DE Final Project

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Task at Hand

A large IT company is losing its employees at a particular location recently and management would like to closely monitor the HC and Attrition of this location.

We have been tasked to set up an automated dashboard for the management. HR data will be provided by HR Talent team on a regular basis. We would like to set up a workflow management to ensure that dashboard is automatically updated.

To achieve this, we have set up Airflow running on Dockers. Workflow will update the data in Google BigQuery table which in turn will be connected to a Looker Studio Report Dashboard providing overview of HC, Attrition and some Deep Dives into Attrition reasons.

Resources Required

Dockers, Python, Airflow, Google Cloud Storage, BigQuery and Looker Studio

Workflow Management in Airflow

Task 1 > BashOperator – Download csv file from a server

Task 2 > PythonOperator - Perform ETL and save the file

Task 3 > PythonOperator – Upload the file in Google Cloud Storage Bucket

Task 4 > PythonOperator – Check for table in BigQuery database. If does not exist then create it.

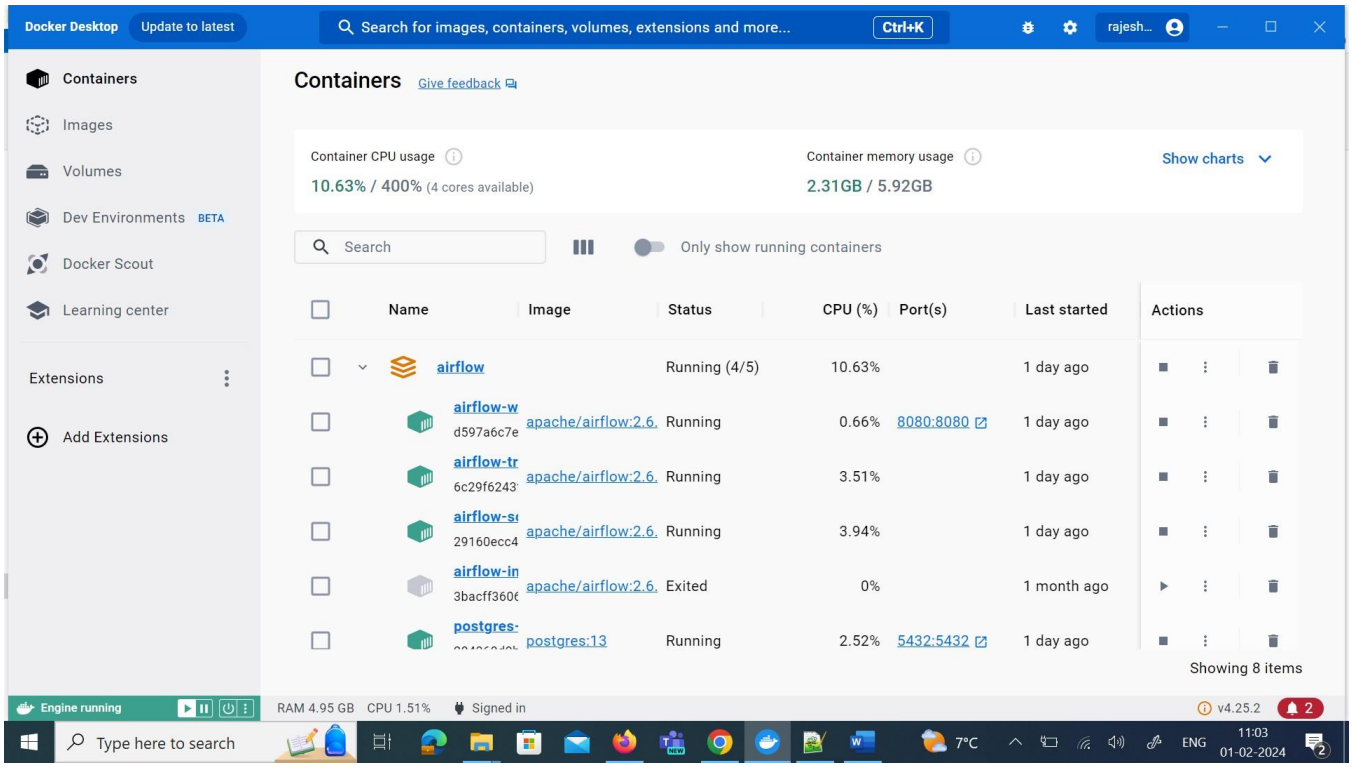
Task 5 > Load the data from Google Storage Bucket to BigQuery Table

