

The screenshot shows a browser window for a Google Cloud Skills Boost lab titled "Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications". The main content area displays a "Set up your environment" step with a timer at 00:59:52. It includes fields for "Username" (student-04-46d58f30e74), "Password" (cJv0dzxCbIH), and "Project ID" (qwiklabs-gcp-02-7e0fdff7bbf). A "Caution" message warns against deviating from lab instructions. To the right, a sidebar titled "Lab instructions and tasks" shows a progress bar at 0/100, listing five tasks: 1. Explore the NYC Citi Bike Trips dataset, 2. Cleaned training data, 3. Training a model, 4. Evaluate the time series model, and 5. Make predictions. The bottom of the screen shows a Windows taskbar with various icons.

The screenshot shows the Google Cloud Platform dashboard for project "qwiklabs-gcp-02-7e0fdff7bbf". The left sidebar lists pinned products like APIs & Services, Billing, IAM & Admin, Marketplace, Vertex AI, Compute Engine, Kubernetes Engine, Cloud Storage, BigQuery, VPC Network, Cloud Run, and SQL. The main dashboard features sections for "Project info" (with details like Project name: qwiklabs-gcp-02-7e0fdff7bbf, Project number: 887796653285, Project ID: qwiklabs-gcp-02-7e0fdff7bbf), "APIs" (showing requests per second over time), "Google Cloud Platform status" (all services normal), "Billing" (estimated charges \$0.00 for Aug 1-15, 2024), and "Monitoring" (options to create dashboards, set alerting policies, and create uptime checks). The bottom of the screen shows a Windows taskbar with various icons.

BigQuery – qwiklabs-gcp-02-7e0fdef7bbf7

console.cloud.google.com/bigquery?authuser=0&project=qwiklabs-gcp-02-7e0fdef7bbf7&ws=!1m0

Google Cloud qwiklabs-gcp-02-7e0fdef7bbf7 Search (/) for resources, docs, products, and more Search

BigQuery Explorer + ADD IK

Analysis BigQuery Studio

Data transfers Viewing resources. SHOW STARRED ONLY

Scheduled queries

Analytics Hub

Dataform

Partner Center

Orchestration

Migration

Assessment

SQL translation

Administration Monitoring

Release Notes

Welcome to BigQuery Studio!

Create new

SQL QUERY PYTHON NOTEBOOK DATA CANVAS

Try with sample data

Try the Google Trends Demo Query This simple query generates the top search terms in the US from the Google Trends public dataset.

OPEN THIS QUERY VIEW DATASET

Try the Colab Demo Notebook This notebook walks you through their basics and showcases BigQuery DataFrames.

OPEN THIS NOTEBOOK

Add your own data Job history

REFRESH

25°C Partly cloudy 07:58 16-08-2024

BigQuery – qwiklabs-gcp-02-7e0fdef7bbf7

new_york_citibike – BigQuery

console.cloud.google.com/bigquery?p=bigquery-public-data&d=new_york_citibike&page=dataset&project=qwiklabs-gcp-02-7e0fdef7bbf7&ws=!1m4!1m3!1sbigquery-public-data!2snew_york_ci... 08:00 16-08-2024

Google Cloud qwiklabs-gcp-02-7e0fdef7bbf7 Search

Explorer + ADD IK

Search BigQuery resources

Viewing resources. SHOW STARRED ONLY

new_york_citibike

CREATE TABLE SHARING COPY DELETE REFRESH

Dataset info

| | |
|--------------------------|---|
| Dataset ID | bigrquery-public-data.new_york_citibike |
| Created | Apr 11, 2017, 6:47:32 PM UTC+5:30 |
| Default table expiration | Never |
| Last modified | Sep 20, 2022, 1:14:20 PM UTC+5:30 |
| Data location | US |
| Description | |
| Default collation | |
| Default rounding mode | ROUNDING_MODE_UNSPECIFIED |
| Case insensitive | false |
| Labels | |
| Tags | |

Dataset replica info PREVIEW

VIEW REPLICAS

Primary location US

Job history

REFRESH

25°C Partly cloudy 08:00 16-08-2024

The screenshot shows the Google Cloud BigQuery interface. On the left, the 'Explorer' sidebar is open, displaying a list of datasets and tables, including 'new_york_citibike'. The main area shows an 'Untitled query' with the following SQL code:

```
1 SELECT
2   bikeid,
3   starttime,
4   start_station_name,
5   end_station_name,
6   FROM
7   `bigquery-public-data.new_york_citibike.citibike_trips`
8 WHERE starttime is not null
9 LIMIT 5
```

The 'Query results' section displays a table with five rows of data:

| Row | bikeid | starttime | start_station_name | end_station_name |
|-----|--------|---------------------|--------------------|------------------|
| 1 | 31876 | 2017-10-01T09:16:46 | WS Don't Use | Newport PATH |
| 2 | 14924 | 2014-07-31T23:46:38 | W 52 St & 5 Ave | W 52 St & 5 Ave |
| 3 | 17537 | 2014-12-11T11:35:12 | W 52 St & 5 Ave | W 52 St & 5 Ave |
| 4 | 18536 | 2017-07-23T17:58:27 | W 52 St & 5 Ave | W 52 St & 5 Ave |
| 5 | 18126 | 2015-08-23T11:13:12 | W 52 St & 5 Ave | W 52 St & 5 Ave |

At the bottom, the 'Job history' section is visible, along with system status icons and a footer with the date 16-08-2024.

The screenshot shows the Google Cloud BigQuery interface. The left sidebar displays the 'Explorer' section with various datasets like 'ecmwf_era5_reanalysis', 'epa_historical_air_quality', 'ethereum_blockchain', 'etsi_technical_standards', 'faa', 'fcc_political_ads', 'fda_drug', 'fda_food', 'fdic_banks', and 'new_york_citibike'. A 'SHOW STARRED ONLY' button is present. Below this is a 'SUMMARY' section stating 'Nothing currently selected'. The main area is titled 'Untitled query' and contains the following SQL code:

```
1 SELECT
2   EXTRACT (DATE FROM TIMESTAMP(starttime)) AS start_date,
3   start_station_id,
4   COUNT(*) as total_trips
5 FROM
6   `bigquery-public-data.new_york_citibike.citibike_trips`
7   WHERE
8     starttime BETWEEN DATE('2016-01-01') AND DATE('2017-01-01')
9   GROUP BY
10    start_station_id, start_date
11 LIMIT 5
```

The 'Query results' section shows the following data:

| start_date | start_station_id | total_trips |
|------------|------------------|-------------|
| 2016-09-20 | 520 | 370 |
| 2016-05-02 | 520 | 238 |
| 2016-09-22 | 520 | 347 |
| 2016-05-17 | 520 | 310 |
| 2016-04-21 | 520 | 258 |

At the bottom, the 'Job history' section is visible. The status bar at the bottom right shows '08:02 16-08-2024'.

You are signed in as 2348526

Lab - 8

Building Demand Forecasting

https://www.cloudskillsboost.google/course_templates/673/labs/459529

Google Cloud Skills Boost

Google Cloud

Dashboard Paths Explore Profile Subscriptions

10 pts

You earned 10 points for completing a lab step!

Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications

Main menu

Course overview

Applying BQML's Classification, Regression, and Demand Forecasting for Retail Applications

Course · 4 hours < 1% complete

Introduction to SQL

for BigQuery and Cloud SQL

Building Demand Forecasting with BigQuery ML

End Lab 00:51:57

Submit

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

Learn more.

Open Google Cloud Console

Username: student-04-46d58f30e74:

Password: cJv0dzxCbIH

Project ID: qwiklabs-gcp-02-7e0fde:

Click Check my progress to verify the objective.

Explore the NYC Citi Bike Trips dataset

Check my progress

Assessment Completed!

