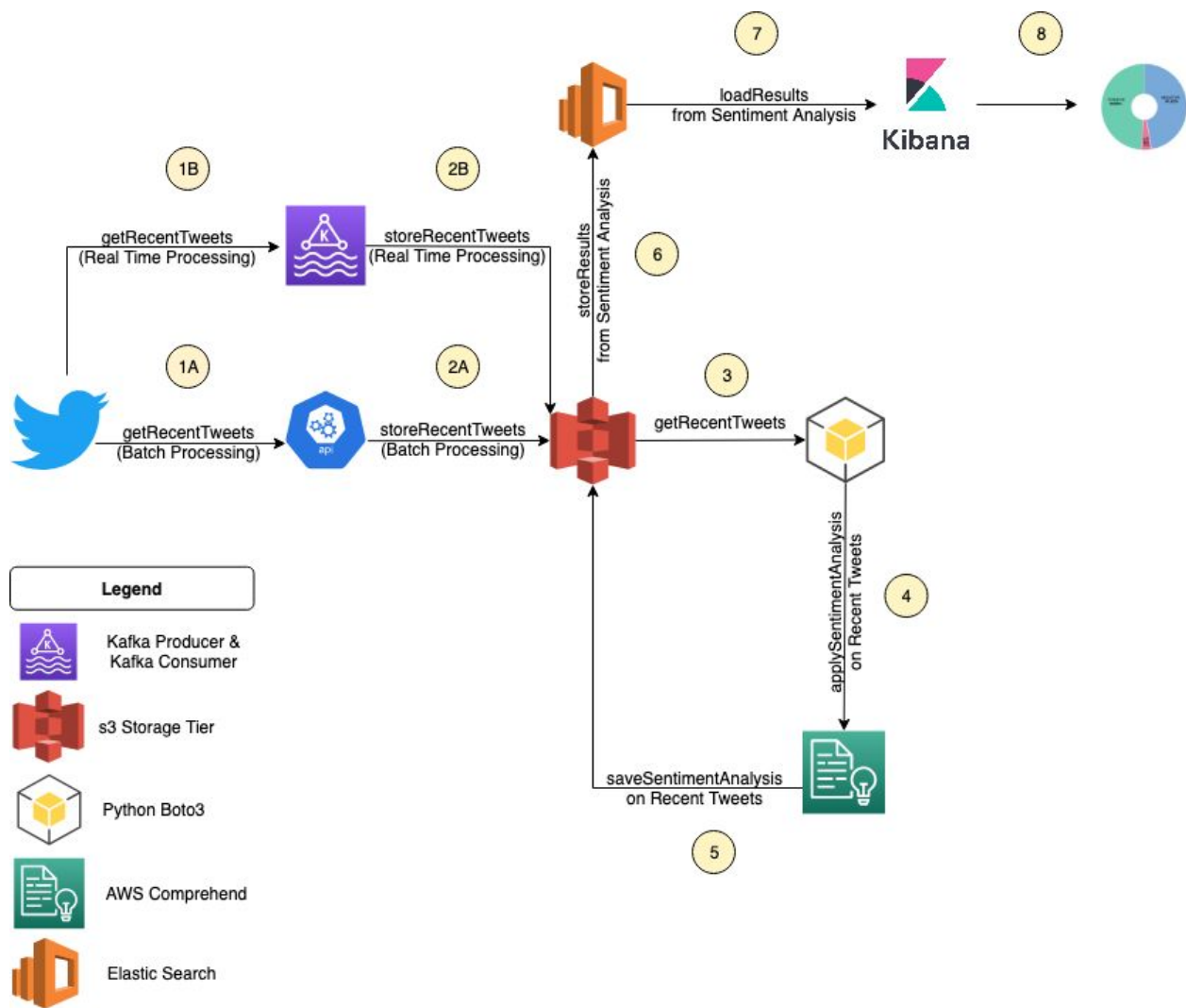# Elon Musk

Sentiment Analysis Pipeline
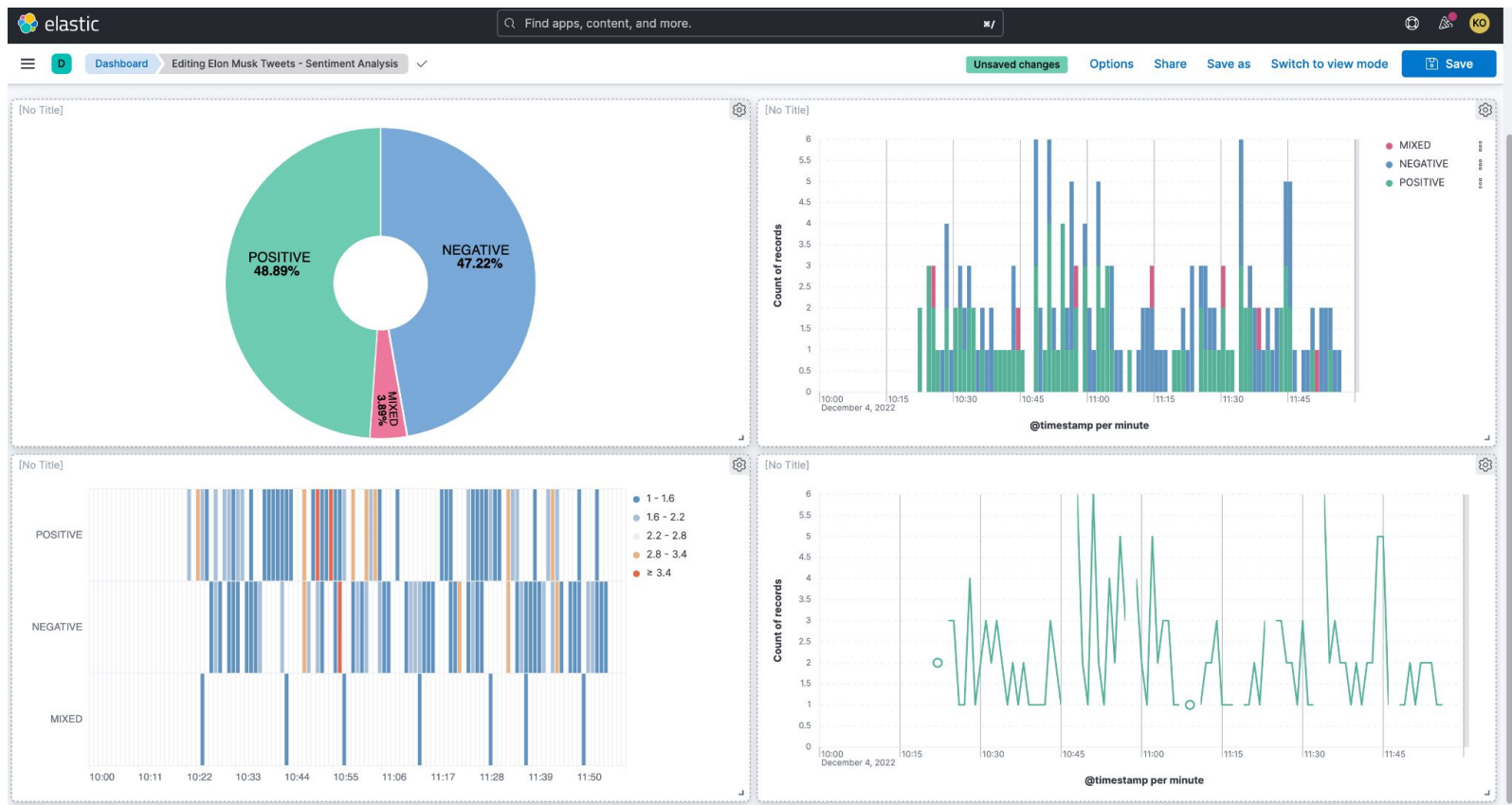**E-88 Final Project**

Project OVerview

- exploring whether Elon Musk's popularity has changed since the mass Twitter layoffs.

- leverage several Big Data Processing frameworks to extract Tweets that reference Elon Musk and analyze the sentiment associated with them.

