“Cloud is about how you do computing ,not where you do computing.”

- Paul Maritz, Computer Scientist, Microsoft.

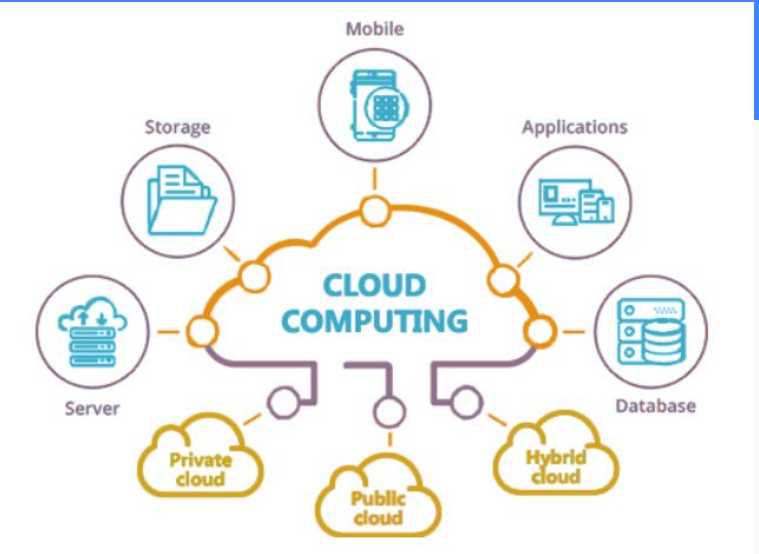
AGENDA:

1.Introduction

2.Fundamental

3.Implementation

4.Results



https://blog.knoldus.com/know-about-cloud-computing-architecture/

Introduction

Motivation:

- Why ML models might have to be retrained again and again???
- Use cases- Music Recommendation Systems, Product Recommendation Systems.

About Google Cloud:

- GCP offers a suite of computing services to do everything from GCP cost management to data management to delivering web and video over the web to AI and machine learning tools.
- Established in 2010

Fundamental

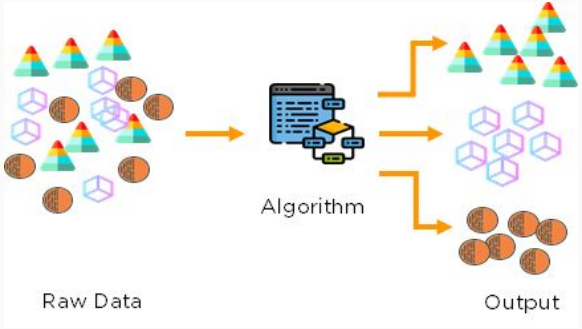
Services Used in our Project:

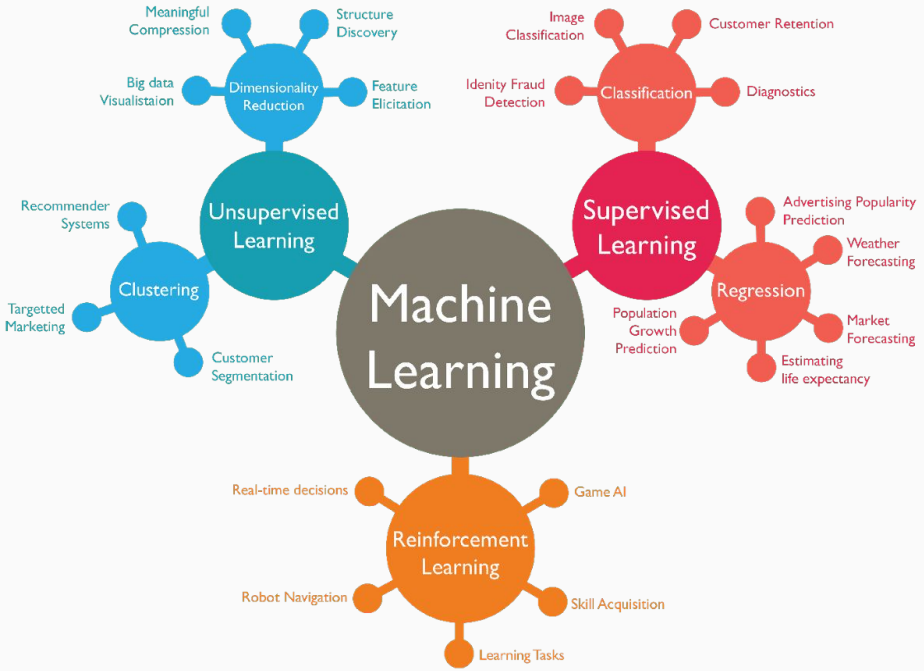
Compute	App Engine - Infrastructure as a Service to run Microsoft Windows and Linux virtual machines.
Big Data (Big Query)	Big Query - Scalable, managed enterprise data warehouse for analytics. Cloud Pub/Sub - Scalable event ingestion service based on message queues. Cloud Dataflow - Managed service based on Apache Beam for stream and batch data processing.
Management Tools	Cloud Console - Web interface to manage Google Cloud Platform resources.
Storage and Databases	Cloud Storage - Object storage with integrated edge caching to store unstructured data.

