

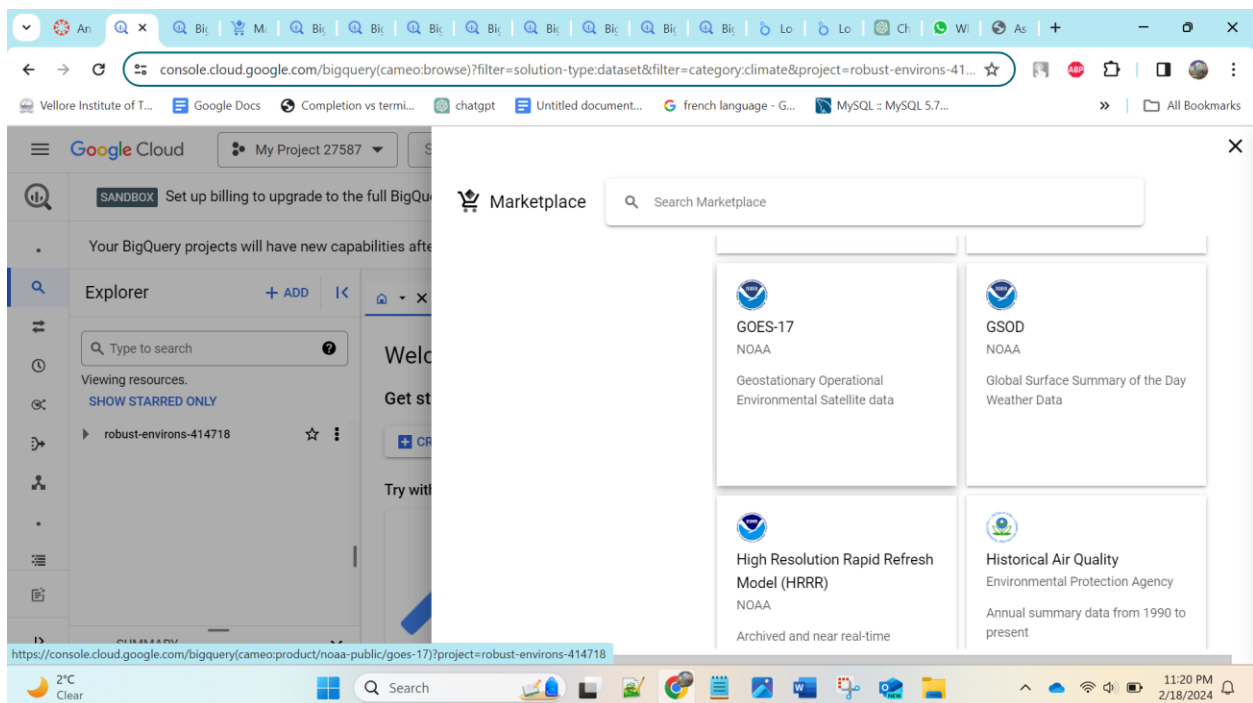
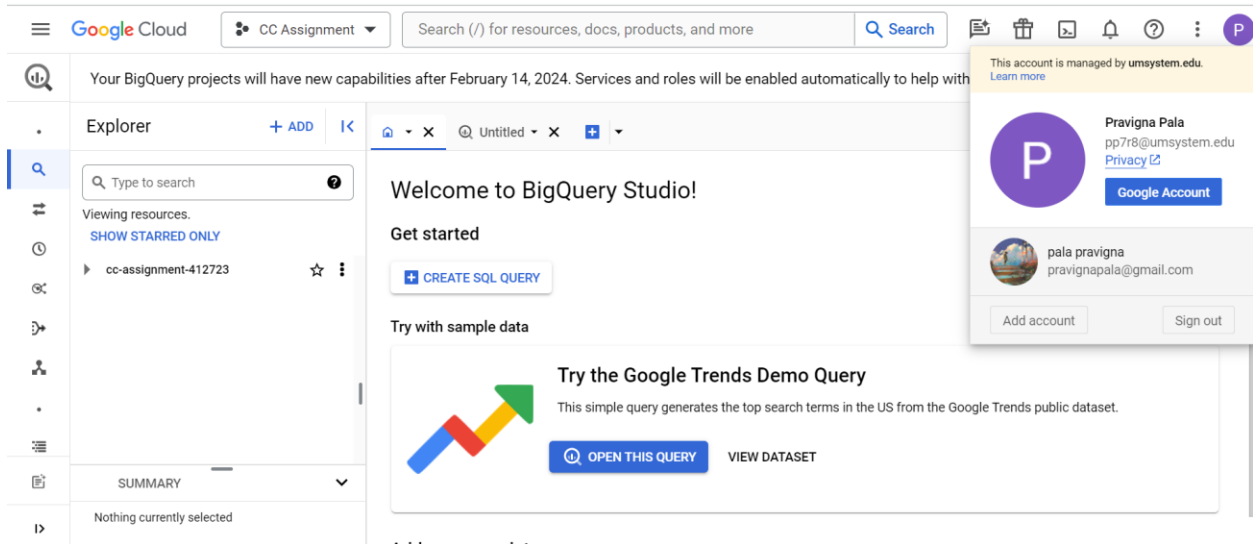
CLOUD COMPUTING

