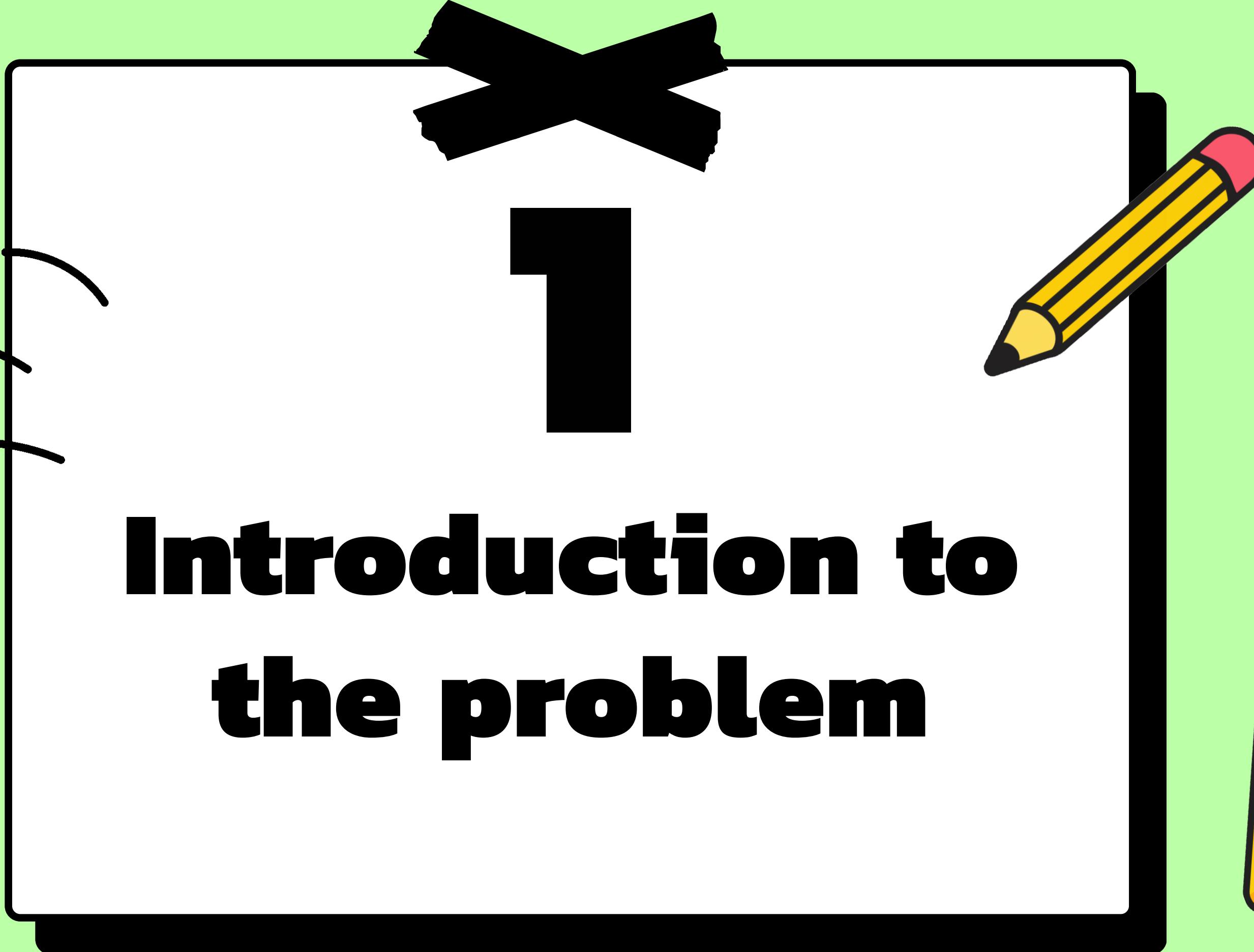


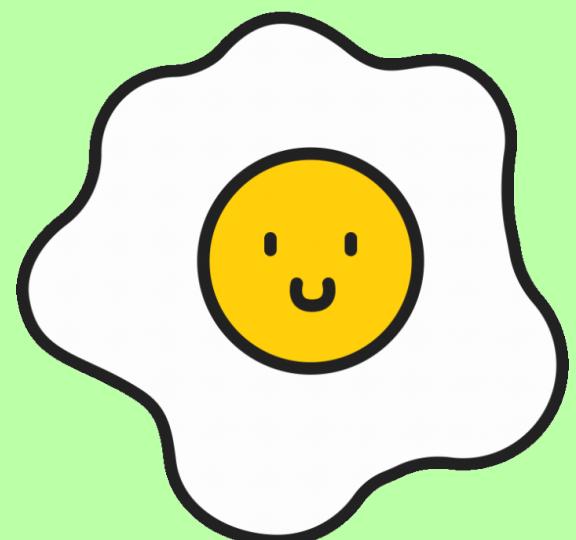
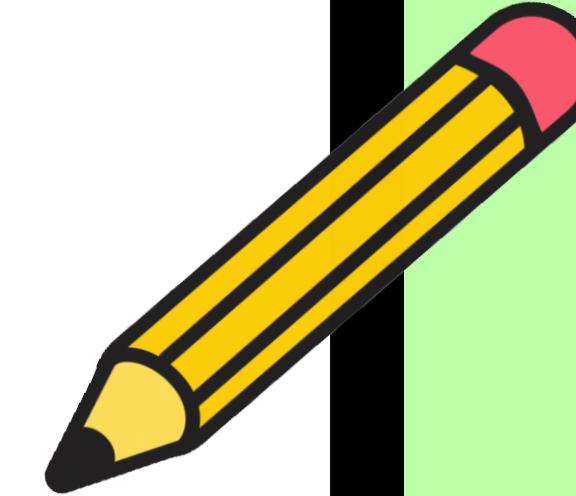
US Accidents

Data Model



Introduction to the problem

1



Introduction to the problem

นีอัตราการเกิดอุบัติเหตุบนถนนมากขึ้น เราจึงนำชุด
ข้อมูลอุบัติเหตุทางรถยนต์มาวิเคราะห์แนวโน้มของ
การเกิดอุบัติเหตุต่างๆตามสถานการณ์

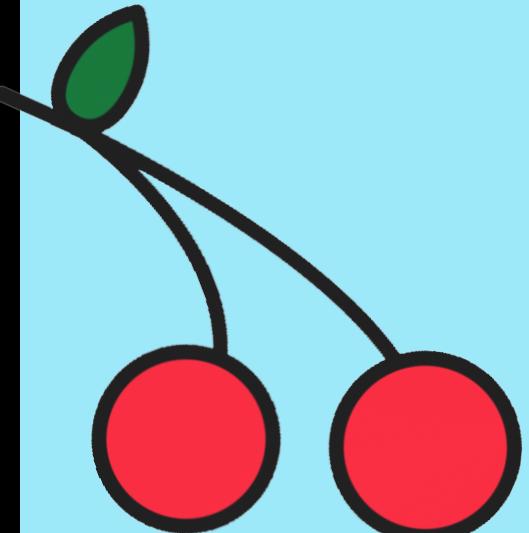
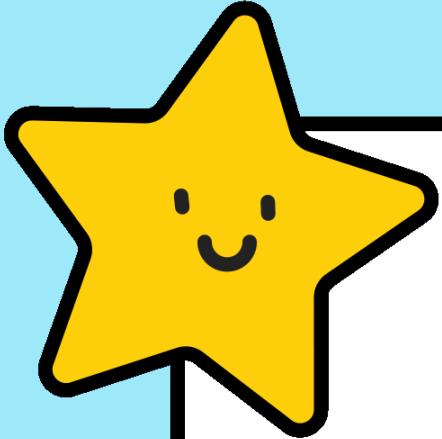
เพื่อหาแนวทางหรือวิธีการรับมือที่ลดจำนวนอุบัติเหตุ
ที่จะเกิดขึ้นต่อลดระดับความรุนแรง และ ศึกษาผล
ผลกระทบของฝนหรือสิ่งเร้าสิ่งแวดล้อมอื่นๆ





2

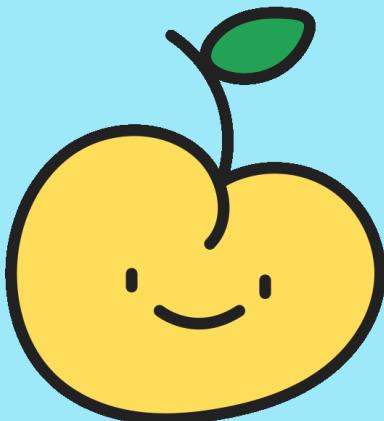
Analytic objective



Analytic objective

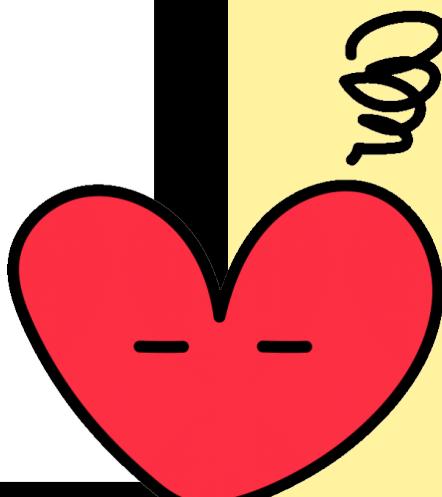
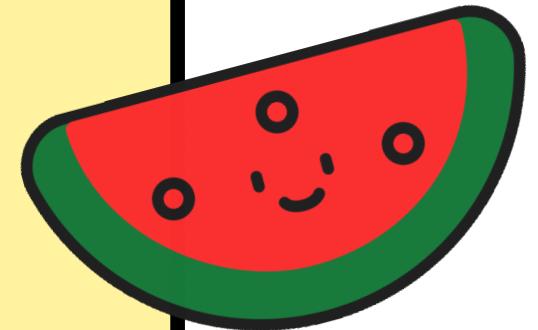
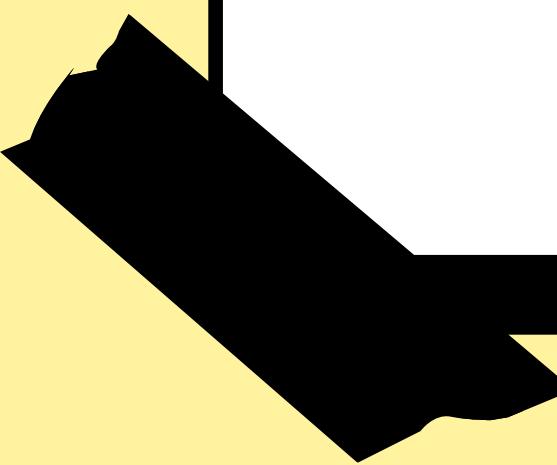
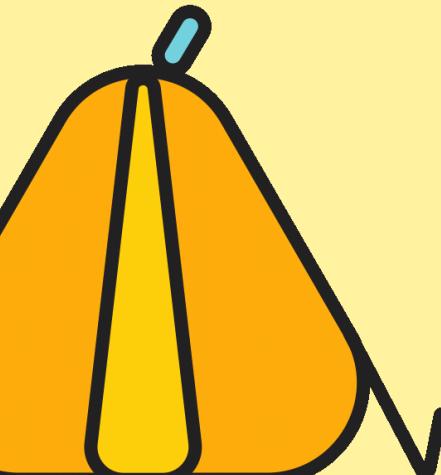


- 01 เพื่อวิเคราะห์แนวโน้มการเกิดอุบัติเหตุในแต่ละรัฐของสหรัฐอเมริกา
- 02 เพื่อวิเคราะห์ปัจจัยต่างๆ ที่ทำให้เกิดอุบัติเหตุทางรถยนต์ของสหรัฐอเมริกา
- 03 เพื่อคาดการณ์ระดับความรุนแรงต่างๆ แล้วนำมาเตรียมพร้อมรับมือสำหรับอุบัติเหตุ
- 04 เพื่อนำข้อมูลทางสถิติต่างๆ ไปประกอบการตัดสินใจสำหรับคนที่จะนำข้อมูลมาทำนายการเกิดอุบัติเหตุทางรถยนต์ต่างๆ ของสหรัฐอเมริกา



3

Data description and preparation



Data description

```
US<-read.csv('US_Accidents.csv')
ACC <- US %>% select(severity,Start_Time,State,Temperature.F.,Humidity...,
visibility.mi.,wind_direction,weather_condition,Sunrise_Sunset)
```

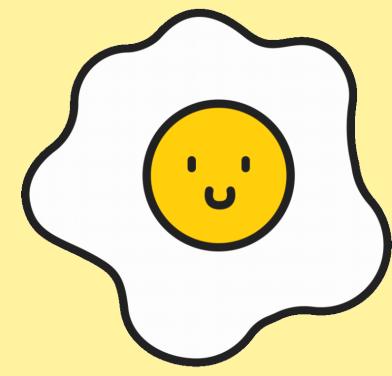
Data

ACC

2845342 obs. of 9 variables

```
> str(ACC)
'data.frame': 2845342 obs. of 9 variables:
 $ severity      : int 3 2 2 2 3 2 2 2 2 ...
 $ Start_Time    : chr "2016-02-08 00:37:08" "2016-02-08 05:56:20" "2016-02-08 06:15:39" "2016-02-08 06:51:45" ...
 $ State         : chr "OH" "OH" "OH" "OH" ...
 $ Temperature.F.: num 42.1 36.9 36 39 37 35.6 33.8 33.1 39 32 ...
 $ Humidity...    : num 58 91 97 55 93 100 100 92 70 100 ...
 $ Visibility.mi.: num 10 10 10 10 10 10 3 0.5 10 0.5 ...
 $ Wind_Direction: chr "Sw" "Calm" "Calm" "Calm" ...
 $ Weather_Condition: chr "Light Rain" "Light Rain" "Overcast" "Overcast" ...
 $ Sunrise_Sunset : chr "Night" "Night" "Night" "Night" ...
```





Data description

Severity

ค่าระดับความรุนแรงของอุบัติเหตุระหว่าง 1 ถึง 4

Start_Time

เวลา วัน/เดือน/ปี ที่เริ่มเกิดอุบัติเหตุ

State

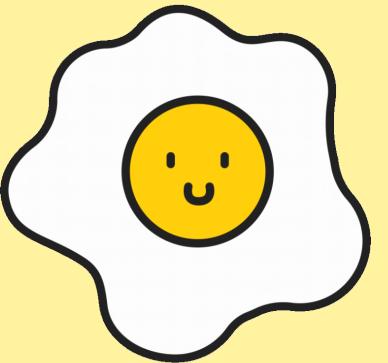
รัฐในประเทศสหรัฐอเมริกา

Temperature.F.

อุณหภูมิ(°F)

Humidity...

ความชื้น(%)



Data description

Visibility.mi.

ทัศนวิสัยการมองเห็นในระยะนั้น(mi)

Wind_Direction

ทิศทางลม

Weather_Condition

สภาพอากาศ

Sunrise_Sunset

ช่วงเวลาของวัน(กลางวันหรือกลางคืน)

Data preparation

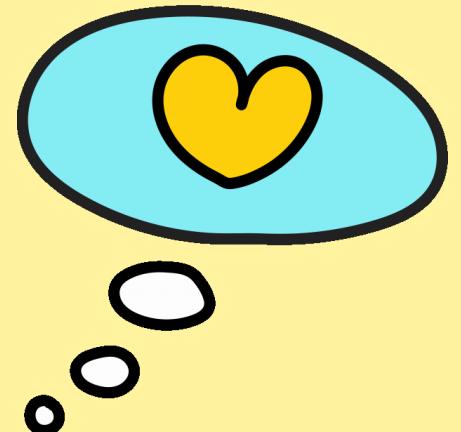


```
names(ACC)[names(ACC)=="Start_Time"]<- "occurrence_start"  
names(ACC)[names(ACC)=="Temperature.F."] <- "Temperature"  
names(ACC)[names(ACC)=="Humidity..."] <- "Humidity"  
names(ACC)[names(ACC)=="visibility.mi."] <- "visibility"  
names(ACC)[names(ACC)=="Sunrise_Sunset"] <- "Period"  
ACC <- ACC %>% mutate(Period=recode(Period, "Day" = "DayTime"  
, "Night" = "NightTime"))
```

CHANGE

Day → DayTime

Night → NightTime



Data preparation



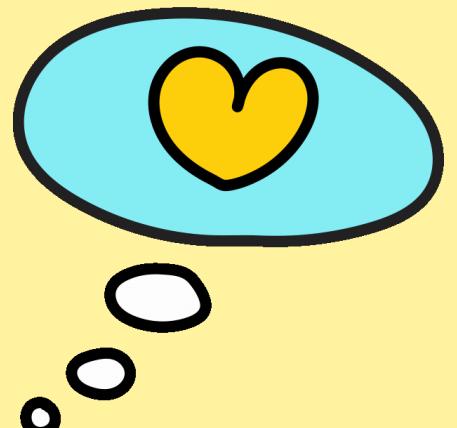
```
ACC <- ACC %>% mutate_if(is.character, as.factor)
ACC <- ACC %>% filter(!is.na(Severity))
ACC <- ACC %>% filter(!is.na(Temperature))
ACC <- ACC %>% filter(!is.na(visibility))
ACC <- ACC %>% filter(!is.na(Humidity))
```

```
> str(ACC)
'data.frame': 2759956 obs. of 9 variables:
 $ Severity      : int 3 2 2 2 3 2 2 2 2 ...
 $ Occurrence_Start: Factor w/ 1959333 levels "2016-01-14 20:18:33",...: 2 3 4 5 6 8 7 9 10 11 ...
 $ State          : Factor w/ 49 levels "AL","AR","AZ",...: 34 34 34 34 34 34 34 34 34 34 ...
 $ Temperature    : num 42.1 36.9 36 39 37 35.6 33.8 33.1 39 32 ...
 $ Humidity       : num 58 91 97 55 93 100 100 92 70 100 ...
 $ visibility     : num 10 10 10 10 10 10 3 0.5 10 0.5 ...
 $ Wind_Direction : Factor w/ 25 levels "", "Calm", "CALM", ...: 19 2 2 2 25 25 19 19 24 23 ...
 $ Weather_Condition: Factor w/ 128 levels "", "Blowing Dust", ...: 58 58 81 81 58 81 78 104 81 104 ...
 $ Period         : Factor w/ 3 levels "", "DayTime", "NightTime": 3 3 3 3 2 2 2 2 2 2 ...
```

