Resume Tracking System

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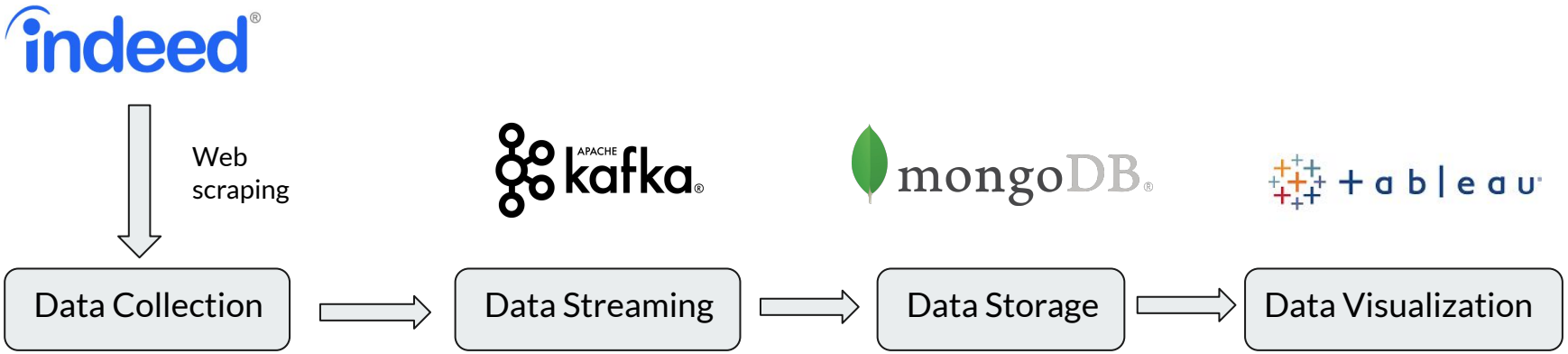
About project

We have developed resume tracking system for recruiters, which keep track of large amount of applicants information and provided better, faster and efficient way to store and analyze informations using advance technology.

System Design



Language used : - Python

Data Collection - Web Scraping

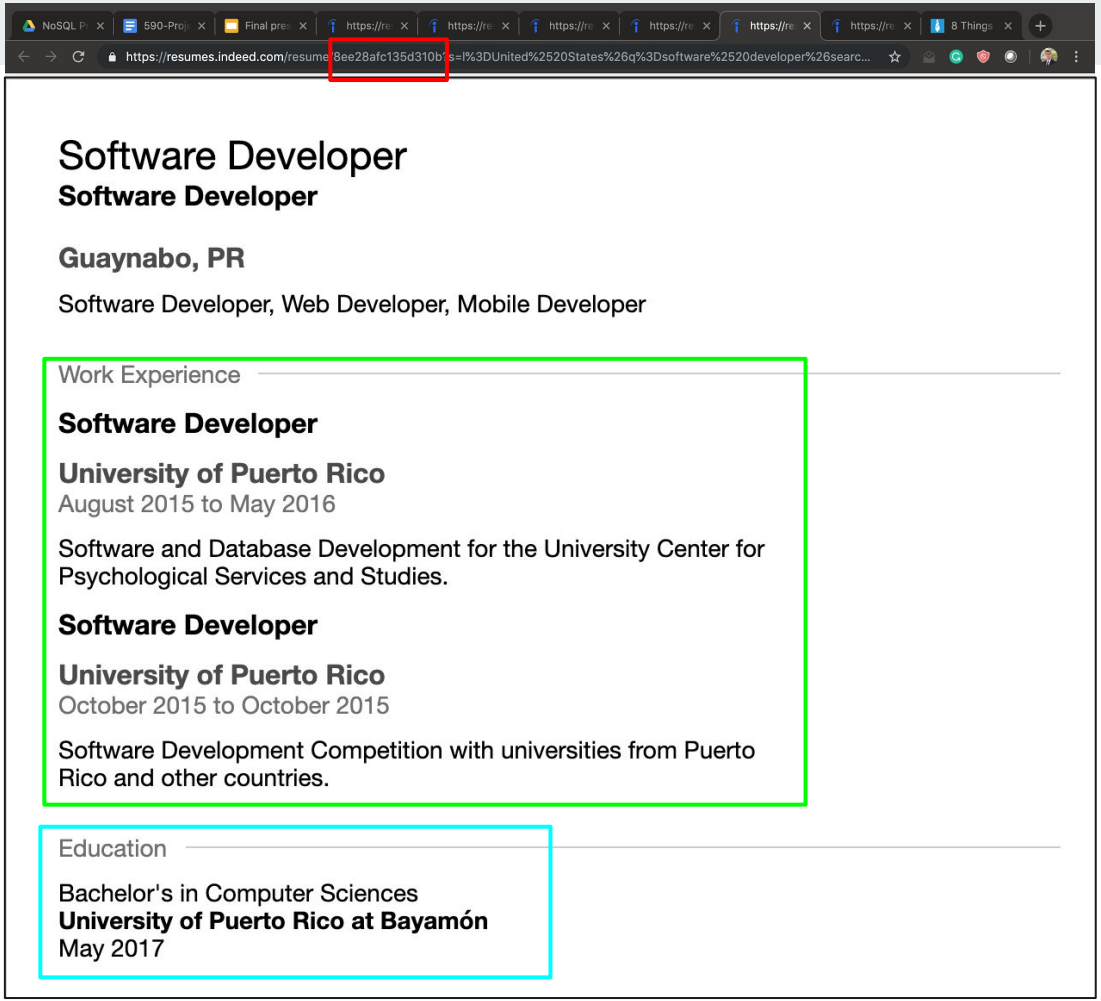
Reason to use web scraping.