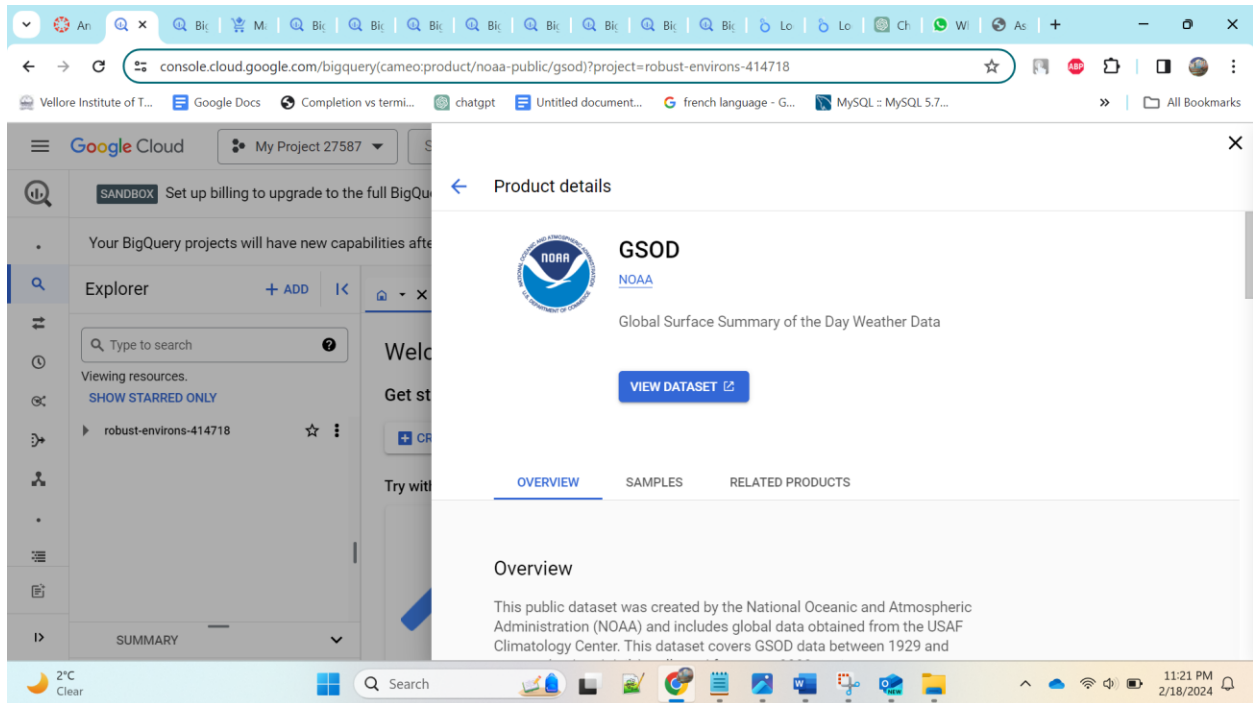
Assignment-2

Name: Pravigna Pala

Student ID: 16352783

Accessing the Dataset:





Exploring the Data:

Weather DataSet:

- NOAA Global Surface Summary of the Day (bigquery-public-data.gsod)

The screenshot shows the Google Cloud console interface. On the left, the 'Explorer' sidebar displays the project 'cc-assignment-412723'. The main area shows a BigQuery query editor with the following SQL code:

```

1 SELECT
2   column_name,
3   data_type,
4   is_nullable
5 FROM
6   `bigquery-public-data.noaa_gsod.INFORMATION_SCHEMA.COLUMNS`
7 WHERE
8   table_name = 'gsod2015'

```

The 'Query results' tab is active, displaying a table with the following data:

Row	column_name	data_type	is_nullable
25	flag_prdp	STRING	YES
26	sndp	FLOAT64	YES
27	fog	STRING	YES
28	rain_drizzle	STRING	YES

A user profile overlay for 'Pravigna Pala' (pp7r8@umsystem.edu) is visible on the right side of the screen.

