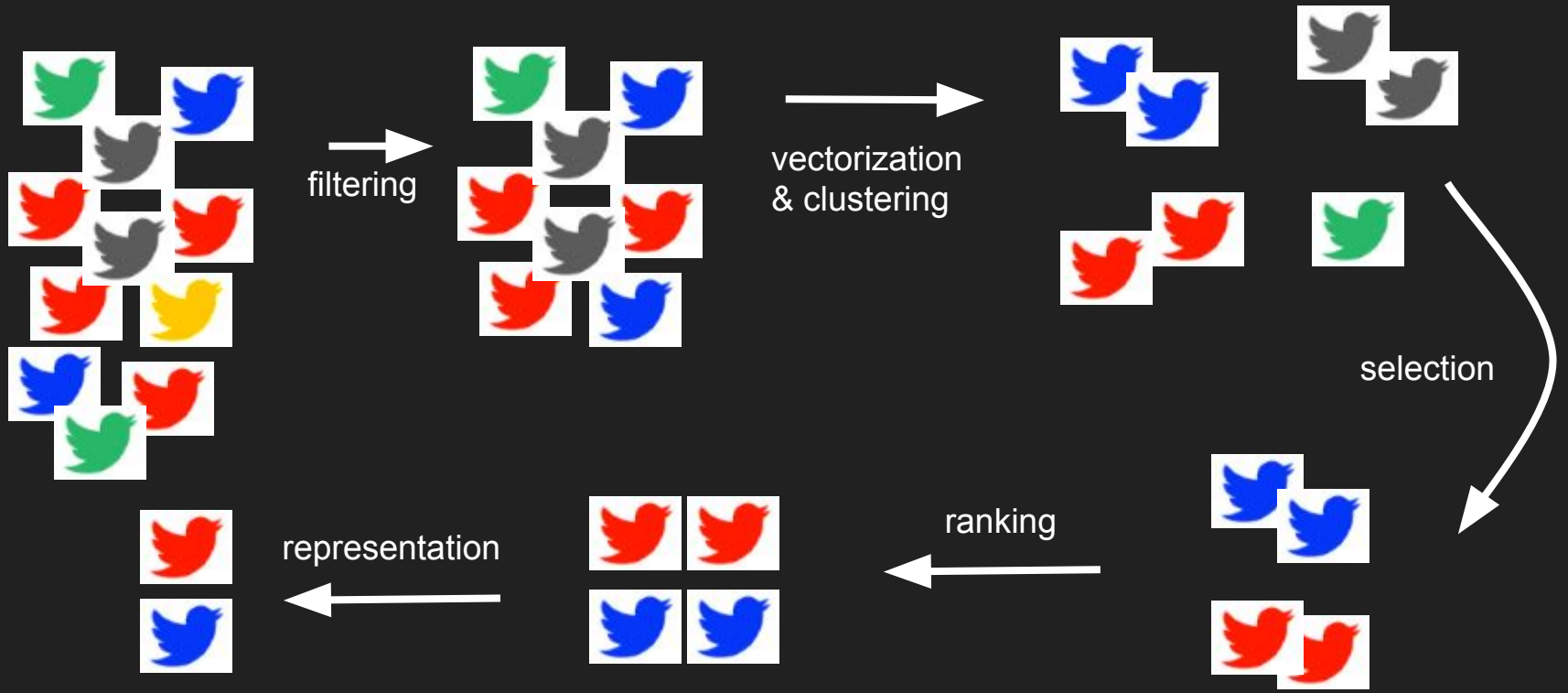
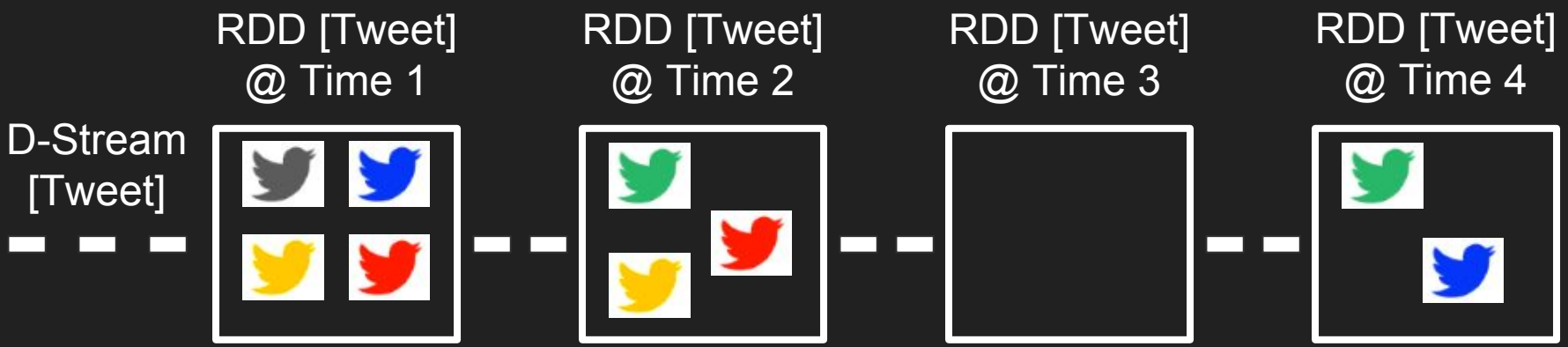
Twitter News Feed