Fundamental - Machine Learning

Types of ML

- ❑ Supervised Learning
- ❑ Unsupervised Learning
- ❑ Reinforcement Learning

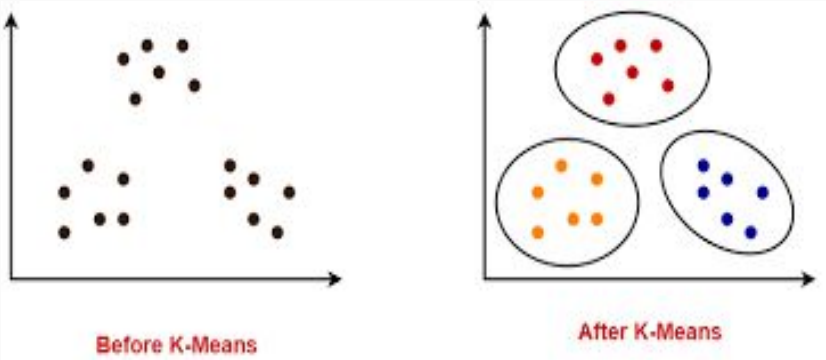




Fundamental

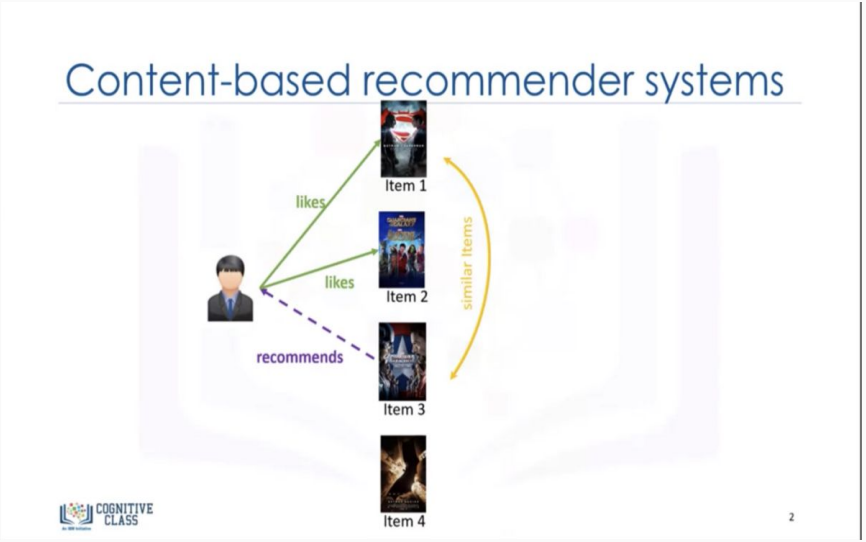
Unsupervised Machine Learning:

- K Means Clustering

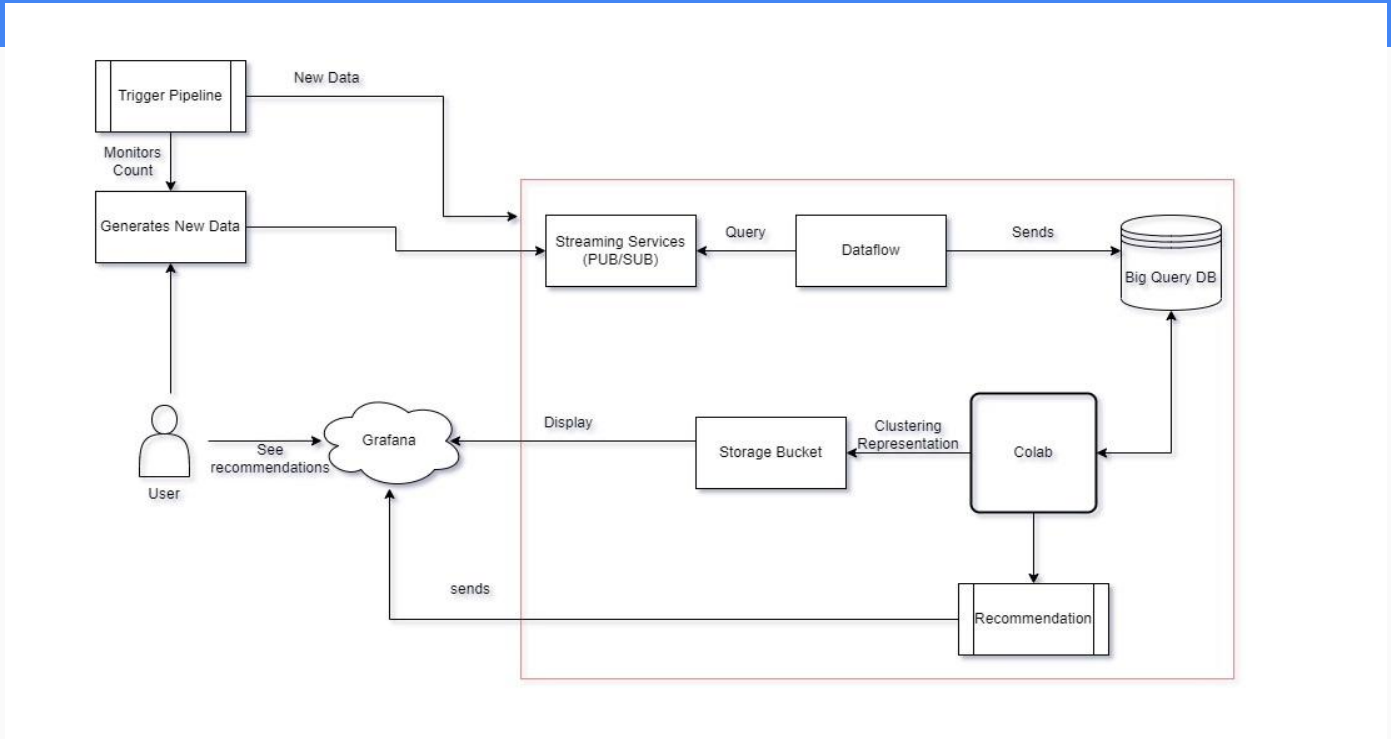


Fundamental - Recommender Systems

Content Based Recommender Systems

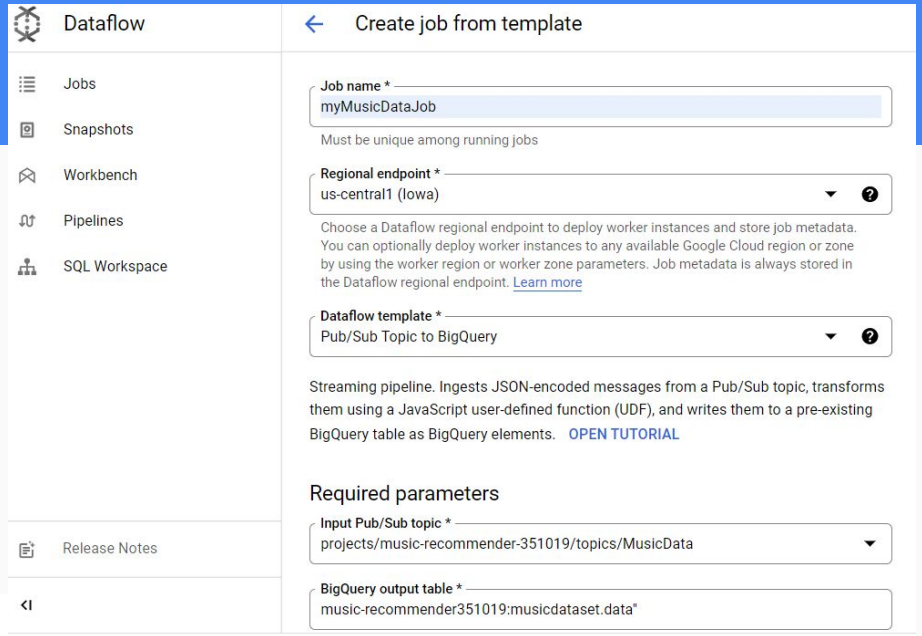


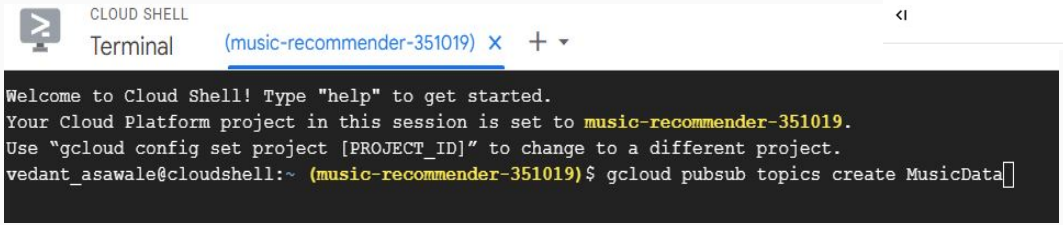
Implementation - Architecture



