

## Activity 2

Query Query History



```
1  ✓ create table gps_data (  
2    datapoint_id varchar ,  
3    journey_id varchar ,  
4    latitude float,  
5    longitude float,  
6    month int,  
7    day int,  
8    hour int,  
9    primary key (datapoint_id)  
10 );  
11  
12  ✓ copy gps_data(datapoint_id, journey_id, latitude, longitude, month, day, hour  
13    from 'D:\gps_data.csv'  
14    delimiter ','  
15    csv header;  
16  
17  ✓ select * from gps_data  
18    where month = 10  
19  
20    select * from gps_data  
21    where month = 10 and day = 3 and hour = 4  
22  
23    SELECT COUNT(DISTINCT journey_id)  
24    FROM gps_data  
25    where month = 10 and day = 3 and hour >= 4  
26      AND month = 10 and day = 3 and hour < 5  
27  
28    SELECT *
```

Query Query History

```
10
17 ✓ select * from gps_data
18 where month = 10
19
20 select * from gps_data
21 where month = 10 and day = 3 and hour = 4
22
23 SELECT COUNT(DISTINCT journey_id)
24 FROM gps_data
25 where month = 10 and day = 3 and hour >= 4
26 AND month = 10 and day = 3 and hour < 5
27
28 SELECT *
29 FROM gps_data
30 WHERE month = 10 and day >= 1 and day <= 3
31 AND hour >= 3 and hour <= 6
32
33 SELECT journey_id
34 FROM gps_data
35 WHERE journey_id LIKE '%abc%';
36
37
38 ✓ SELECT COUNT(*)
39 FROM gps_data
40 WHERE datapoint_id LIKE '9%';
41
42 ✓ SELECT *
43 FROM gps_data
44 WHERE journey_id LIKE '%cc';
```

Data Output Messages Notifications



	count
	bigint
1	7

Data Output Messages Notifications

Successfully run. Total query runtime: 509 msec.  
244614 rows affected.

Data Output Messages Notifications

Successfully run. Total query runtime: 410 msec.  
101116 rows affected.

Data Output Messages Notifications

Successfully run. Total query runtime: 271 msec.  
780 rows affected.

Data Output	Messages	Notifications
<div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>SQL</div> </div> </div>		
	count bigint	
1	15256	

---

Data Output	Messages	Notifications
<p>Successfully run. Total query runtime: 198 msec. 66 rows affected.</p>		

Activity 3

1.

14	FROM	
15	vehicle_data	
16	GROUP BY	
17	model;	
18		
19		
20		
21	SELECT MAX(speed) AS max_speed	
22	FROM vehicle_data;	

---

Data Output	Messages	Graph Visualiser	Notifications
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	max_speed double precision		
1	162.43		

2.

26

27

28

29

30

31

32

SELECT

AVG(speed) AS avg\_speed,

MIN(speed) AS min\_speed,

MAX(speed) AS max\_speed,

STDDEV(speed) AS stddev\_speed

FROM vehicle\_data

WHERE make = 'CHEVROLET';

Data Output

Messages

Graph Visualiser

Notifications

SQL

avg\_speed

double precision

min\_speed

double precision

max\_speed

double precision

stddev\_speed

double precision

1

79.31768078015219

0

157.82

47.025695822996944

3.

```
30 SELECT
31     route_id || '-' || segment_start_measure AS seg_id
32 FROM vehicle_data;
33
```

Data Output Messages Notifications

	seg_id	
	text	
1	C000141010N_2.218	











4.

```
34 -- Step 1: Add the new column to the table
35 ALTER TABLE vehicle_data
36 ADD COLUMN seg_id TEXT;
37
38 -- Step 2: Update the table to populate seg_id
39 UPDATE vehicle_data
40 SET seg_id = route_id || '-' || segment_start_measure;
41
42 -- Step 3 (Optional): Verify the new column values
43 SELECT route_id, segment_start_measure, seg_id
44 FROM vehicle_data;
45
```

Data Output Messages Notifications

	route_id	segment_start_measure	seg_id	
	character varying	double precision	text	
84	S001910080W	209.207	S001910080W_209.207	
85	S001910080W	209.282	S001910080W_209.282	

Downloading results...