Intermediate presentation

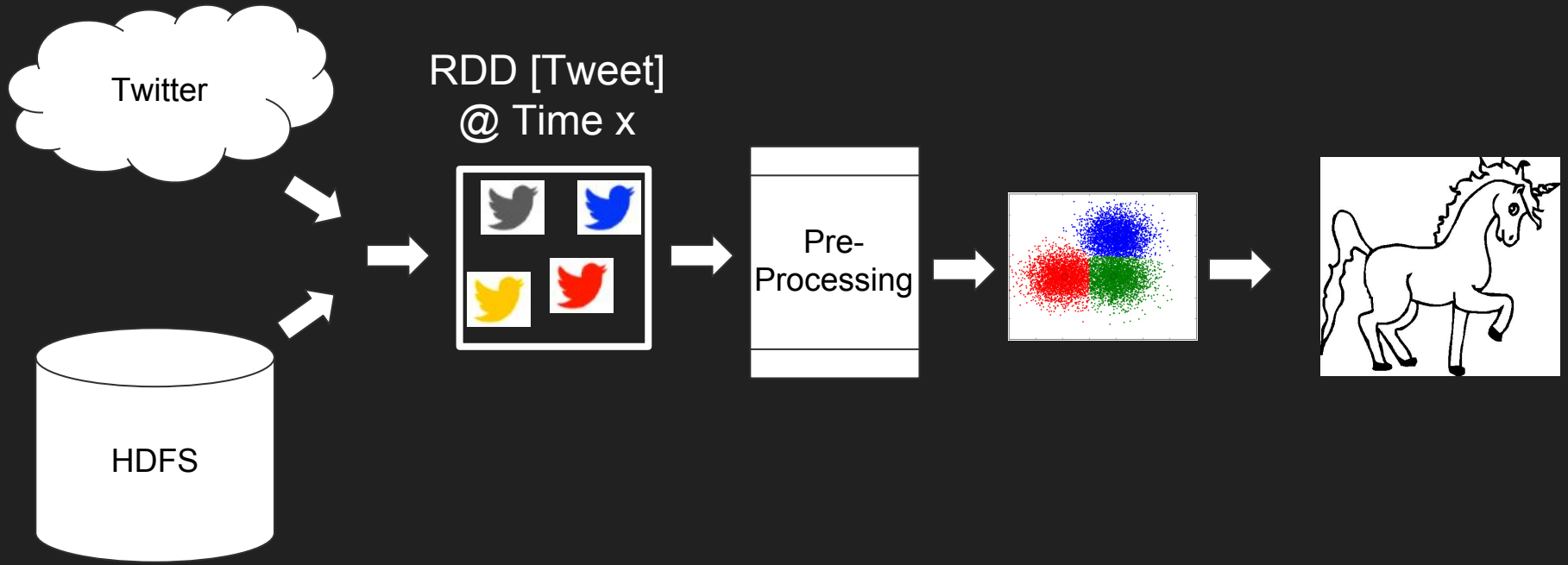
Goal of the project: News feed from Twitter



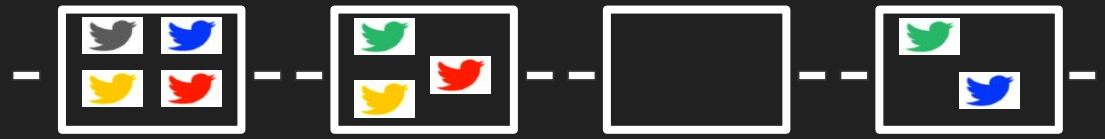
Apache Spark Streaming



Implementation



Preprocessing



Tokenization

Stop words removal

Stemming / Lemmatizing

Term Frequency in Different Batches

- B1 T1: “Hello world, I love programming!”