Implementation

- ★ Collect or Gather Data
- ★ Create BigQuery table
- ★ Create Storage bucket
- ★ Setup ETL Pipeline using PubSub and DataFlow

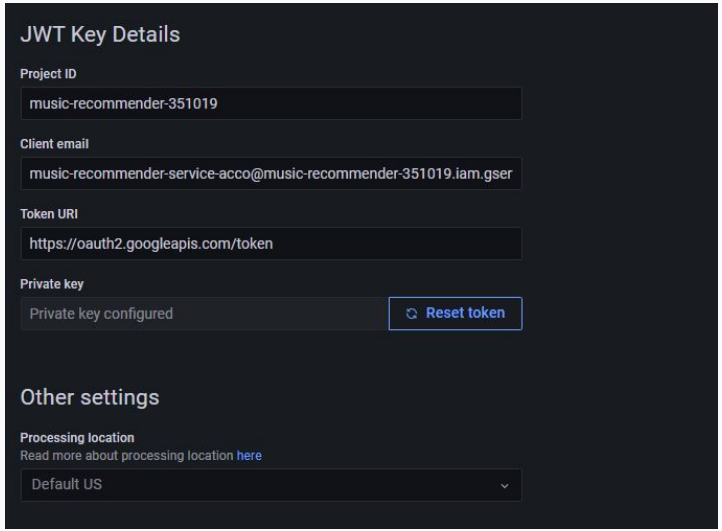




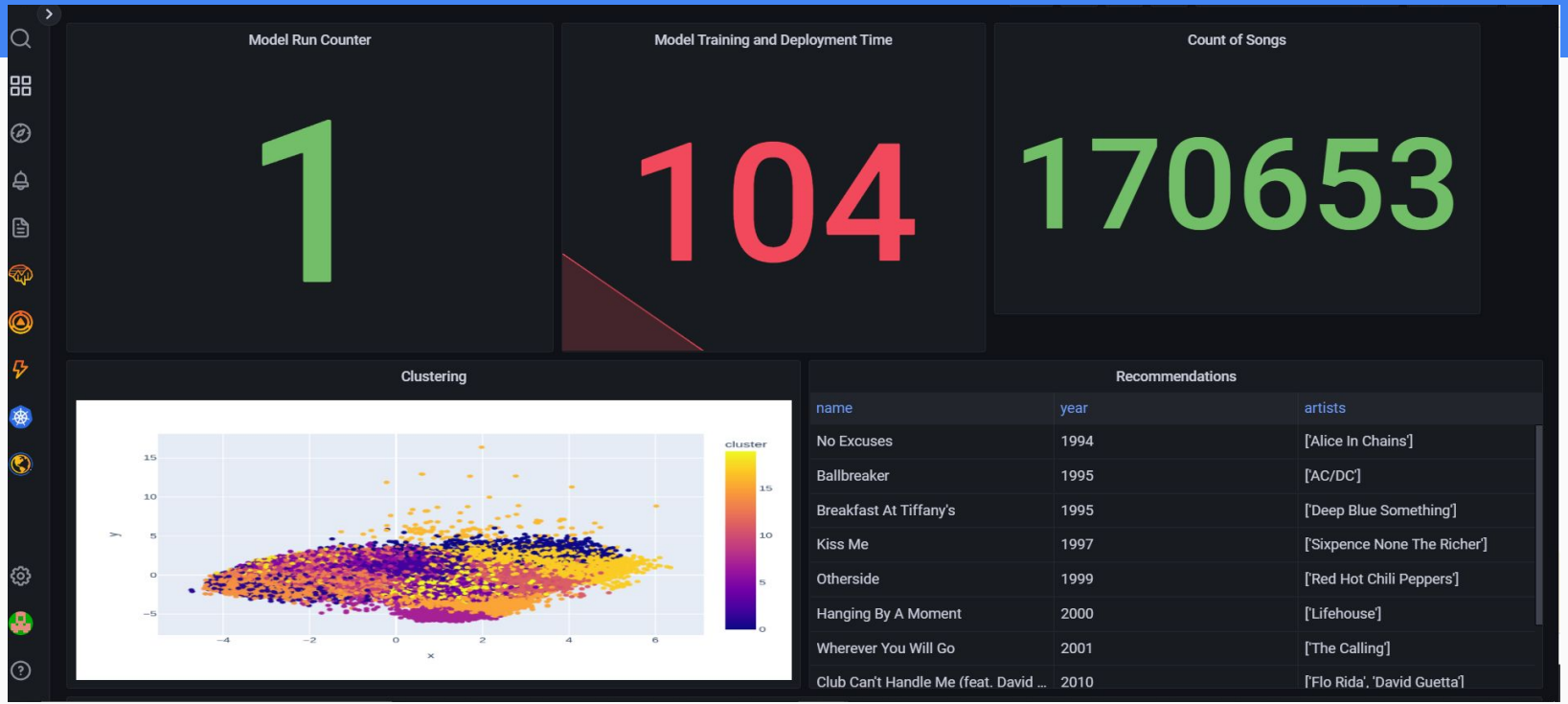
Implementation Contd.