Task in Google Cloud

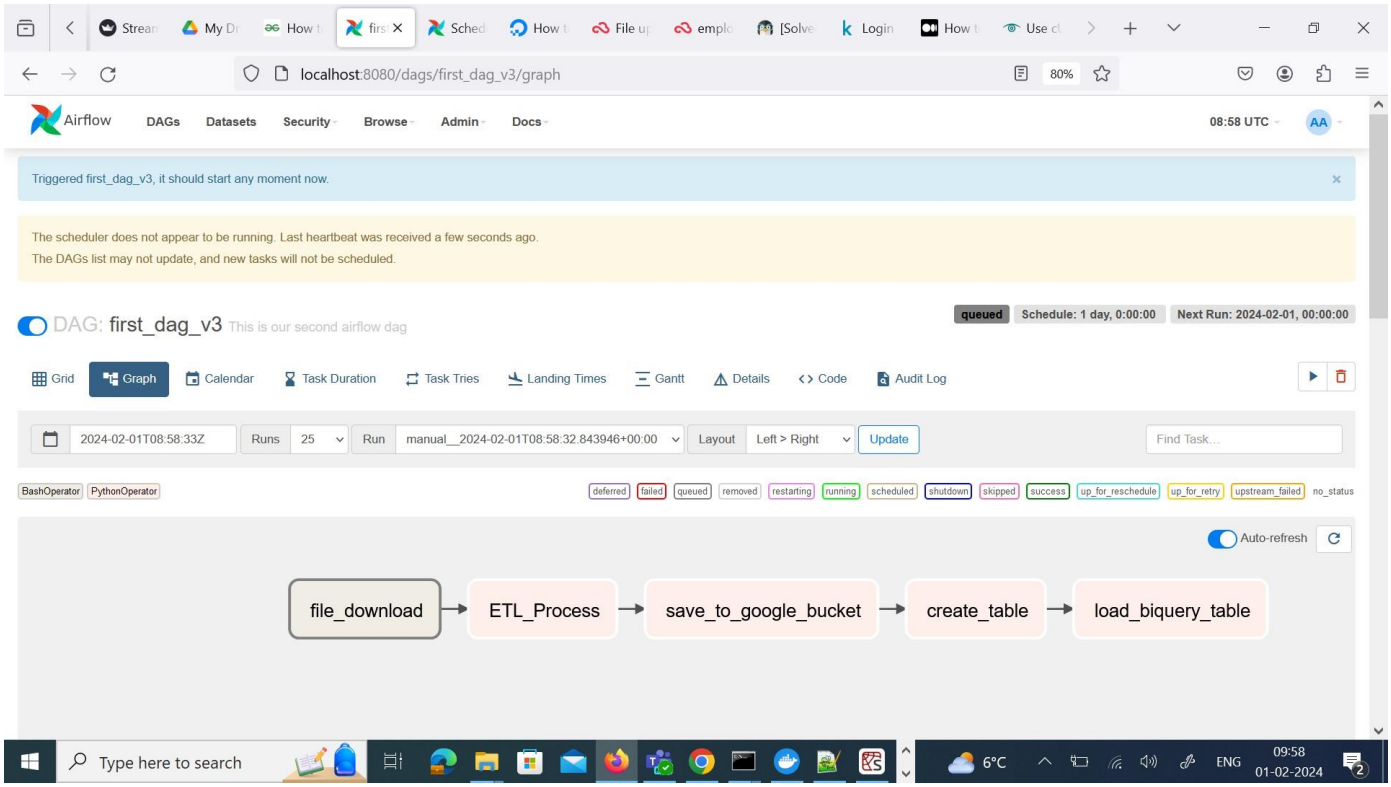
Set up Terraform in Google Cloud Terminal to create Storage Bucket

Create Looker Studio Report based on the requirements of the management to show HC and Attrition Analysis

Airflow set up and running on Dockers



Airflow running – Dag queued



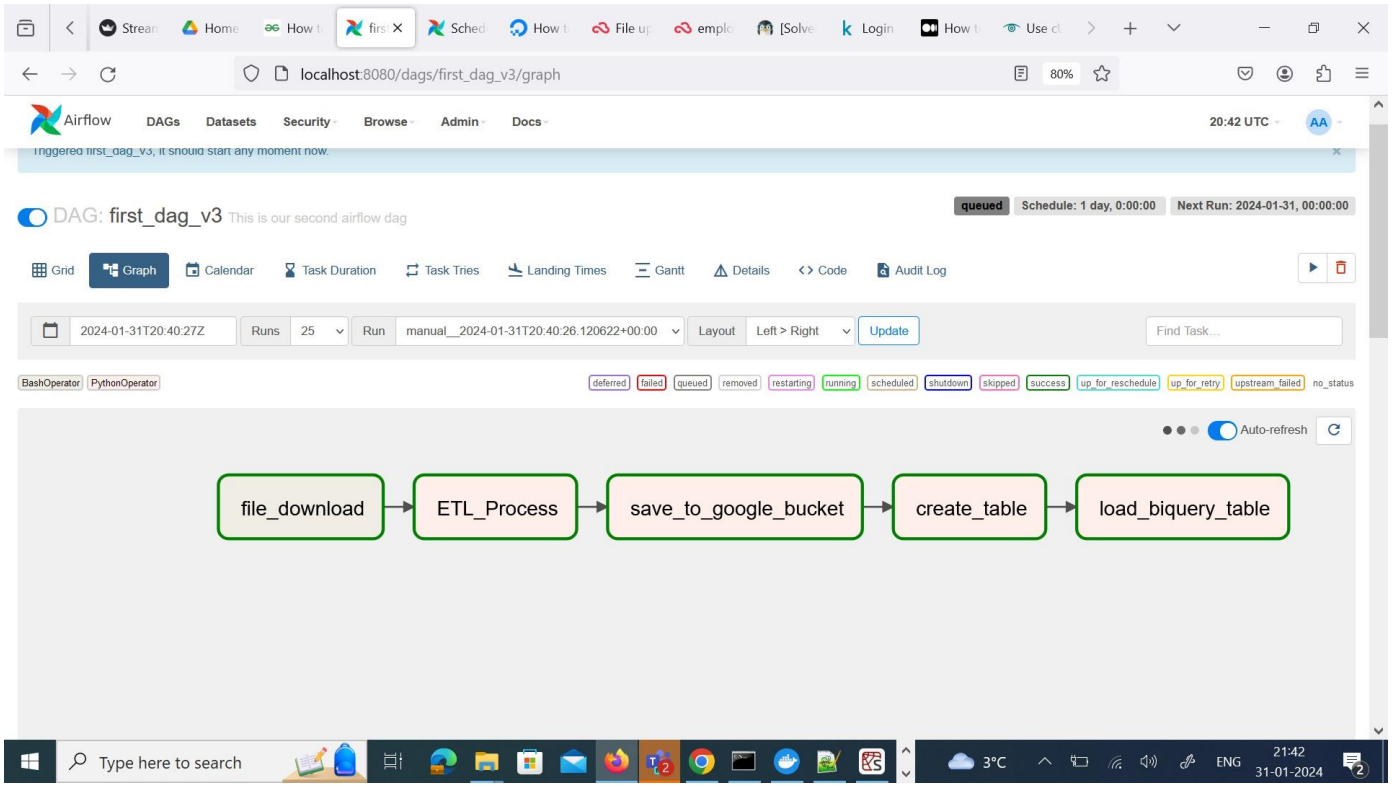
First task is to download the hr data csv file hosted on an intranet file server and rename it to current date. For example