CHANGE CHR -> FACTOR

Occurrence_Start, State, Wind_Direction, Weather_Condition, Period

FILTER NA OUT

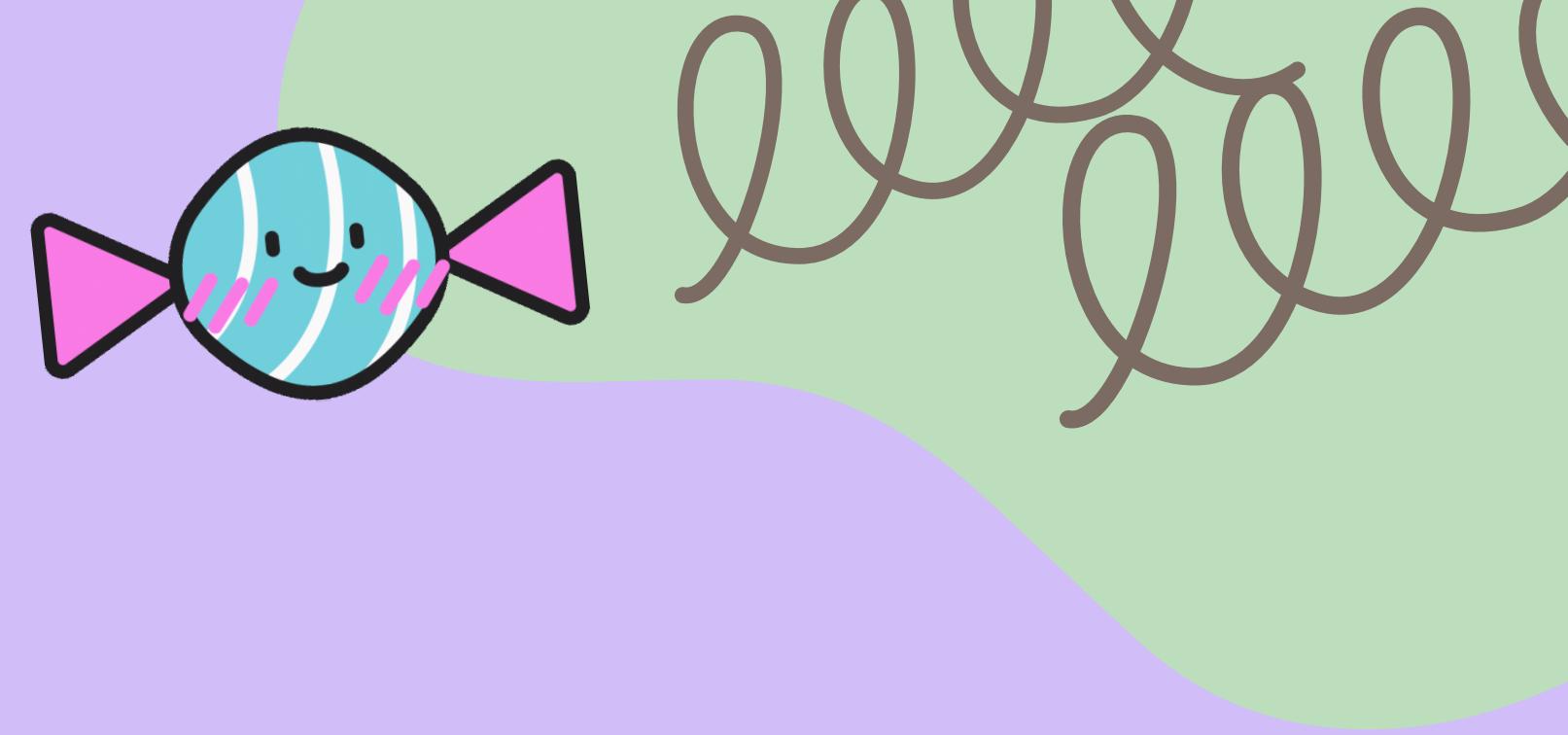
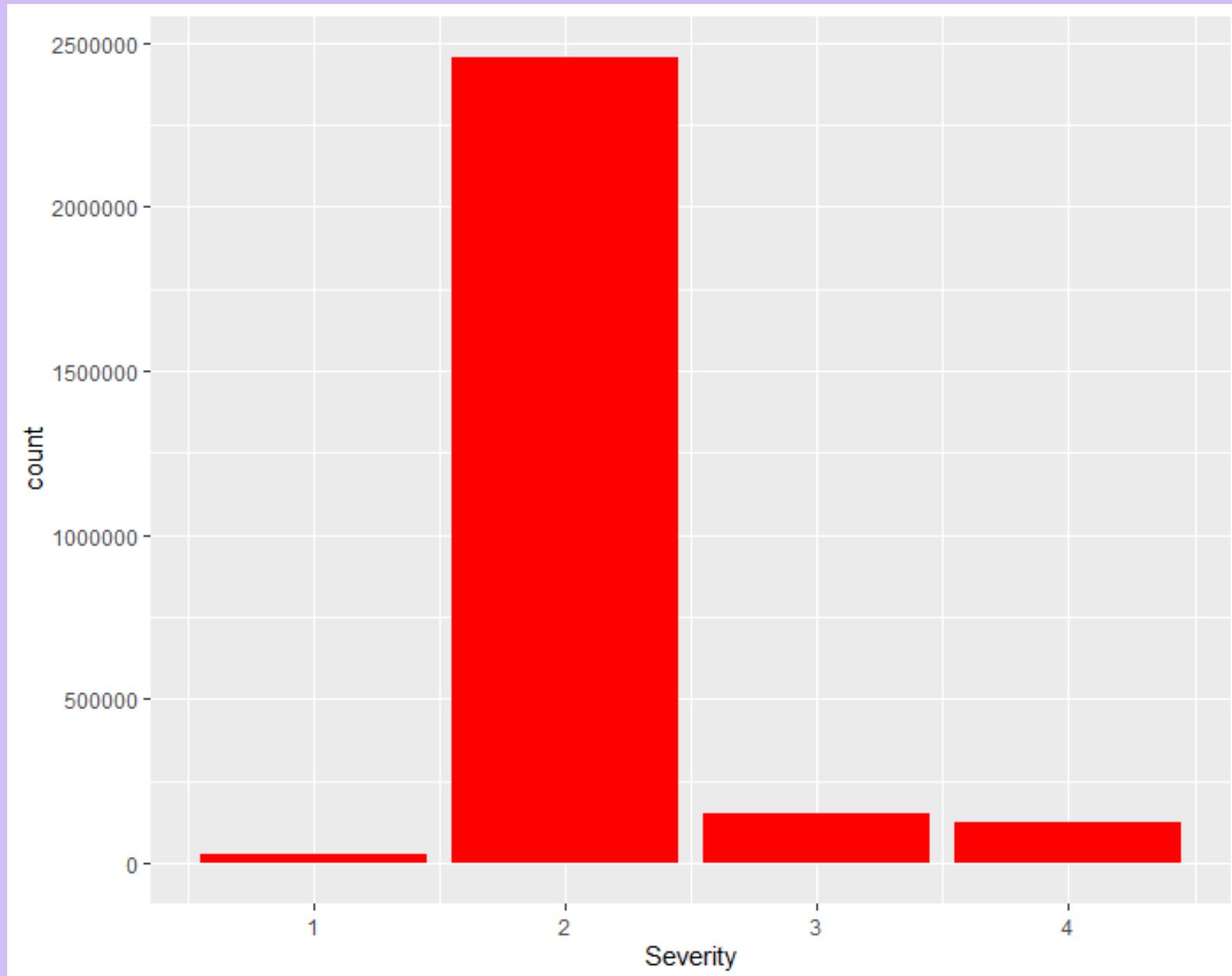


4

Data exploration and visualization



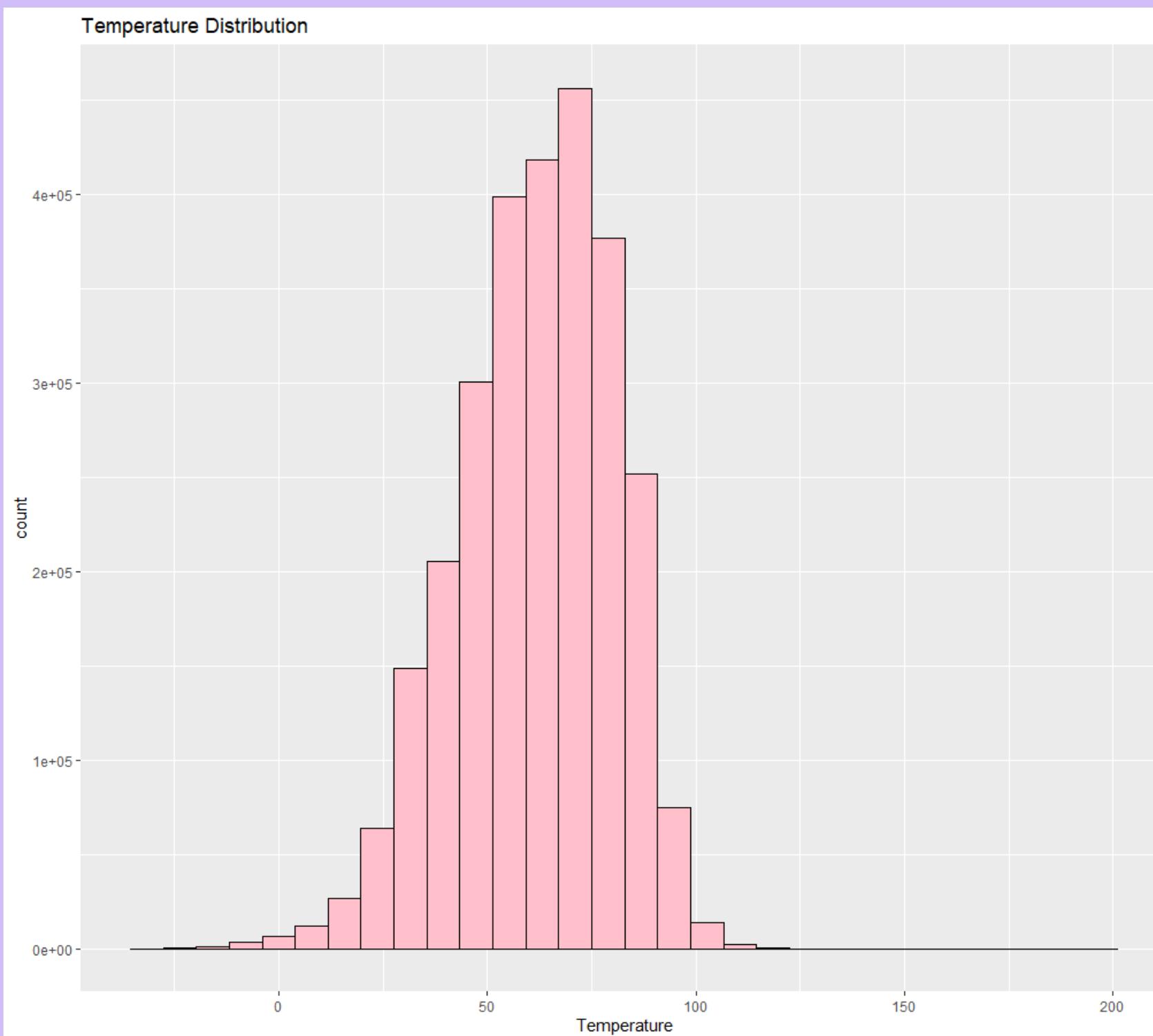
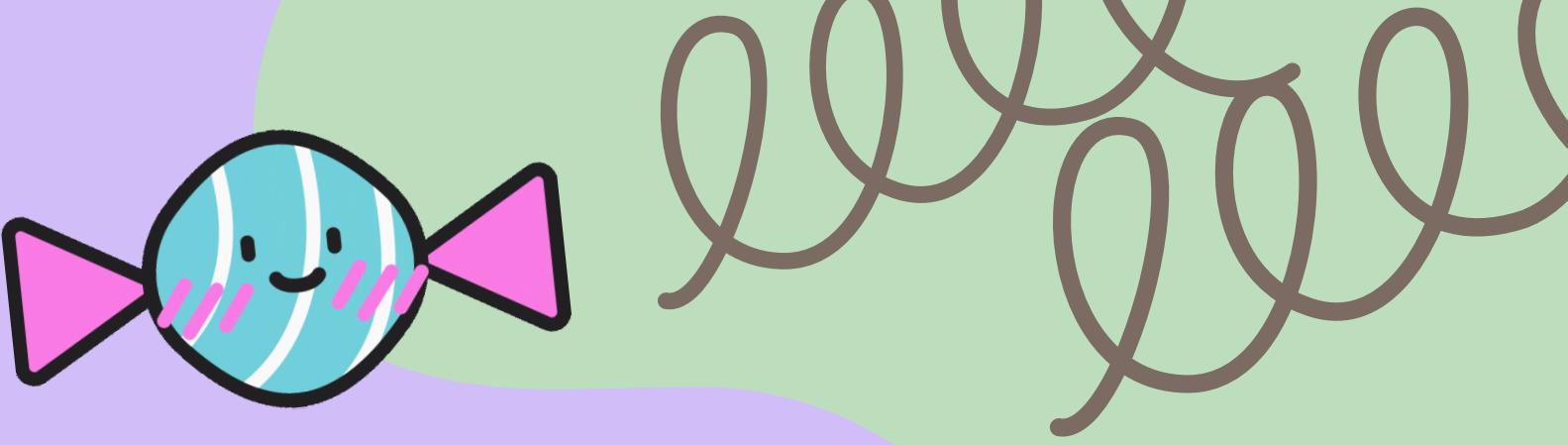
Data visualization



Severity

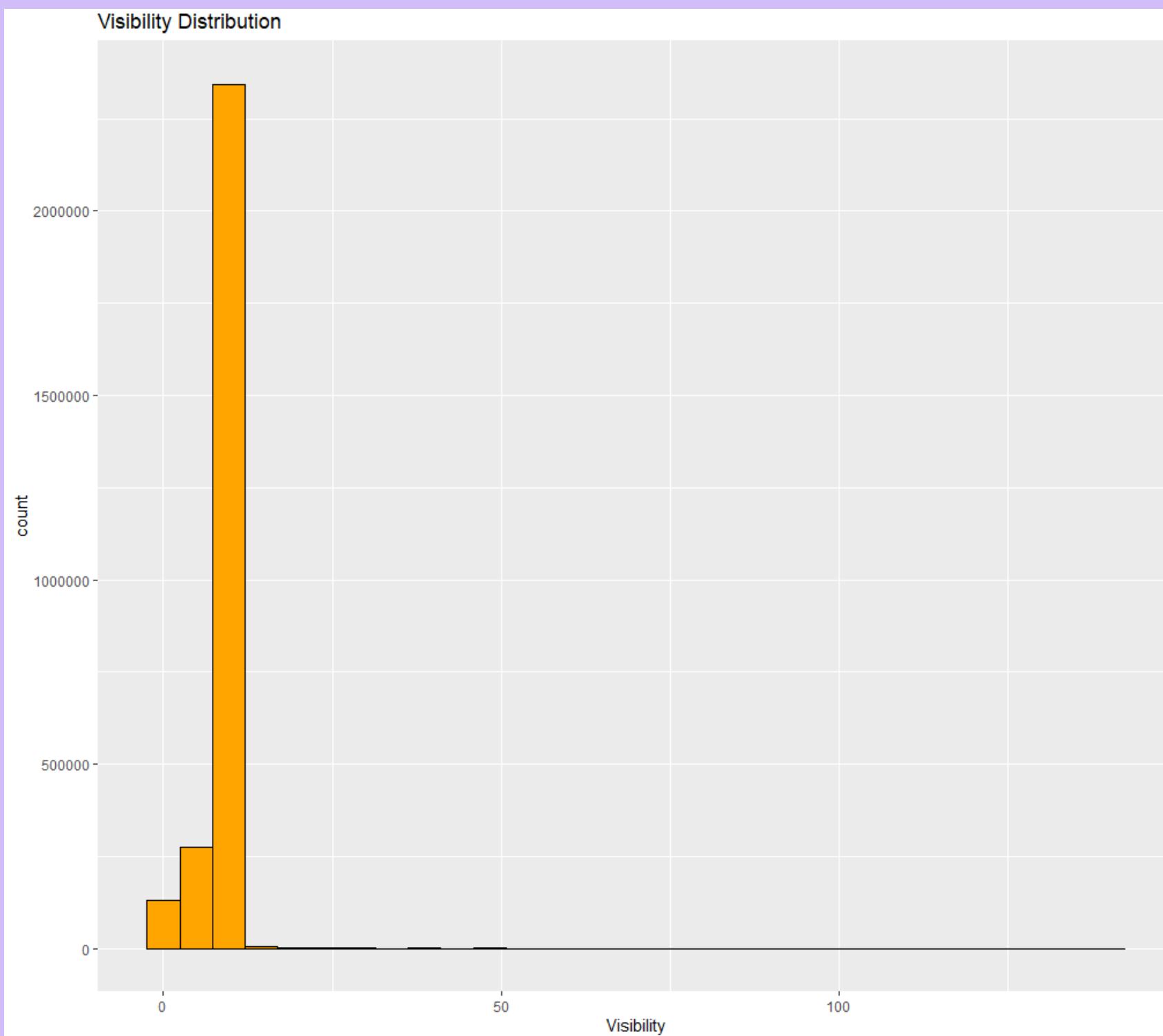
```
Min.    :1.000
1st Qu.:2.000
Median  :2.000
Mean    :2.137
3rd Qu.:2.000
Max.    :4.000
```