- Perform trend Analysis to answer our proposed question

Architectural Diagram

7 loadResults from Sentiment Analysis

8

Kibana

1B getRecentTweets (Real Time Processing)

2B storeRecentTweets (Real Time Processing)

storeResults from Sentiment Analysis

6

1A getRecentTweets (Batch Processing)

2A storeRecentTweets (Batch Processing)

getRecentTweets

3

applySentimentAnalysis on Recent Tweets

4

saveSentimentAnalysis on Recent Tweets

5

Legend

Kafka Producer & Kafka Consumer

s3 Storage Tier

Python Boto3

AWS Comprehend

Elastic Search

Results & Conclusions

Sample Tweets

Negative

```
1   {
2     "_index": "e88_elon_sentiment_analysis",
3     "_id": "XHVK9YQBuIjnogPU-yQN",
4     "_version": 1,
5     "_score": 0,
6     "_source": {
7       "column1": 48,
8       "sentiment": "NEGATIVE",
9       "positive_sentiment_score": 0.006932668853551149,
10      "@timestamp": "2022-12-04T16:53:42.000Z",
11      "negative_sentiment_score": 0.8289788961410522,
12      "created_at": "2022-12-04 16:53:42+00:00",
13      "text": "@Caitlyn_Jenner Word has it that you're very concerned about #Elonmusk.😂Also, I can't blame you for tweeting to him that he's public enemy #1 for very horrific people.; I couldn't agree w/you more.😂",
14      "Unnamed: 0": 48
15    },
16    "fields": {
17      "column1": [
18        48
19      ],
20      "sentiment": [
21        "NEGATIVE"
22      ],
23      "positive_sentiment_score": [
24        0.006932668853551149
25      ],
26      "@timestamp": [
27        "2022-12-04T16:53:42.000Z"
28      ],
29      "negative_sentiment_score": [
30        0.8289788961410522
31      ],
32      "created_at": [
33        "2022-12-04T16:53:42.000Z"
34      ],
35      "text": [
36        "@Caitlyn_Jenner Word has it that you're very concerned about #Elonmusk.😂Also, I can't blame you for tweeting to him that he's public enemy #1 for very horrific people.; I couldn't agree w/you more.😂"
37      ],
38      "Unnamed: 0": [
39        48
40      ]
41    }
42  }
```

positive

```
1   {
2     "_index": "e88_elon_sentiment_analysis",
3     "_id": "y3VK9YQBuIjnogPU-yQN",
4     "_version": 1,
5     "_score": 0,
6     "_source": {
7       "column1": 159,
8       "sentiment": "POSITIVE",
9       "positive_sentiment_score": 0.9774978756904602,
10      "@timestamp": "2022-12-04T16:44:32.000Z",
11      "negative_sentiment_score": 0.00005772089934978536,
12      "created_at": "2022-12-04 16:44:32+00:00",
13      "text": "@mayenusk @tiktok_us WE ALL ADORE ELON FOR HIS GOOD WORK FOR THE HUMANITY ❤️❤️❤️\nELON IS TRUELY THE GOAT 🐐🐐🐐😍😍😍 @elonmusk \n\n#ElonMusk #ElonGOAT #GOAT🐐 #GOAT https://t.co/CZkICJ7bxC",
14      "Unnamed: 0": 159
15    },
16    "fields": {
17      "column1": [
18        159
19      ],
20      "positive_sentiment_score": [
21        0.9774978756904602
22      ],
23      "sentiment": [
24        "POSITIVE"
25      ],
26      "@timestamp": [
27        "2022-12-04T16:44:32.000Z"
28      ],
29      "negative_sentiment_score": [
30        0.00005772089934978536
31      ],
32      "created_at": [
33        "2022-12-04T16:44:32.000Z"
34      ],
35      "text": [
36        "@mayenusk @tiktok_us WE ALL ADORE ELON FOR HIS GOOD WORK FOR THE HUMANITY ❤️❤️❤️\nELON IS TRUELY THE GOAT 🐐🐐🐐😍😍😍 @elonmusk \n\n#ElonMusk #ElonGOAT #GOAT🐐 #GOAT https://t.co/CZkICJ7bxC"
37      ],
38      "Unnamed: 0": [
39        159
40      ]
41    }
42  }
```

Lessons learnt & next Steps

Lessons Learn
- We have the skills to create a working end to end pipeline with AWS
- It's import to be Frugal with Resources= Twitter v2 API & AWS Comprehend CAPS

Next STEPS
- UPgrading from the BASIC Twitter Developer Package to Stream More Data
- Incorporating Time Series Analysis into the Sentiment Analysis Pipeline
- Adding Better Natural Language Processing to Remove Noise in Tweet Data
- Generalizing Code so that we Can ANalyze other Trends outside of Elon Musk