Hands-On Activity: Analyze weather data in BigQuery

coursera.org/learn/analyze-data/quiz/yRIIz/hands-on-activity-analyze-weather-data-in-bigquery/attempt

Congratulations! You passed!

Grade received 100%

To pass 100% or higher

Activity Overview

So far, you've learned how to use BigQuery to clean, prepare, and analyze data. Now, you'll query a dataset and save the results as a new table. This is a useful skill when the original, dynamic data source changes continuously and you need to preserve a specific dataset for continued analysis. It's also valuable when you have access to a large dataset and know you'll be doing more than one analysis on a subset of the dataset. By the time you complete this activity, you will be able to use SQL queries to create new tables when dealing with complex datasets.

Review the following scenario. Then complete the step-by-step instructions.

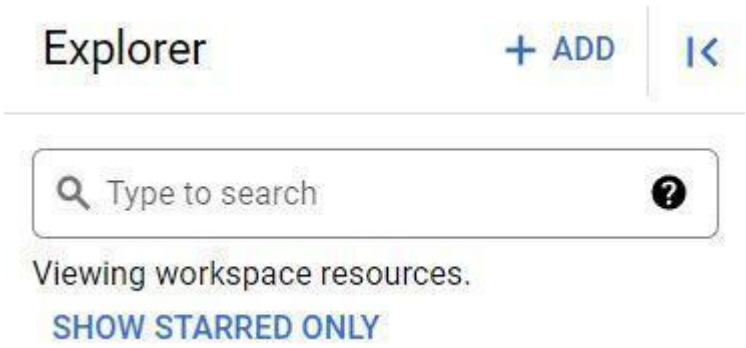
You're a data analyst at a news station in New York City. You've been tasked with answering questions about the weather for meteorologists. You'll work with a public dataset that contains global summaries of the day (GSOD) from the National Oceanic and Atmospheric Administration (NOAA). The GSOD dataset includes information about daily weather elements, such as mean temperature and wind speed, from more than 9,000 weather stations across the globe. This dataset is updated daily, so in addition to being large, this dataset is constantly changing. So, you'll save a subset of the data about the New York region in a new table to make your analysis easier.

Follow the instructions to complete each step of the activity. Then answer the questions at the end of the activity before going to the next course item.

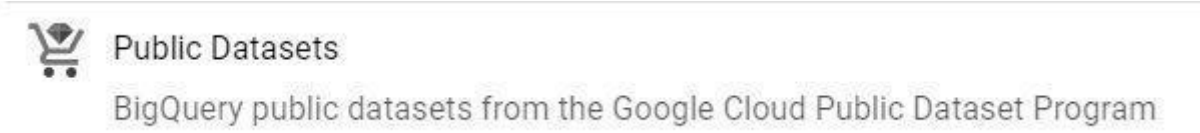
Log in to your BigQuery account (or BigQuery sandbox) and initiate a new project or locate an existing project that you already created.

First, add the NOAA weather data from BigQuery's public datasets.