Data visualization



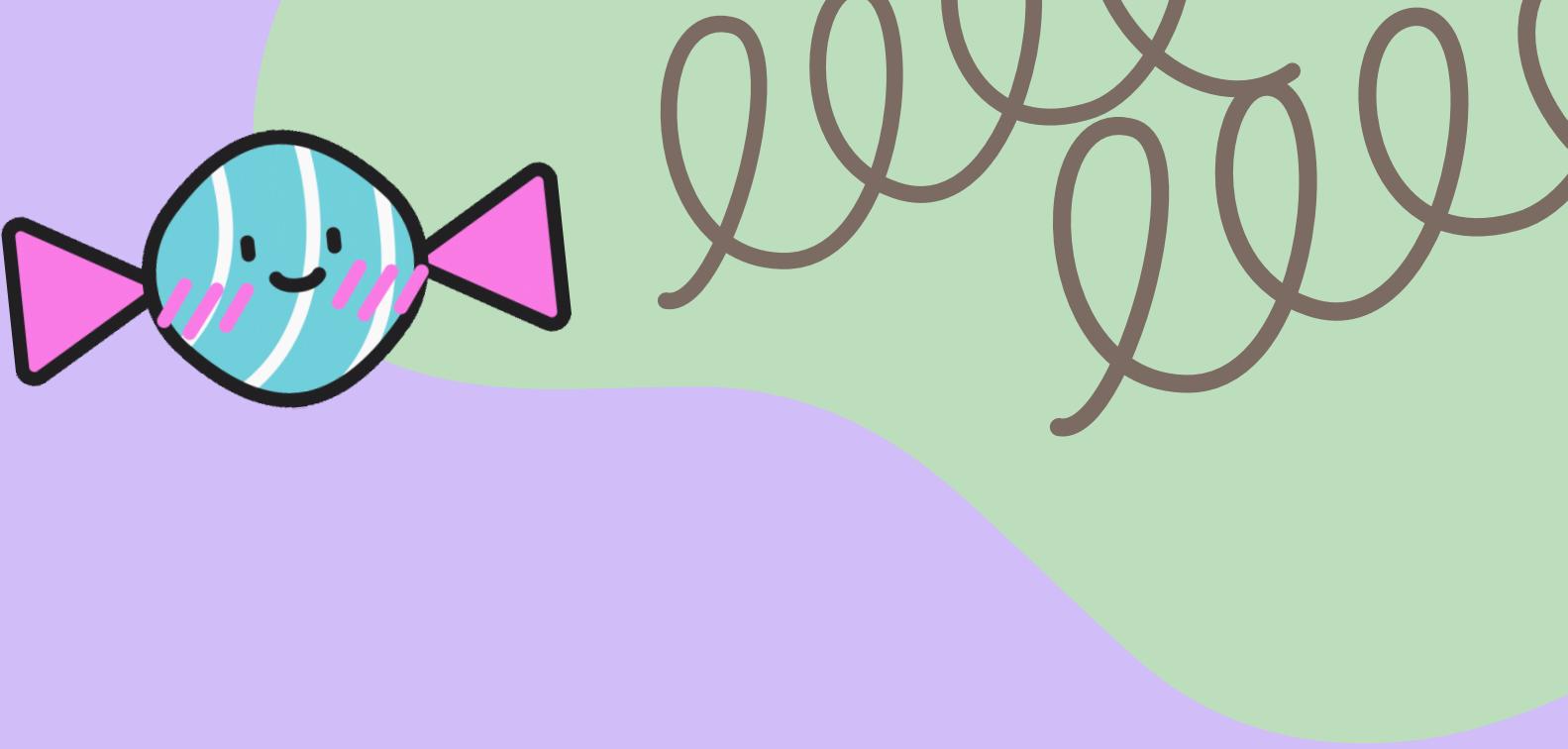
Temperature
Min. : -33.00
1st Qu. : 50.00
Median : 64.00
Mean : 61.82
3rd Qu. : 76.00
Max. : 196.00

Data visualization

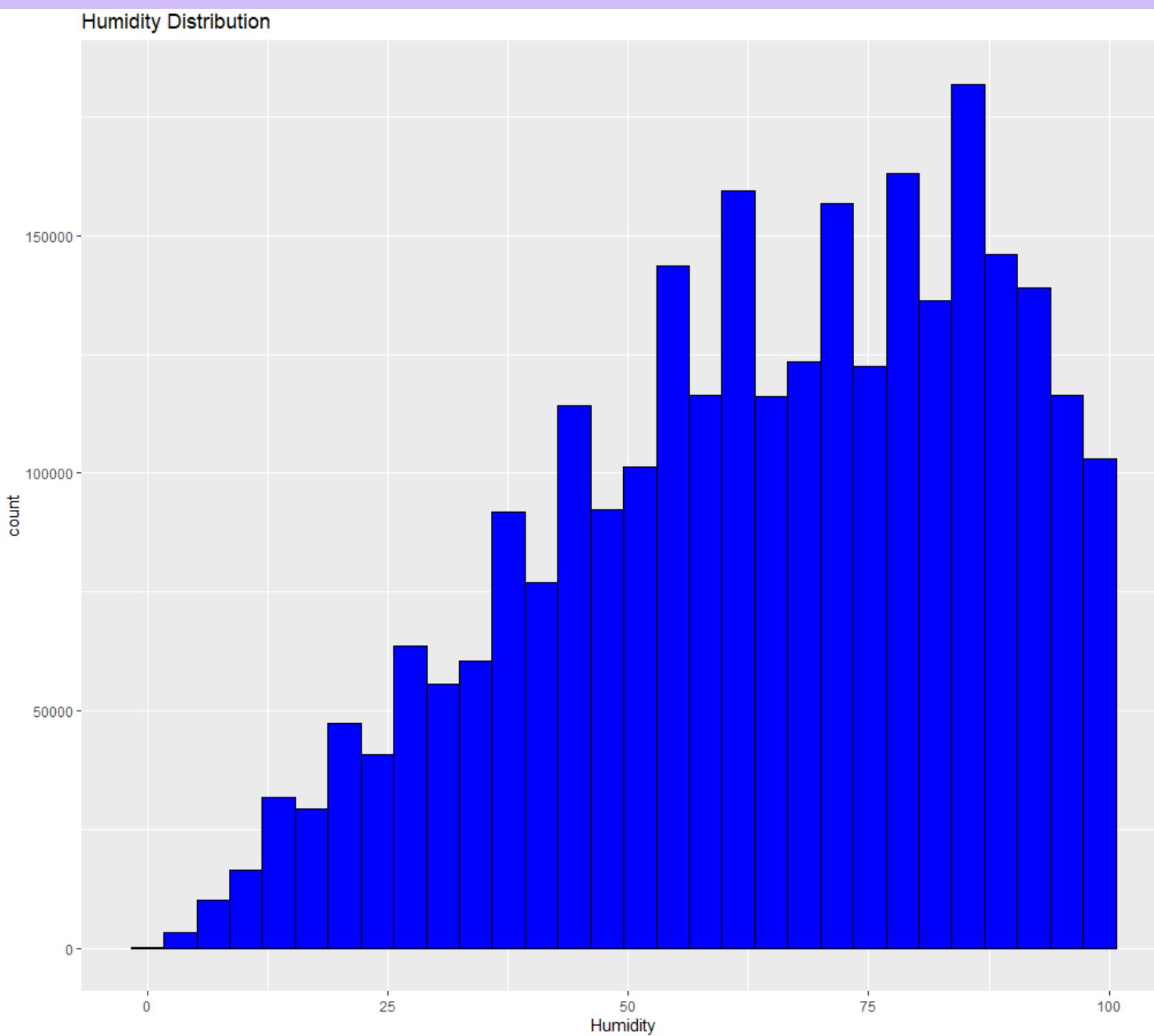


visibility

```
min. : 0.000
1st Qu.: 10.000
Median : 10.000
Mean   : 9.101
3rd Qu.: 10.000
Max.   :140.000
```



Data visualization

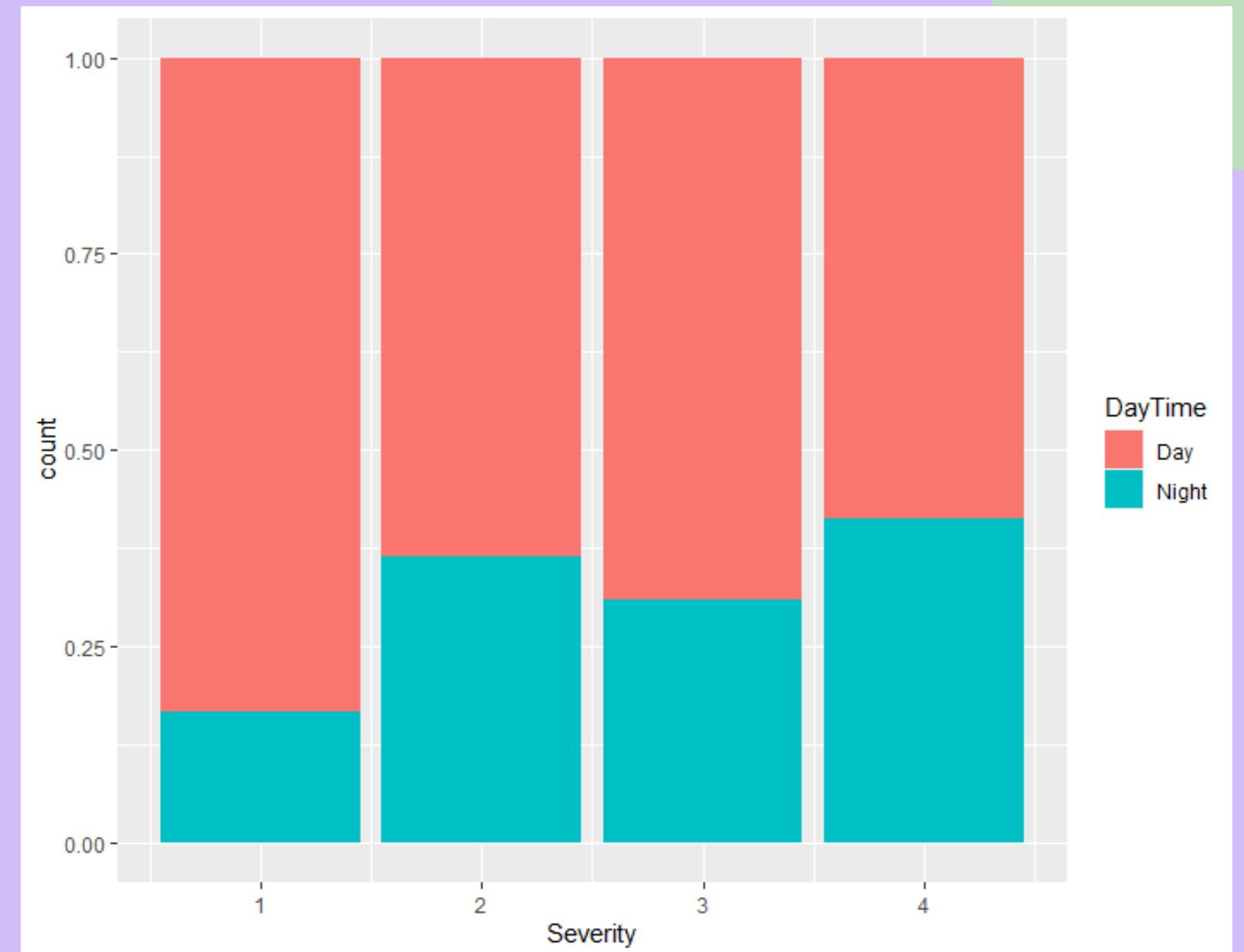
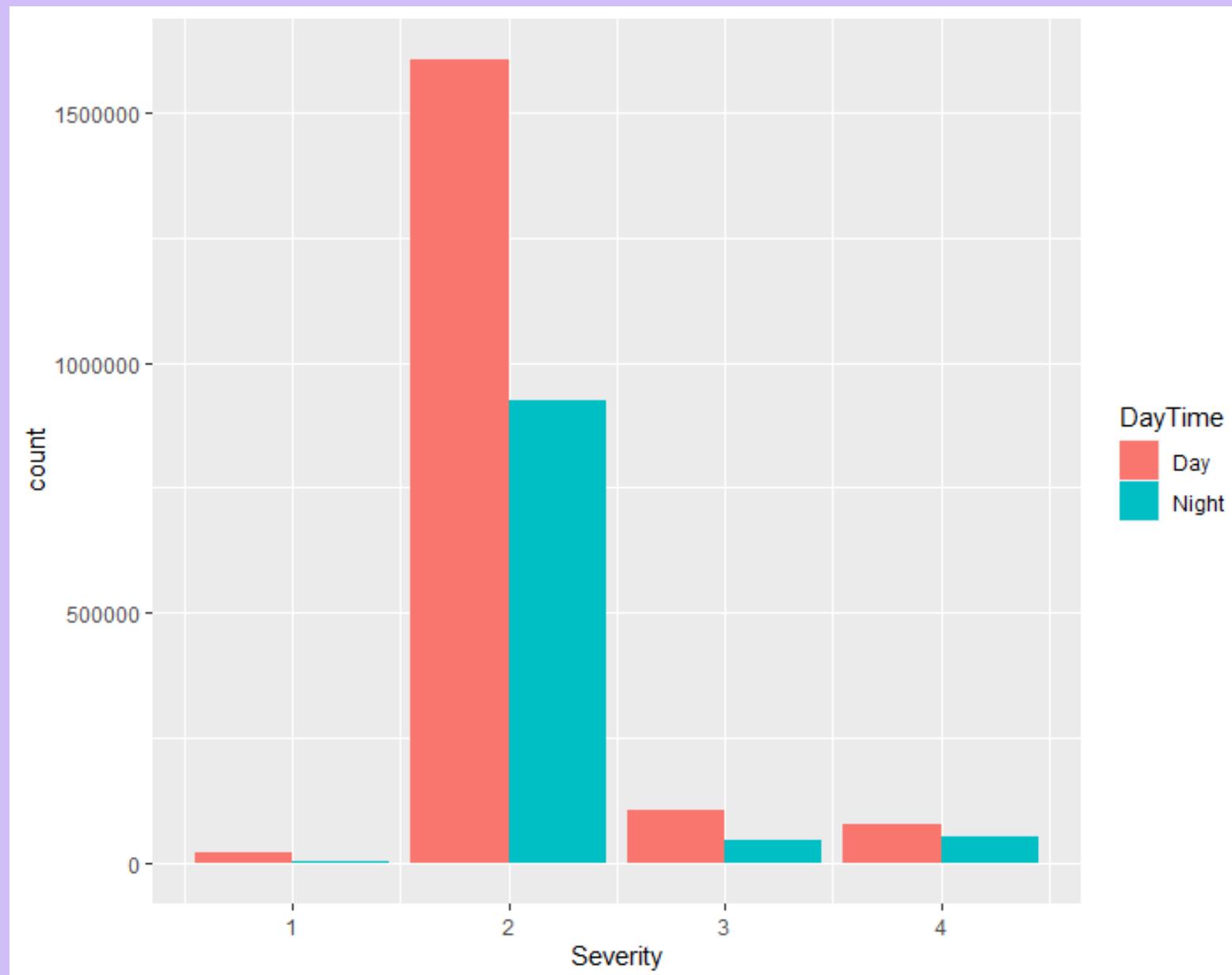


Humidity

Min.	: 1.00
1st Qu.	: 48.00
Median	: 67.00
Mean	: 64.35
3rd Qu.	: 83.00
Max.	: 100.00

