Triggered Training of Machine Learning Model in Cloud

Supervisor : Prof. Dr. Christian Baun
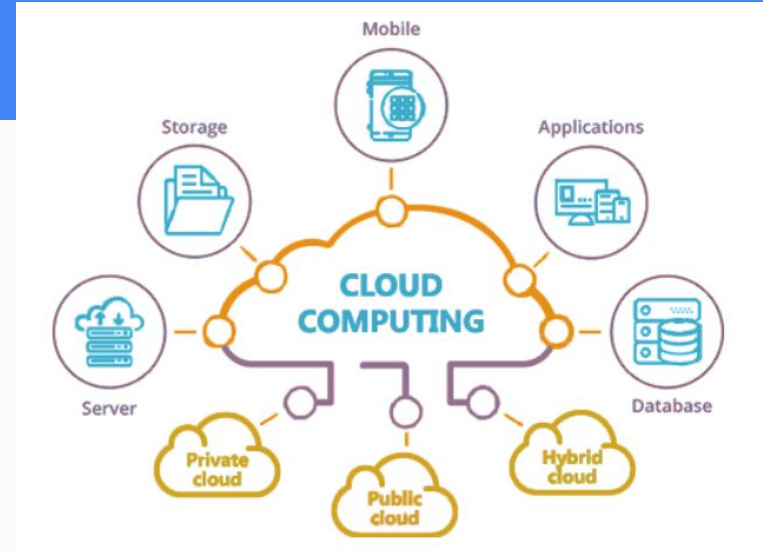
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"Cloud is about how you do computing ,not where you do computing."

- 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.