20240201.csv.

ETL is performed on this file in next step, one field is changed from categorical to numerical required for analysis. Extra columns which are not required are dropped and a new file is saved.

For example employee_hr_data20240201.csv.

Subsequently the next task continues.



Bucket Created on Google Cloud using Terraform. This file was saved main.tf was run on Google Cloud Terminal

```
provider "google"{
credentials=file("access-keys.json")
project=var.project_id
}
variable "bucket_name"{
type=string
description="Bucket created using terraform"
}
variable "bucket_location"{
type=string
default="us-east1"
}
variable "project_id"{
type=string
}
variable "storage_class"{
```

type=string

}

resource "google_storage_bucket" "default"{

name=var.bucket_name

storage_class=var.storage_class

location=var.bucket_location

}

Airflow runs and uploads the new created csv file after the ETL process and it is then uploaded in the designated Bucket

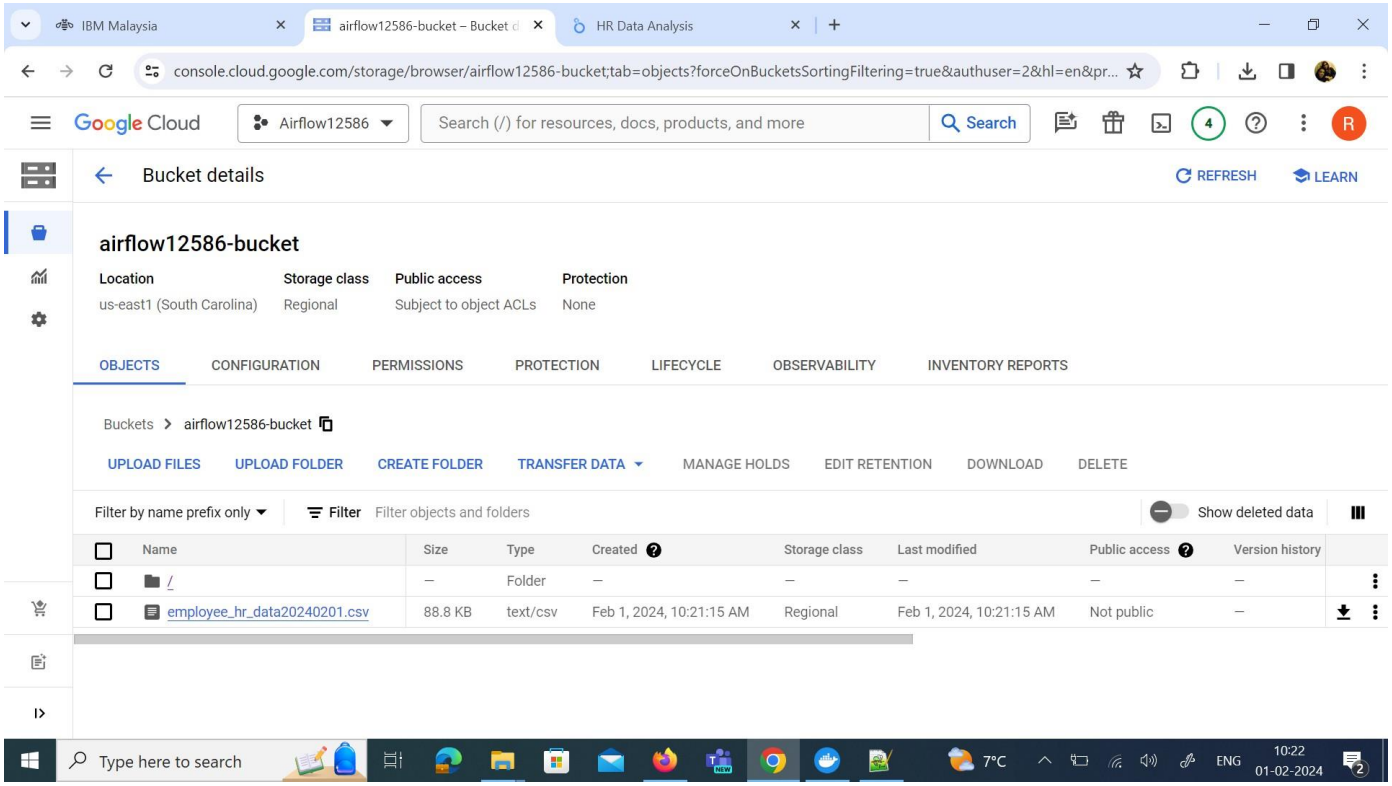
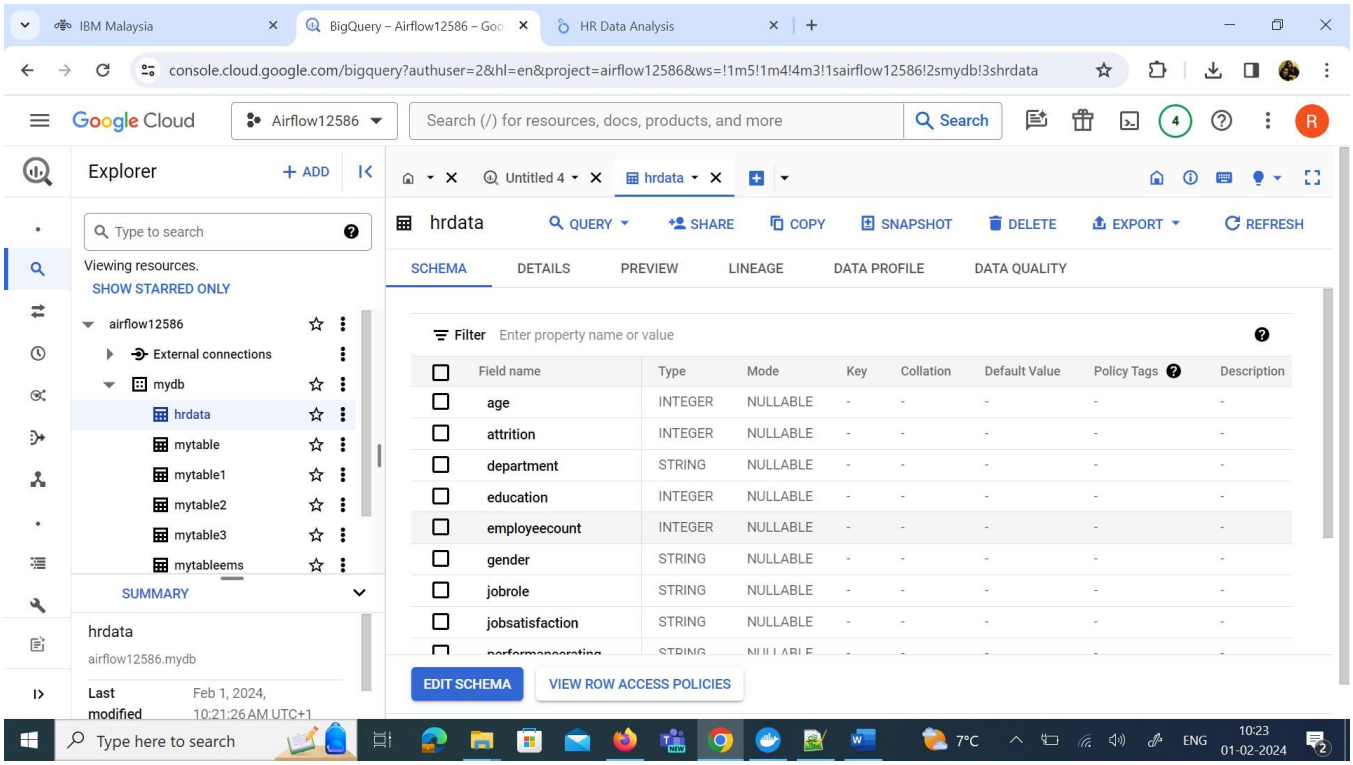
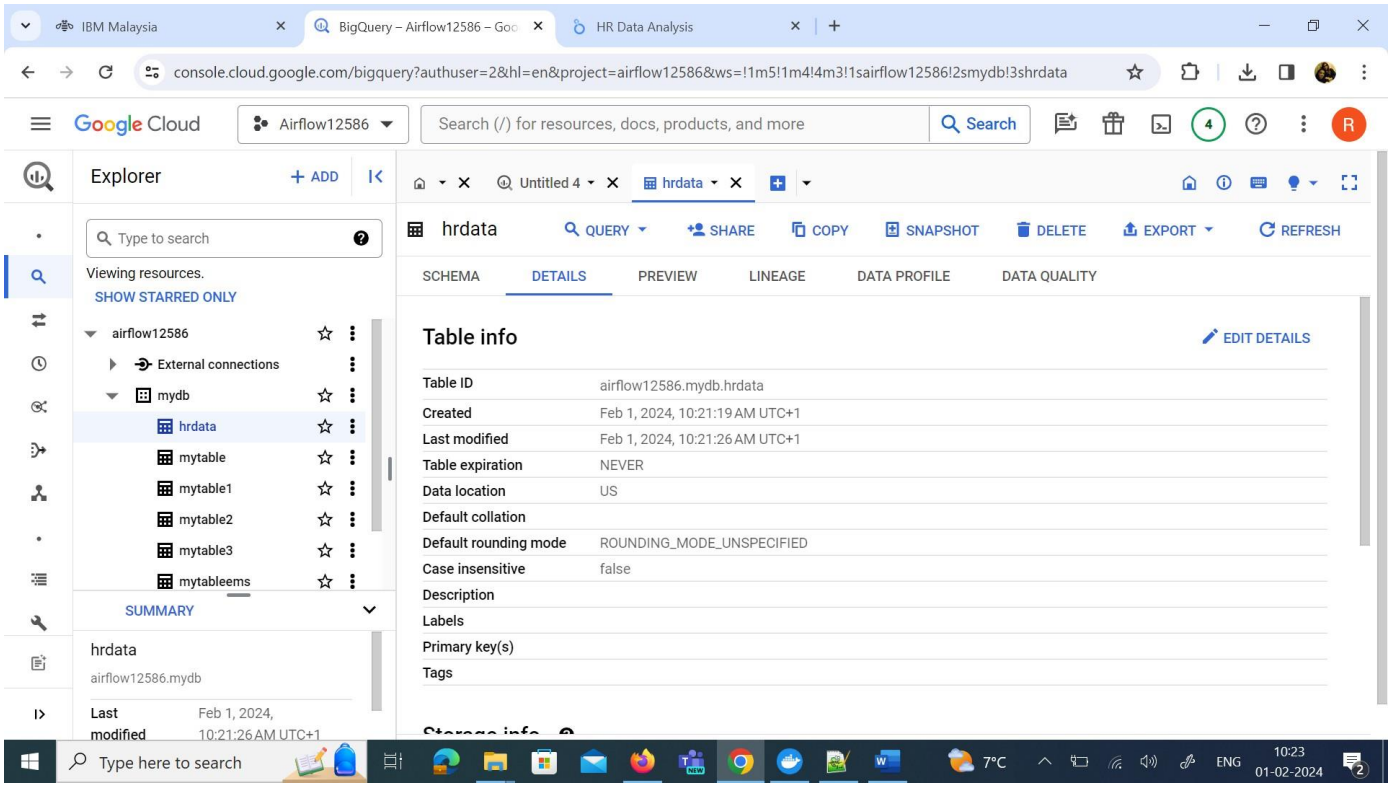
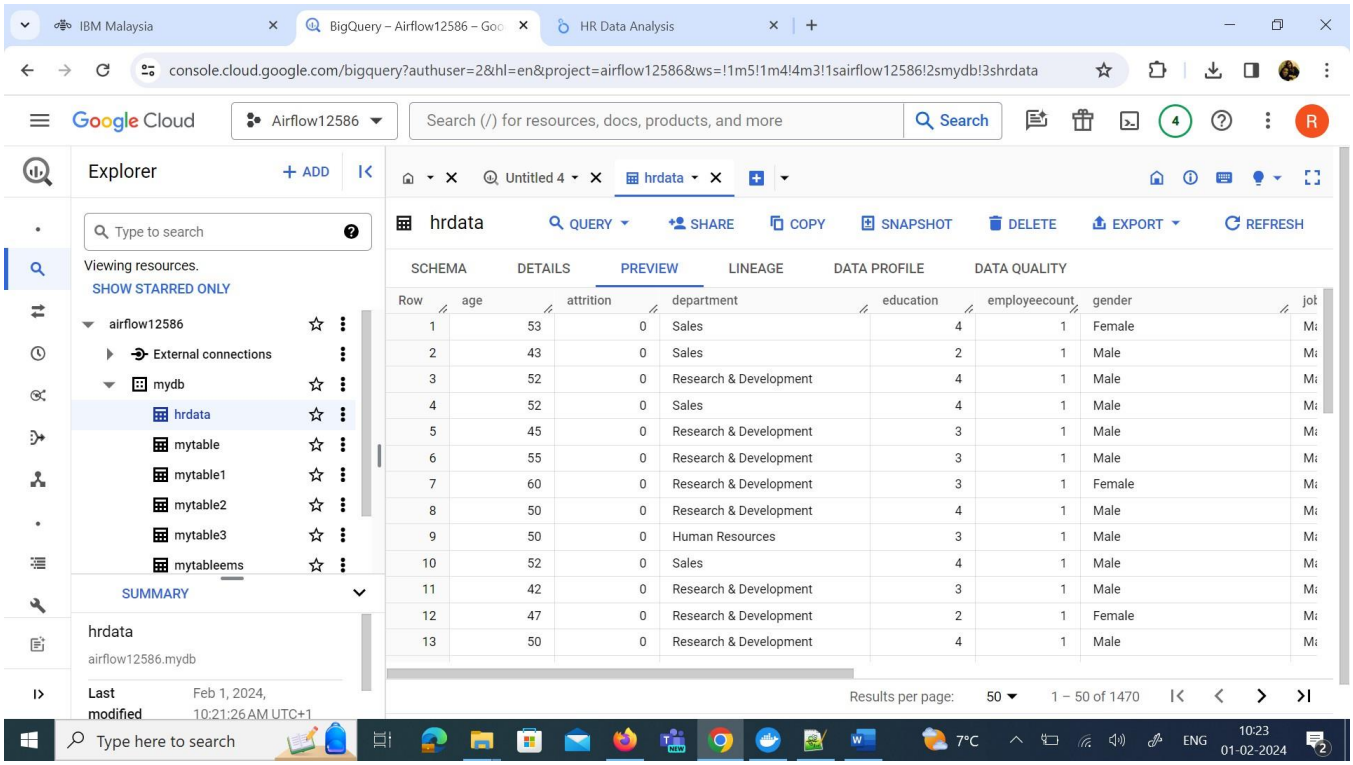


