ...      0.5        0.00           0.0                    0.3         15.70                   NaN          NaN
2463930     2  2022-01-31 23:46:00   2022-02-01 00:13:00              NaN           8.94         NaN               None  ...      0.5        6.28           0.0                    0.3         35.06                   NaN          NaN


[2463931 rows x 19 columns]
[...]
```

yellow_tripdata_2022-01.parquet

Goal

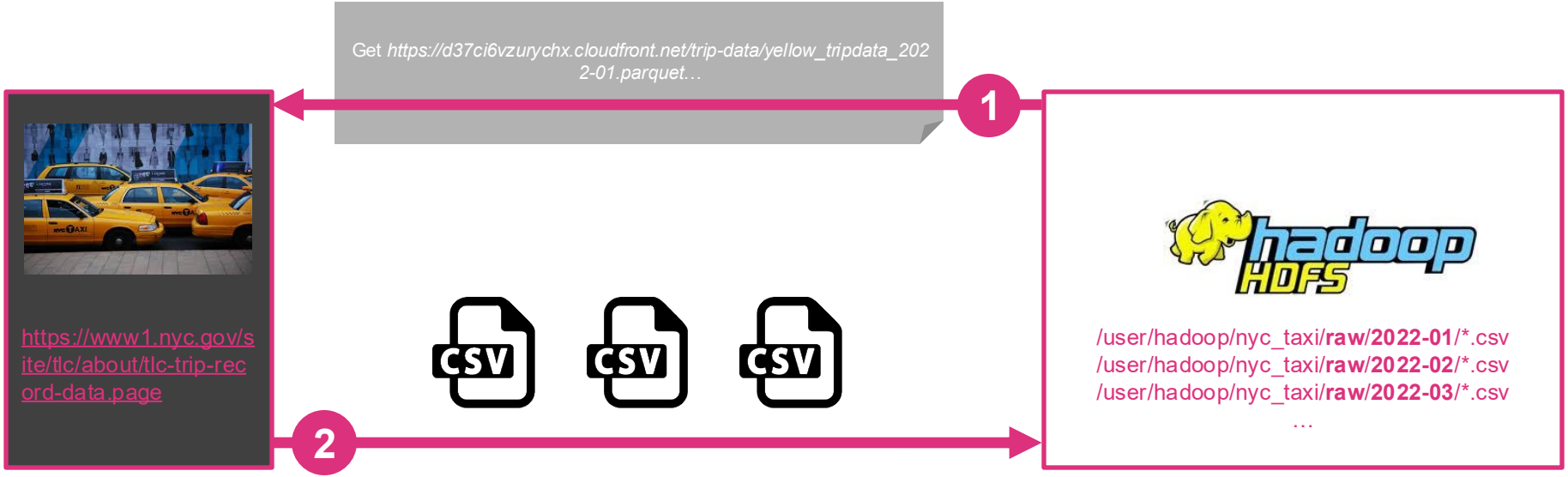
We want to make use of this data to calculate some KPIs

Workflow:

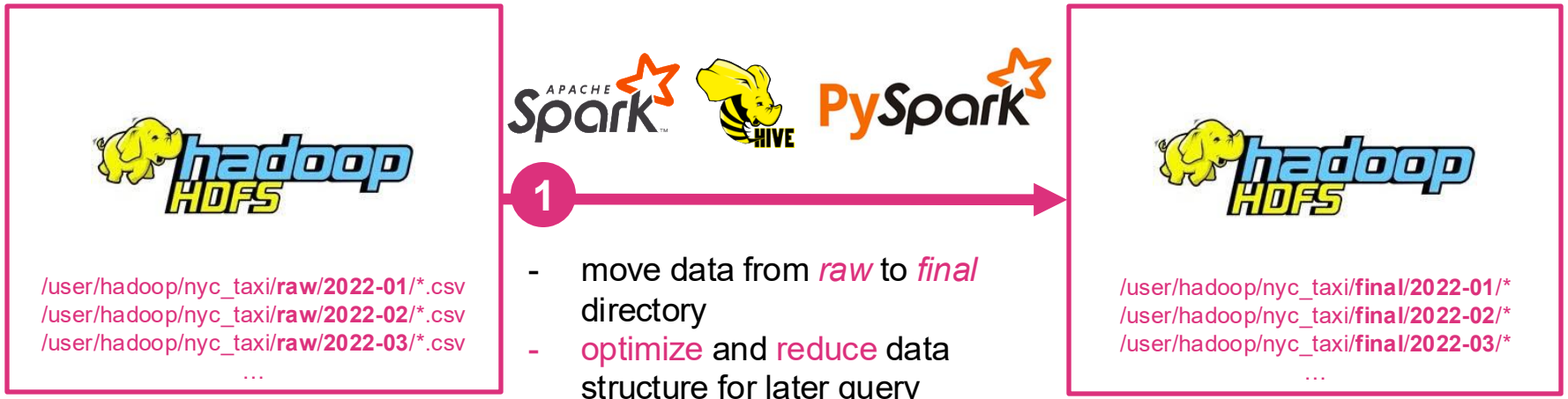
- **Gather data** from https://www1.nyc.gov/site/tlc/about/tlc-trip-record-data.page
- **Save raw data** (*CSV files*) to HDFS (partitioned by *YYYY-MM*)
- **Optimize**, **reduce** and **clean raw data** and save it to **final** directory on HDFS