▼	 vehicle_data
▼	 Columns (8)
	 datapoint_id
	 geohash
	 speed
	 make
	 model
	 route_id
	 segment_start_me
	 seg_id

5.

1

2

3

4

5

6

7

8

SELECT

seg\_id,

PERCENTILE\_CONT(0.85) WITHIN GROUP (ORDER BY speed) AS percentile\_85\_speed

FROM

vehicle\_data

GROUP BY

seg\_id;

Data Output

Messages

Graph Visualiser

×

Notifications

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SQL

	seg_id text	percentile_85_speed double precision
1	C000141000N_2.997	13.469
2	C000141000N_3.011	35.477
3	C000141000N_3.061	42.62
4	C000141000N_3.086	48.035000000000004
5	C000141000N_3.161	48.38
6	C000141000N_3.198	44.92
7	C000141000N_3.241	42.735
8	C000141000N_3.32	39.972
9	C000141000N_3.375	31.617499999999996
10	C000141000N_3.453	26.49
11	C000141000N_3.497	22.923999999999996
12	C000141000N_9.11	0
13	C000141000N_9.17	12.785000000000002
14	C000141000N_9.243	49.3585
15	C000141000N_9.291	62.894
16	C000141000N_9.351	70.3805
17	C000141000N_9.416	66.291

```

10
11 ▼ SELECT
12     model,
13     PERCENTILE_CONT(0.95) WITHIN GROUP (ORDER BY speed) AS percentile_95_speed
14 FROM
15     vehicle_data
16 GROUP BY
17     model;
18

```

Data Output Messages Graph Visualiser X Notifications

	model character varying	percentile_95_speed double precision
1	ACADIA	126.71
2	ATS	118.65
3	AVEO_SONIC	130.17
4	BLAZER	126.71
5	CAMARO	127.87
6	CANYON	80.64
7	COLORADO	129.02
8	CORVETTE_STINGRAY	124.41
9	CRUZE	129.02
10	CTS	127.87
11	ENCLAVE	123.26
12	ENCORE	136.4474999999998
13	ENVISION	131.32
14	EQUINOX	126.71
15	ESCALADE	130.17
16	ESCALADE_ESV	23.5575
17	IMPALA	125.56

## Activity 4

1.

36

SELECT

37

vehicle\_data.\*,

38

gps\_data.\*

39

FROM

40

vehicle\_data

41

JOIN

42

gps\_data

43

ON

44

vehicle\_data.datapoint\_id = gps\_data.datapoint\_id;

Scratch Pad

Data Output

Messages

Graph Visualiser

Notifications

SQL

	datapoint_id character varying	geohash character varying	speed double precision	make character varying	model character varying	route_id character varying	segment_start_measure double precision	seg_id text
1	c38c9038-bd14-47b7-8b4b-a2ff0dd355...	9zksjf	97.91	CHEVROLET	TRAVERSE	C000141060N	12.895	C000141060N_1
2	65a98c70-1e88-4a4d-a3cb-3d04a224e2...	9zksjf	93.31	CHEVROLET	TRAVERSE	C000146580E	1.185	C000146580E_1
3	5f027be4-a200-44a7-a011-4900fb66e1...	9zksn4	46.08	CHEVROLET	TRAVERSE	M002246040E	0.384	M002246040E_0
4	a61bf214-cd6e-47e9-878c-d73c4e5560...	9zksn6	35.71	CHEVROLET	TRAVERSE	M002246040E	0.614	M002246040E_0
5	e6d6dde4-2c95-4b0d-a5c3-1c4916635...	9zksn6	13.82	CHEVROLET	TRAVERSE	M002246040E	0.724	M002246040E_0
6	45fc686d-8d8b-4f9e-9317-f6c5f68bc449	9zksn7	47.23	CHEVROLET	TRAVERSE	M002241060N	0.83	M002241060N_C
7	fa5858fc-35e5-4020-9f2f-6bc7598527ed	9zkunc	123.26	GMC	SIERRA	S001910080W	210.156	S001910080W_2
8	67eed3b7-b732-46c4-909c-0e05793ca2...	9zkunc	123.26	GMC	SIERRA	S001910080W	210.261	S001910080W_2
9	e4ccd255-1c77-4473-93d7-d6545900a...	9zkun9	124.41	GMC	SIERRA	S001910080W	210.567	S001910080W_2
10	52fa7fa4-00ea-47e8-bc41-3ddb669a9...	9zkun3	123.26	GMC	SIERRA	S001910080W	211.115	S001910080W_2
11	d149700c-d422-4535-890c-1491ba589...	9zkun3	123.26	GMC	SIERRA	S001910080W	211.414	S001910080W_2
12	b1e9e2f5-e8da-4796-b909-b91a6a0188...	9zkun1	123.26	GMC	SIERRA	S001910080W	212.064	S001910080W_2
13	64c2f50e-b756-4986-aa1a-7cc09d7acd...	9zkujc	123.26	GMC	SIERRA	S001910080W	212.205	S001910080W_2
14	db74d98f-6217-4076-a1a1-70b44de48f...	9zkujc	123.26	GMC	SIERRA	S001910080W	212.78	S001910080W_2
15	c65d21da-268b-4f22-9a60-8e92ec470d...	9zkuj3	124.41	GMC	SIERRA	S001910080W	213.738	S001910080W_2
16	fe9b4106-0b55-4dcd-b929-9935f736fc92	9zkuj3	124.41	GMC	SIERRA	S001910080W	213.791	S001910080W_2