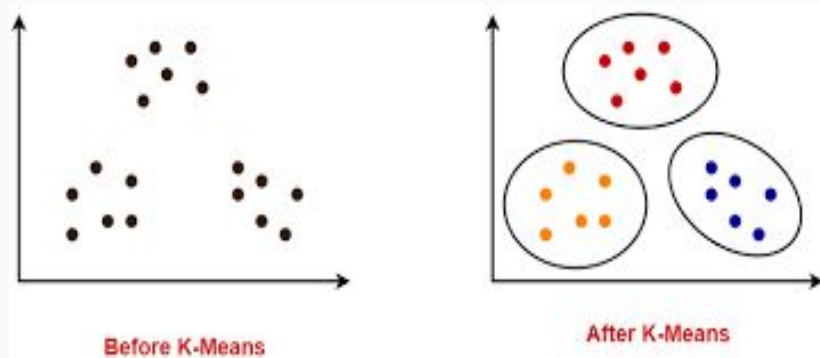# Fundamental - Machine Learning

Types of ML

❏ Supervised Learning
❏ Unsupervised Learning
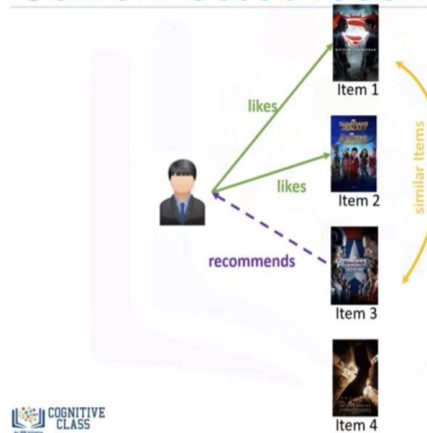❏ Reinforcement Learning
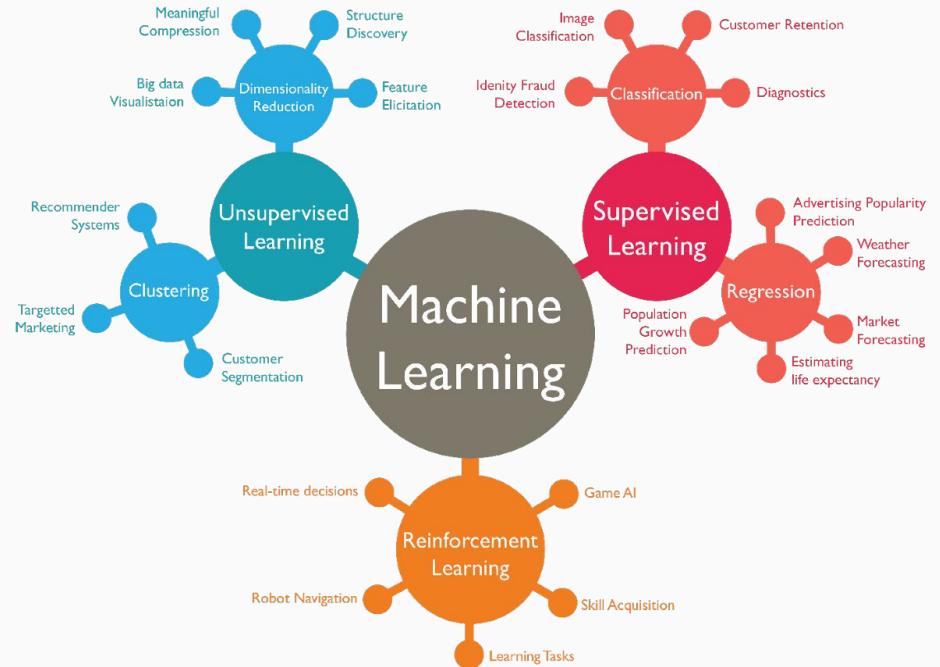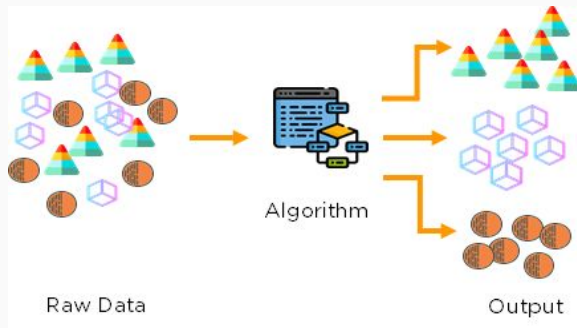
Fundamental

Unsupervised Machine Learning:
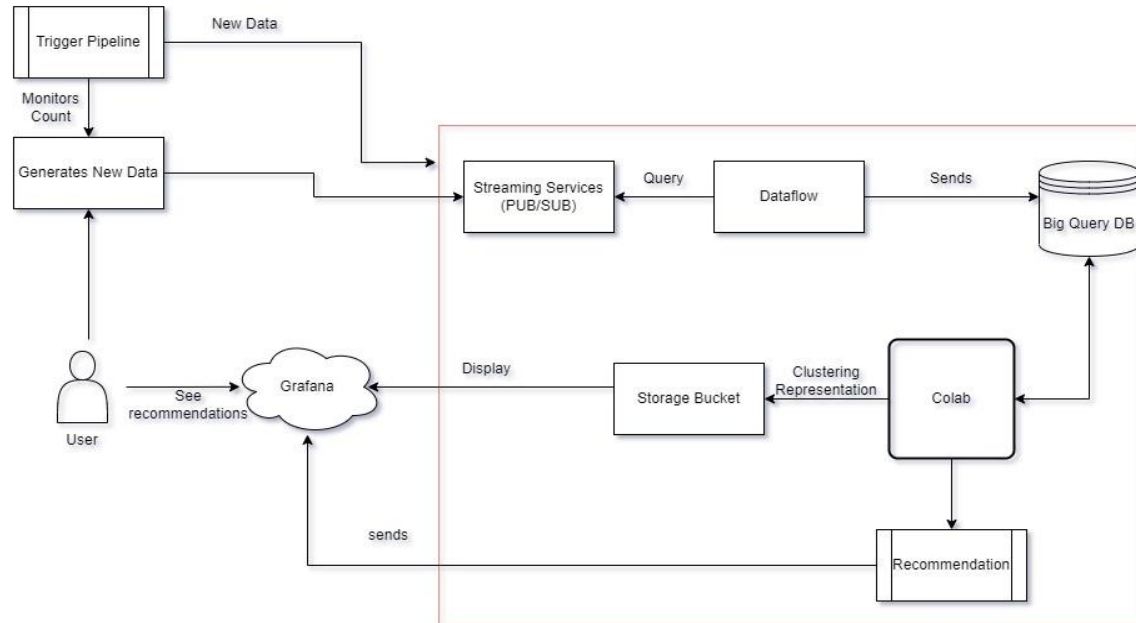
● K Means Clustering