- To get updated information.
- Open opportunity to get access large amount of data.
- Advantage to collect data from multiple platforms.

We choose indeed platform to collect resume information.

Technology used for web scraping:

- **Language**: Python
- **Packages**: beautifulsoup, selenium and threading



JSON

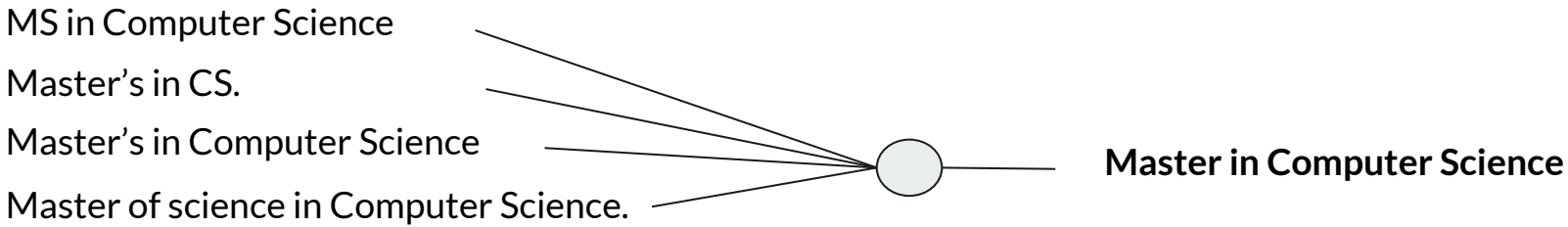

```
[{
"id": "8ee28afc135d310b1",

"jobs": [
        {"company": "University of Puerto Rico",
        "hire_date": "August 2015",
        "location": "",
        "title": "Software Developer"},

        {"company": "University of Puerto Rico",
        "hire_date": "October 2015",
        "location": "",
        "title": "Software Developer"},
],

"schools": [
        {"degree": "Bachelor's in Computer Science",
        "school_name": "University of  Puerto Rico at bayamon",
        "grad_date": "May 2017", }
]

}]
```

Issue - data is not uniform.

California State University Long Beach	**Master in Computer Science**
CSULB	MS in Computer Science
CSU - Long Beach.	Master’s in CS.
Cal State Long Beach	Master’s in Computer Science
California State University, LB	Master of science in Computer Science.
	MSCS

Method to make data uniform.