1. Select the **+ ADD** button in the **Explorer** pane.



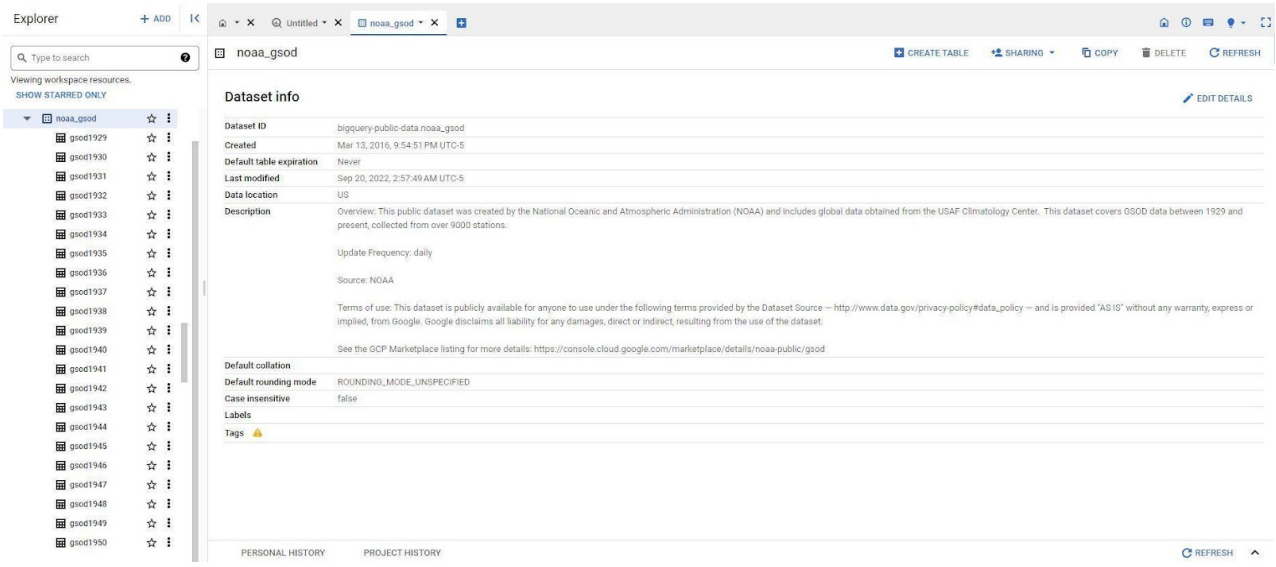
2. This opens a new **Add menu** where you can search public datasets available through Google Cloud. Scroll down the list and select **Public Datasets**.



3. This opens the **Marketplace** menu. In the search bar, enter the acronym **gsod** and press enter.

4. Select the search result titled **GSOD**.

5. Select **VIEW DATASET** to return to the main workspace with the NOAA dataset tables in the **Explorer** pane. The **Details** pane now contains details about this dataset.



Note: Many of the public databases on BigQuery are living records and, as such, are periodically updated with new data. Throughout this course (and others in this certificate program), if your results differ from those you encounter in videos or screenshots, there's a good chance it is due to a data refresh.

The meteorologists you're working with have asked you to obtain the temperature, wind speed, and precipitation for stations La Guardia and JFK, for every day in 2020. They've also requested the data be presented to them in descending order by date and ascending order by Station ID. To return this information:

1. Select the **QUERY** button in the row of tab functions

2. Select the In **split tab** option in the drop-down menu.

3. Enter the following query into the Query Editor:

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

3

4

```
5

1

2

    NULL,

    temp) AS temperature,

  IF(

    wdsp="999.9",

    NULL,

    CAST(wdsp AS Float64)) AS wind_speed,

  IF(

    prcp=99.99,

    0,

    prcp) AS precipitation

FROM

  `bigquery-public-data.noaa_gsod.gsod2020`

WHERE

  stn="725030" -- La Guardia

  OR stn="744860" -- JFK

ORDER BY

  date DESC,

  stn ASC

  date,

  IF(

    temp=9999.9,

SELECT

  stn,
```

Note: This query uses the *IF* function to replace values 9999, 999.9, and 99.99 with *NULL*. The dataset description explains that these are the default values when the measurement is missing.