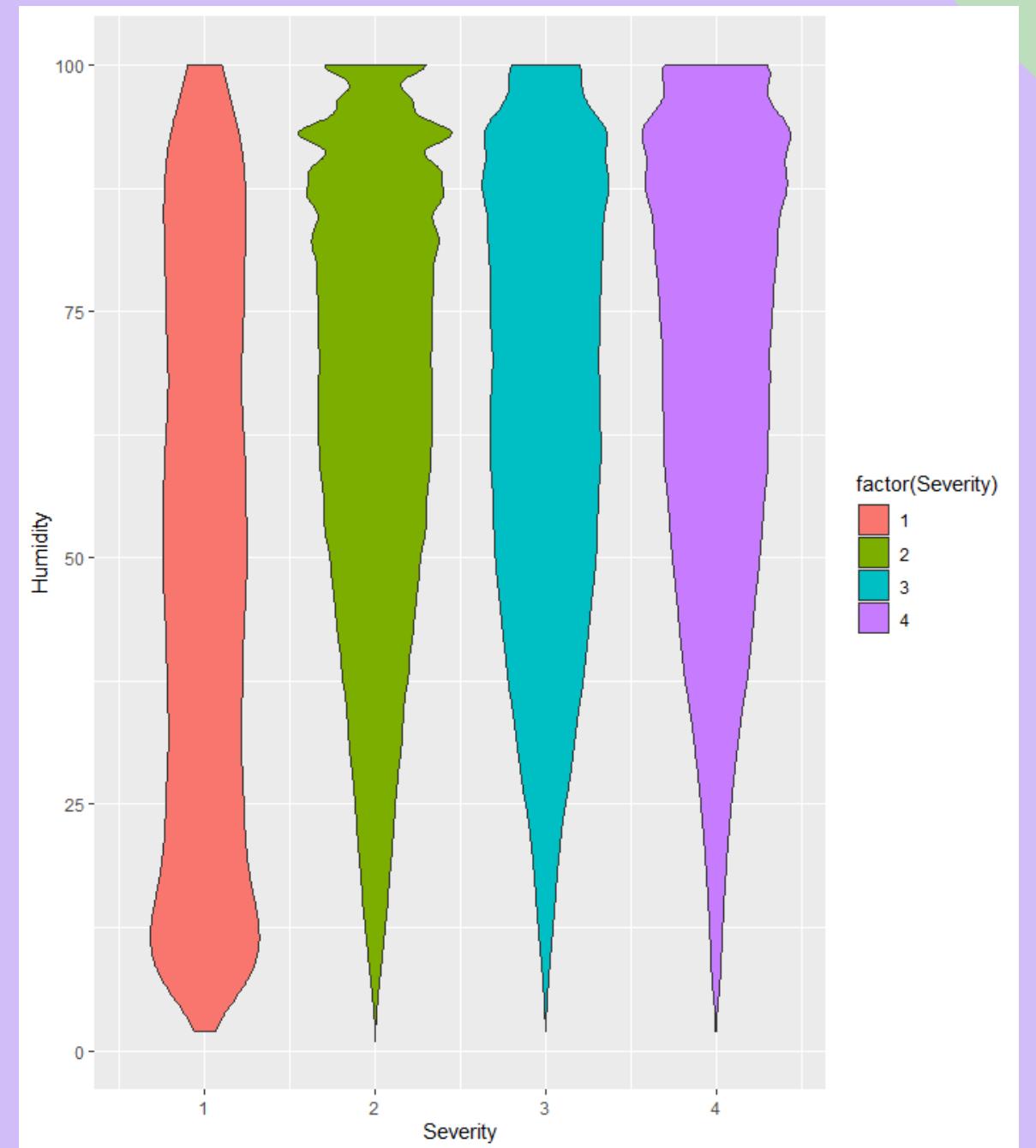
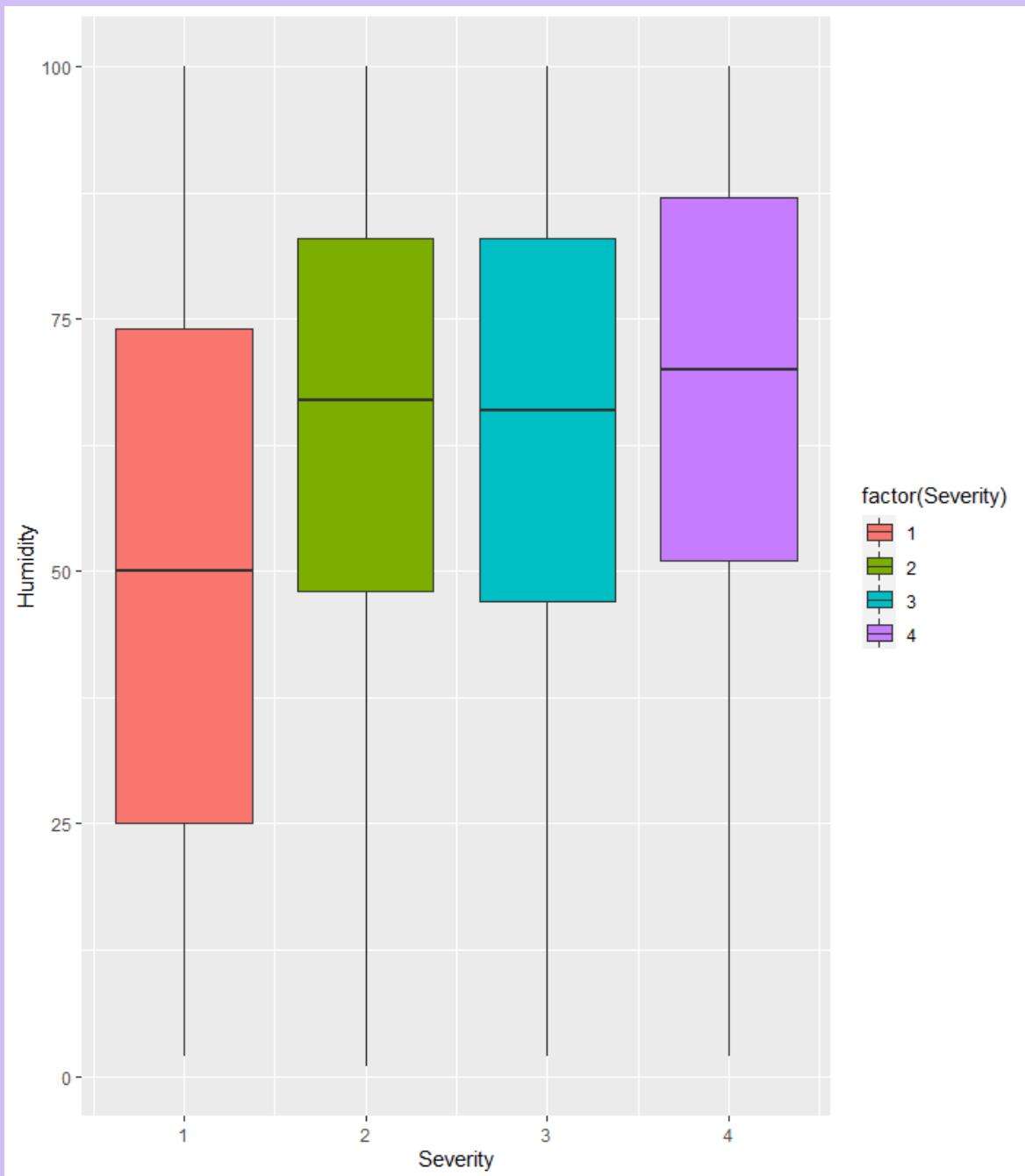
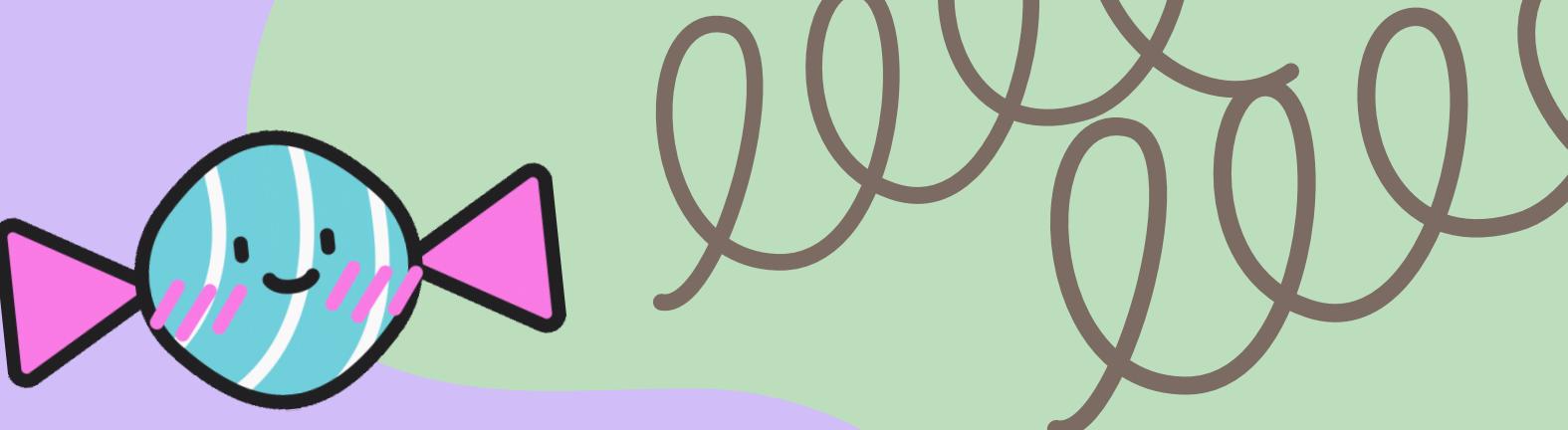


Data visualization



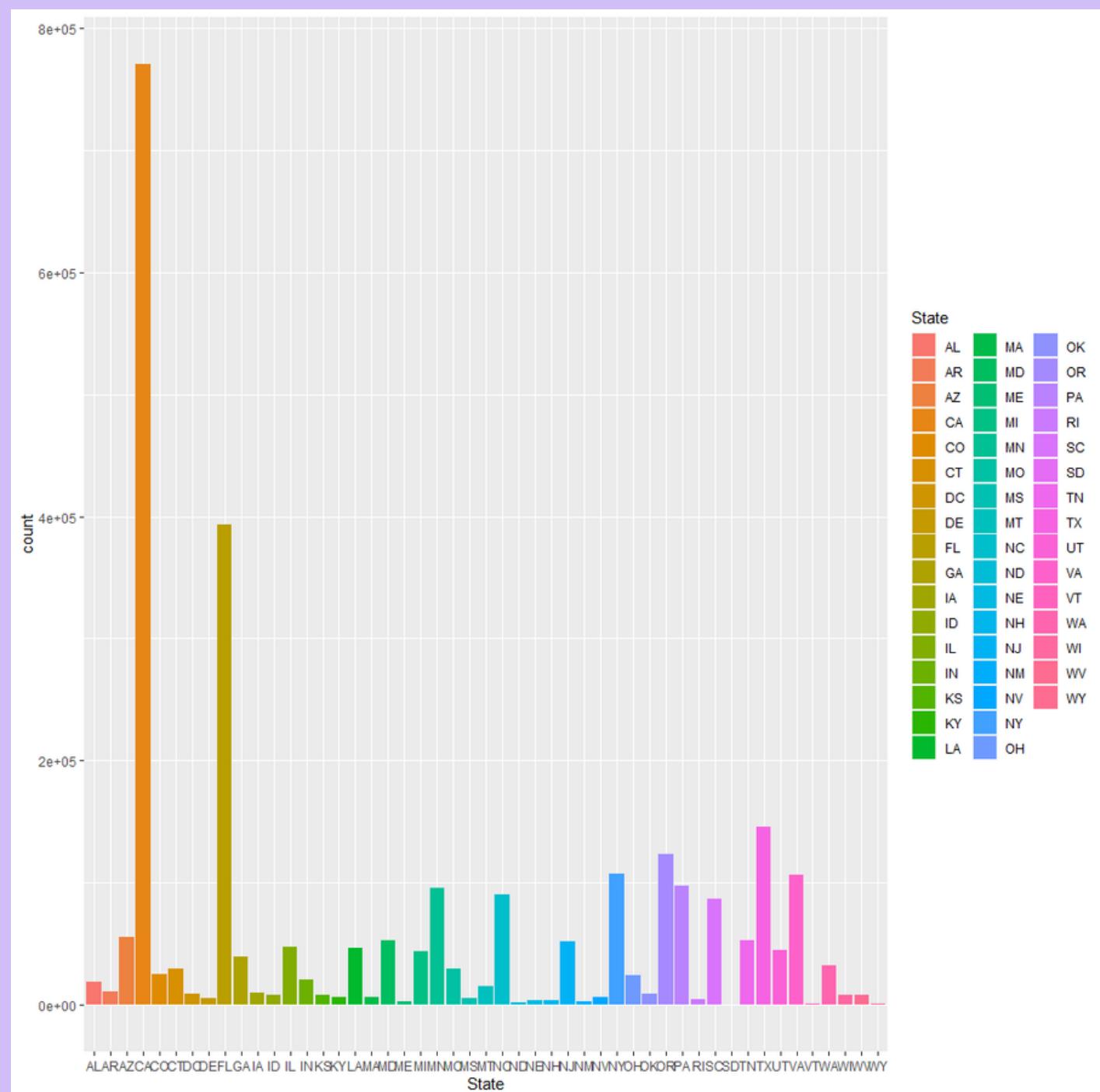
ระดับความรุนแรง กับ ช่วงการเกิดเหตุ

Data visualization



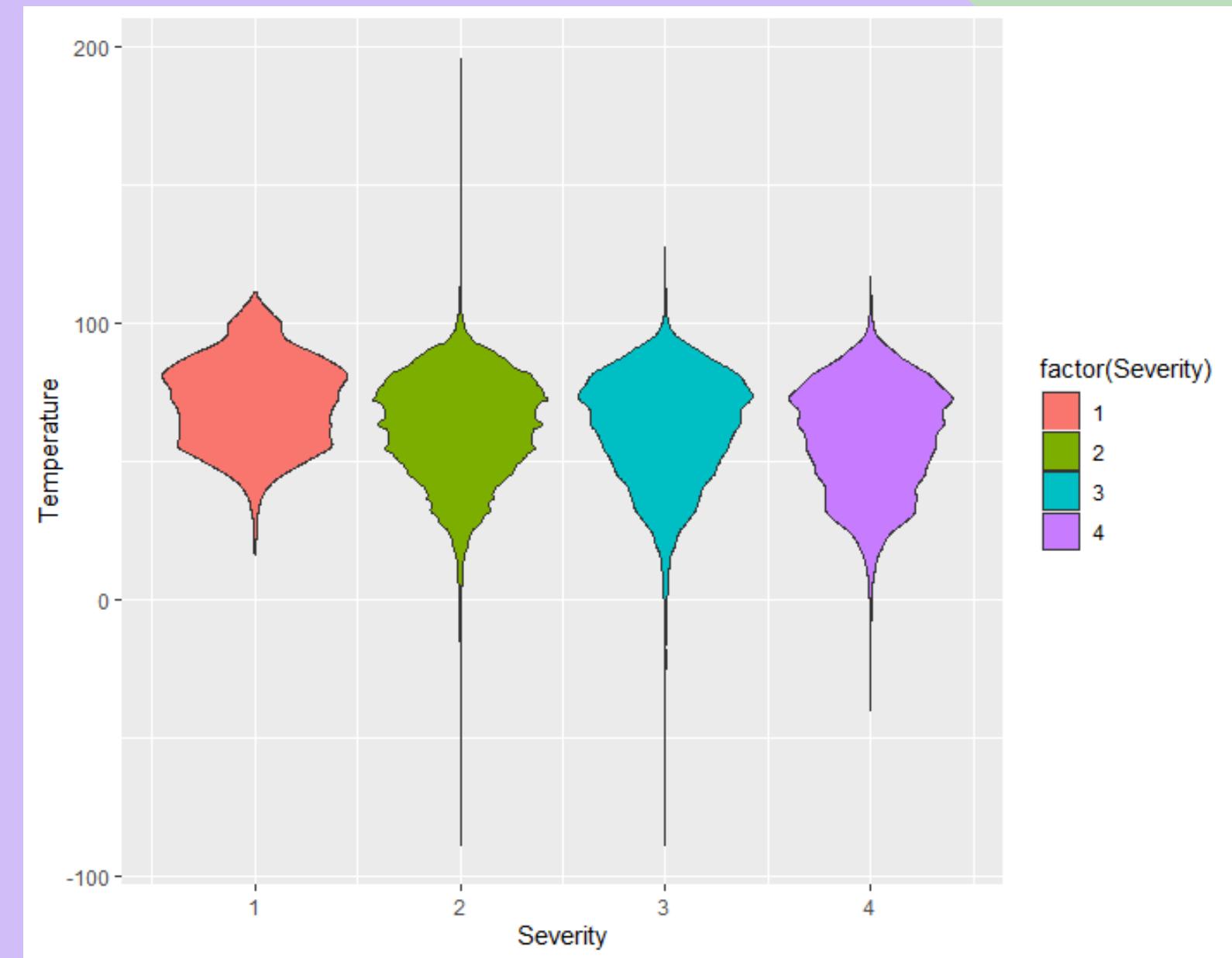
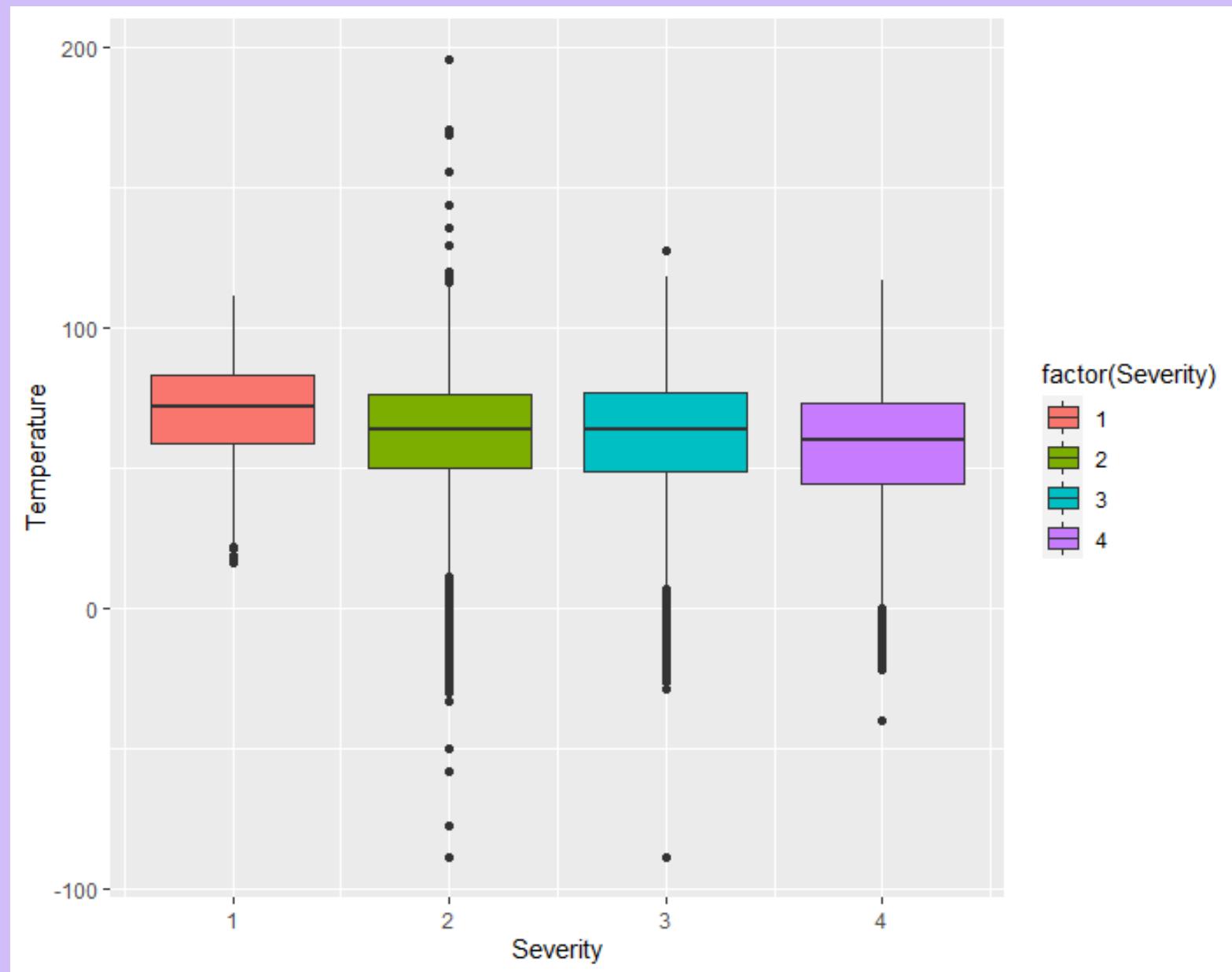
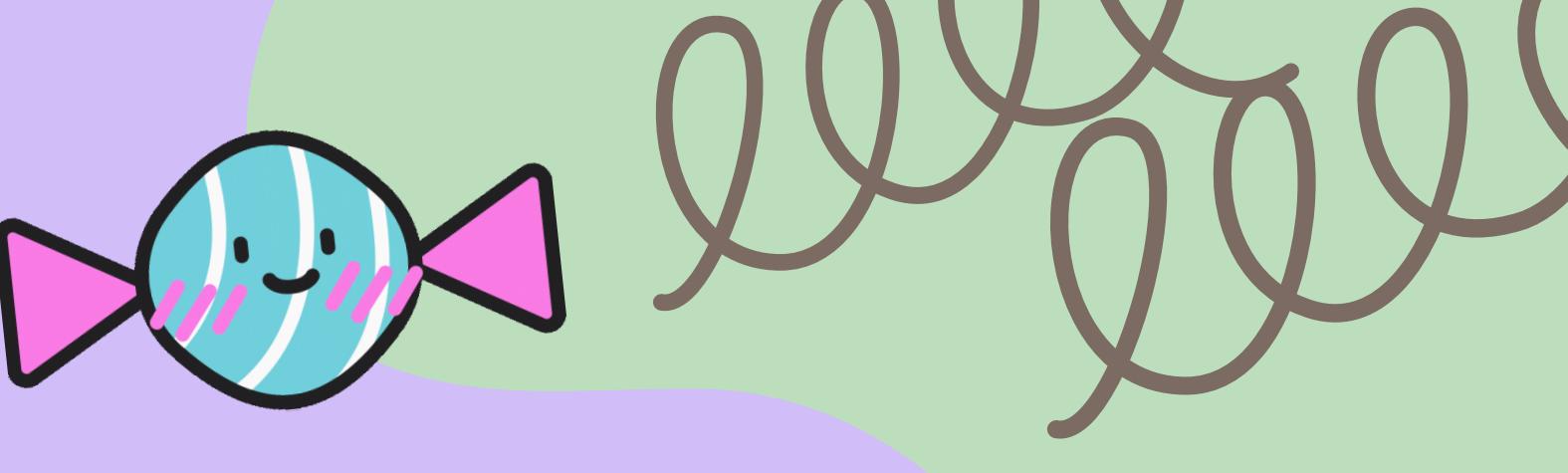
ระดับความรุนแรง กับ ความชื้น