- ★ Train ML Model using KMeans Clustering
- ★ Recommendations
- ★ Setup Grafana and link data source
- ★ Create Dashboards and display data

```
predictions=recommend_songs([{'name': 'Put Your Records On', 'year':2020},
                {'name': 'you broke me first', 'year': 2020},
                {'name': 'Forever After All', 'year': 2020},
                {'name': 'Colors of the Wind', 'year': 2019},
                {'name': 'Comforting You', 'year': 2019}
               ],  read_data.data)
```

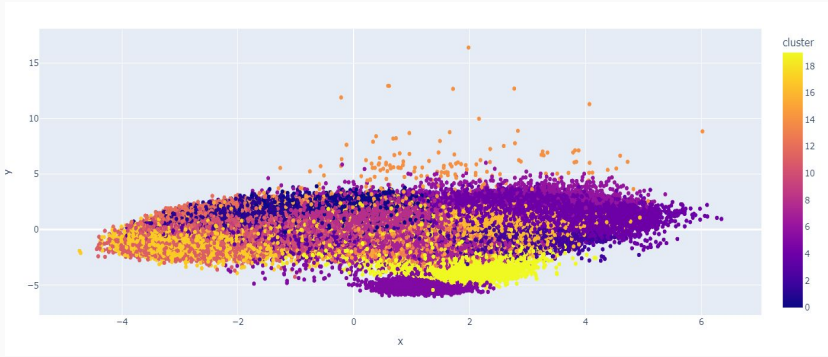


Live Demo


Model Run Counter
1
Model Training and Deployment Time
104
Count of Songs
170653
Clustering
cluster
Recommendations
name
year
artists
No Excuses
1994
['Alice In Chains']
Ballbreaker
1995
['AC/DC']
Breakfast At Tiffany's
1995
['Deep Blue Something']
Kiss Me
1997
['Sixpence None The Richer']
Otherside
1999
['Red Hot Chili Peppers']
Hanging By A Moment
2000
['Lifehouse']
Wherever You Will Go
2001
['The Calling']
Club Can't Handle Me (feat. David ...
2010
['Flo Rida', 'David Guetta']

Results

- Created ML Pipeline
- Added Trigger to pipeline
- Generated Clusters
- Recommend Songs



Recommendations		
name	year	artists
No Excuses	1994	['Alice In Chains']
Ballbreaker	1995	['AC/DC']
Breakfast At Tiffany's	1995	['Deep Blue Something']
Kiss Me	1997	['Sixpence None The Richer']
Otherside	1999	['Red Hot Chili Peppers']
Hanging By A Moment	2000	['Lifehouse']
Wherever You Will Go	2001	['The Calling']
Club Can't Handle Me (feat. David Guetta)	2010	['Flo Rida', 'David Guetta']
Runaway (U & I)	2015	['Galantis']
It's Not Living (If It's Not With You)	2018	['The 1975']

THANK YOU