Lab instructions and tasks 0/100

GSP852 Overview Set up your environment Task 1. Explore the NYC Citi Bike Trips dataset Task 2. Cleaned training data Task 3. Training a model Task 4. Evaluate the time series model Task 5. Make predictions

25°C Partly cloudy

08:02 16-08-2024

BigQuery - qwiklabs-gcp-02-7e0fdef7bbf7

console.cloud.google.com/bigquery?p=bqquery-public-data&d=new_york_citibike&page=dataset&project=qwiklabs-gcp-02-7e0fdef7bbf7&ws=!1m9!1m4!1m3!1sqwiklabs-gcp-02-7e0fdef7bbf7!2sbq...

Google Cloud

Explorer + ADD

Untitled query

Search (/) for resources, docs, products, and more

RUN SAVE DOWNLOAD SHARE SCHEDULE MORE

```
1 SELECT
2   EXTRACT (DATE FROM TIMESTAMP(starttime)) AS start_date,
3   start_station_id,
4   COUNT(*) as total_trips
5   FROM
6   `bigquery-public-data.new_york_citibike.citibike_trips`
7   WHERE
8   | starttime BETWEEN DATE('2016-01-01') AND DATE('2017-01-01')
9   GROUP BY
10  | start_station_id, start_date
11 LIMIT 5
```

Query results

JOB INFORMATION RESULTS CHART JSON EXECUTION DETAILS EXECUTION GRAPH

| Row | start_date | start_station_id | total_trips |
|-----|------------|------------------|-------------|
| 1 | 2016-09-20 | 520 | 370 |
| 2 | 2016-05-02 | 520 | 238 |
| 3 | 2016-09-22 | 520 | 347 |
| 4 | 2016-05-17 | 520 | 310 |
| 5 | 2016-04-21 | 520 | 258 |

Nothing currently selected

Job history

bqmforecast created. GO TO DATASET

Results per page: 50 1 – 5 of 5

REFRESH

25°C Partly cloudy

08:07 16-08-2024

The screenshot shows the Google Cloud BigQuery interface. The left sidebar has 'Google Cloud' selected. Under 'Explorer', there's a search bar and a list of resources: 'Viewing resources.', 'SHOW STARRED ONLY', and a folder named 'bqmiforecast' containing 'bqmiforecast'. A 'SHOW MORE' button is also present. The main area shows an 'Untitled query' tab with the following SQL code:

```
1 SELECT
2   DATE(starttime) AS trip_date,
3   start_station_id,
4   COUNT(*) AS num_trips
5   FROM
6   `bigquery-public-data.new_york_citibike.citibike_trips`
7   WHERE
8   starttime BETWEEN DATE('2014-01-01') AND ('2016-01-01')
9   AND start_station_id IN (521,435,497,293,519)
10 GROUP BY
11   start_station_id,
12   trip_date
```

The 'Query results' section displays the following data:

| Row | trip_date | start_station_id | num_trips |
|-----|------------|------------------|-----------|
| 1 | 2015-10-21 | 497 | 366 |
| 2 | 2015-10-30 | 497 | 336 |
| 3 | 2014-06-07 | 497 | 337 |
| 4 | 2014-05-06 | 497 | 280 |
| 5 | 2014-09-27 | 497 | 338 |
| 6 | 2015-11-11 | 497 | 304 |

Below the table, a message says 'Nothing currently selected'. At the bottom, a notification says "'bqmiforecast' created." with a 'GO TO DATASET' button. The status bar at the bottom right shows '08:08 16-08-2024'.

The screenshot shows the Google Cloud BigQuery interface. The left sidebar displays the 'Explorer' section, which includes a search bar for 'BigQuery resources' and a list of datasets: 'Viewing resources.', 'SHOW STARRED ONLY', 'qwiklabs-gcp-02-7e0fdef7bbf7' (selected), 'bqmfirocast' (under 'qwiklabs-gcp-02-7e0fdef7bbf7'), 'training_data' (under 'bqmfirocast'), 'SHOW MORE', and 'SHOW MORE'. The main area shows an 'Untitled query' tab with the following SQL code:

```
1 SELECT
2   DATE(starttime) AS trip_date,
3   start_station_id,
4   COUNT(*) AS num_trips
5   FROM
6   `bigquery-public-data.new_york_citibike.citibike_trips`
7   WHERE
8   starttime BETWEEN DATE('2014-01-01') AND ('2016-01-01')
9   AND start_station_id IN (521,435,497,293,519)
10 GROUP BY
11   start_station_id,
12   trip_date
```