Data visualization



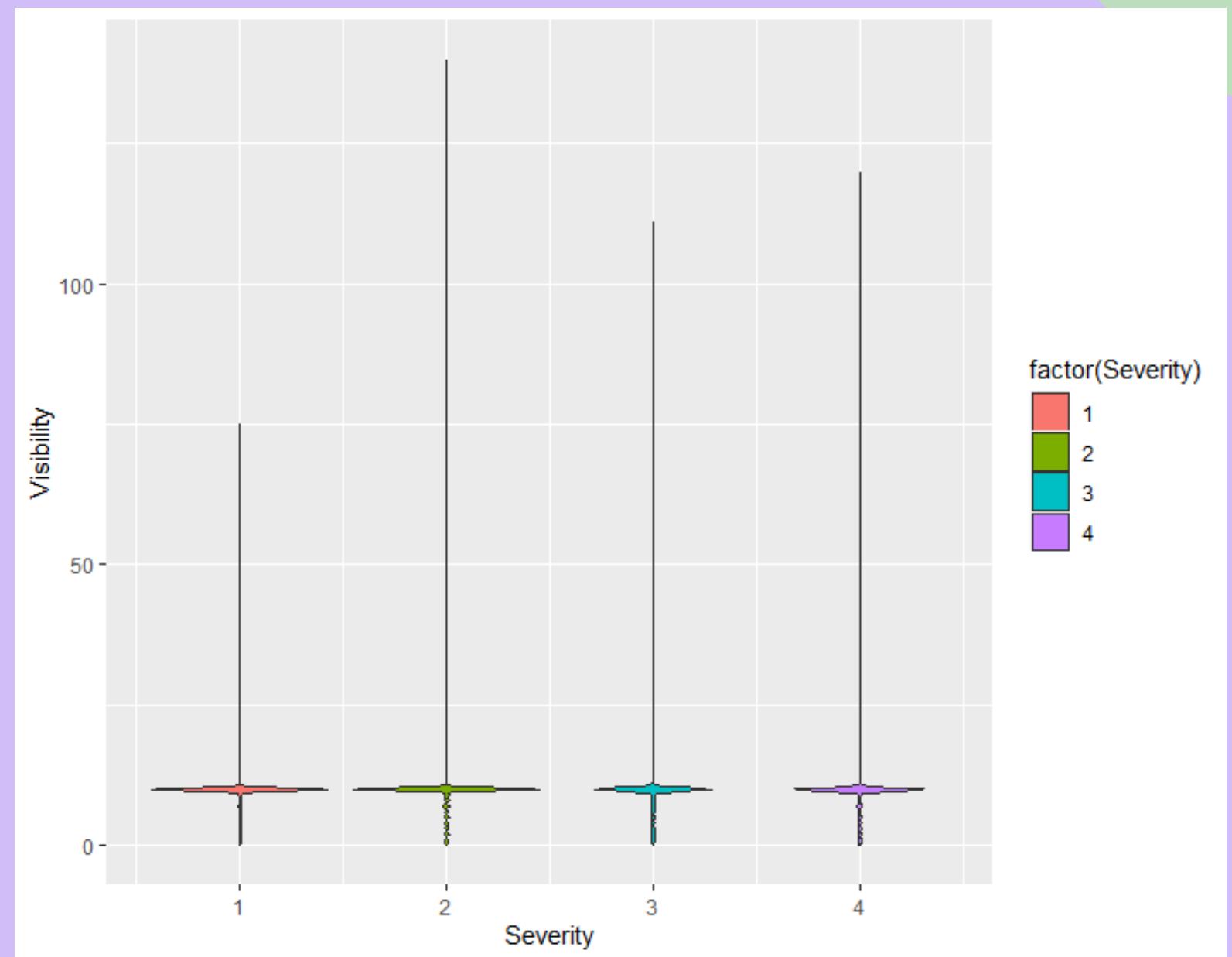
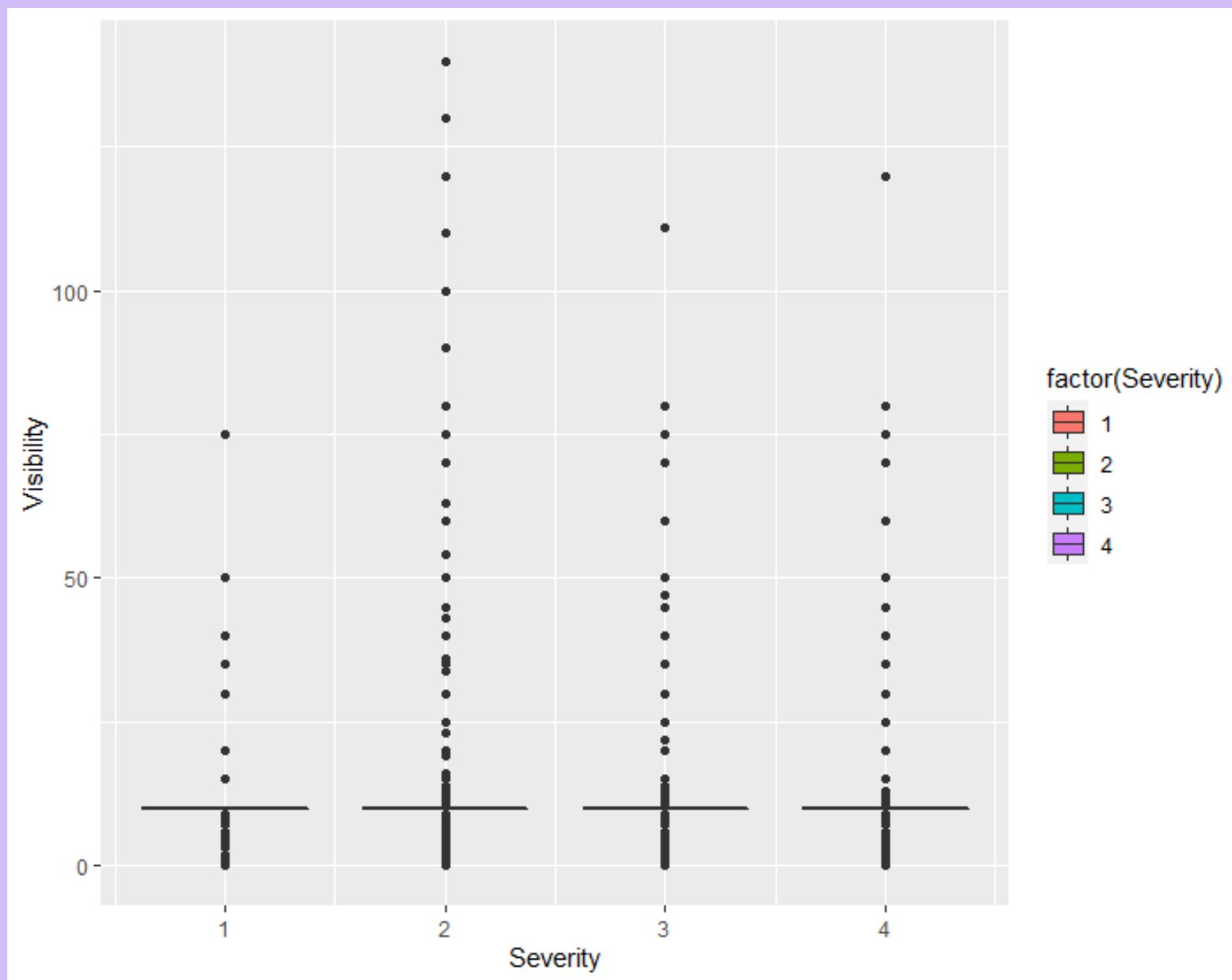
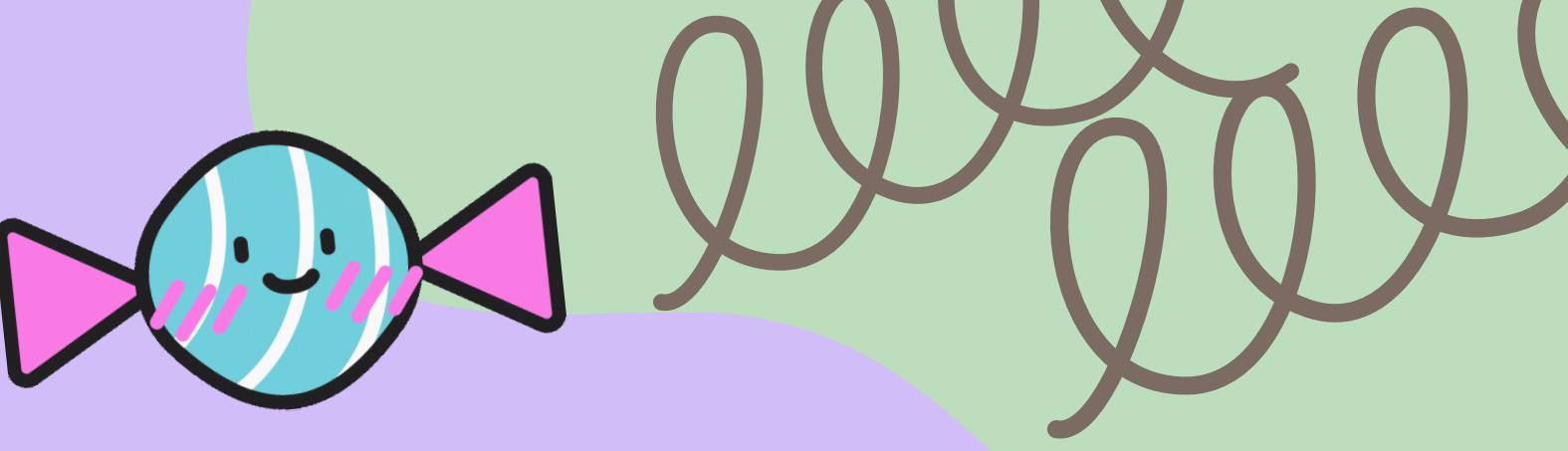
ឧបតិលក្ខក់កំណត់ខ្លួននូវរដ្ឋិស្ស ពារ៉ា