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

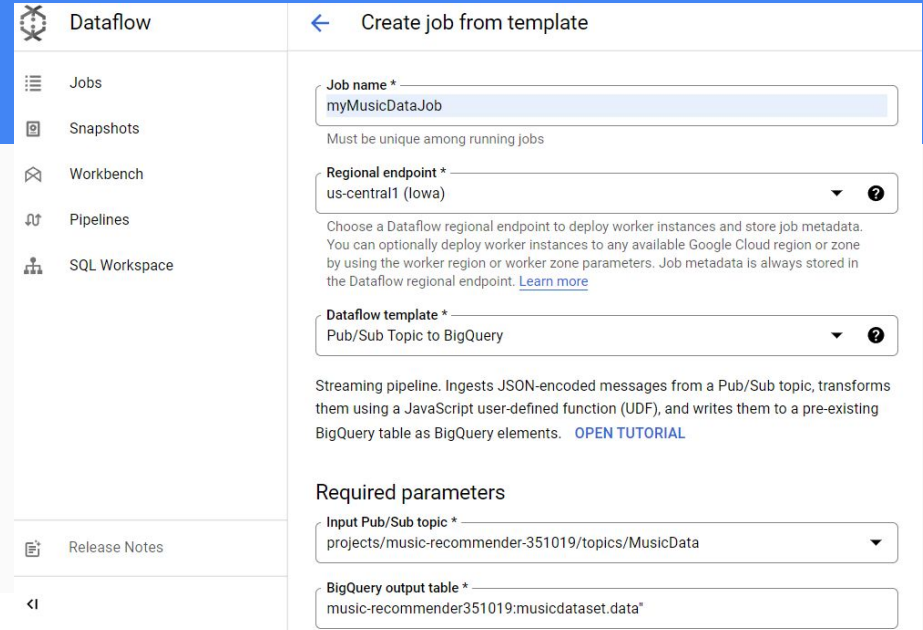# Implementation Contd.

★ 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)
```

JWT Key Details

Project ID
`music-recommender-351019`

Client email
`music-recommender-service-acco@music-recommender-351019.iam.gser`

Token URI
`https://oauth2.googleapis.com/token`

Private key
`Private key configured`   ⟳ Reset token

Other settings

Processing location
Read more about processing location here
`Default US`

Live Demo

Results

- Created ML Pipeline
- Added Trigger to pipeline
- Generated Clusters
- Recommend Songs
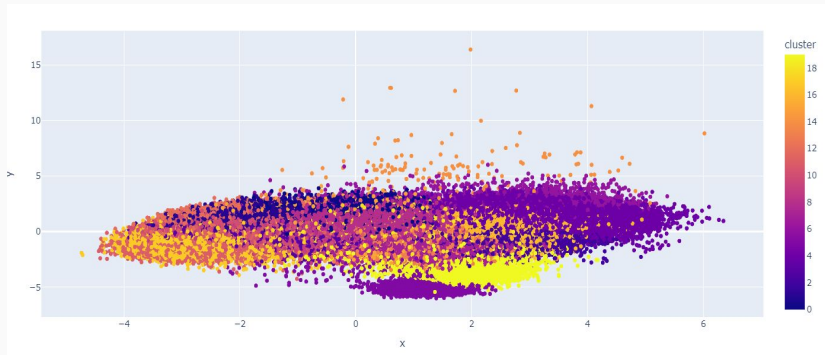
Recommendations		
name	year	artists
No Excuses	1994	['Alice In Chains']
Ballbreaker	1995	['AC/DC']
Breakfast At Tiffany's	1995	['Deep Blue Something']
Kiss Me	1997	['Sixpence None The Richer']
Otherside	1999	['Red Hot Chili Peppers']
Hanging By A Moment	2000	['Lifehouse']
Wherever You Will Go	2001	['The 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