The 'Query results' section shows the following data:

| Row | trip_date | start_station_id | num_trips |
|-----|------------|------------------|-----------|
| 1 | 2015-10-21 | 497 | 366 |
| 2 | 2015-10-30 | 497 | 336 |
| 3 | 2014-06-07 | 497 | 337 |
| 4 | 2014-05-06 | 497 | 280 |
| 5 | 2014-09-27 | 497 | 338 |
| 6 | 2015-11-11 | 497 | 304 |

At the bottom, a message says 'Query result exported.' and there are buttons for 'GO TO TABLE' and 'REFRESH'.

The screenshot shows the Google Cloud BigQuery interface. On the left, the Explorer sidebar displays a project named 'qwiklabs-gcp-02-7e0fdef7bbf7' with a folder 'bqmiforecast' containing a 'Models (1)' folder. Inside is a 'bike_model' model. The main area shows an 'Untitled query' tab with the following SQL code:

```
1 CREATE OR REPLACE MODEL bqmiforecast.bike_model
2 OPTIONS(
3   MODEL_TYPE='ARIMA',
4   TIME_SERIES_TIMESTAMP_COL='trip_date',
5   TIME_SERIES_DATA_COL='num_trips',
6   TIME_SERIES_ID_COL='start_station_id',
7   HOLIDAY_REGION='US'
8 ) AS
9 SELECT
10   trip_date,
11   start_station_id,
12   num_trips
13 FROM
14   bqmiforecast.training_data
```

The 'Query results' section shows a message: 'Successfully created model named bike_model.' A 'GO TO MODEL' button is available. A 'Query result exported' message with a 'GO TO TABLE' link is also present.

The screenshot shows the Google Cloud Skills Boost interface. On the left, the 'Main menu' lists courses: 'Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications' (marked as complete), 'Introduction to SQL for BigQuery and Cloud SQL', and 'Building Demand Forecasting with BigQuery ML'. The current course is 'Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications'. The 'Lab - 8' section shows a step titled 'Drift regression' with a progress bar at 40/100. The step details: 'Click Check my progress to verify the objective.' A 'Check my progress' button is shown with a green checkmark and the message 'Assessment Completed!'. A sidebar on the right lists 'Lab instructions and tasks' with points: 'GSP852' (30 pts), 'Overview' (0 pts), 'Set up your environment' (0 pts), 'Task 1. Explore the NYC Citi Bike Trips dataset' (0 pts), 'Task 2. Cleaned training data' (0 pts), 'Task 3. Training a model' (0 pts), 'Task 4. Evaluate the time series model' (0 pts), and 'Task 5. Make predictions' (0 pts). A notification at the top says 'You earned 10 points for completing a lab step!'.

The screenshot shows the Google Cloud BigQuery interface. On the left, the Explorer sidebar displays resources under the project 'qwiklabs-gcp-02-7e0fdef7bbf7'. A model named 'bike_model' is selected. The main panel shows the 'Untitled query' editor with the following SQL code:

```
1 SELECT
2 *
3 FROM
4 | ML.EVALUATE(MODEL bqmlforecast.bike_model)
```

The 'Model Details' section indicates the model type is ARIMA. The 'Query results' section shows a table with three rows of data from the 'bike_model' evaluation. The table includes columns for start_station_id, non_seasonal_p, non_seasonal_d, non_seasonal_q, has_drift, log_likelihood, AIC, and variance.

The screenshot shows a web browser window with the URL https://www.cloudskillsboost.google/course_templates/673/labs/459529. The page displays a course template for 'Building Demand Forecasting'.

The screenshot shows the Google Cloud Skills Boost interface for the 'Building Demand Forecasting' course. The left sidebar shows the course structure with sections like 'Introduction to SQL for BigQuery and Cloud SQL' and 'Forecasting with BigQuery ML'. The main area displays a lab step titled 'Task 5. Make predictions using the model'. It includes a timer (00:41:30), a 'Submit' button, and a message: 'Click Check my progress to verify the objective.' Below this, there's a form for entering credentials (Username: student-04-46d58f30e74; Password: cJv0dzxCbIH; Project ID: quicklabs-gcp-02-7e0fdef7bbf7). A green checkmark icon and the message 'Assessment Completed!' are visible. To the right, a sidebar shows 'Lab instructions and task' with a score of 60/100 and a list of tasks: GSP852, Overview, Set up your environment, Task 1. Explore the NYC Citi Bike Trips dataset, Task 2. Cleaned training data, Task 3. Training a model, and Task 4. Evaluate the time series model. A blue banner at the top right says 'You earned 10 points for completing a lab step!'. Navigation buttons 'Previous' and 'Next' are at the bottom.

The screenshot shows the Google Cloud BigQuery interface. The left sidebar has an 'Explorer' tab selected, showing a tree view of resources under 'qwiklabs-gcp-02-7e0def7bbf7'. A 'bike_model' node is expanded, showing 'DETAILS' and 'TRAINING' tabs. The 'DETAILS' tab displays the 'Model type' as ARIMA. The 'TRAINING' tab shows 'All results' for an ML.PREDICTION query. The query details are as follows:

```
DECLARE HORIZON STRING DEFAULT "30"; #number of values to forecast
DECLARE CONFIDENCE_LEVEL STRING DEFAULT "0.98";
EXECUTE IMMEDIATE format("""
    SELECT *
    FROM
        ML.PREDICTION(MODEL bqmlforecast.bike_model,
        STRUCT(%s AS horizon,
               %s AS confidence_level)
    )
    ,%%, HORIZON, CONFIDENCE_LEVEL)
```

The 'All results' table shows one row with the following data:

| | Elapsed time | Statements processed | Job status |
|--|--------------|----------------------|------------|
| | 1 sec | 2 | SUCCESS |

Below the table, there are sections for 'Training Options' and 'Job history'. The bottom navigation bar includes a weather icon (25°C, Partly cloudy), a search bar, and various Google Cloud services like Cloud Storage, Cloud Functions, and Cloud Spanner.

You are signed in as 2348526

Lab - 8

Building Demand Forecasting

storage.googleapis.com/spis/g

Google Cloud Skills Boost

Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications

Course · 4 hours < 1% complete

Main menu

End Lab 00:38:31

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

Learn more.

Open Google Cloud Console

Username: student-04-46d58f30e74:

Password: cJv0dzxCbIH

Project ID: qwiklabs-gcp-02-7e0fde:

Submit

You earned 10 points for completing a lab step! ×

Lab instructions and task 80/100

GSP852

Overview

Set up your environment

Task 1. Explore the NYC Citi Bike Trips dataset

Task 2. Cleaned training data

Task 3. Training a model

Task 4. Evaluate the time series model

Task 5. Make predictions

You are signed in as 2348526

Lab - 8

Building Demand Forecasting

Building Demand Forecasting

Google Cloud Skills Boost

Applying BigQuery ML's Classification, Regression, and Demand Forecasting for Retail Applications

Course · 4 hours < 1% complete

Main menu

End Lab 00:35:38

Caution: When you are in the console, do not deviate from the lab instructions. Doing so may cause your account to be blocked.

Learn more.

Open Google Cloud Console

Username: student-04-46d58f30e74:

Password: cJv0dzxCbIH

Project ID: qwiklabs-gcp-02-7e0fde:

Lab 1 hour 1 Credit Introductory

★★★★★

This lab may incorporate AI tools to support your learning.

Lab instructions and task 100/100

GSP852

Overview

Set up your environment

Task 1. Explore the NYC Citi Bike Trips dataset

Task 2. Cleaned training data

Task 3. Training a model

Task 4. Evaluate the time series model

Task 5. Make predictions