Schema

column_name	data_type	is_nullable	Description
stn	STRING	YES	Station number
wban	STRING	YES	WBAN number
year	STRING	YES	Year
mo	STRING	YES	Month
da	STRING	YES	Day
temp	FLOAT64	YES	Mean temperature for the day (Fahrenheit)
count_temp	INT64	YES	Number of observations for temperature
dewp	FLOAT64	YES	Mean dew point temperature for the day (Fahrenheit)
count_dewp	INT64	YES	Number of observations for dew point
slp	FLOAT64	YES	Mean sea level pressure for the day (millibars)
count_slp	INT64	YES	Number of observations for sea level pressure
stp	FLOAT64	YES	Mean station pressure for the day (millibars)

count_stp	INT64	YES	Number of observations for station pressure
visib	FLOAT64	YES	Mean visibility for the day (miles)
count_visib	INT64	YES	Number of observations for visibility
wdsp	STRING	YES	Mean wind speed for the day (knots)
count_wdsp	STRING	YES	Number of observations for wind speed
mxpsd	STRING	YES	Maximum sustained wind speed for the day (knots)
gust	FLOAT64	YES	Gust speed for the day (knots)
max	FLOAT64	YES	Maximum temperature for the day (Fahrenheit)
flag_max	STRING	YES	Flag for maximum temperature
min	FLOAT64	YES	Minimum temperature for the day (Fahrenheit)
flag_min	STRING	YES	Flag for minimum temperature
prcp	FLOAT64	YES	Precipitation for the day (inches)
flag_prcp	STRING	YES	Flag for precipitation
sndp	FLOAT64	YES	Snow depth for the day (inches)
fog	STRING	YES	Indicator for fog
rain_drizzle	STRING	YES	Indicator for rain or drizzle
snow_ice_pellets	STRING	YES	Indicator for snow or ice pellets
hail	STRING	YES	Indicator for hail
thunder	STRING	YES	Indicator for thunder
tornado_funnel_cloud	STRING	YES	Indicator for tornado or funnel cloud

Average temperature: SELECT city, year, AVG(temperature) FROM bigquery-public-data.gsod WHERE city = 'London' AND year = 2020

console.cloud.google.com/bigquery?authuser=1&project=cc-assignment-412723&ws=1m8l1m7i8m2l1s105766684151412s8d6...

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cc-assignment-412723

noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query completed.

```

1 SELECT
2   name AS city,
3   2020 AS year,
4   AVG(max / 10) AS avg_temperature
5 FROM
6   bigquery-public-data.noaa_gsod.gsod2020 AS weather
7 JOIN
8   bigquery-public-data.noaa_gsod.stations AS stations
9   ON
10  stations.usaf = weather.stn
11  AND stations.wban = weather.wban
12 WHERE

```

Query results SAVE RESULTS EXPLORE DATA

JOB INFORMATION RESULTS CHART JSON EXECUTION DETAILS EXECUTION GRAPH

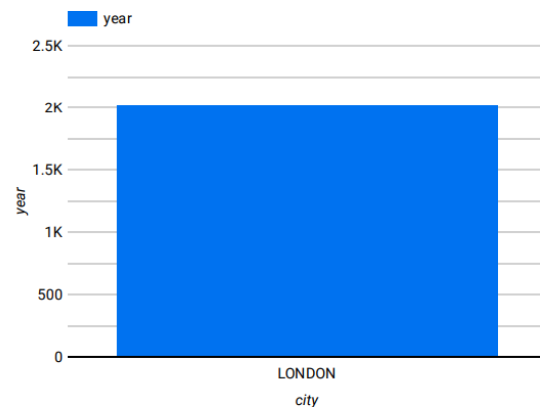
Row	city	year	avg_temperature
1	LONDON	2020	5.794398907103...