2.



Query Query History



```
1 SELECT
2     vehicle_data.datapoint_id,
3     gps_data.journey_id,
4     vehicle_data.speed,
5     vehicle_data.seg_id
6 FROM
7     vehicle_data
8 JOIN
9     gps_data
```

Data Output Messages Notifications

	datapoint_id character varying	journey_id character varying (50)	speed double precision	seg_id text
1	9e21912c-8309-4b40-84b5-bc3dd0141a...	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	99.07	C000141060N_12.522
2	fcee60e3-4456-46f4-befc-f197fcb4f92b	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	99.07	C000141060N_12.522
3	c38c9038-bd14-47b7-8b4b-a2ff0dd35543	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	97.91	C000141060N_12.895
4	65a98c70-1e88-4a4d-a3cb-3d04a224e262	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	93.31	C000146580E_1.185
5	29f64967-6cf8-4f04-97a9-c65a80c84d92	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	86.39	M002246040E_0
6	5f027be4-a200-44a7-a011-4900fb66e148	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	46.08	M002246040E_0.384
7	58bf14a0-051c-4d35-9a21-6eab37fbd1b6	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	46.08	M002246040E_0.462
8	92ea6cb5-8d9c-422b-9103-c7b63f3016d3	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	46.08	M002246040E_0.462
9	3e96f2f0-5365-4201-8513-321cece9cbaf	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	33.4	M002246040E_0.542
10	02c1e5f5-6403-4595-ae9-63cf834d7f21	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	29.95	M002246040E_0.57
11	88615f74-6c34-4044-998a-0246b541e677	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	36.86	M002246040E_0.614
12	a61bf214-cd6e-47e9-878c-d73c4e55604b	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	35.71	M002246040E_0.614
13	fedda6b9-306a-439b-ac48-55d1d394a132	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	31.1	M002246040E_0.69
14	e6d6dde4-2c95-4b0d-a5c3-1c49166354ce	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	13.82	M002246040E_0.724
15	b43e3ca9-e583-4a19-8561-1bd1840aa2...	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	3.45	M002246040E_0.724
16	2095afb1-5854-4efc-ab14-2e4457c39a5b	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	39.16	M002241060N_0.591
17	a69c50fc-7c16-47d2-a333-cfa89ed7f833	e74cc1aca5d0d95b4ae48f5086d4f6ec1c6159...	42.62	M002241060N_0.659

3.

```
2
3
4 -- Step 1: Join tables and select specific columns
5 WITH joined_data AS (
6     SELECT
7         vehicle_data.datapoint_id,
8         gps_data.journey_id,
9         vehicle_data.speed,
```

Data Output Messages Notifications

	stopped_journey_count bigint
1	646

## Activity 5

1.

```
1 SELECT
2     gps_data.*
3 FROM
4     gps_data
5 JOIN
6     (SELECT datapoint_id
7      FROM vehicle_data
8      WHERE model = 'GMC') AS gmc_vehicle_data
9 ON
10    gps_data.datapoint_id = gmc_vehicle_data.datapoint_id;
11
```

Data Output Messages Notifications

datapoint_id	journey_id	latitude	longitude	month	day	hour	
[PK] character varying (50)	character varying (50)	double precision	double precision	integer	integer	integer	

2.