4. Select **RUN**.

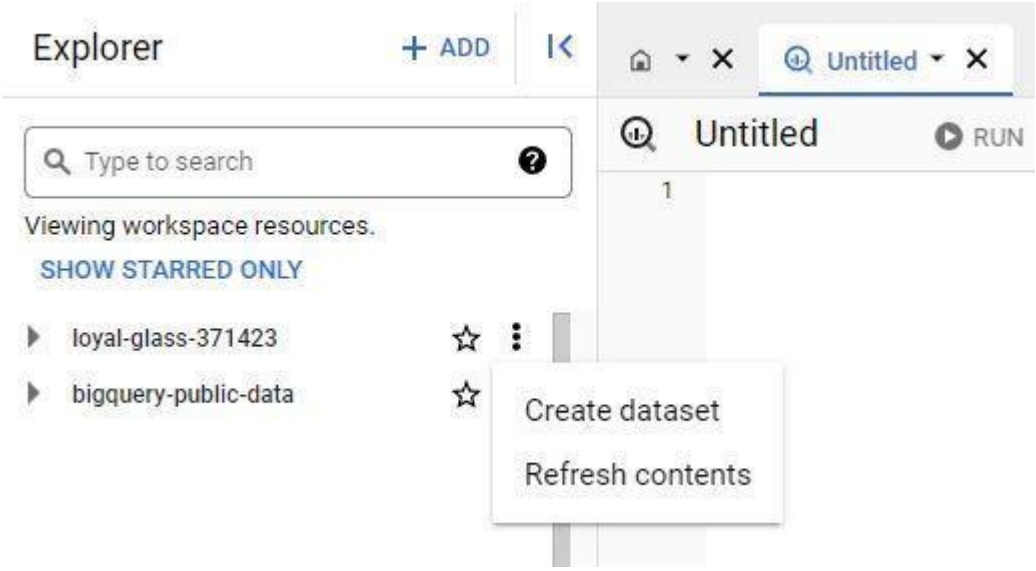
Now you've run the query and gotten results. But these results aren't saved anywhere, so each time you want to examine them, you would have to run this query again.

In addition to the data the meteorologists requested, they also asked you some questions while preparing for the nightly news: They want to know the average temperature in June 2020 and the average wind speed in December 2020.