9°C Sunny 5:46 PM 2/18/2024

Visualization:

BigQuery Custom SQL

	city	year
1.	LONDON	2,020

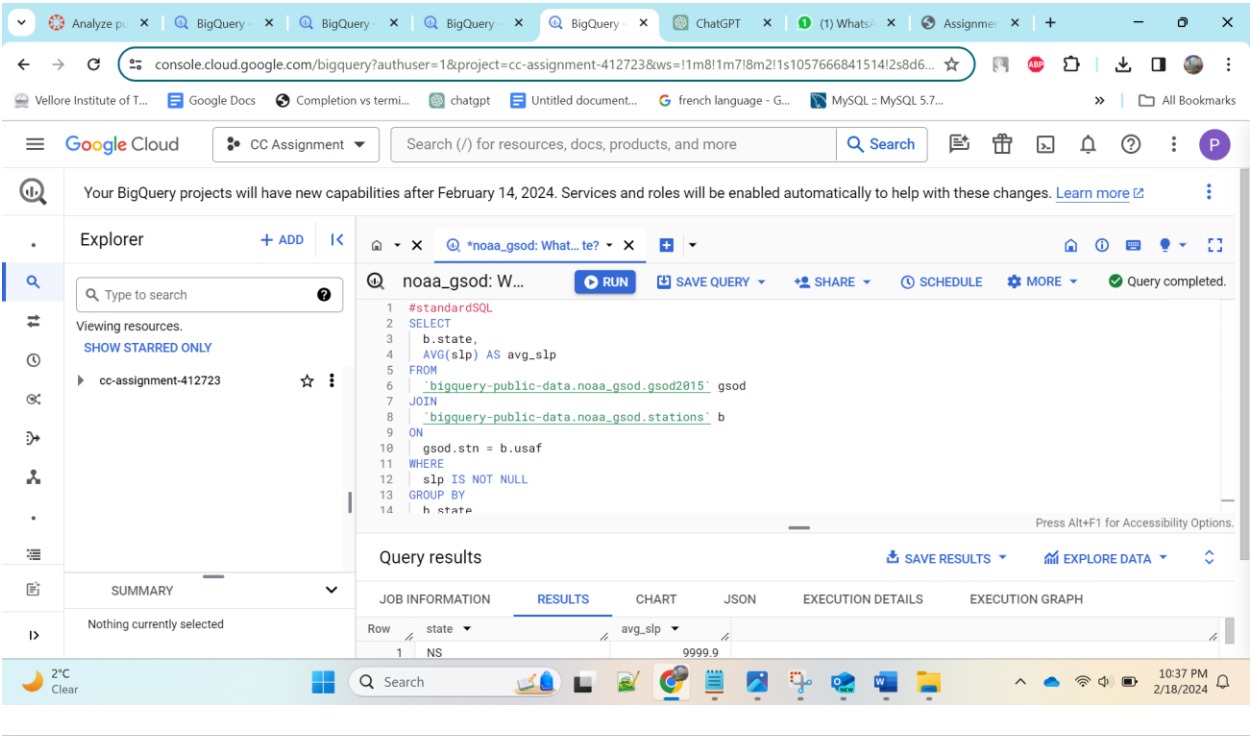


1 - 1 / 1 < >

<https://lookerstudio.google.com/s/q0aJAFo9YdU>

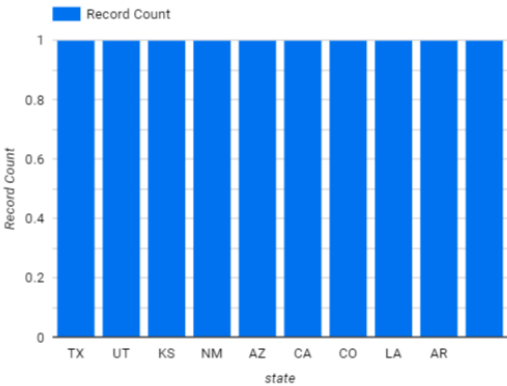
Average Sea Level Pressure by State:

This query calculates the average sea level pressure for each state and sorts the result by the average sea level pressure in descending order.



