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

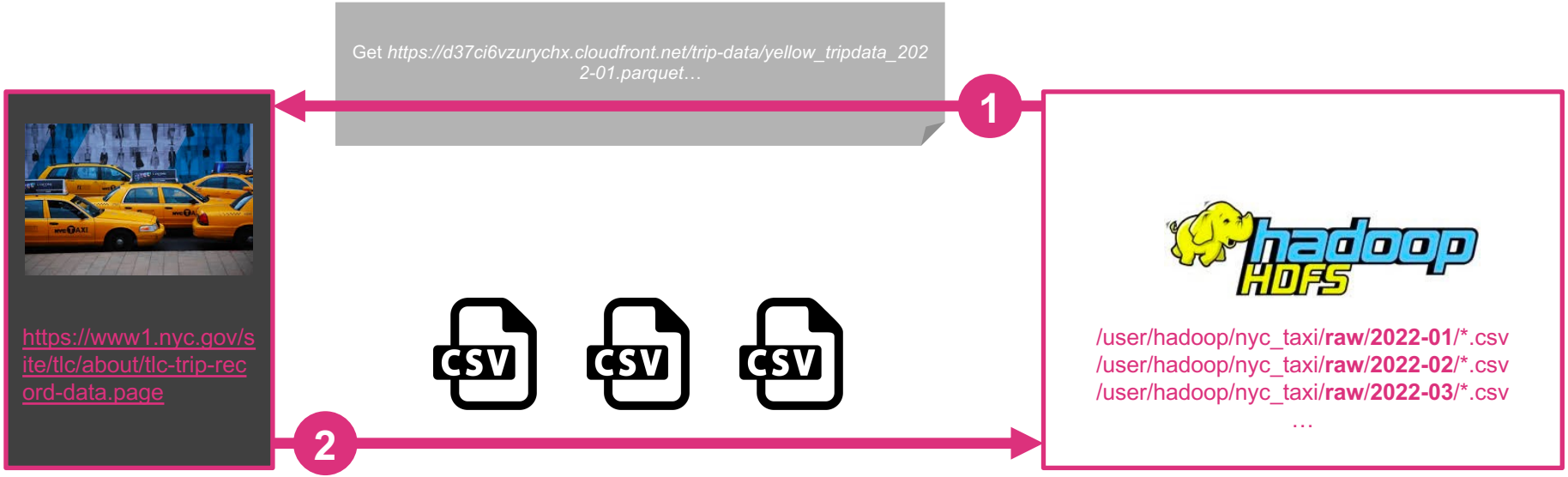
We want to make use of this data to calculate some KPIs

Workflow:

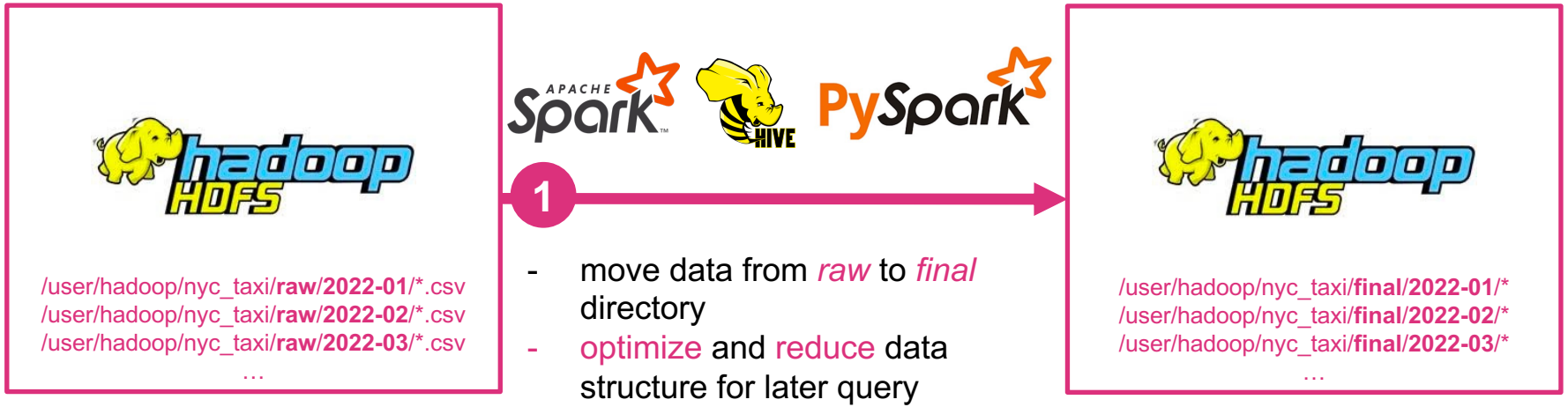
- **Gather data** from https://www1.nyc.gov/site/tlc/about/tlc-trip-record-data.page
- **Save raw data** (*CSV files*) to HDFS (partitioned by *YYYY-MM*)
- **Optimize**, **reduce** and **clean raw data** and save it to **final** directory on HDFS
- **Calculate KPIs** and **Export** them to an **Excel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

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

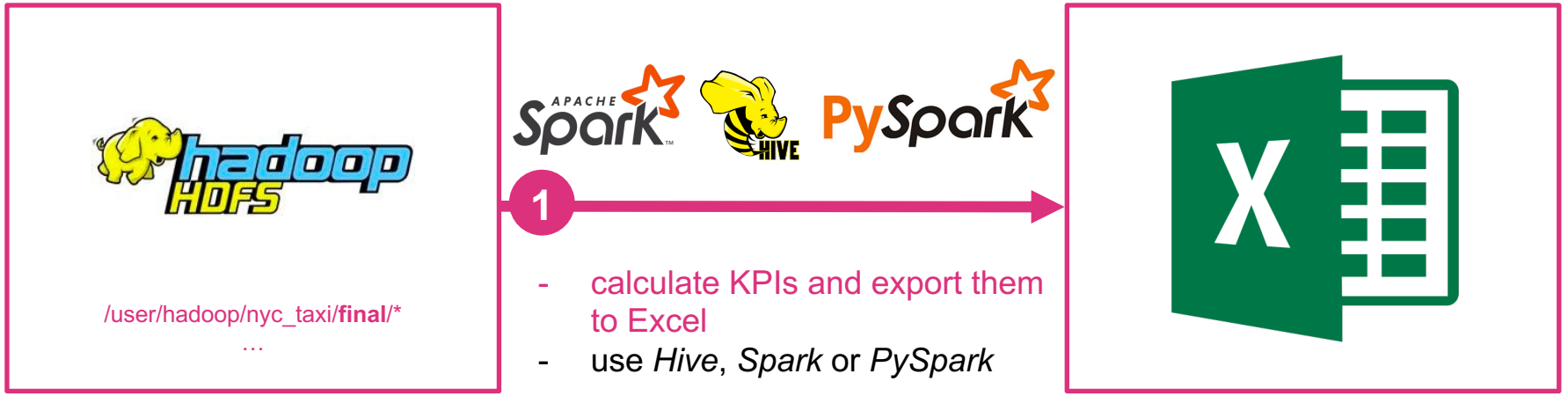
Dataflow: 1. Get TLC NYC Taxi Data



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