- **Calculate KPIs** and **Export** them to an **Excel File**

- The whole data workflow **must be implemented** within an ETL **workflow tool** (e.g. Pentaho Data Integration or Airflow) and **run automatically**

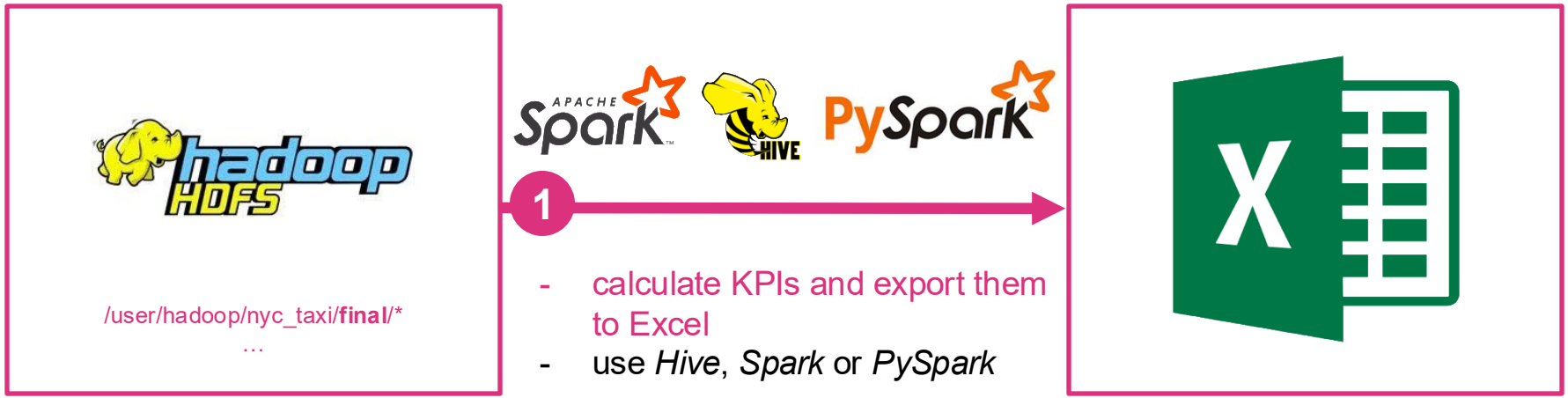
Dataflow: 1. Get TLC NYC Taxi Data



Dataflow: 2. Raw To Final Transfer



Dataflow: 3. Calculate And Export KPIs



Dataflow: 4. KPIs To Calculate

Calculate per Month:

- Average Trip Duration (in minutes)
- Average Trip Distance (in miles)
- Average total amount (in USD)
- Average tip amount (in USD)
- Average passenger count (as Number)
- Usage Share by payment type (credit card, cash… in percent)
- Usage share per timeslot (in percent):
  - 00:00-06:00
  - 06:00-12:00
  - 12:00-18:00
  - 18:00-24:00