Data visualization



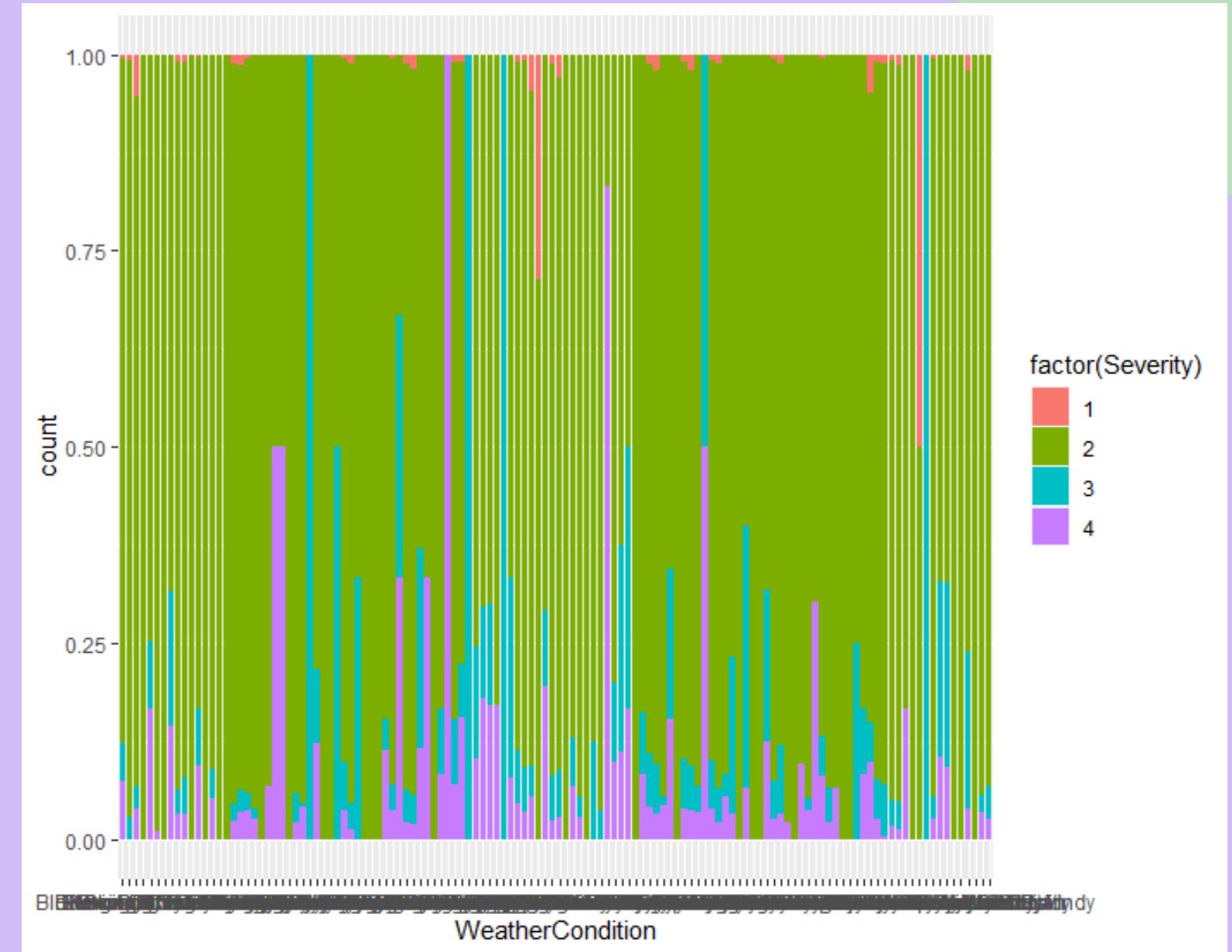
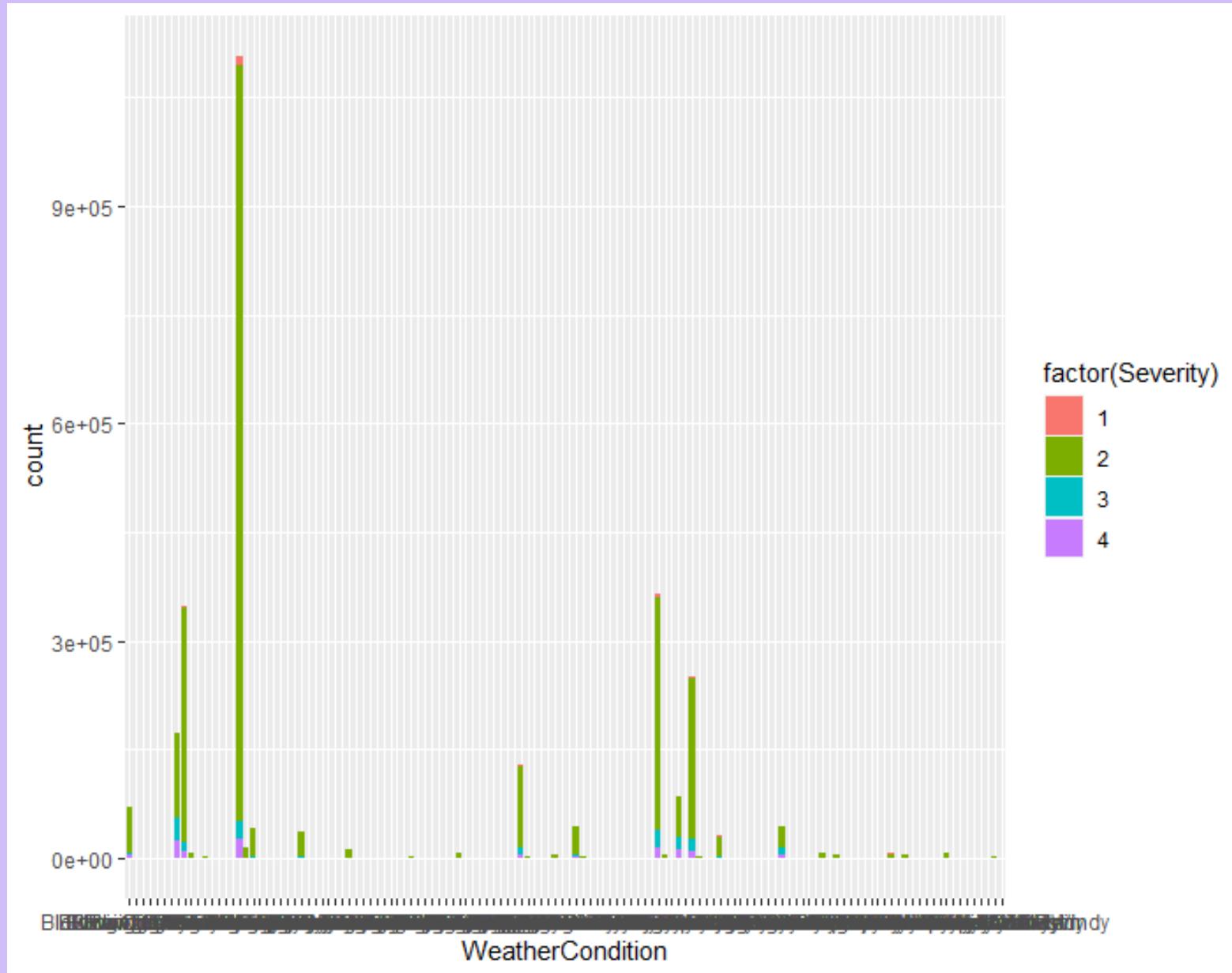
ระดับความรุนแรง กับ อุณหภูมิ

Data visualization



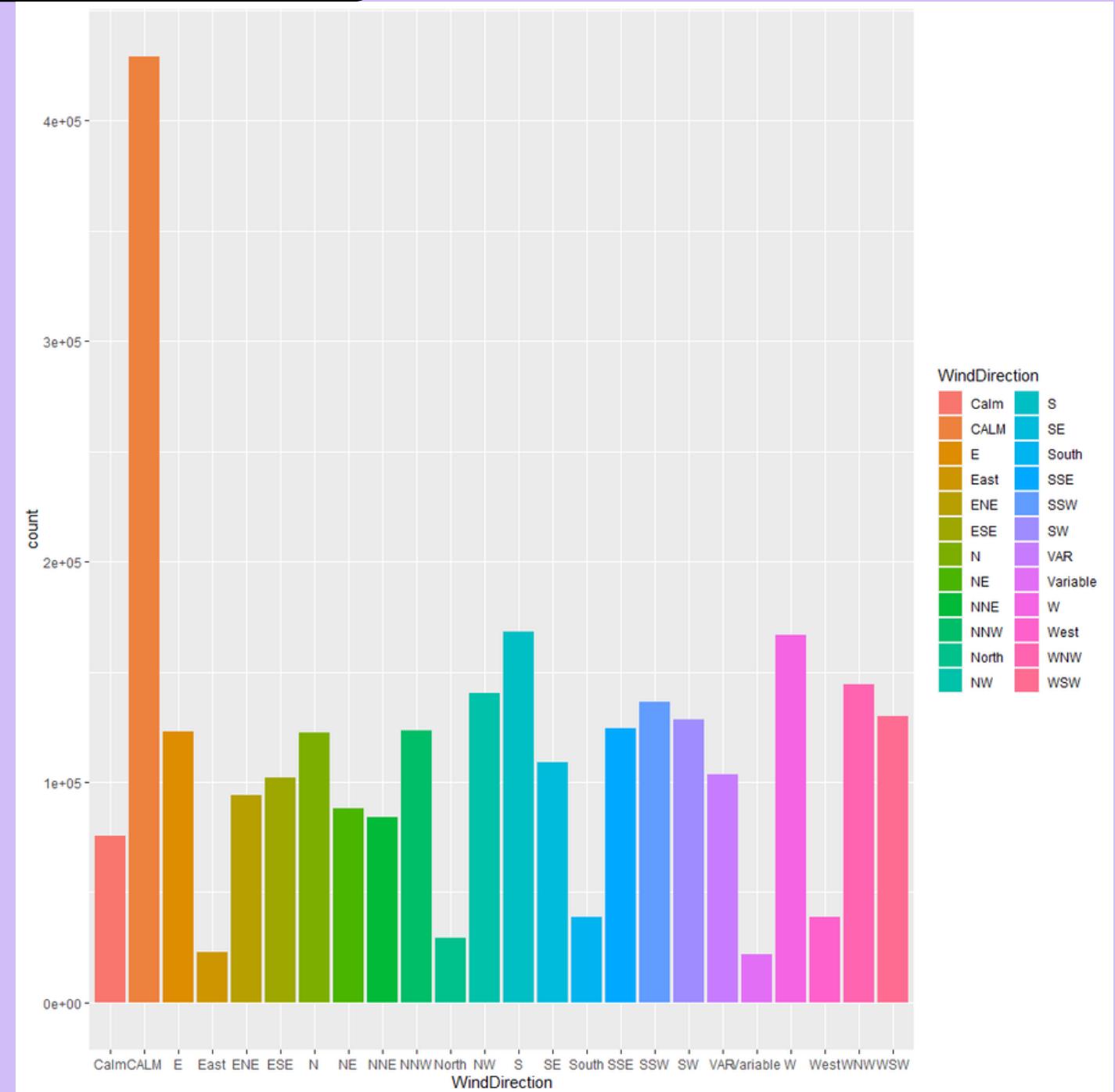
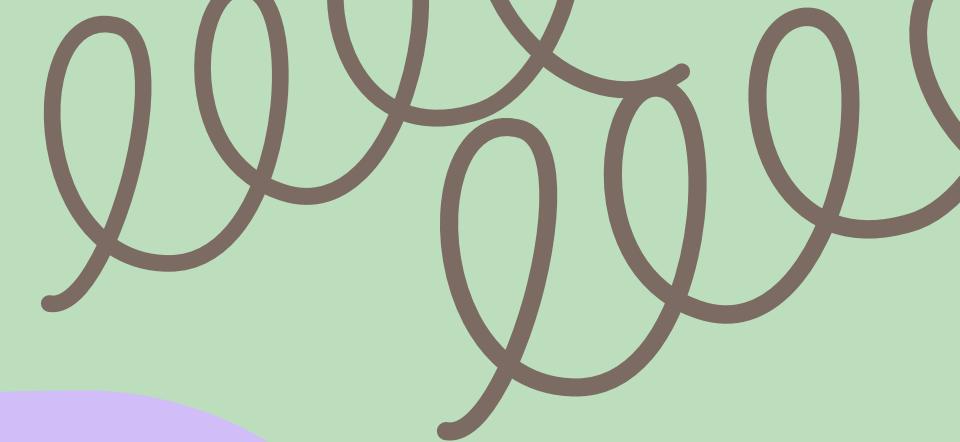
ຮະດັບຄວາມຮຸນແຮງ ກັບ ຮະຍະກາຣນອງເໜີນ

Data visualization



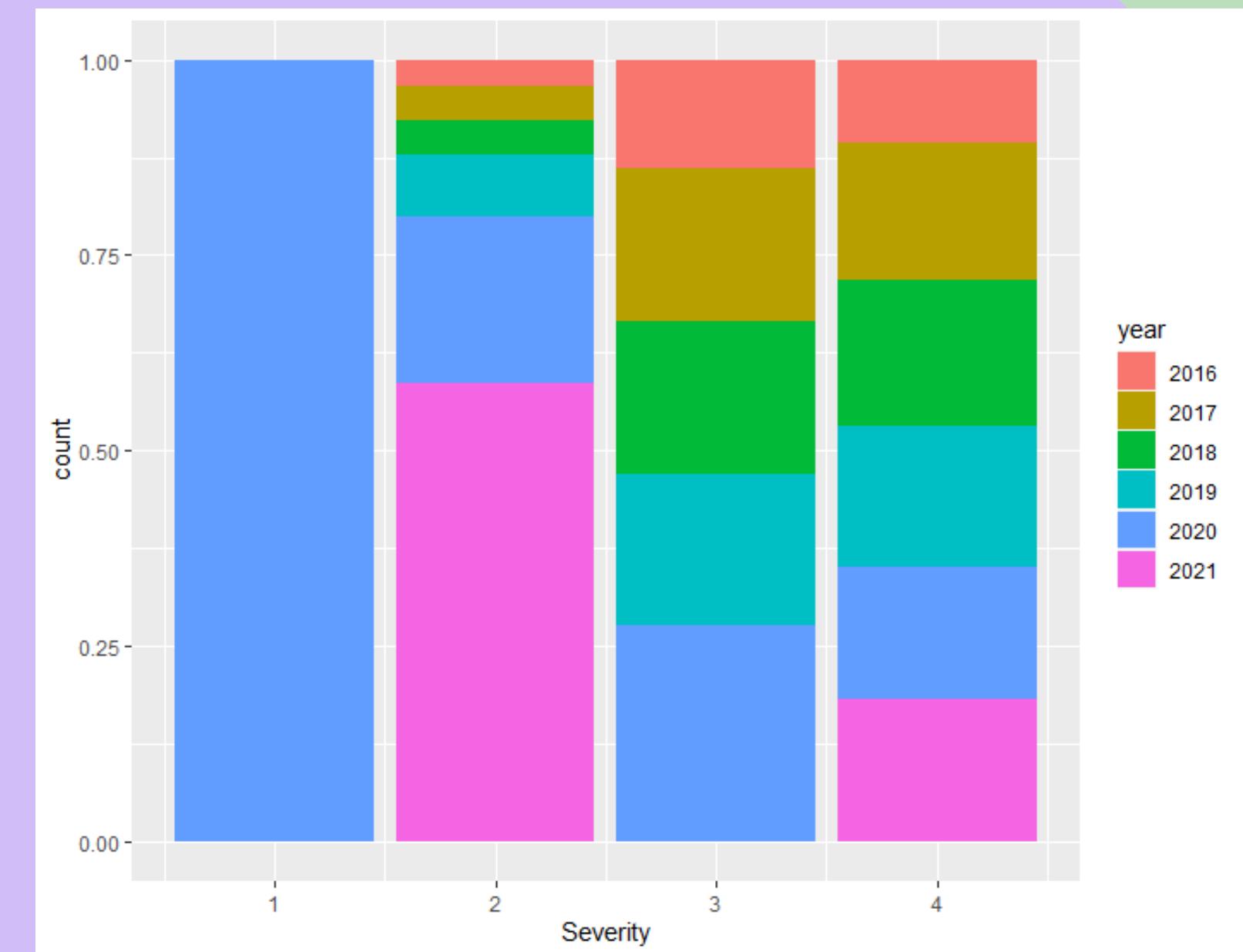
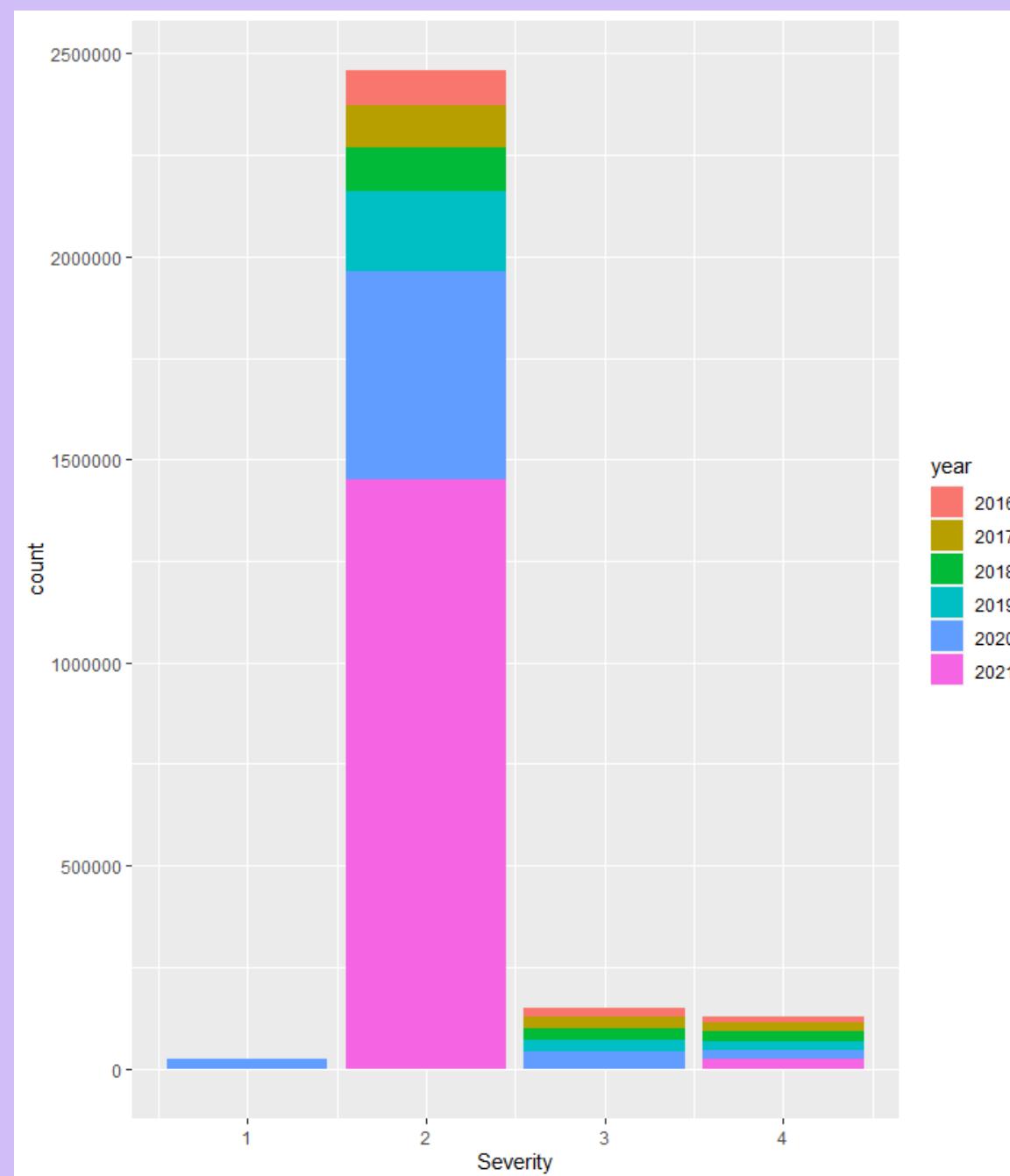
ระดับความรุนแรง กับ สภาพอากาศ