Query Query History

```
1
2
3     -- Step 1: Join tables and select specific columns
4 WITH joined_data AS (
5     SELECT
6         vehicle_data.datapoint_id,
7         gps_data.journey_id,
8         vehicle_data.speed,
9         vehicle_data.seg_id
10    FROM
11        vehicle_data
12   JOIN
13        gps_data
14   ON
15        vehicle_data.datapoint_id = gps_data.datapoint_id
16 )
17
18 -- Step 2: Count unique journey_ids that came to stop at least once
19 SELECT
20     make,
21     model,
22     COUNT(DISTINCT journey_id) AS unique_journey_count
23 FROM
24     (SELECT vehicle_data.make, vehicle_data.model, gps_data.journey_id
25      FROM vehicle_data
26      JOIN gps_data ON vehicle_data.datapoint_id = gps_data.datapoint_id) AS joined_data
27 GROUP BY
28     make, model
29 ORDER BY
30     make DESC, model DESC;
31
```



	make character varying	model character varying	unique_journey_count bigint
1	GMC	YUKON_XL	11
2	GMC	YUKON	10
3	GMC	TERRAIN	12
4	GMC	SIERRA_HD	37
5	GMC	SIERRA	47
6	GMC	CANYON	5
7	GMC	ACADIA	21
8	CHEVROLET	TRAX_TRACKER_TRAILBLAZER_B	24
9	CHEVROLET	TRAVERSE	65
10	CHEVROLET	TAHOE	24
11	CHEVROLET	SUBURBAN	29
12	CHEVROLET	SPARK	3
13	CHEVROLET	SILVERADO_HD	123
14	CHEVROLET	SILVERADO	234
15	CHEVROLET	MALIBU	61
16	CHEVROLET	IMPALA	16
17	CHEVROLET	EQUINOX	127
18	CHEVROLET	CRUZE	33
19	CHEVROLET	CORVETTE_STINGRAY	2
20	CHEVROLET	COLORADO	24
21	CHEVROLET	CAMARO	2
22	CHEVROLET	BLAZER	12
23	CHEVROLET	AVEO_SONIC	11
24	CADILLAC	XT4	1
25	CADILLAC	SRX	1
26	CADILLAC	ESCALADE_ESV	2
27	CADILLAC	ESCALADE	5
28	CADILLAC	CTS	1
29	CADILLAC	ATS	2
30	BUICK	VERANO	5
31	BUICK	LACROSSE	2
32	BUICK	ENVISION	13
33	BUICK	ENCORE	12
34	BUICK	ENCLAVE	15

3.

```
35 SELECT
36     journey_id,
37     MAX(speed) AS max_speed
38 FROM
39     vehicle_data
40 JOIN
41     gps_data
42 ON
43     vehicle_data.datapoint_id = gps_data.datapoint_id
44 GROUP BY
45     journey_id
46 ORDER BY
47     max_speed DESC
48 LIMIT 1;
49
```

Data Output Messages Notifications

	journey_id character varying (50)	max_speed double precision
1	a37cf85fe887cb5b54fd828664ace413938a6e5d	162.43

Query Query History Scratch Pad x

```
50 -- Using a subquery to dynamically find the journey with the highest speed
51 SELECT
52     gps_data.*
53 FROM
54     gps_data
55 JOIN
56     (SELECT journey_id
57      FROM vehicle_data
58      JOIN gps_data
59      ON vehicle_data.datapoint_id = gps_data.datapoint_id
60      GROUP BY journey_id
61      ORDER BY MAX(speed) DESC
62      LIMIT 1) AS highest_speed_journey
63 ON
64     gps_data.journey_id = highest_speed_journey.journey_id;
```

Data Output Messages Notifications

	datapoint_id [PK] character varying (50)	journey_id character varying (50)	latitude double precision	longitude double precision	month integer	day integer	hour integer
1	9e44e4dc-6bc9-4bed-8741-a8147f07f836	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496849	-94.70037	10	2	5
2	b119c023-15c4-427f-b699-6c9e1a9df035	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496848	-94.698934	10	2	5
3	29b0050c-c3ae-4ad3-9cb8-0983dbf97487	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496848	-94.697556	10	2	5
4	f53d6a77-0cb0-4d31-b926-a8196633ac...	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496845	-94.69623	10	2	5
5	4619d09a-83e1-4bbb-ae45-00c788ac8a9f	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496848	-94.694941	10	2	5
6	a70f3572-cabe-42ef-bb0f-4f10ae3bf424	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496849	-94.693666	10	2	5
7	23a7cba7-c73c-4a14-bec2-afebbe7ad852	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496846	-94.692395	10	2	5
8	12b32aad-8b1b-4441-89c9-6951a8cad7...	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496846	-94.691064	10	2	5
9	b9761088-c0c3-4e4b-9beb-bfec54373298	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496842	-94.689661	10	2	5
10	009ba3ad-3639-4efc-9765-c7264f7bcdea	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496813	-94.688176	10	2	5
11	40acd3ca-8267-4ef4-af3e-b0575c71ea15	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496632	-94.686669	10	2	5
12	58ab2af5-d265-4864-8b0f-f40f6512106e	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.496301	-94.685211	10	2	5
13	35201289-df5b-4b72-a3d1-55a88f37b384	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.495833	-94.683883	10	2	5

Query Query History Scratch Pad X

```

50 -- Using a subquery to dynamically find the journey with the highest speed
51 SELECT
52     gps_data.*
53 FROM
54     gps_data
55 JOIN
56     (SELECT journey_id
57      FROM vehicle_data
58      JOIN gps_data
59      ON vehicle_data.datapoint_id = gps_data.datapoint_id
60      GROUP BY journey_id
61      ORDER BY MAX(speed) DESC
62      LIMIT 1) AS highest_speed_journey
63 ON
64     gps_data.journey_id = highest_speed_journey.journey_id;

```

Data Output Messages Notifications

	datapoint_id [PK] character varying (50)	journey_id character varying (50)	latitude double precision	longitude double precision	month integer	day integer	hour integer
331	73a1385b-6a53-42cf-9a65-57bd98aa5dc0	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.492986	-94.258342	10	2	6
332	9b57684c-4114-4b67-b75a-f3fd96310ef3	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.492989	-94.25698	10	2	6
333	dcf97469-e31f-4522-987e-fe50e5154244	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.49299	-94.255567	10	2	6
334	cb62f5b6-39c1-45d7-9523-e4e73a8b3514	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493016	-94.254119	10	2	6
335	7a147d4c-9151-4f55-b14b-e144a21b64...	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493034	-94.25263	10	2	6
336	ef56801c-46da-4de7-860d-cd81d85b185b	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493047	-94.251155	10	2	6
337	7ce9cb4d-ee8e-439f-a50c-071799ed989d	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493089	-94.249671	10	2	6
338	5a83c523-83d0-4c90-a7e7-e202ff877522	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.49314	-94.248215	10	2	6
339	ef263056-c0b3-4a6e-8e86-a5709f4b8064	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493184	-94.24681	10	2	6
340	2f52590b-7de2-4149-aab3-e85f40530d39	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493223	-94.245461	10	2	6
341	4a8df8f5-b8dc-4bb9-8c9c-2377f7661181	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.49327	-94.244155	10	2	6
342	722b86fd-afce-457f-8068-c391af3b190c	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493311	-94.24288	10	2	6
343	f3dc9714-c2d0-4439-9b64-9fa6de54553b	a37cf85fe887cb5b54fd828664ace413938a6e5d	41.493353	-94.241613	10	2	6

## Activity 6

1.

```

66 SELECT
67     2 * 6371 * ASIN(
68         SQRT(
69             POWER(SIN(RADIANS(41.997339 - 41.948637) / 2), 2) +
70             COS(RADIANS(41.948637)) * COS(RADIANS(41.997339)) *
71             POWER(SIN(RADIANS(-93.610229 - (-93.610065)) / 2), 2)
72         )
73     ) AS distance_km;
74

```

Data Output Messages Notifications

	distance_km double precision
1	5.4154322885654365