Average Sea Level Pressure by State:

	state	Record Count
1.	TX	1
2.	UT	1
3.	KS	1
4.	NM	1
5.	AZ	1
6.	CA	1
7.	NV	1
8.	MI	1
9.	TN	1
10.	NC	1
11.	KY	1



Average Maximum Temperature by Month:

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noaa_gsod: What... te? x

noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query complete

```

1 #standardSQL
2 SELECT
3   mo,
4   AVG(max) AS avg_max_temperature
5 FROM
6   `bigquery-public-data.noaa_gsod.gsod2015`
7 WHERE
8   max < 1000

```

Query results SAVE RESULTS EXPLORE DATA

JOB INFORMATION RESULTS CHART JSON EXECUTION DETAILS EXECUTION GRAPH

Row	mo	avg_max_temperatur
4	04	63.92796695739...
5	05	71.00285526360...
6	06	76.32450366593...
7	07	79.27178948613...

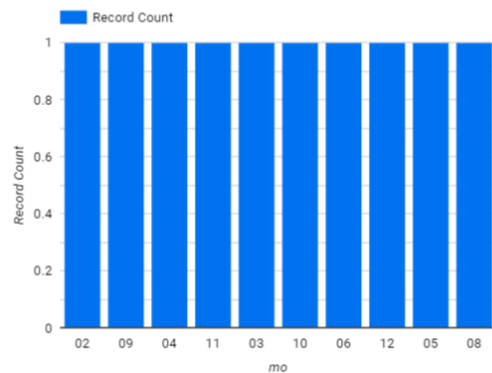
SUMMARY Nothing currently selected

Visualization:

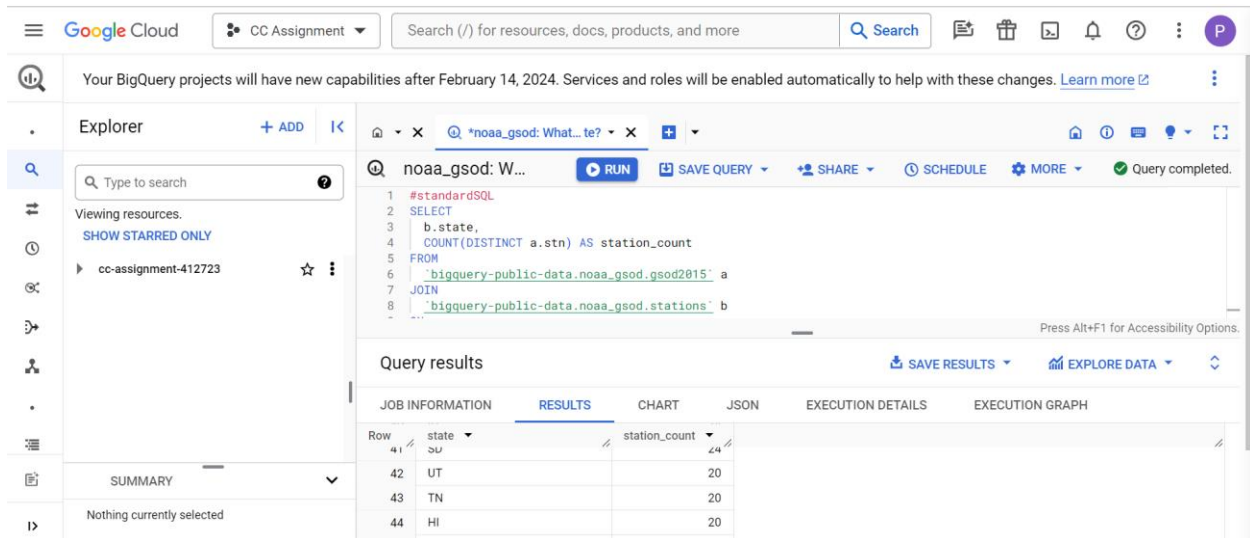
Average Maximum Temperature by Month:

	mo	Record Count
1.	02	1
2.	09	1
3.	04	1
4.	11	1
5.	03	1
6.	10	1
7.	01	1
8.	07	1
9.	06	1
10.	12	1
11.	05	1

1 - 12 / 12 < >

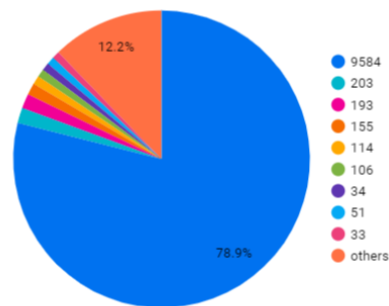


Count of Weather Stations by State:



Count of Weather Stations by State:

	state	station_count
6.	MI	106
7.	MN	98
8.	NC	83
9.	LA	69
10.	WI	68
11.	VA	66
12.	IL	62
13.	CO	61
14.	GA	60
15.	IA	59
16.	WA	54



Complex Queries:

Daily Temperature Fluctuation:

This query calculates the daily temperature fluctuation (difference between maximum and minimum temperatures) for each day across all stations.

console.cloud.google.com/bigquery?authuser=1&project=cc-assignment-412723&ws=1m81m718m21s105766684151412s8d6d112...

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Explorer + ADD

noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query completed.

```
1 #standardSQL
2 SELECT
3   mo,
4   da,
5   AVG(max) - AVG(min) AS temperature_fluctuation
6 FROM
7   `bigquery-public-data.noaa_gsod.gsod2015`
8 WHERE
9   max < 1000
10 GROUP BY
11   mo, da
12 ORDER BY
13   mo, da;
```

Query results SAVE RESULTS EXPLORE DATA

SUMMARY Nothing currently selected

Row	mo	da	temperature_fluctuation
1	01	01	14.25751946213...

2°C Clear 10:57 PM 2/18/2024

console.cloud.google.com/bigquery?authuser=1&project=cc-assignment-412723&ws=1m81m718m21s105766684151412s8d6d112...

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noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query completed.

```
1 #standardSQL
2 SELECT
```

Query results SAVE RESULTS EXPLORE DATA

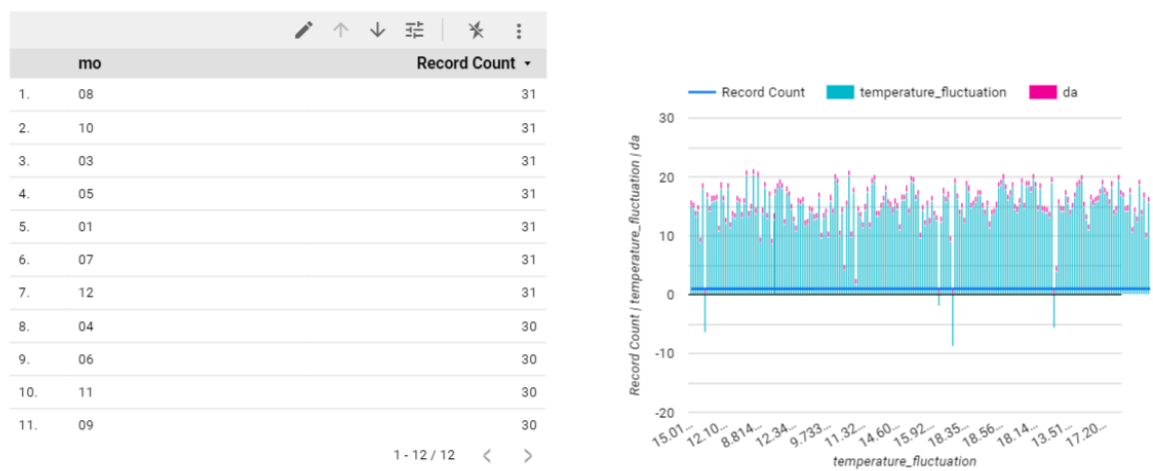
SUMMARY Nothing currently selected

Row	mo	da	temperature_fluctuation
1	01	01	14.25751946213...
2	01	02	15.01265601815...
3	01	03	11.68615289874...
4	01	04	9.868215694870...
5	01	05	11.95117103102...
6	01	06	15.36412529042...
7	01	07	13.48864613796...
8	01	08	13.13652874154...

2°C Clear 10:58 PM 2/18/2024

Visualization:

Daily Temperature Fluctuation



Top 5 States with the Greatest Temperature Fluctuation:

This query identifies the top 5 states with the highest temperature variations (difference between maximum and minimum temperatures).

console.cloud.google.com/bigquery?authuser=1&project=cc-assignment-412723&ws=11m811m718m211s105766684151412s8d6d112...