Instead of rewriting similar, but slightly different, queries over and over again, there is an easier approach: Save the results from the original query as a table for future queries.

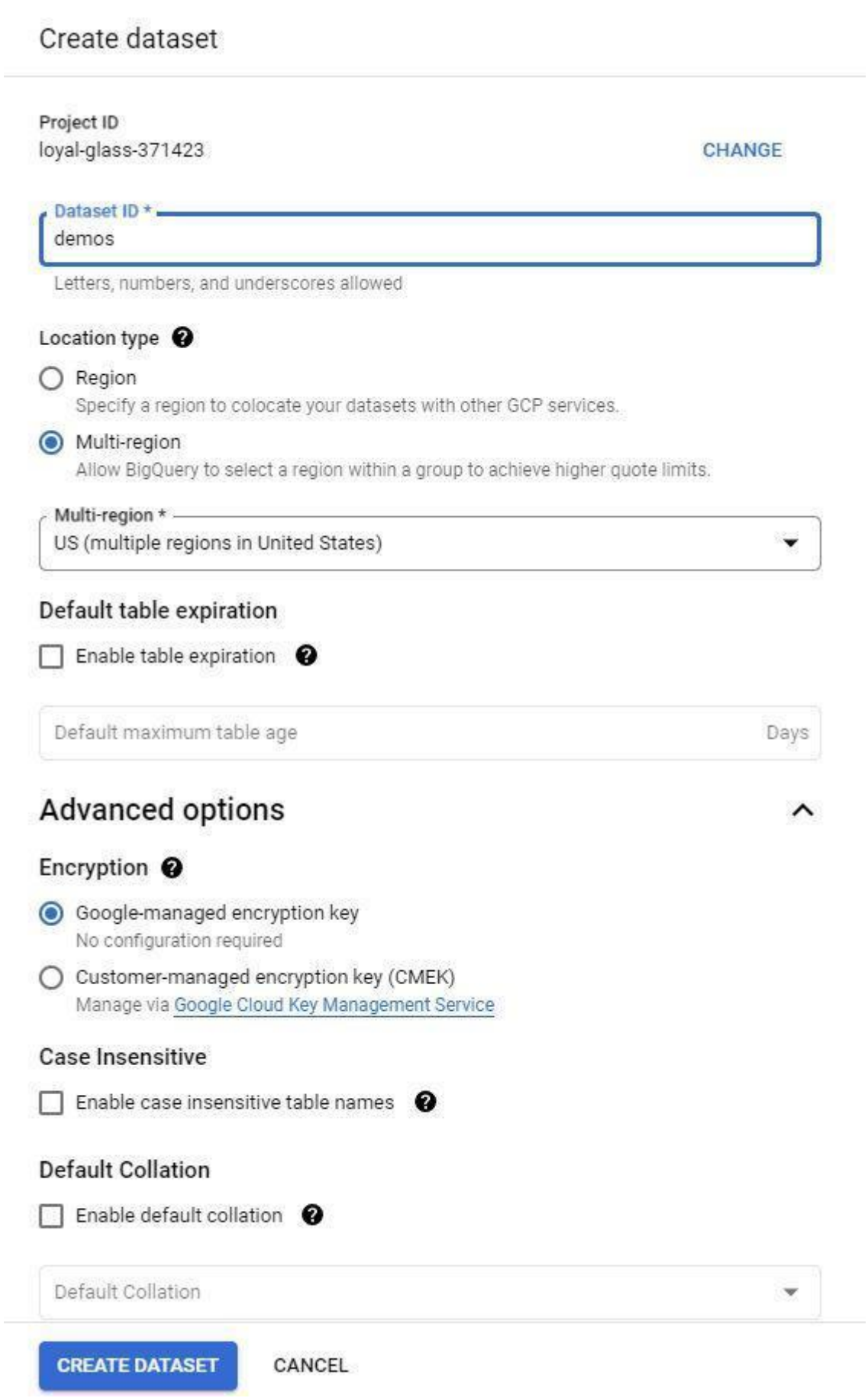
To make this subset of data easier to query from, you'll save this query as a table. First, though, you'll create a new dataset to store the table.

1. From the **Explorer** pane, **select the three vertical dots** next to your project and select **Create dataset**. Note that unless you have specified your own project name, a unique name is assigned to your project by BigQuery, typically in the format of two words and a number, separated by hyphens (e.g., loyal-glass-371423 in the image below). You are not allowed to create a new dataset in the *bigquery-public-data* project.



A screenshot of the results of selecting the three vertical dots next to the project. The menu options are Create dataset and Refresh contents.

2. Enter **demos** into the Data ID box and set the **Location type** to **Multi-region,** then select **US (multiple regions in United States)**. Leave the rest of the **Advanced Options** as the default. Once you have done this, select **CREATE DATASET**.



3. Open the new dataset.

4. Click on the **+ button** in the **Details** pane.

5. If needed, re-enter the query you ran in the previous section:

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

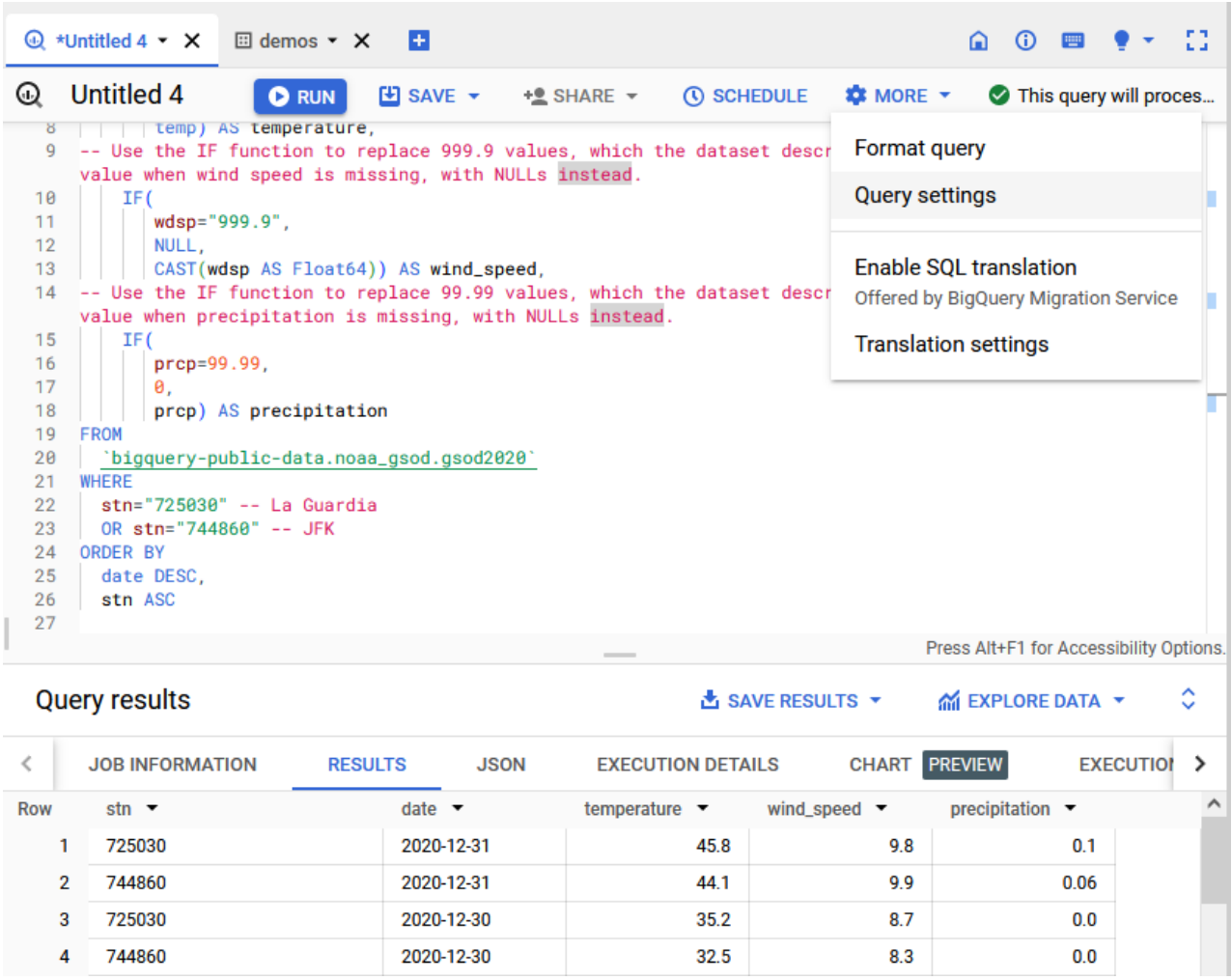
SELECT

```
  stn,
  date,


    IF(
      temp=9999.9,
      NULL,
      temp) AS temperature,
    IF(
      wdsp="999.9",
      NULL,
      CAST(wdsp AS Float64)) AS wind_speed,
    IF(
      prcp=99.99,
      0,
      prcp) AS precipitation
FROM
  `bigquery-public-data.noaa_gsod.gsod2020`
WHERE
  stn="725030" -- La Guardia
  OR stn="744860" -- JFK
ORDER BY
  date DESC,
  stn ASC
```

Note: Use the *IF* function to replace values 9999, 999.9, and 99.99 with *NULL*. The dataset description explains that these are the default values when the measurement is missing.