1. Replace mnemonic with actual words (using mnemonic data set).
2. Used “best string matching” algorithm to map all data to its respective category



- Degree **- College name** **- Company name** **- Job Title**

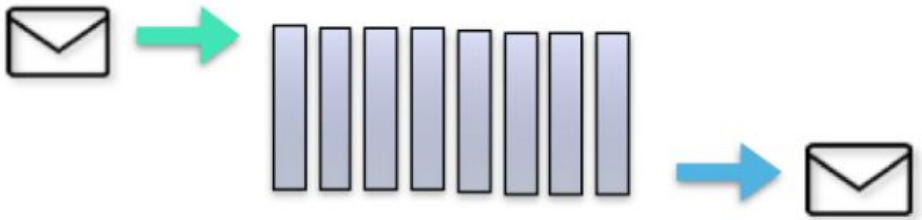
```
[{  "id": "8ee28afc135d310b1",
"jobs": [{"company": "University of Puerto Rico",
"hire_date": "August 2015", "location": "",
"title": "Software Developer"},{"company":
"University of Puerto Rico", "hire_date": "October
2015", "location": "", "title": "Software
Developer"},
],"schools": [
        {"degree": "Bachelor's in Computer
Science",
        "school_name": "University of  Puerto Rico
at bayamon",
         "grad_date": "May 2017", }
]
}] ……. . .  1000+
```


Data Streaming

Data Streaming

Apache Kafka is a distributed publish-subscribe messaging system that receives data from different source systems and makes the data available to target systems in real time.

- Acts as Safety buffer.
- Highly Scalable.



Kafka Topic

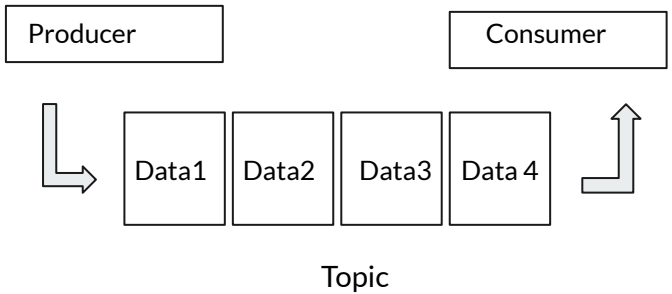
A list of data where producers add data to one end (back in this case) and consumers read from the other end

Kafka Producers

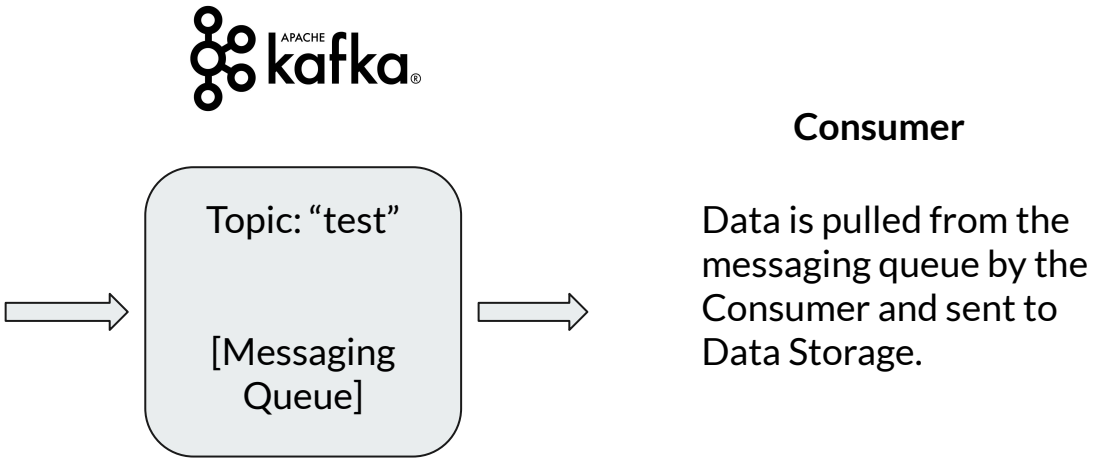
Producers are processes that publish data (push messages) into Kafka topics within the broker.

Kafka Consumers

A consumer of topics pulls messages off a Kafka topic.



How did we use Kafka?



Producer code.

```
from kafka import KafkaProducer
import json

producer = KafkaProducer(value_serializer=lambda v:
json.dumps(v).encode('utf-8'),bootstrap_servers=['localhost:9092'])

producer.send('test', #data)
```

Consumer code.

```
from kafka import KafkaConsumer
import json

consumer = KafkaConsumer('test', group_id='my-group', bootstrap_servers=['localhost:9092'])
KafkaConsumer(auto_offset_reset='latest',value_deserializer=lambda m:
json.loads(m.decode('ascii')))

for message in consumer:
    try:
      Message #(single resume data)
    except:
      print("Error")
      break
```

Single resume

[{ "**id**": "8ee28afc135d310b1",
"**jobs**": [{"**company**": "University of Puerto Rico",
"**hire_date**": "August 2015", "**location**": "",
"**title**": "Software Developer"},{"**company**":
"University of Puerto Rico", "**hire_date**": "October
2015", "**location**": "", "**title**": "Software
Developer"},
],"**schools**": [
{"**degree**": "Bachelor's in Computer
Science",
"**school_name**": "University of Puerto Rico
at bayamon",
"**grad_date**": "May 2017", }
]
}]

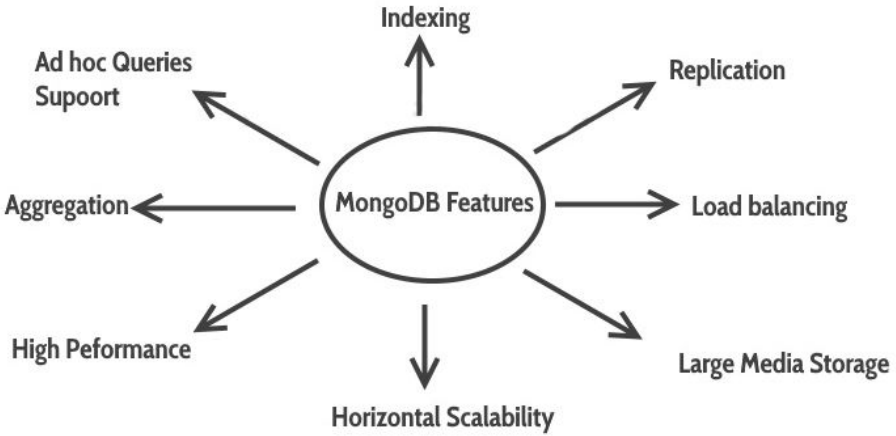
Data Storage

Data Storage

MongoDB is an open-source document-based database management tool that stores data in JSON-like formats.

Main Features :

- Highly scalable
- Faster Performance
- Flexible and distributed NoSQL database.



MongoDB - Implementation

```
from kafka import KafkaConsumer
import json
import pymongo
from pymongo import MongoClient

client = MongoClient()
db = client.project
collection = db.myCollection

consumer = KafkaConsumer('test', group_id='my-group', bootstrap_servers=['localhost:9092'])
KafkaConsumer(auto_offset_reset='latest',value_deserializer=lambda m: json.loads(m.decode('ascii')))

for message in consumer:
    try:
       post_id = collection.insert_one(json.loads(message.value)).inserted_id
    except pymongo.errors.DuplicateKeyError:
       pass
    except:
       print("Error")
       break
```

All data..

[{ "**id**": "8ee28afc135d310b1", ,,,,,,,]
[{ "**id**": "2ee28afc135d310d1", ,,,,,,,]
[{ "**id**": "3ee28afc135d310g1", ,,,,,,,]
[{ "**id**": "4ee28afc135d310b2", ,,,,,,,]
[{ "**id**": "6ee28afc135d310b3", ,,,,,,,]
[{ "**id**": "6ee28afc135d310b4", ,,,,,,,]
[{ "**id**": "3ee28afc135d310b5", ,,,,,,,]
[{ "**id**": "4ee28afc135d310b6", ,,,,,,,]
[{ "**id**": "6ee28afc135d310b6", ,,,,,,,]
[{ "**id**": "6ee28afc135d310b7", ,,,,,,,]
.....
.
.
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Live update

Data Visualization

Data visualization

We used Tableau.

- Powerful.
- Faster growing data visualization tool.
- Used widely in business intelligence industry.

We connected tableau to MongoDB using BI connector.