Table is created from Airflow into the Bigquery Database





Data loaded from the csv file in the Bucket into the the BigQuery table.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BigQuery – Airflow12586 – Goo
HR Data Analysis
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Google Cloud
Airflow12586
Search (/) for resources, docs, products, and more
Search
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airflow12586
External connections
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DATA QUALITY
Row age attrition department education employeecount gender job
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2 43 0 Sales 2 1 Male
3 52 0 Research & Development 4 1 Male
4 52 0 Sales 4 1 Male
5 45 0 Research & Development 3 1 Male
6 55 0 Research & Development 3 1 Male
7 60 0 Research & Development 3 1 Female
8 50 0 Research & Development 4 1 Male
9 50 0 Human Resources 3 1 Male
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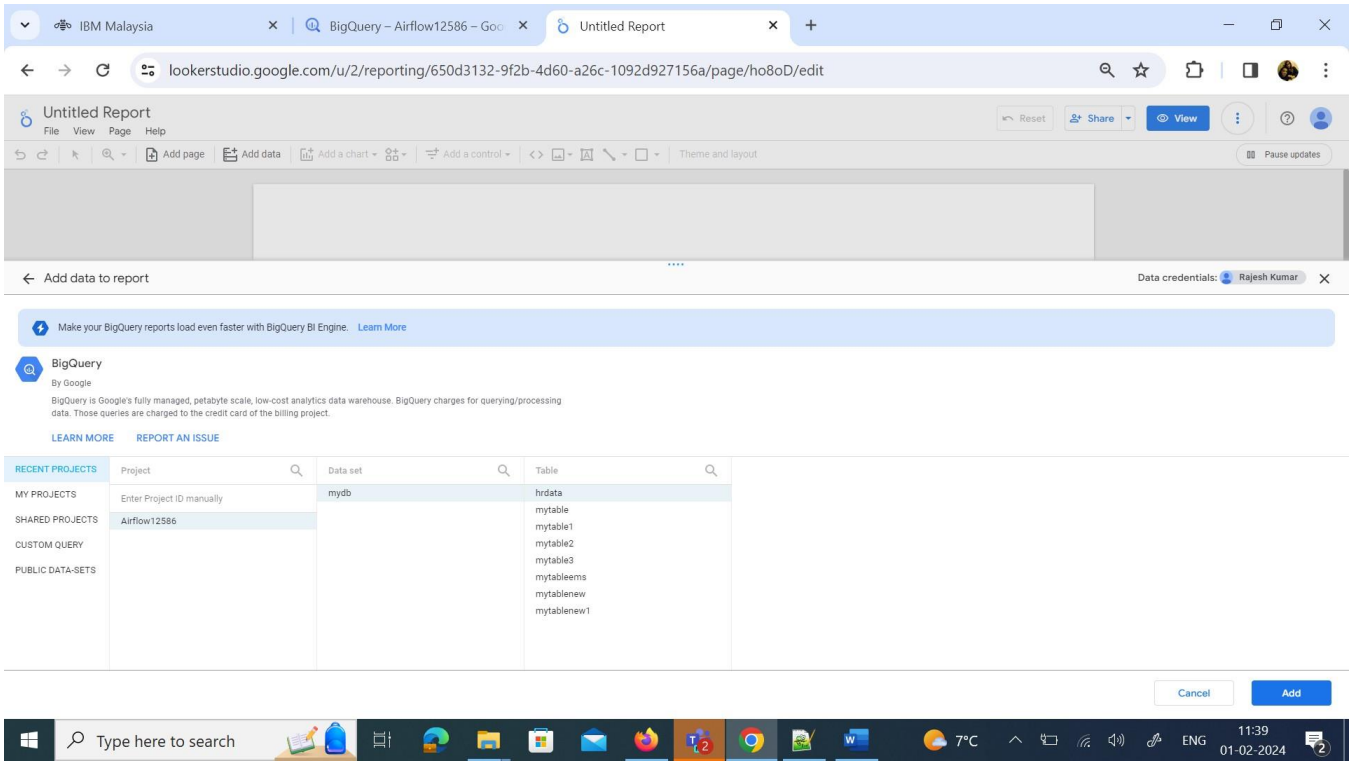
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Untitled Report
File View Page Help
Reset
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Add data
Add a chart
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Theme and layout