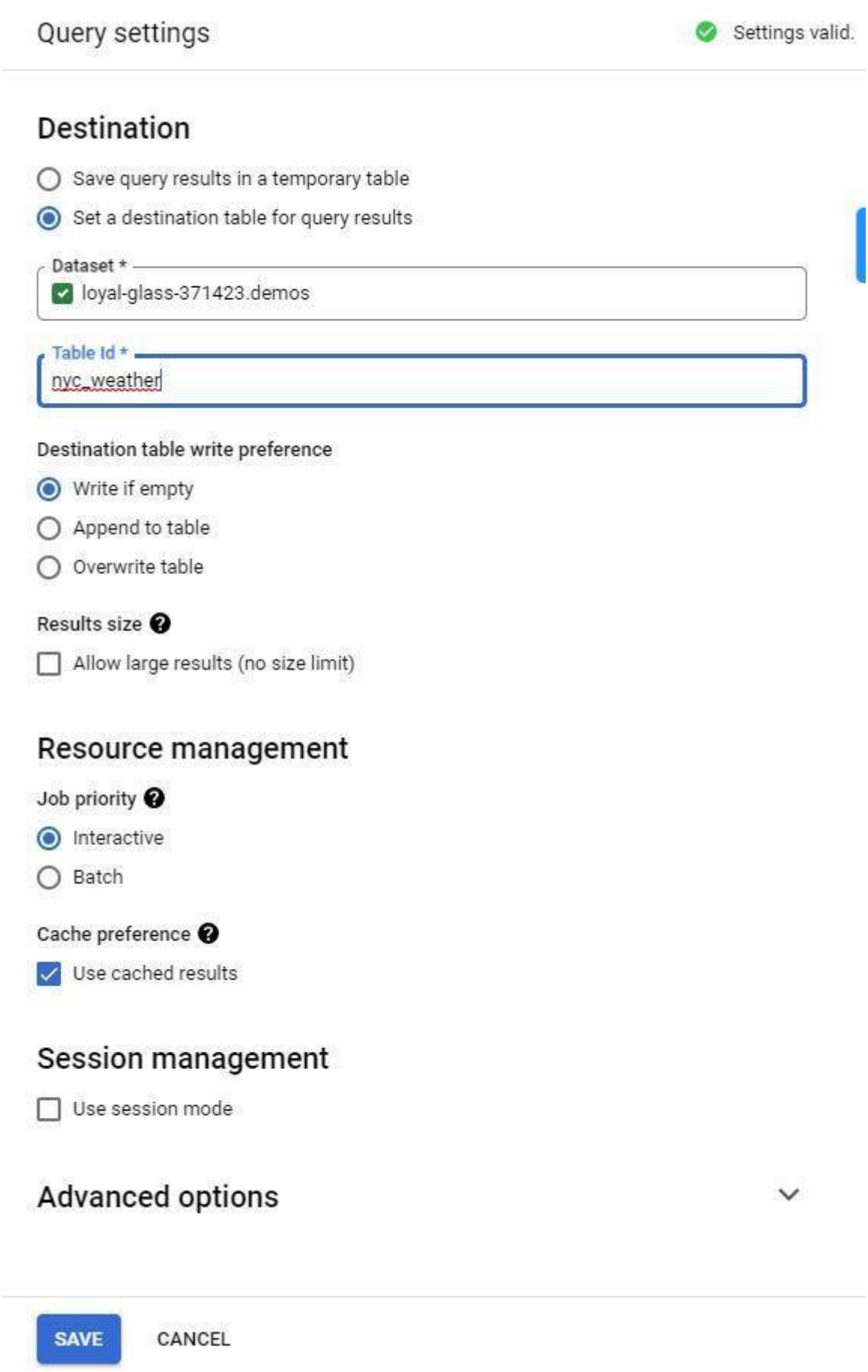
6. **Before** you run the query, select the **MORE** menu from the Query Editor and open the **Query Settings** menu.



Row	stn	date	temperature	wind_speed	precipitation
1	725030	2020-12-31	45.8	9.8	0.1
2	744860	2020-12-31	44.1	9.9	0.06
3	725030	2020-12-30	35.2	8.7	0.0
4	744860	2020-12-30	32.5	8.3	0.0