	hello	world	I	love	programming
B1 T1	1	1	1	1	1

- B2 T1: “Hello Peter, I love dancing Tango!”

	hello	peter	I	love	dancing	tango
B1 T1	1	1	1	1	1	1

Hashing-TF

- Fixed vector dimension size
- hash(word) → Index in vector
- Can lead to collisions

	hello, programming	world	peter, love	I, dancing	tango
B1 T1	2	1	1	1	0
B2 T1	1	0	2	2	1

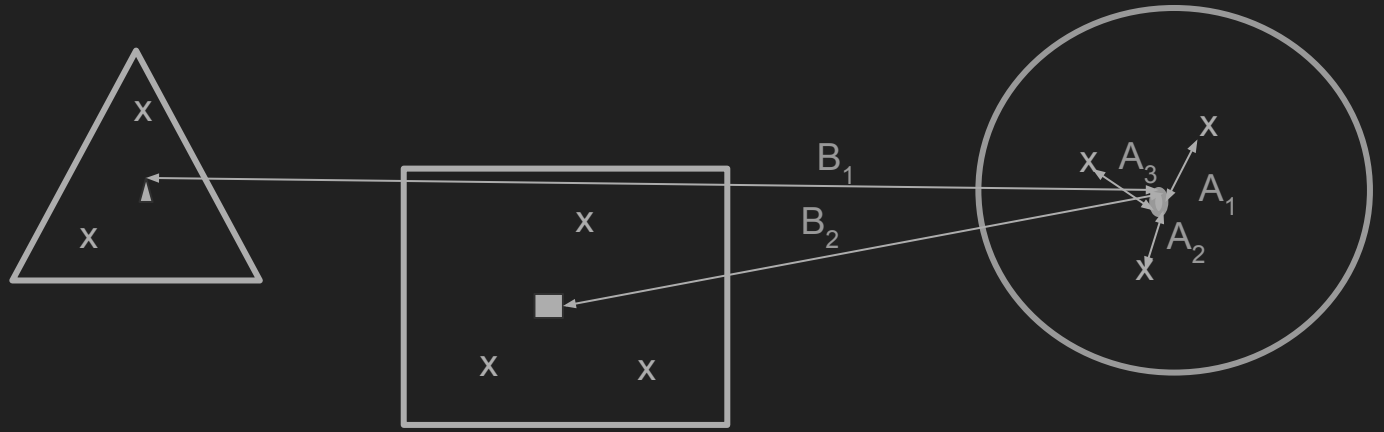
Clustering using Streaming K-Means (1/2)

- Continuous clustering with batches
- Centroids and cluster size are saved
- For every batch, new centroids are calculated
    - Centroids are weighted by their cluster size
    - Old centroids also weighted by decay

Clustering using Streaming K-Means (2/2)

- Important parameters:
  - batch size
  - k
  - decay
  - initial centroids

Cluster Analysis and Selection



- Silhouette = (B - A) / max(A, B) [range: -1 .. 1]
- Only consider clusters with a minimum number of tweets (relevant) and a minimum silhouette score (likely correct)