Data visualization



ຖົກສາງລວມ

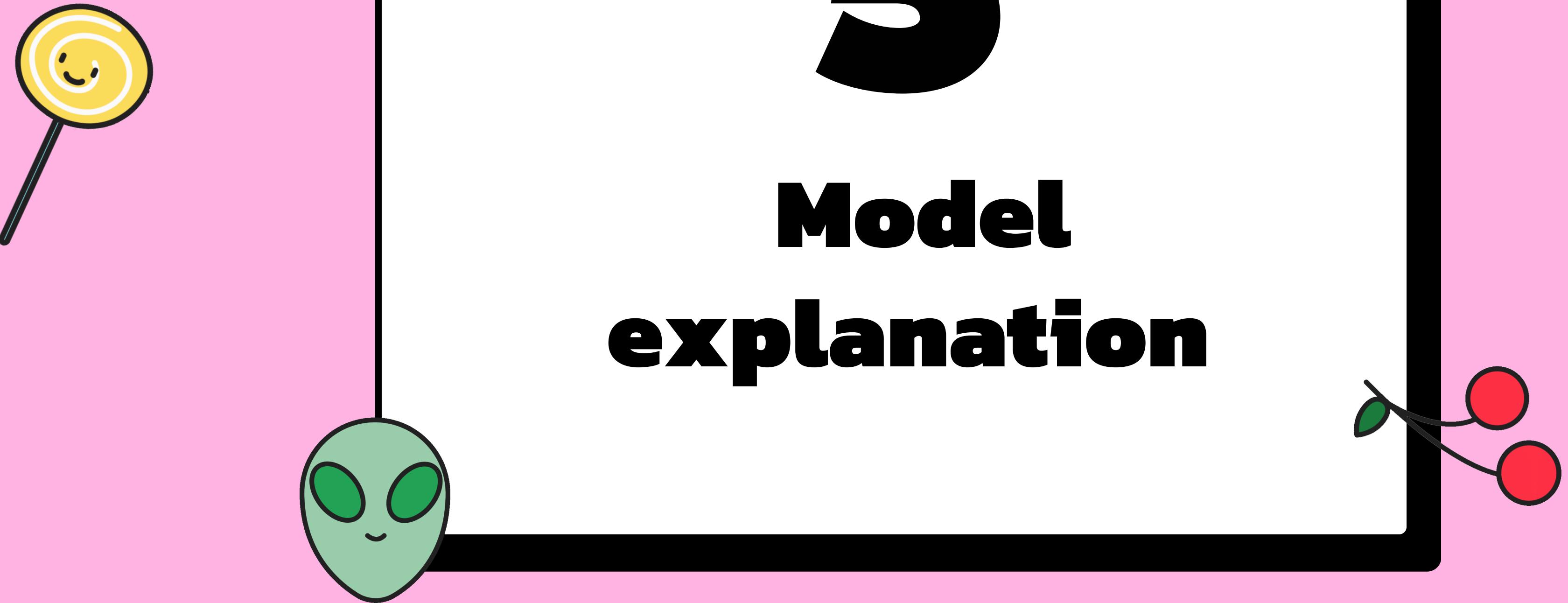
Data visualization



ระดับความรุนแรง กับ จำนวนอุบัติเหตุที่เกิดต่อปี

5

Model explanation



អ៊ូខាង

ផែនកម្ពស់បង្កើត Linear Model

```
library("ggpubr")
ggscatter(newData, x="Severity", y="visibility",
          add="reg.line", conf.int = TRUE,
          cor.coef = TRUE, cor.method = "pearson",
          xlab = "Severity", ylab="visibility")
```

```
call:
lm(formula = severity ~ visibility, data = ACC)

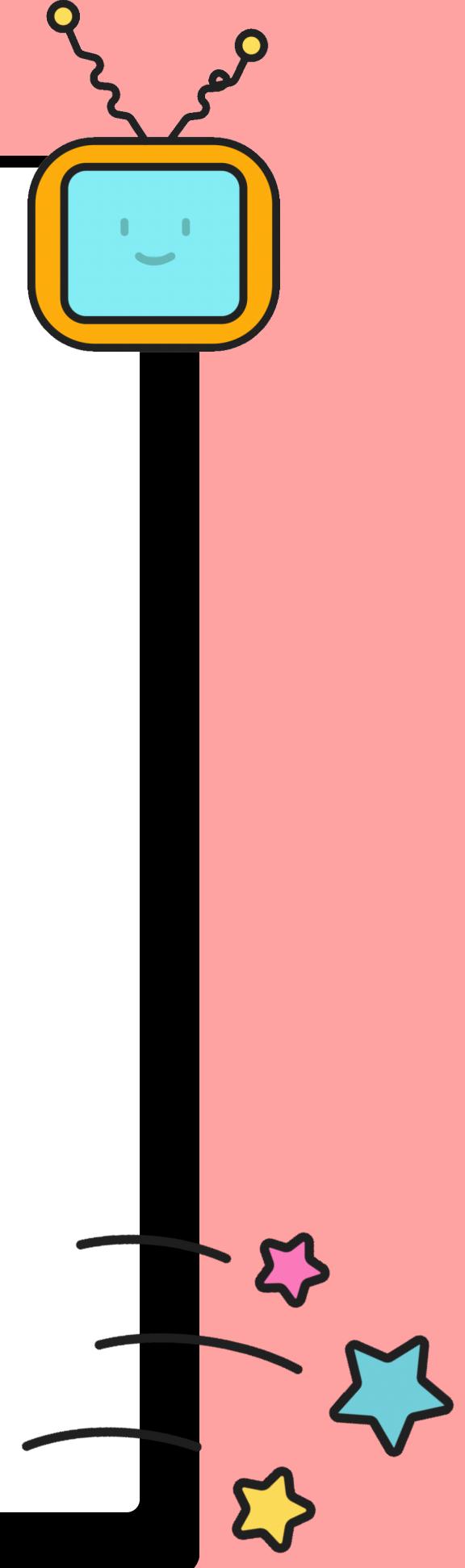
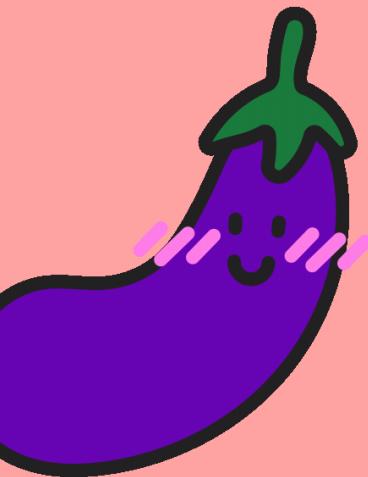
Residuals:
    Min      1Q  Median      3Q     Max 
-1.2220 -0.1378 -0.1378 -0.1365  1.8751 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.1248669  0.0010016 2121.44   <2e-16 ***
visibility  0.0012951  0.0001055   12.28   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

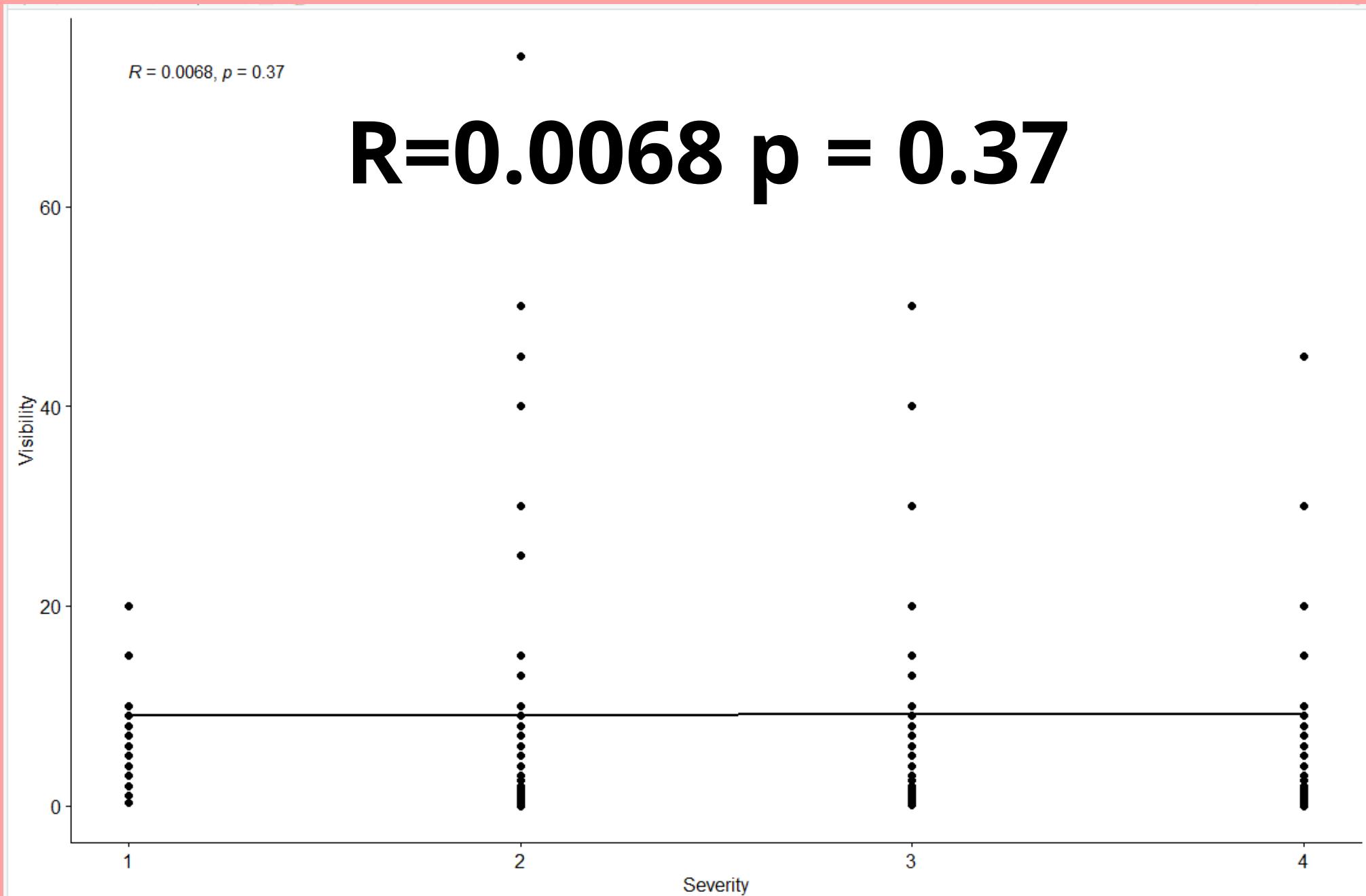
Residual standard error: 0.4775 on 2774794 degrees of freedom
(70546 observations deleted due to missingness)
Multiple R-squared:  5.434e-05, Adjusted R-squared:  5.398e-05 
F-statistic: 150.8 on 1 and 2774794 DF,  p-value: < 2.2e-16
```

6

Modeling implementation



Correlation



```
library("ggpubr")
ggscatter(newData, x="Severity", y="visibility",
          add="reg.line", conf.int = TRUE,
          cor.coef = TRUE, cor.method = "pearson",
          xlab = "Severity", ylab="visibility")
```



- กรณี Significant หรือ $p < .05$ หมายถึง ตัวแปรทั้งคู่มีความสัมพันธ์กัน
- มีเครื่องหมาย “-” อยู่ แสดงว่ามี ความสัมพันธ์เชิงลบ หรือตรงข้ามกัน
- ค่า r เข้าใกล้ 0 มีความสัมพันธ์กันน้อย หากค่าเข้าใกล้ 1 สัมพันธ์กันมาก
หากค่าเท่ากับ 1 คือ เป็นความประดิษฐ์ที่แน่นอน

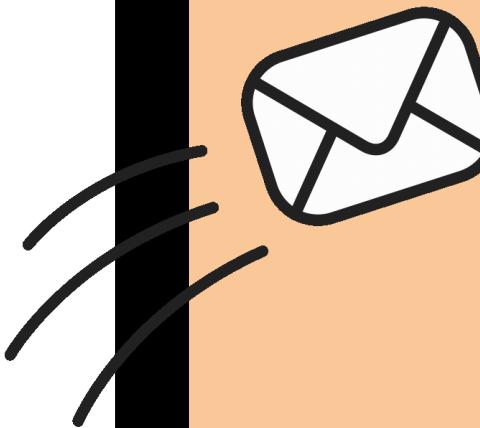
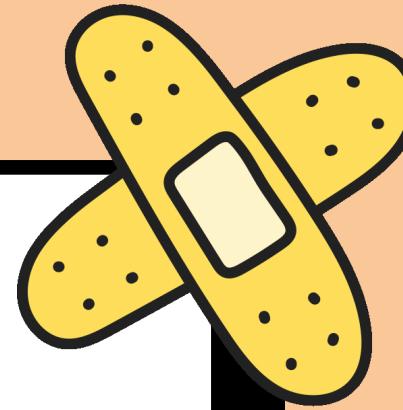
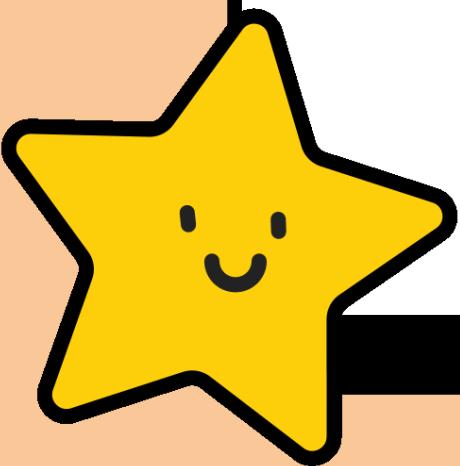


$$R=0.0068 \ p = 0.37$$

เมื่อใช้ฟังก์ชัน ggscatter Significant หรือ p ที่ได้ < 0.5 หมายความว่า ตัวแปรทั้งคู่ระหว่าง Visibility และ Severity มีความสัมพันธ์กันพอสมควร แต่หากใช้ฟังก์ชัน Linear Model ที่ได้ค่า R-square นั้น แสดงว่า ค่า visibility ส่งผลต่อการ Severity มาก

7

Evaluation



```
> model <- lm(Severity ~ Temperature*Humidity*visibility, data = ACC)
> summary(model)

Call:
lm(formula = Severity ~ Temperature * Humidity * visibility,
   data = ACC)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.8961 -0.1541 -0.1401 -0.1129  2.0316 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.031e+00 1.175e-02 172.841 < 2e-16 ***
Temperature -1.185e-03 1.691e-04 -7.011 2.36e-12 ***
Humidity    1.964e-03 1.412e-04 13.905 < 2e-16 ***
Visibility  2.509e-02 1.146e-03 21.887 < 2e-16 ***
Temperature:Humidity -8.817e-07 2.149e-06 -0.410 0.682  
Temperature:Visibility -1.554e-04 1.656e-05 -9.386 < 2e-16 ***
Humidity:Visibility -3.311e-04 1.430e-05 -23.153 < 2e-16 ***
Temperature:Humidity:visibility 3.021e-06 2.190e-07 13.791 < 2e-16 ***
---
Signif. codes:  0 '****' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4765 on 2759948 degrees of freedom
(85386 observations deleted due to missingness)
Multiple R-squared:  0.004146, Adjusted R-squared:  0.004144 
F-statistic: 1642 on 7 and 2759948 DF,  p-value: < 2.2e-16
```

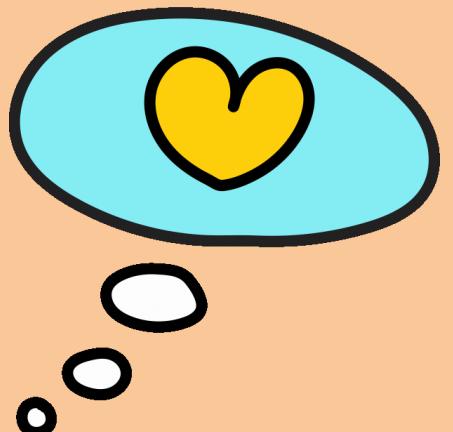
R-squared

หลังจากที่เราสร้าง model แล้ว

ทำการ summary เพื่อคำนวณค่าที่มีผลต่อ Severity ผลที่ได้มาค่า

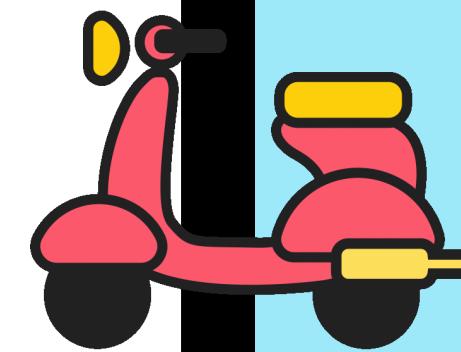
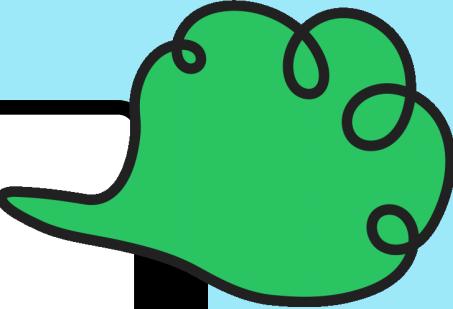
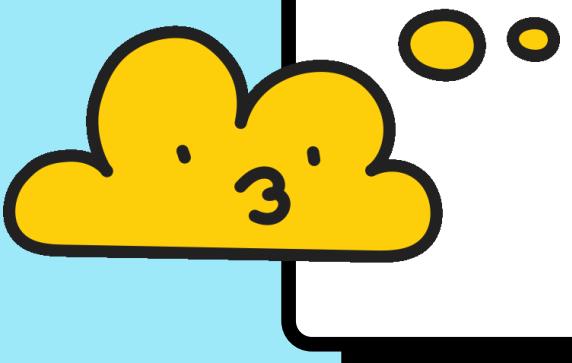
Adjusted R-squared = 0.004144