Pause updates
Add data to report
Data credentials: Rajesh Kumar
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CUSTOM QUERY
PUBLIC DATA-SETS
Project
Enter Project ID manually
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Data set
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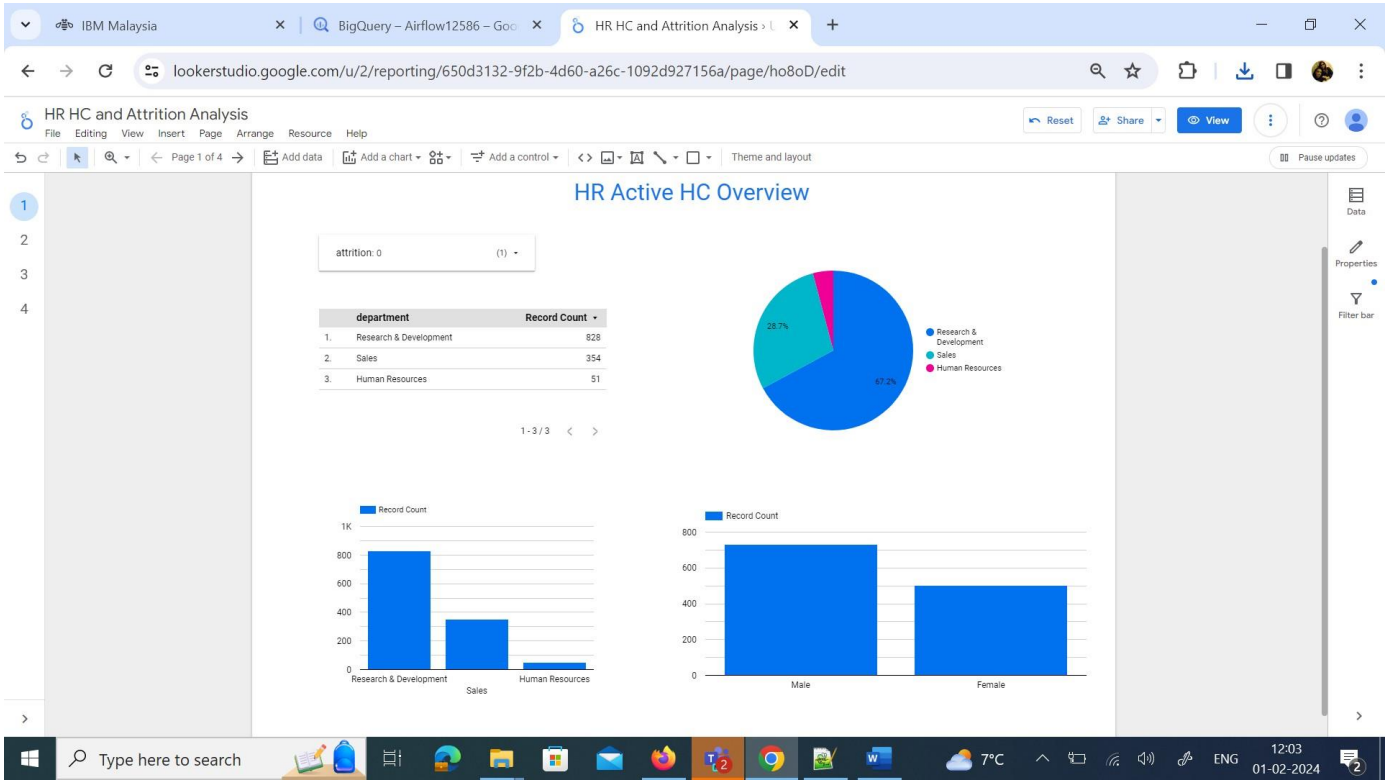
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HR HC and Attrition Analysis
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HR HC and Attrition Analysis
File Editing View Insert Page Arrange Resource Help
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Page 1 of 4
Add data
Add a chart
Add a control
Theme and layout
Pause updates
HR Active HC Overview
attrition: 0
(1)
department
Record Count
1. Research & Development 828
2. Sales 354
3. Human Resources 51
1 - 3 / 3
28.7%
67.2%
Research & Development
Sales
Human Resources
Record Count
1K
800
600
400
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Research & Development
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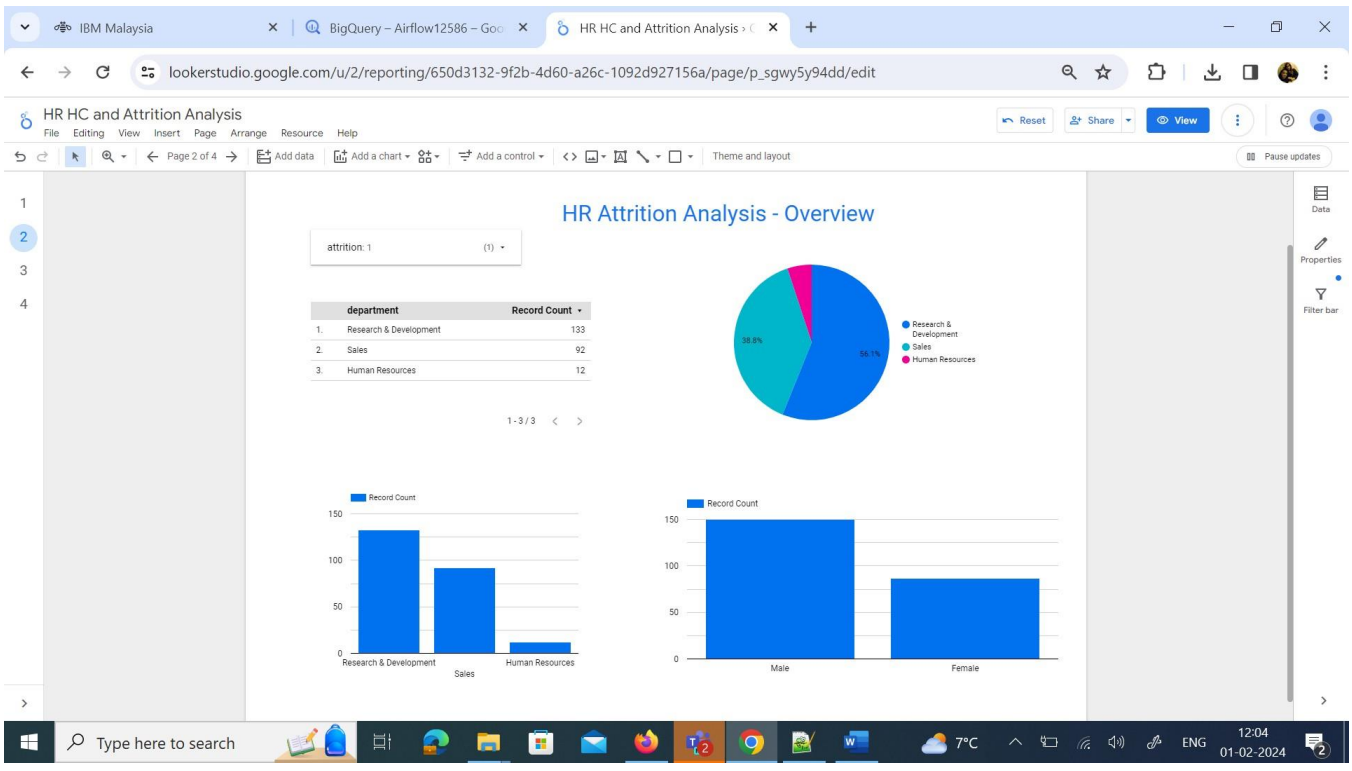
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HR HC and Attrition Analysis
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HR HC and Attrition Analysis