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cc-assignment-412723

SUMMARY

Nothing currently selected

noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query completed.

```
2 WITH TemperatureVariations AS (  
3   SELECT  
4     b.state,  
5     AVG(max) - AVG(min) AS temperature_variation  
6   FROM  
7     `bigquery-public-data.noaa_gsod.gsod2015` a  
8   JOIN  
9     `bigquery-public-data.noaa_gsod.stations` b  
10  ON  
11    a.stn = b.usaf  
12  AND a.wban = b.wban  
13  WHERE  
14    max < 1000  
15  GROUP BY  
16    b.state  
17 )  
18 SELECT  
19   state,  
20   temperature_variation  
21 FROM  
22   TemperatureVariations  
23 ORDER BY
```

2°C Clear

Search

console.cloud.google.com/bigquery?authuser=1&project=cc-assignment-412723&ws=11m811m718m211s105766684151412s8d6d112...

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Explorer + ADD

Type to search

Viewing resources. SHOW STARRED ONLY

cc-assignment-412723

SUMMARY

Nothing currently selected

noaa_gsod: W... RUN SAVE QUERY SHARE SCHEDULE MORE Query completed.

Query results SAVE RESULTS EXPLORE DATA

Row	state	temperature_variatig
1	NV	temperature_variation
2	NM	30.31707962472...
3	MT	28.57947151681...
4	UT	27.53513846153...
5	KS	27.09028902652...

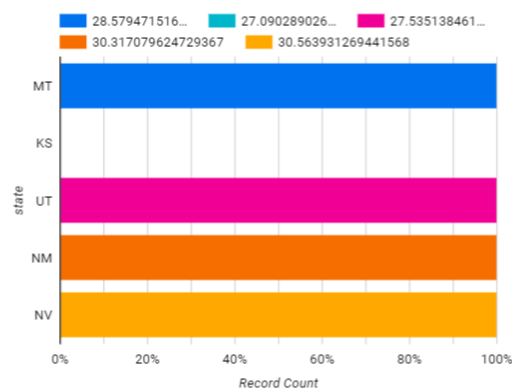
2°C Clear

Search

Visualization:

Top 5 States with the Greatest Temperature Fluctuation

	state	Record Count
1.	MT	1
2.	KS	1
3.	UT	1
4.	NM	1
5.	NV	1



Monthly Temperature Variation by State:

This query calculates the difference between the maximum and minimum temperatures for each month in each state.

The screenshot shows the Google Cloud BigQuery console interface. The Explorer panel on the left displays the project 'cc-assignment-412723'. The main panel shows a SQL query titled 'noaa_gsod: What... te?'. The query is a standard SQL query that calculates the monthly temperature variation for each state. The query is as follows:

```
1 #standardSQL
2 SELECT
3   b.state,
4   a.mo,
5   AVG(a.max) AS avg_max_temperature,
6   AVG(a.min) AS avg_min_temperature,
7   AVG(a.max) - AVG(a.min) AS temperature_variation
8 FROM
9   `bigquery-public-data.noaa_gsod.gsod2015` a
10 JOIN
11   `bigquery-public-data.noaa_gsod.stations` b
12 ON
13   a.stn = b.usaf
14   AND a.wban = b.wban
15 WHERE
16   a.max < 1000
17 GROUP BY
18   b.state, a.mo
19 ORDER BY
20   b.state, a.mo;
```

The query is executed, and the results are displayed in the main panel. The results show the monthly temperature variation for each state, ordered by state and month.

Screenshot of Google Cloud BigQuery console showing a query result for temperature data by state and month.

Query results table:

Row	state	mo	avg_max_temperatur	avg_min_temperatur	temperature_variatig
41	AR	05	80.14438040345...	59.397502401537	20.74687800192...
42	AR	06	89.12019801980...	68.80049504950...	20.31970297029...
43	AR	07	92.57113502935...	72.69383561643...	19.87729941291...
44	AR	08	90.68554572271...	66.31681415929...	24.36873156342...
45	AR	09	88.15601990049...	62.36218905472...	25.79383084577...
46	AR	10	77.39775171065...	51.09237536656...	26.30537634408...
47	AR	11	65.26079999999...	44.14360000000...	21.11719999999...
48	AR	12	61.53818359375...	39.097265625...	22.44091796875...
49	AS	01	88.03225806451...	77.05161290322...	10.98064516129...
50	AS	02	88.96785714285...	77.52857142857...	11.43928571428...

Visualization:

Monthly Temperature Variation by State:

