**US Accidents Visualizations**

***By Somendra, Pablo and Balaji***

**Visualization 1:**

**SPICE:**

WITH sev1 as(SELECT DISTINCT count(id) as Acc\_Sev1, state

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 1

GROUP BY state),

sev2 as(SELECT DISTINCT count(id) as Acc\_Sev2, state

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 2

GROUP BY state),

sev3 as(SELECT DISTINCT count(id) as Acc\_Sev3, state

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 3

GROUP BY state),

sev4 as(SELECT DISTINCT count(id) as Acc\_Sev4, state

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 4

GROUP BY state)

SELECT sev1.state, Acc\_Sev1, Acc\_Sev2, Acc\_Sev3, Acc\_Sev4

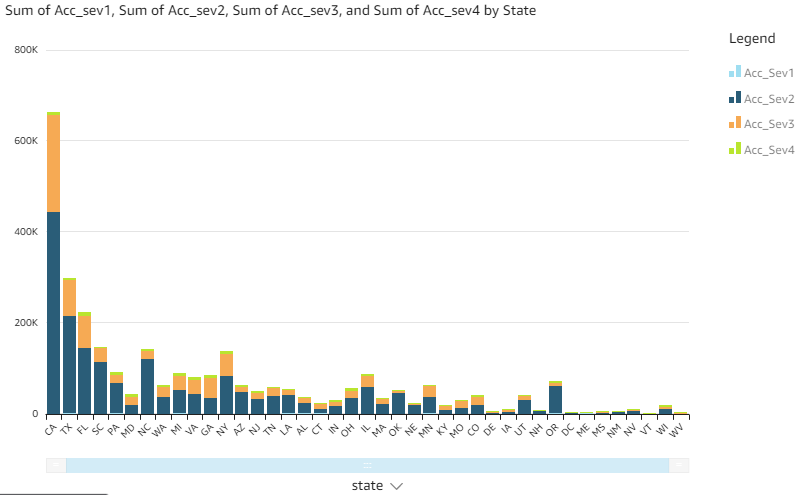
FROM sev1, sev2, sev3, sev4

WHERE sev1.state = sev2.state AND

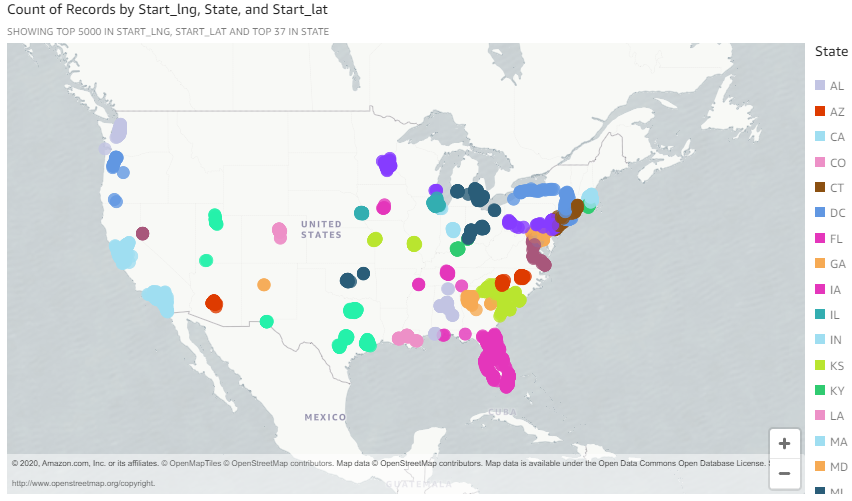
sev2.state = sev3.state AND

sev3.state = sev4.state

ORDER BY sev1.state ASC;



**Visualization 2:**



**Visualization 3:**

**SPICE:**

with cte AS (select

CASE

WHEN date\_diff('minute', start\_time, end\_time)

BETWEEN 0

AND 59 THEN

'minutes'

WHEN date\_diff('minute', start\_time, end\_time)

BETWEEN 60

AND 239 THEN

'hours'

WHEN date\_diff('minute', start\_time, end\_time)

BETWEEN 240

AND 959 THEN

'4hours\_16hours'

WHEN date\_diff('minute', start\_time, end\_time)

BETWEEN 960

AND 1439 THEN

'16hours\_24hours'

WHEN date\_diff('minute', start\_time, end\_time) >= 1440 THEN

'days'

ELSE 'unknown'

END AS time\_range, count(\*) AS cnt

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

GROUP BY start\_time, end\_time)

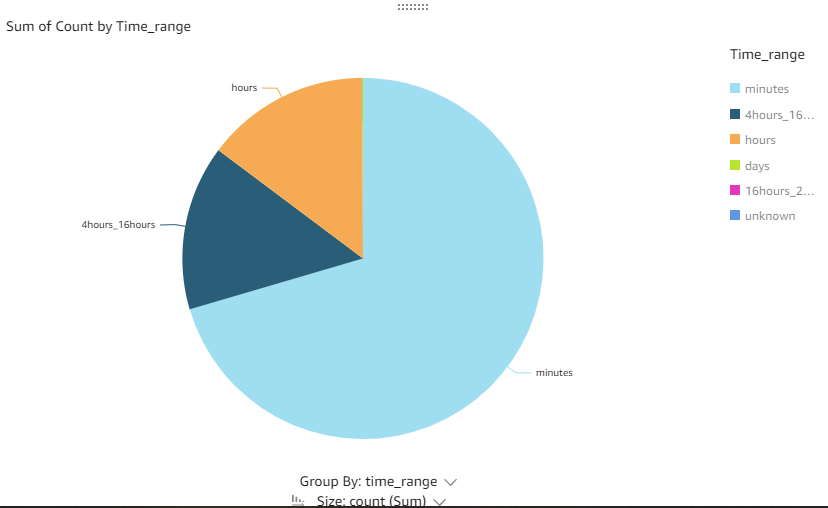
SELECT time\_range,

sum(cnt) AS count

FROM cte

GROUP BY time\_range

ORDER BY count desc;



**Visualization 4:**

**SPICE:**

WITH sev1 as(SELECT DISTINCT count(id) as Acc\_Sev1, weather\_condition

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 1

GROUP BY weather\_condition),

sev2 as(SELECT DISTINCT count(id) as Acc\_Sev2, weather\_condition

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 2

GROUP BY weather\_condition),

sev3 as(SELECT DISTINCT count(id) as Acc\_Sev3, weather\_condition

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 3

GROUP BY weather\_condition),

sev4 as(SELECT DISTINCT count(id) as Acc\_Sev4, weather\_condition

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

WHERE severity = 4

GROUP BY weather\_condition)

SELECT sev1.weather\_condition, Acc\_Sev1, Acc\_Sev2, Acc\_Sev3, Acc\_Sev4

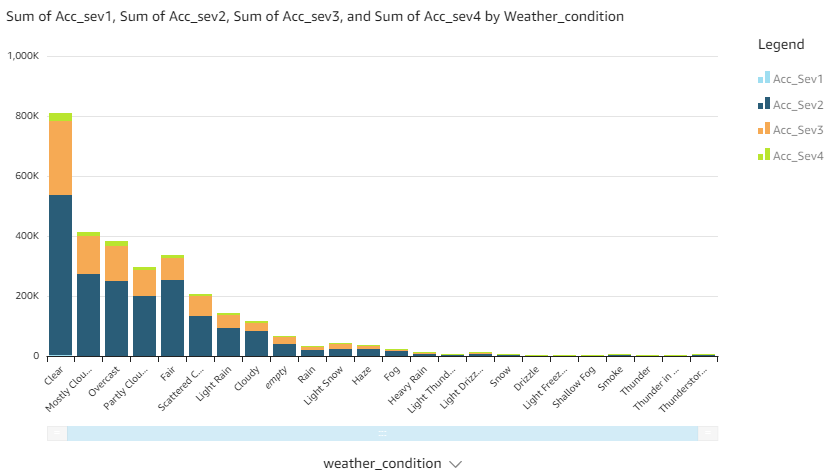
FROM sev1, sev2, sev3, sev4

WHERE sev1.weather\_condition = sev2.weather\_condition AND

sev2.weather\_condition = sev3.weather\_condition AND

sev3.weather\_condition = sev4.weather\_condition

ORDER BY sev1.weather\_condition ASC;



**Visualization 5:**

**SPICE (weather\_condition ‘good’):**

with cte1 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 1 and (weather\_condition like 'Clear' or weather\_condition like 'Cloudy%' or weather\_condition like 'Drizzle' or weather\_condition like 'Drizzle / Windy' or weather\_condition like 'Fair%' or weather\_condition like 'Haze' or weather\_condition like 'Light%' or weather\_condition like 'Mist' or weather\_condition like 'Mostly%' or weather\_condition like 'N/A Precipitation' or weather\_condition like 'Overcast' or weather\_condition like 'Partial%' or weather\_condition like 'Partly%' or weather\_condition like 'Patches of Fog' or weather\_condition like 'Scattered Clouds' or weather\_condition like 'Shallow Fog' or weather\_condition like 'Showers in the Vicinity' or weather\_condition like 'Small Hail' or weather\_condition like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte2 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 2 and (weather\_condition like 'Clear' or weather\_condition like 'Cloudy%' or weather\_condition like 'Drizzle' or weather\_condition like 'Drizzle / Windy' or weather\_condition like 'Fair%' or weather\_condition like 'Haze' or weather\_condition like 'Light%' or weather\_condition like 'Mist' or weather\_condition like 'Mostly%' or weather\_condition like 'N/A Precipitation' or weather\_condition like 'Overcast' or weather\_condition like 'Partial%' or weather\_condition like 'Partly%' or weather\_condition like 'Patches of Fog' or weather\_condition like 'Scattered Clouds' or weather\_condition like 'Shallow Fog' or weather\_condition like 'Showers in the Vicinity' or weather\_condition like 'Small Hail' or weather\_condition like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte3 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 3 and (weather\_condition like 'Clear' or weather\_condition like 'Cloudy%' or weather\_condition like 'Drizzle' or weather\_condition like 'Drizzle / Windy' or weather\_condition like 'Fair%' or weather\_condition like 'Haze' or weather\_condition like 'Light%' or weather\_condition like 'Mist' or weather\_condition like 'Mostly%' or weather\_condition like 'N/A Precipitation' or weather\_condition like 'Overcast' or weather\_condition like 'Partial%' or weather\_condition like 'Partly%' or weather\_condition like 'Patches of Fog' or weather\_condition like 'Scattered Clouds' or weather\_condition like 'Shallow Fog' or weather\_condition like 'Showers in the Vicinity' or weather\_condition like 'Small Hail' or weather\_condition like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte4 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 4 and (weather\_condition like 'Clear' or weather\_condition like 'Cloudy%' or weather\_condition like 'Drizzle' or weather\_condition like 'Drizzle / Windy' or weather\_condition like 'Fair%' or weather\_condition like 'Haze' or weather\_condition like 'Light%' or weather\_condition like 'Mist' or weather\_condition like 'Mostly%' or weather\_condition like 'N/A Precipitation' or weather\_condition like 'Overcast' or weather\_condition like 'Partial%' or weather\_condition like 'Partly%' or weather\_condition like 'Patches of Fog' or weather\_condition like 'Scattered Clouds' or weather\_condition like 'Shallow Fog' or weather\_condition like 'Showers in the Vicinity' or weather\_condition like 'Small Hail' or weather\_condition like 'Thunder in the Vicinity'

))

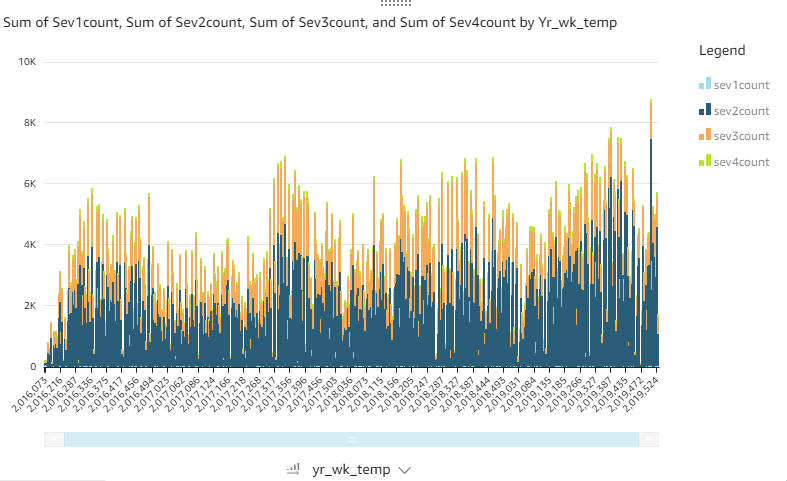
group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity)

select cte1.yr\_wk\_temp, cte1.count as sev1count, cte2.count as sev2count, cte3.count as sev3count, cte4.count as sev4count

from cte1, cte2, cte3, cte4

where cte1.yr\_wk\_temp = cte2.yr\_wk\_temp and cte2.yr\_wk\_temp = cte3.yr\_wk\_temp and cte3.yr\_wk\_temp = cte4.yr\_wk\_temp;



**SPICE (weather\_condition ‘bad’):**

with cte1 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 1 and (weather\_condition not like 'Clear' or weather\_condition not like 'Cloudy%' or weather\_condition not like 'Drizzle' or weather\_condition not like 'Drizzle / Windy' or weather\_condition not like 'Fair%' or weather\_condition not like 'Haze' or weather\_condition not like 'Light%' or weather\_condition not like 'Mist' or weather\_condition not like 'Mostly%' or weather\_condition not like 'N/A Precipitation' or weather\_condition not like 'Overcast' or weather\_condition not like 'Partial%' or weather\_condition not like 'Partly%' or weather\_condition not like 'Patches of Fog' or weather\_condition not like 'Scattered Clouds' or weather\_condition not like 'Shallow Fog' or weather\_condition not like 'Showers in the Vicinity' or weather\_condition not like 'Small Hail' or weather\_condition not like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte2 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 2 and (weather\_condition not like 'Clear' or weather\_condition not like 'Cloudy%' or weather\_condition not like 'Drizzle' or weather\_condition not like 'Drizzle / Windy' or weather\_condition not like 'Fair%' or weather\_condition not like 'Haze' or weather\_condition not like 'Light%' or weather\_condition not like 'Mist' or weather\_condition not like 'Mostly%' or weather\_condition not like 'N/A Precipitation' or weather\_condition not like 'Overcast' or weather\_condition not like 'Partial%' or weather\_condition not like 'Partly%' or weather\_condition not like 'Patches of Fog' or weather\_condition not like 'Scattered Clouds' or weather\_condition not like 'Shallow Fog' or weather\_condition not like 'Showers in the Vicinity' or weather\_condition not like 'Small Hail' or weather\_condition not like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte3 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 3 and (weather\_condition not like 'Clear' or weather\_condition not like 'Cloudy%' or weather\_condition not like 'Drizzle' or weather\_condition not like 'Drizzle / Windy' or weather\_condition not like 'Fair%' or weather\_condition not like 'Haze' or weather\_condition not like 'Light%' or weather\_condition not like 'Mist' or weather\_condition not like 'Mostly%' or weather\_condition not like 'N/A Precipitation' or weather\_condition not like 'Overcast' or weather\_condition not like 'Partial%' or weather\_condition not like 'Partly%' or weather\_condition not like 'Patches of Fog' or weather\_condition not like 'Scattered Clouds' or weather\_condition not like 'Shallow Fog' or weather\_condition not like 'Showers in the Vicinity' or weather\_condition not like 'Small Hail' or weather\_condition not like 'Thunder in the Vicinity'

))

group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity),

cte4 as (select (year\*100+week)\*10+cast(range as integer) as yr\_wk\_temp, count(\*) as count from

(select year(start\_time) as year, week(start\_time) as week,

case when temperature between -10 and 1 then '0'

when temperature between 2 and 13 then '1'

when temperature between 14 and 25 then '2'

when temperature between 26 and 37 then '3'

when temperature between 37 and 48 then '4'

when temperature between 49 and 61 then '5'

when temperature between 62 and 73 then '6'

when temperature between 74 and 85 then '7'

when temperature between 86 and 97 then '8'

when temperature between 98 and 109 then '9'

end as range, severity

from us\_accidents\_dec\_19\_database.us\_accident\_v3

where temperature between -10 and 109 and severity = 4 and (weather\_condition not like 'Clear' or weather\_condition not like 'Cloudy%' or weather\_condition not like 'Drizzle' or weather\_condition not like 'Drizzle / Windy' or weather\_condition not like 'Fair%' or weather\_condition not like 'Haze' or weather\_condition not like 'Light%' or weather\_condition not like 'Mist' or weather\_condition not like 'Mostly%' or weather\_condition not like 'N/A Precipitation' or weather\_condition not like 'Overcast' or weather\_condition not like 'Partial%' or weather\_condition not like 'Partly%' or weather\_condition not like 'Patches of Fog' or weather\_condition not like 'Scattered Clouds' or weather\_condition not like 'Shallow Fog' or weather\_condition not like 'Showers in the Vicinity' or weather\_condition not like 'Small Hail' or weather\_condition not like 'Thunder in the Vicinity'

))

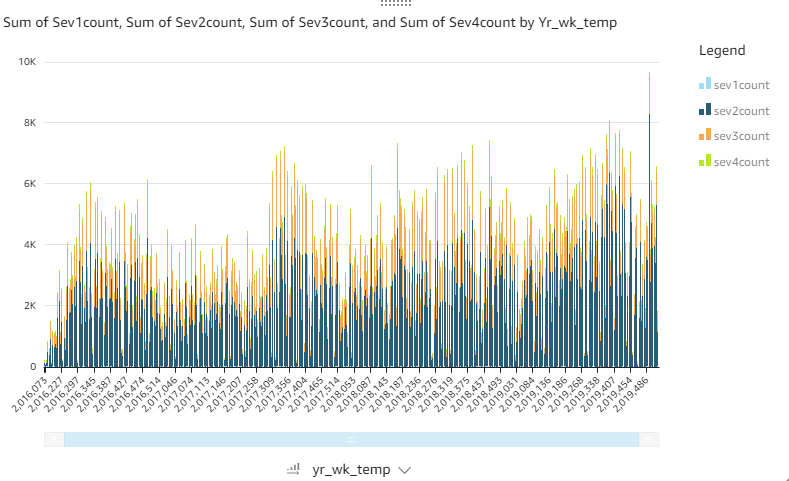
group by (year\*100+week)\*10+cast(range as integer), severity

order by (year\*100+week)\*10+cast(range as integer), severity)

select cte1.yr\_wk\_temp, cte1.count as sev1count, cte2.count as sev2count, cte3.count as sev3count, cte4.count as sev4count

from cte1, cte2, cte3, cte4

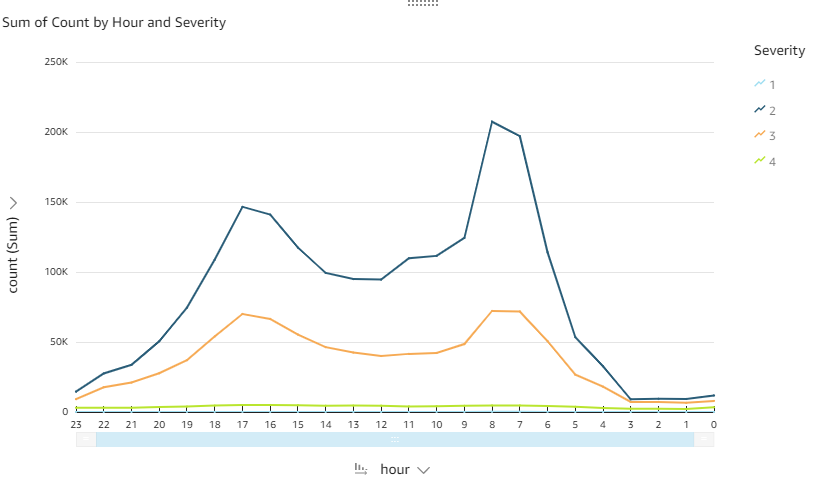
where cte1.yr\_wk\_temp = cte2.yr\_wk\_temp and cte2.yr\_wk\_temp = cte3.yr\_wk\_temp and cte3.yr\_wk\_temp = cte4.yr\_wk\_temp;



**Visualization 6:**

**SPICE:**

select hour(start\_time) as hour, severity, count(\*) as count from us\_accidents\_dec\_19\_database.us\_accident\_v3 group by hour(start\_time), severity order by hour(start\_time), severity desc;



**Visualization 7:**

**SPICE:**

SELECT DISTINCT severity,

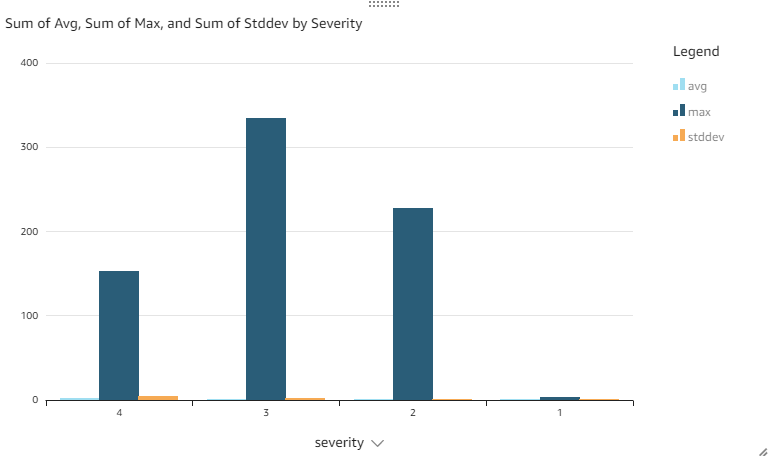
avg(distance)

OVER (partition by severity) as avg, max(distance)

OVER (partition by severity) as max, stddev(distance)

OVER (partition by severity) as stddev

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3;



**Visualization 10:**

**SPICE:**

select Concept, sum(Frequency) as Freq from (with cte1 AS

(SELECT b.slno,

b.pattrn,

b.concpt,

cardinality(regexp\_extract\_all(lower(a.n\_description),

lower(b.pattrn))) count

FROM base\_corpus3 a

CROSS JOIN concept7 b

ORDER BY slno)

SELECT DISTINCT slno AS Serial\_No,

concpt AS Concept,

pattrn AS Pattern,

sum(count)

OVER (partition by pattrn) AS Frequency

FROM cte1

ORDER BY slno) group by Concept;



**Visualization 13:**

**SPICE:**

SELECT DISTINCT state,

date,

avg(sum\_precip)

OVER (partition by date, state) AS avg\_precip2

FROM

(SELECT DISTINCT state,

zipcode,

date,

sum(avg\_precip)

OVER (partition by date, zipcode, state) AS sum\_precip

FROM

(SELECT DISTINCT state,

zipcode,

date(start\_time) AS date,

hour(start\_time) AS hour,

minute(start\_time) AS minute,

count(\*) AS count,

avg(precipitation) AS avg\_precip

FROM us\_accidents\_dec\_19\_database.us\_accident\_v3

GROUP BY state, zipcode, date(start\_time), hour(start\_time), minute(start\_time)

ORDER BY count desc)

ORDER BY state, zipcode, date)

WHERE state = 'NY'

OR state = 'NJ'

OR state = 'PA'or state = 'IN'

OR state = 'WY'

ORDER BY state, date;