7. From the **Query Settings** menu, select the button next to **Set a destination table for query results**.

8. Set the dataset option to **demos** and name the table **nyc_weather**.



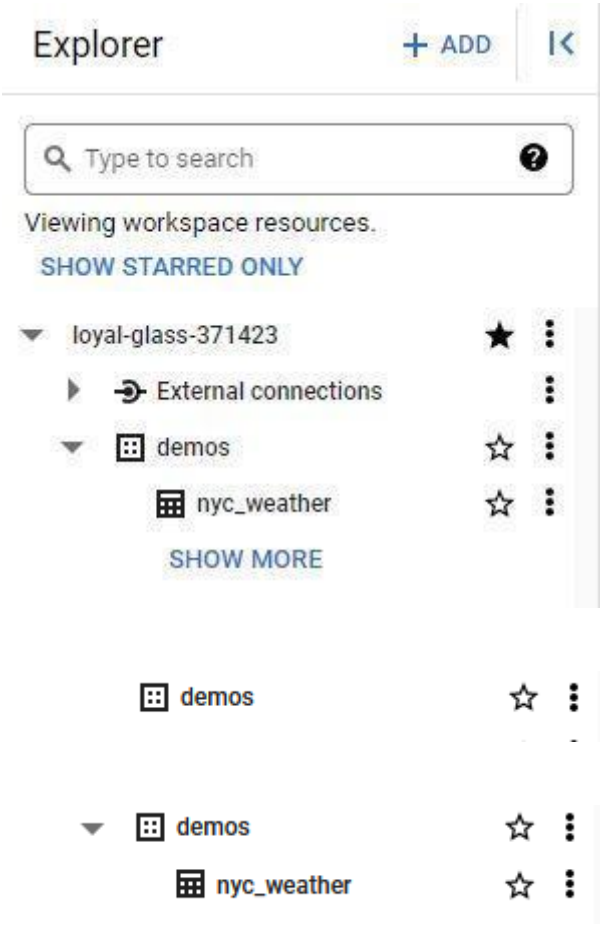
9. Run the query to save the results as a new table in the **demos** dataset.

Before:

After:

10. Return to the **Query settings menu** by selecting the **MORE** dropdown menu.

11. Reset the settings to **Save query results in a temporary table**. This will prevent you from accidentally adding every query as a table to your new dataset.



Now that you have the subset of this data saved in a new table, you can use the following query to find the average temperature in June 2020. First, replace *your_project_name* with your project name in BigQuery.

```
1
2
3
4
5
6
SELECT
   AVG(temperature)
FROM
   `your_project_name.demos.nyc_weather`
```

```
WHERE
  date BETWEEN '2020-06-01' AND '2020-06-30'
```

Note: Format the beginning syntax to your project name before running this query. View the full Table ID by selecting on the **Details** tab of your new **nyc_weather** data table.

You can also use this syntax to find the average wind speed or any other information from this subset of data. Try writing a few more queries to answer the meteorologists' questions.

The ability to save your results into a new table is helpful when you know you're only interested in a subset of a larger complex dataset that you plan on querying multiple times, such as the weather data for just La Guardia and JFK. This also helps minimize errors during your analysis.

1.

Question 1

Reflection

What was the average temperature at the JFK and LaGuardia weather stations between June 1, 2020 and June 30, 2020?

1 / 1 point

✓
Correct

The average temperature at JFK and LaGuardia weather stations between June 1, 2020 and June 30, 2020 was 72.883. To find the average temperature during this time period, you successfully created a new table and ran another query against that table. Going forward, you will be able to use your ability to create tables from specific subsets of data. This will help you draw insights from multiple data sources more efficiently in the future.

1

2

3

4

5

6

```
SELECT
  AVG(temperature)
FROM
  'your_project_name.demos.nyc_weather'
WHERE
  date BETWEEN '2020-06-01' AND '2020-06-30'
```

2.

Question 2
In the text box below, write 2-3 sentences (40-60 words) in response to each of the following questions.

- How can creating tables from queries help you perform data analysis in the future?
- Why is being able to view specific subsets of a dataset important?

1 / 1 point

Queries act like filters, letting you grab specific data for analysis. This creates organized tables you can reuse, saving time and effort. Viewing specific subsets is key because it simplifies complex data, helps target hidden trends, and allows for faster analysis. In short, creating tables from queries focuses your analysis for better results.

Correct

In this activity, you explored two public datasets and created a new table using a query. An effective response might include that creating tables using your queries allows you to work with a subset of data without changing the original.

For instance, now you can query weather data from just the relevant weather stations. This is important for finding trends within a subset of data.