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Page 2 of 4
Add data
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Add a control
Theme and layout
Pause updates
HR Attrition Analysis - Overview
attrition: 1
(1)
department
Record Count
1. Research & Development 133
2. Sales 92
3. Human Resources 12
1 - 3 / 3
38.8%
55.1%
Research & Development
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Human Resources
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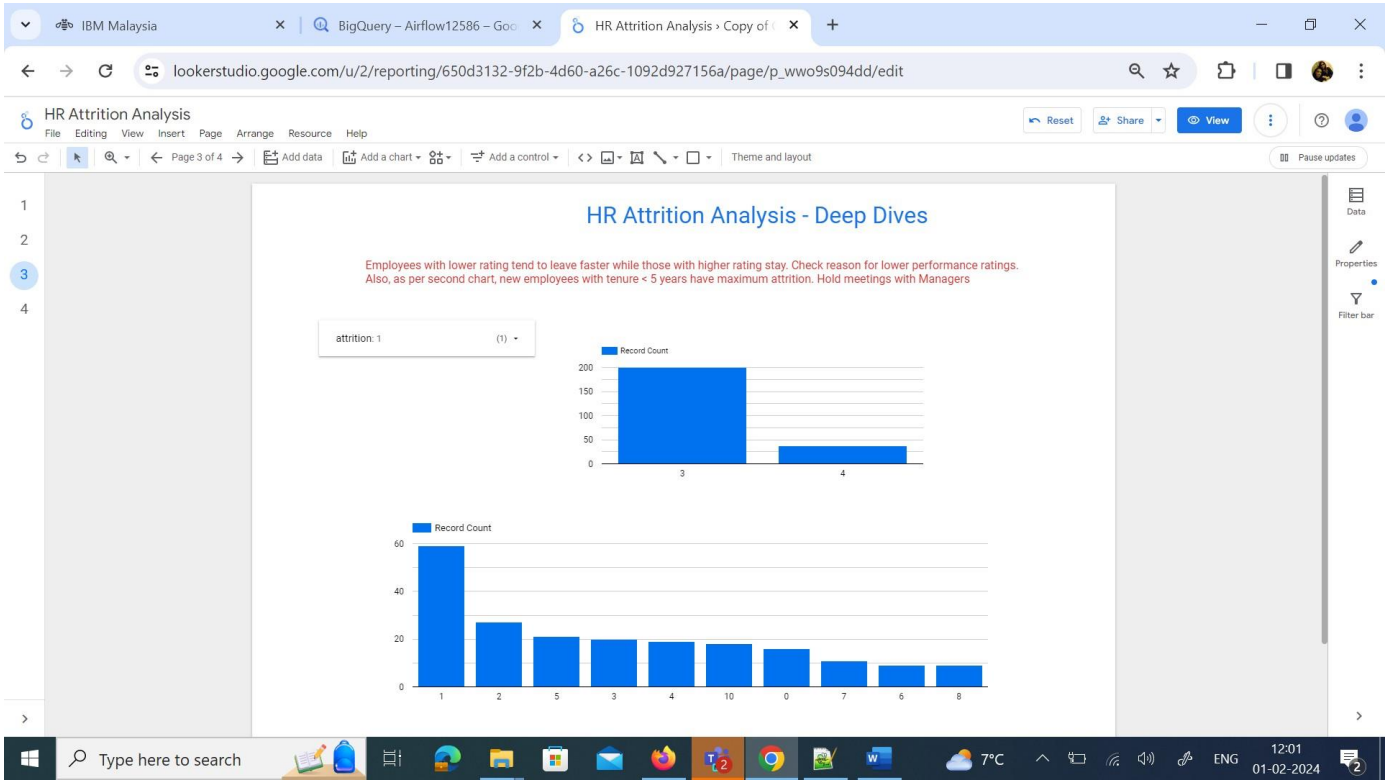
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HR Attrition Analysis › Copy of
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HR Attrition Analysis
File Editing View Insert Page Arrange Resource Help
Reset
Share
View
Page 3 of 4
Add data
Add a chart
Add a control
Theme and layout
Pause updates
HR Attrition Analysis - Deep Dives
Employees with lower rating tend to leave faster while those with higher rating stay. Check reason for lower performance ratings.
Also, as per second chart, new employees with tenure < 5 years have maximum attrition. Hold meetings with Managers
attrition: 1
(1)
Record Count
200
150
100
50
0
3
4
Record Count
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