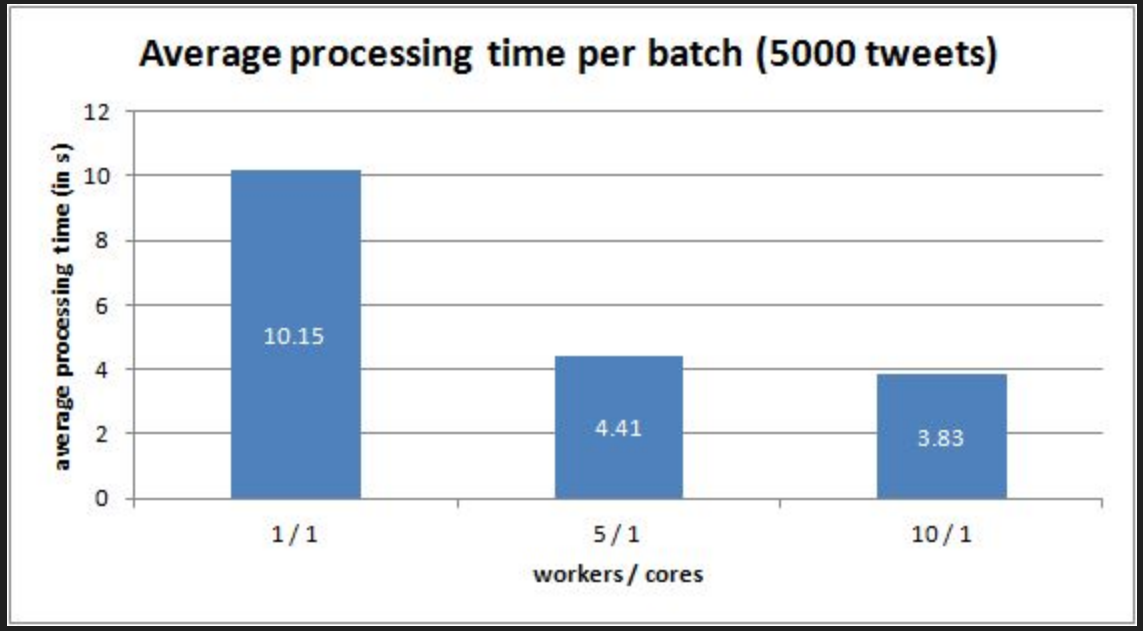
Representation

- Representative: Closest Tweet to centroid
- Linked article(s): Most frequently occurring URL(s)

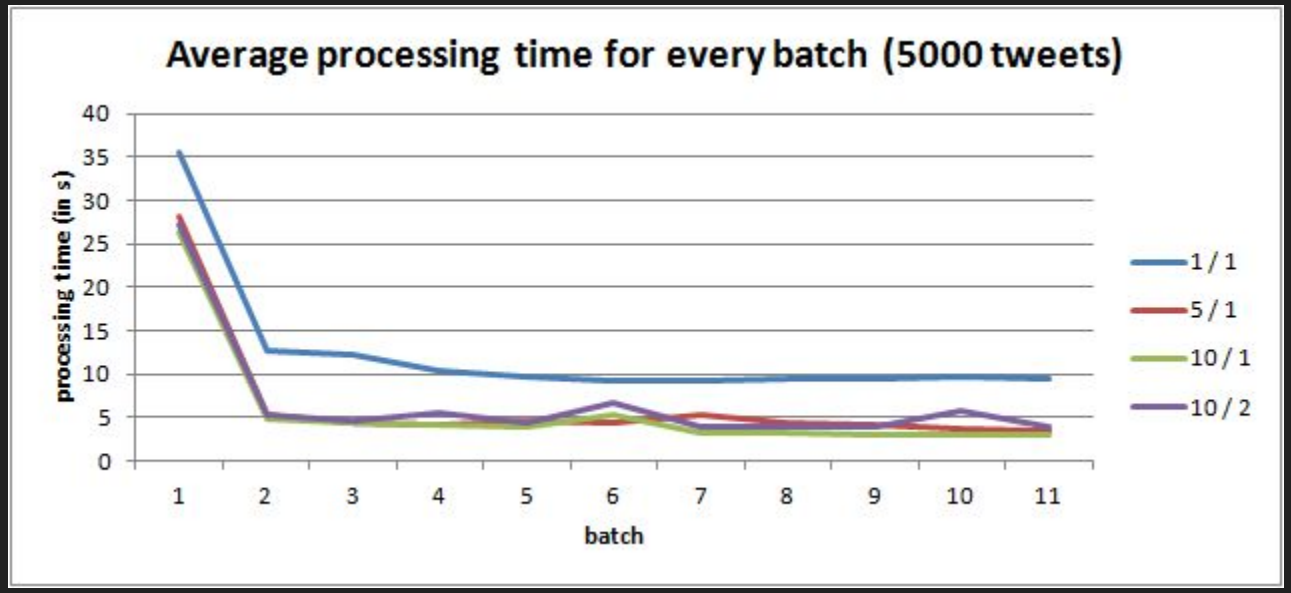
Example result

Cluster size: 14, simplified silhouette: 0.170

Performance



Performance



Outlook

- Track results across badges
- Better initial centroids
- Dynamically adjust parameters based on cluster results
- Sentiment analysis for interesting clusters

→ Improve the quality of the clustering