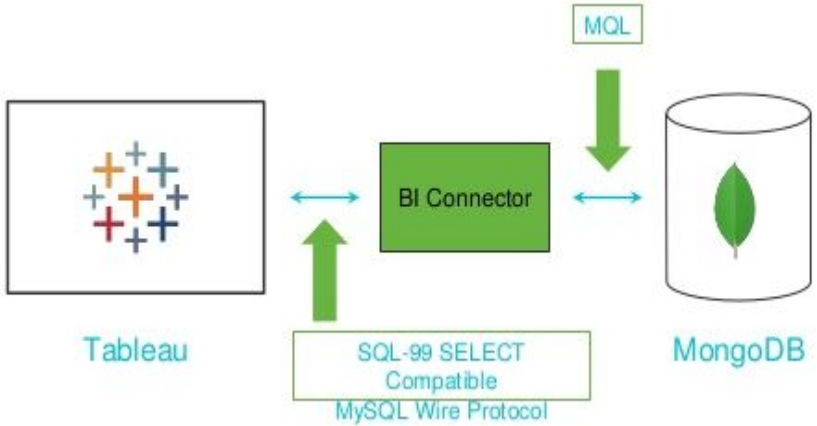


Tableau data import interface

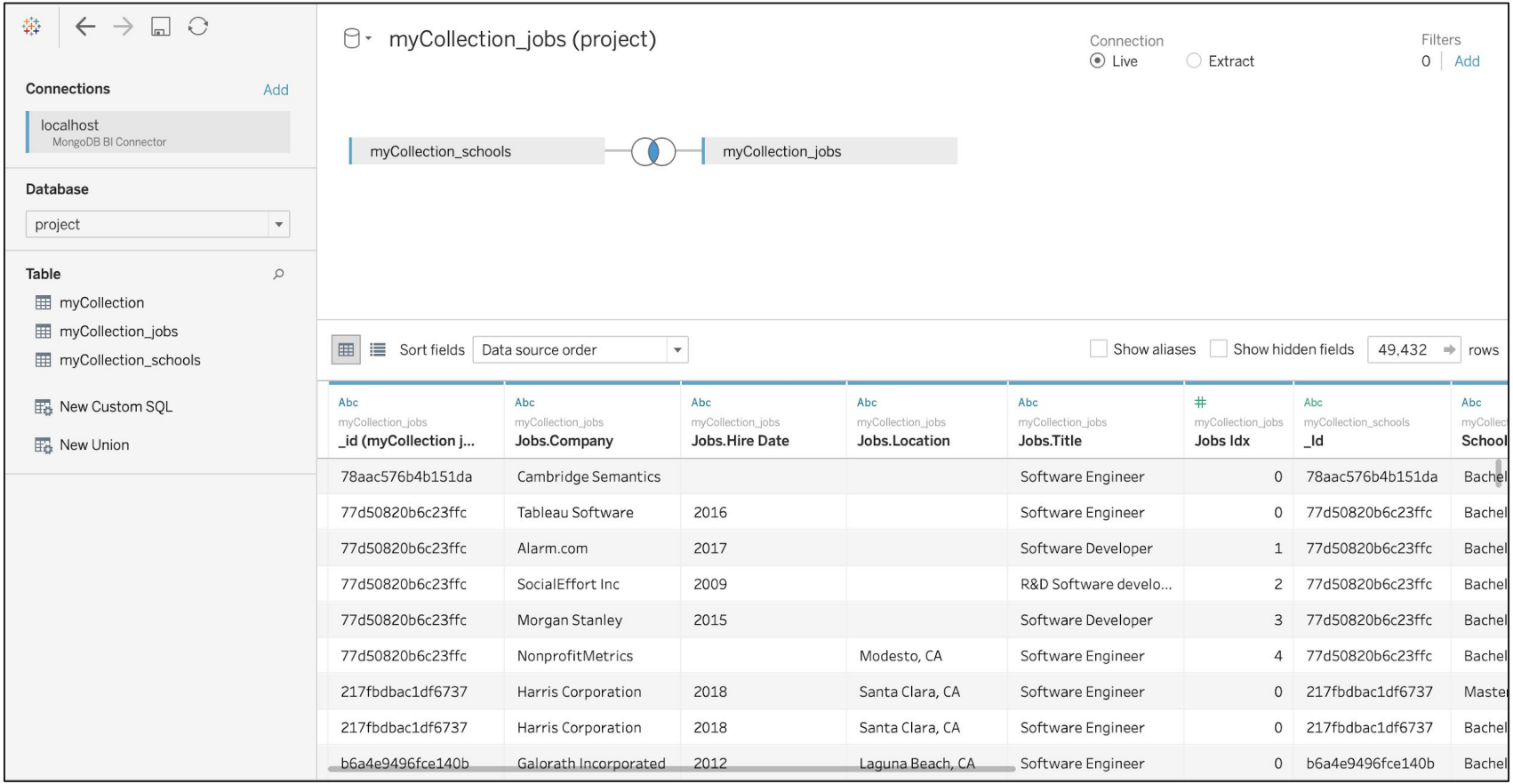
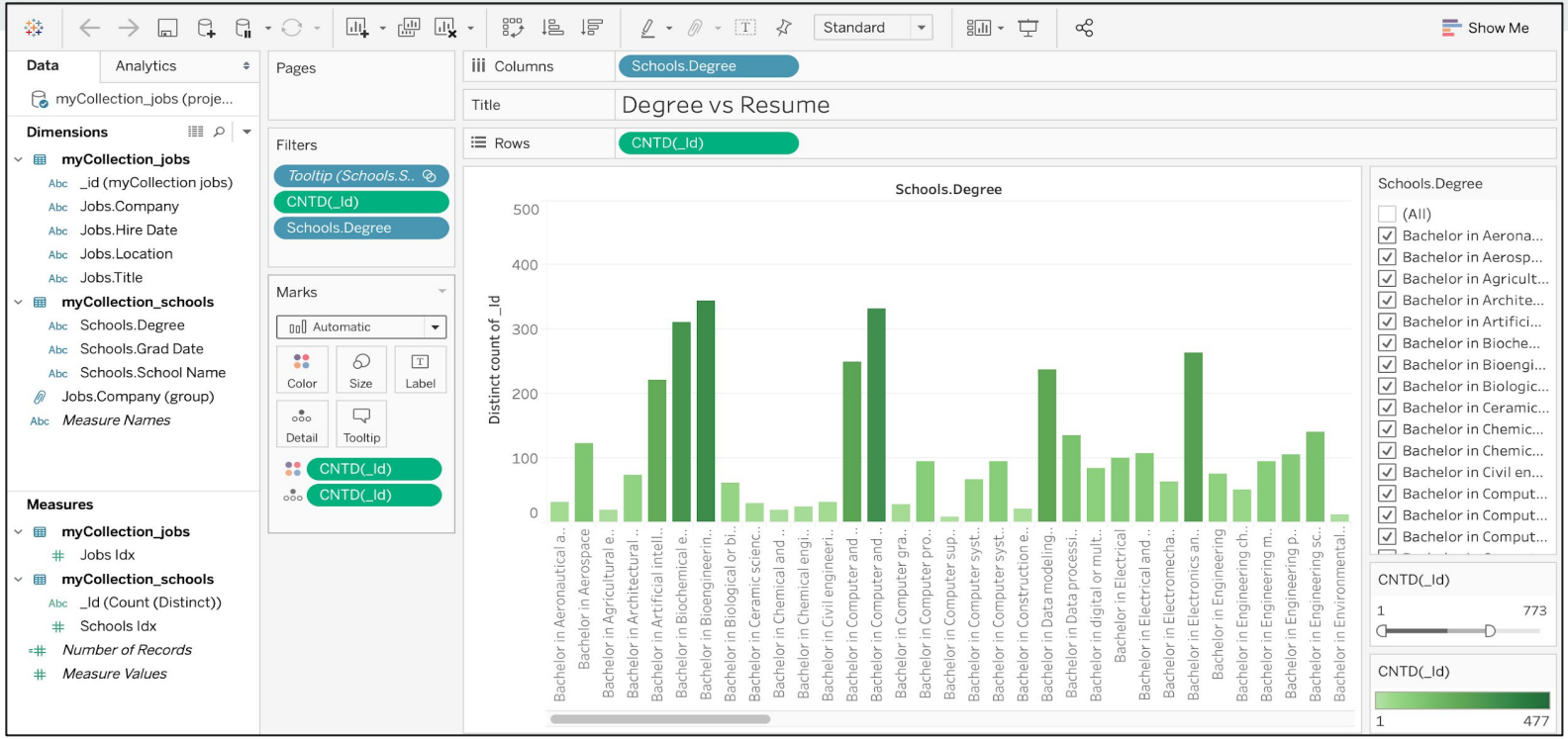


Tableau sheets.



In the above sheet we are generating the information about the count of resumes filtered out on the basis of their degree earned.

We can also use the filter to choose count of any particular degree earned.

Demo

https://public.tableau.com/profile/suraj.nair1535#!/vizhome/Resumeactivitytracker/Dashboard1?publish=yes

Benefit over existing systems

- Resume information is a semi-structured data.
- Kafka is used here as a safety buffer.
- MongoDB provides the best of NoSQL DB.
- Using Tableau users can visually interact with data to get insights faster, and make critical decisions.