Multiple R-squared = 0.004146



8

Discussion Conclusion



```

> model <- lm(severity ~ Temperature, data = ACC)
> summary(model)

Call:
lm(formula = severity ~ Temperature, data = ACC)

Residuals:
    Min      1Q   Median      3Q      Max 
-1.1906 -0.1499 -0.1324 -0.1161  1.9270 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.2092491  0.0009939 2222.74 <2e-16 ***
Temperature -0.0011645  0.0000154   -75.61 <2e-16 *** 
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4779 on 2776066 degrees of freedom
(69274 observations deleted due to missingness)
Multiple R-squared:  0.002055, Adjusted R-squared:  0.002055 
F-statistic: 5717 on 1 and 2776066 DF, p-value: < 2.2e-16

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Call:
lm(formula = severity ~ Wind_Direction, data = ACC)

Residuals:
    Min      1Q   Median      3Q      Max 
-1.1537 -0.1406 -0.1303 -0.0647  1.9433 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.128119  0.001721 1236.611 <2e-16 ***
Wind_DirectionCalm 0.369032  0.002412 153.016 <2e-16 *** 
Wind_DirectionCALM -0.063418  0.001862 -34.067 <2e-16 *** 
Wind_DirectionE -0.056128  0.002174 -25.821 <2e-16 *** 
Wind_DirectionEast 0.362430  0.003523 102.872 <2e-16 *** 
Wind_DirectionENE 0.012491  0.002295  5.443 5.24e-08 *** 
Wind_DirectionESE 0.005462  0.002256  2.421 0.01550 *  
Wind_DirectionN -0.052105  0.002175 -23.957 <2e-16 *** 
Wind_DirectionNE 0.022934  0.002329  9.847 <2e-16 *** 
Wind_DirectionNNE 0.025532  0.002352 10.855 <2e-16 *** 
Wind_DirectionNNW 0.009692  0.002171  4.464 8.06e-06 *** 
Wind_DirectionNorth 0.350152  0.003052 114.713 <2e-16 *** 
Wind_DirectionNW 0.002166  0.002123  1.020 0.30769 
Wind_DirectionS -0.047733  0.002061 -23.157 <2e-16 *** 
Wind_DirectionSE 0.007254  0.002226  3.258 0.00112 ** 
Wind_DirectionSouth 0.317216  0.002922 108.556 <2e-16 *** 
Wind_DirectionSSE 0.016269  0.002168  7.502 6.27e-14 *** 
Wind_DirectionSSW 0.017282  0.002134  8.099 5.53e-16 *** 
Wind_DirectionSW 0.014852  0.002158  6.883 5.85e-12 *** 
Wind_DirectionVAR -0.071449  0.002249 -31.767 <2e-16 *** 
Wind_DirectionVariable 0.242613  0.003576  67.837 <2e-16 *** 
Wind_DirectionW -0.064358  0.002065 -31.169 <2e-16 *** 
Wind_DirectionWest 0.294165  0.002921 100.721 <2e-16 *** 
Wind_DirectionWNW 0.008541  0.002114  4.041 5.33e-05 *** 
Wind_DirectionWSW 0.002168  0.002152  1.007 0.31378 

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4674 on 2845317 degrees of freedom
Multiple R-squared:  0.04662, Adjusted R-squared:  0.04661 
F-statistic: 5798 on 24 and 2845317 DF, p-value: < 2.2e-16

```

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Call:
lm(formula = Severity ~ Humidity, data = ACC)

Residuals:
    Min      1Q   Median      3Q      Max 
-1.1654 -0.1512 -0.1362 -0.1180  1.9120 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.086e+00 8.573e-04 2433.80 <2e-16 *** 
Humidity    7.905e-04 1.255e-05   62.99 <2e-16 *** 
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.478 on 2772248 degrees of freedom
(73092 observations deleted due to missingness)
Multiple R-squared:  0.001429, Adjusted R-squared:  0.001429 
F-statistic: 3967 on 1 and 2772248 DF, p-value: < 2.2e-16

```

```

Call:
lm(formula = severity ~ weather_condition, data = ACC)

Residuals:
    Min      1Q   Median      3Q      Max 
-1.66667 -0.14087 -0.08706 -0.05982  1.97674 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.175916  0.001741 1249.747 <2e-16 *** 
weather_conditionBlowing dust -0.154789  0.038871  -3.982 6.83e-05 *** 
weather_conditionBlowing dust / windy -0.121862  0.038076  -3.200 0.001372 ** 
weather_conditionBlowing sand -0.175916  0.462739  -0.380 0.703825 
weather_conditionBlowing snow 0.243837  0.036398  6.699 2.10e-11 *** 
weather_conditionBlowing snow / windy -0.152660  0.049928  -3.058 0.002231 ** 
weather_conditionBlowing snow Nearby -0.175916  0.327208  -0.538 0.590835 
weather_conditionClear 0.286888  0.002065  138.945 <2e-16 *** 
weather_conditionCloudy -0.088855  0.001909  -46.539 <2e-16 *** 
weather_conditionCloudy / windy -0.072392  0.005860  -12.353 <2e-16 *** 
weather_conditionDrifting snow -0.175916  0.462739  -0.380 0.703825 
weather_conditionDrizzle 0.084495  0.011341  7.450 9.31e-14 *** 
weather_conditionDrizzle / windy -0.175916  0.154255  -1.140 0.254110 
weather_conditionDrizzle and Fog -0.033059  0.040162  -0.823 0.410431 
weather_conditionDust whirls -0.175916  0.462739  -0.380 0.703825 
weather_conditionDuststorm -0.175916  0.327208  -0.538 0.590835 
weather_conditionFair -0.116098  0.001796  -64.651 <2e-16 *** 
weather_conditionFair / windy -0.091151  0.004138  -22.028 <2e-16 *** 
weather_conditionFog -0.083135  0.002868  -28.987 <2e-16 *** 
weather_conditionFog / windy -0.112953  0.028215  -4.003 6.25e-05 *** 
weather_conditionFreezing drizzle -0.175916  0.139531  -1.261 0.207393 
weather_conditionFreezing rain -0.039552  0.069782  -0.567 0.570850 

---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4627 on 2845214 degrees of freedom
Multiple R-squared:  0.06571, Adjusted R-squared:  0.06567 
F-statistic: 1576 on 127 and 2845214 DF, p-value: < 2.2e-16

```

```

Call:
lm(formula = Severity ~ State, data = ACC)

Residuals:
    Min      1Q   Median      3Q      Max 
-1.83523 -0.17665 -0.06936 -0.04200  1.98804 

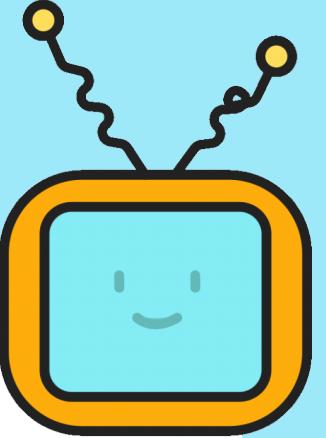
Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept) 2.128351  0.003303 644.373 <2e-16 *** 
StateAR 0.127890  0.005494 23.277 <2e-16 *** 
StateAZ -0.058799  0.003826 -15.367 <2e-16 *** 
StateCA -0.086353  0.003343 -25.832 <2e-16 *** 
StateCO 0.533922  0.004385 121.760 <2e-16 *** 
StateCT 0.136685  0.004242 32.224 <2e-16 *** 
StateDC 0.062605  0.005830 10.738 <2e-16 *** 
StateDE 0.373921  0.007379 50.676 <2e-16 *** 
StateFL -0.058992  0.003382 -17.445 <2e-16 *** 
StateGA 0.391182  0.004021 97.285 <2e-16 *** 
StateIA 0.228368  0.005732 39.843 <2e-16 *** 
StateID -0.010139  0.005965 -1.700 0.089164 . 
StateIL 0.420529  0.003922 107.214 <2e-16 *** 
StateIN 0.333184  0.004585 72.672 <2e-16 *** 
StateKS 0.091620  0.005852 15.656 <2e-16 *** 
StateKY 0.217386  0.006532 33.281 <2e-16 *** 
StateLA -0.074045  0.003921 -18.885 <2e-16 *** 
StateMA 0.233351  0.006625 35.224 <2e-16 *** 
StateMD 0.183441  0.003761 48.769 <2e-16 *** 
StateME -0.024384  0.010346 -2.357 0.018427 * 
StateMI 0.207643  0.003965 52.375 <2e-16 *** 
StateMN -0.081266  0.003616 -22.471 <2e-16 *** 
StateMO 0.118232  0.004245 27.850 <2e-16 *** 
StateMS 0.070897  0.007109 9.973 <2e-16 *** 
StateMT -0.090954  0.004911 -18.522 <2e-16 *** 
StateNC -0.009987  0.003636 -2.747 0.006014 ** 
StateND -0.116394  0.010211 -11.399 <2e-16 *** 
StateNE 0.187613  0.008626 21.750 <2e-16 *** 
StateNH -0.001088  0.008089 -0.134 0.893029 
StateNJ 0.113039  0.003859 29.290 <2e-16 *** 
StateNM 0.248864  0.009993 24.905 <2e-16 *** 
StateNV 0.097726  0.006703 14.580 <2e-16 *** 
StateNY 0.087847  0.003586 24.496 <2e-16 *** 
StateOH 0.358273  0.004421 81.038 <2e-16 *** 
StateOK 0.062769  0.005903 10.633 <2e-16 *** 
StateOR -0.054646  0.003547 -15.408 <2e-16 *** 
StatePA 0.075090  0.003608 20.812 <2e-16 *** 
StateRI 0.027344  0.007633 3.582 0.000341 *** 
StateSC -0.078125  0.003643 -21.444 <2e-16 *** 
StateSD 0.339311  0.032552 10.424 <2e-16 *** 
StateTN -0.047097  0.003862 -12.195 <2e-16 *** 
StateTX 0.056590  0.003511 16.120 <2e-16 *** 
StateUT -0.055455  0.003898 -14.226 <2e-16 *** 
StateVA 0.048299  0.003573 13.518 <2e-16 *** 
StateVT 0.268909  0.024258 11.086 <2e-16 *** 
StateWA 0.176711  0.004170 42.382 <2e-16 *** 
StateWI 0.706882  0.006132 115.270 <2e-16 *** 
StateWV 0.057577  0.006207 9.276 <2e-16 *** 
StateWY 0.443366  0.014961 29.635 <2e-16 *** 

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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4591 on 2845293 degrees of freedom
Multiple R-squared:  0.08021, Adjusted R-squared:  0.08019 
F-statistic: 5169 on 48 and 2845293 DF, p-value: < 2.2e-16

```

Visibility



call:
lm(formula = Severity ~ visibility, data = ACC)

Residuals:

Min	1Q	Median	3Q	Max
-1.2220	-0.1378	-0.1378	-0.1365	1.8751

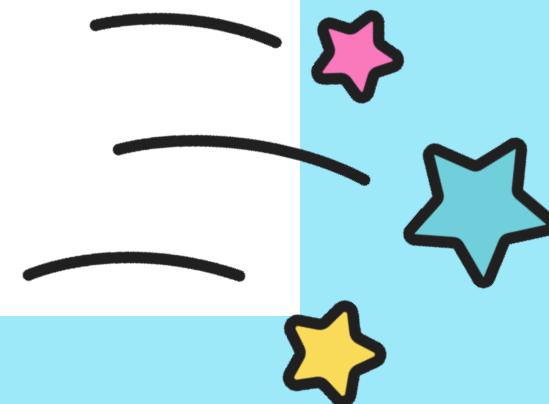
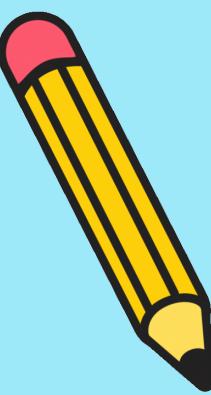
Coefficients:

	Estimate	Std. Error	t value	Pr(> t)		
(Intercept)	2.1248669	0.0010016	2121.44	<2e-16 ***		
visibility	0.0012951	0.0001055	12.28	<2e-16 ***		

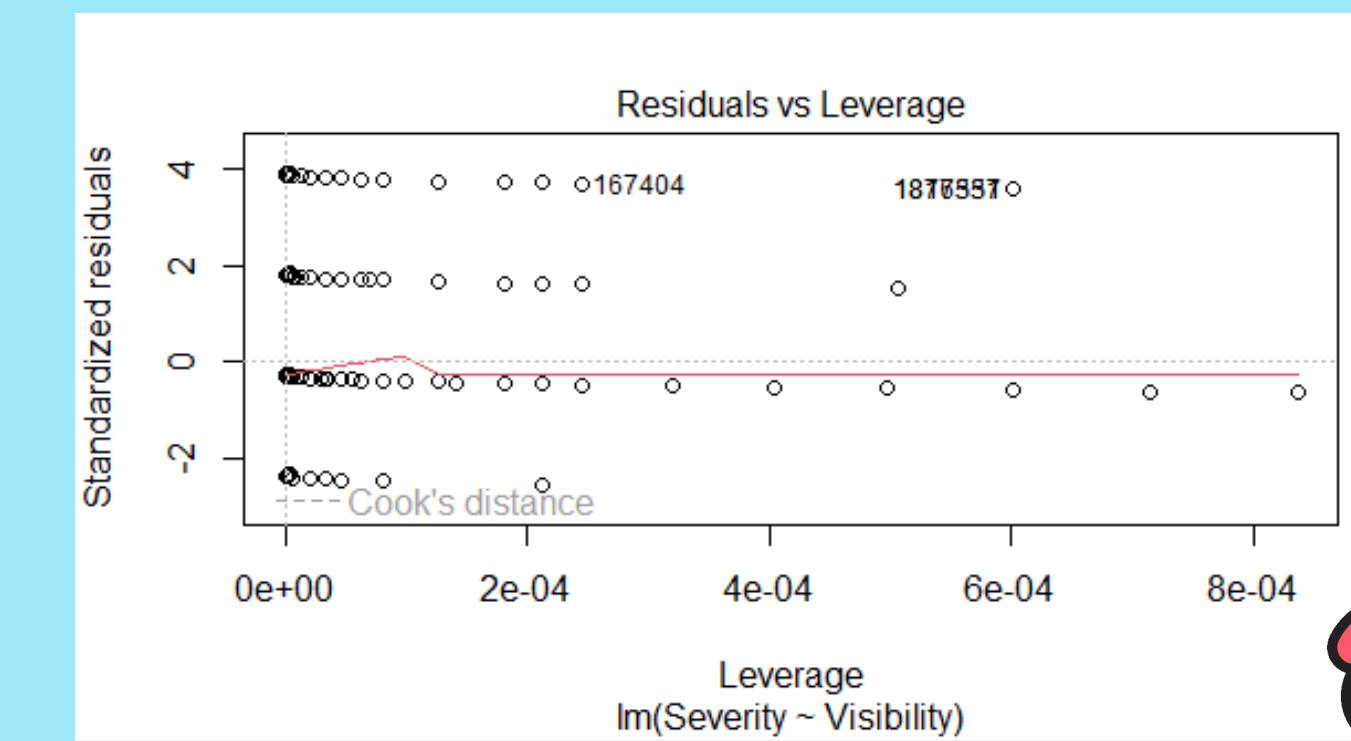
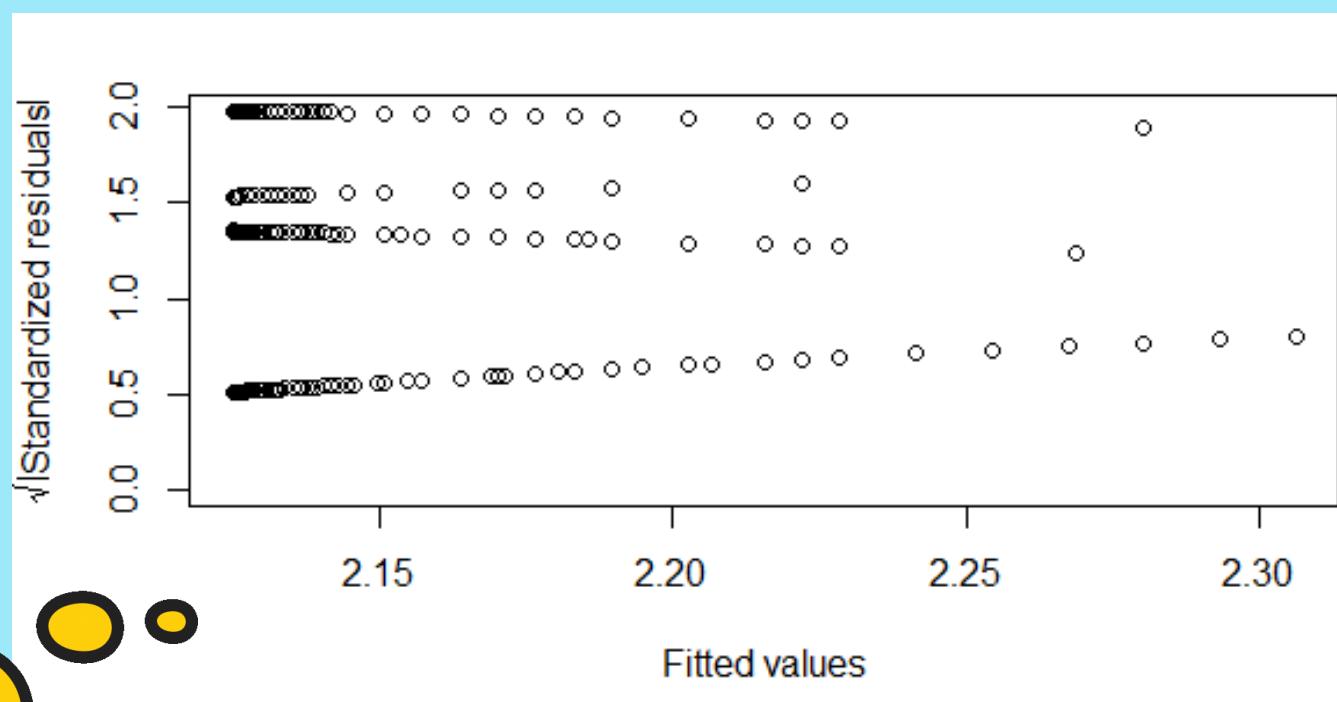
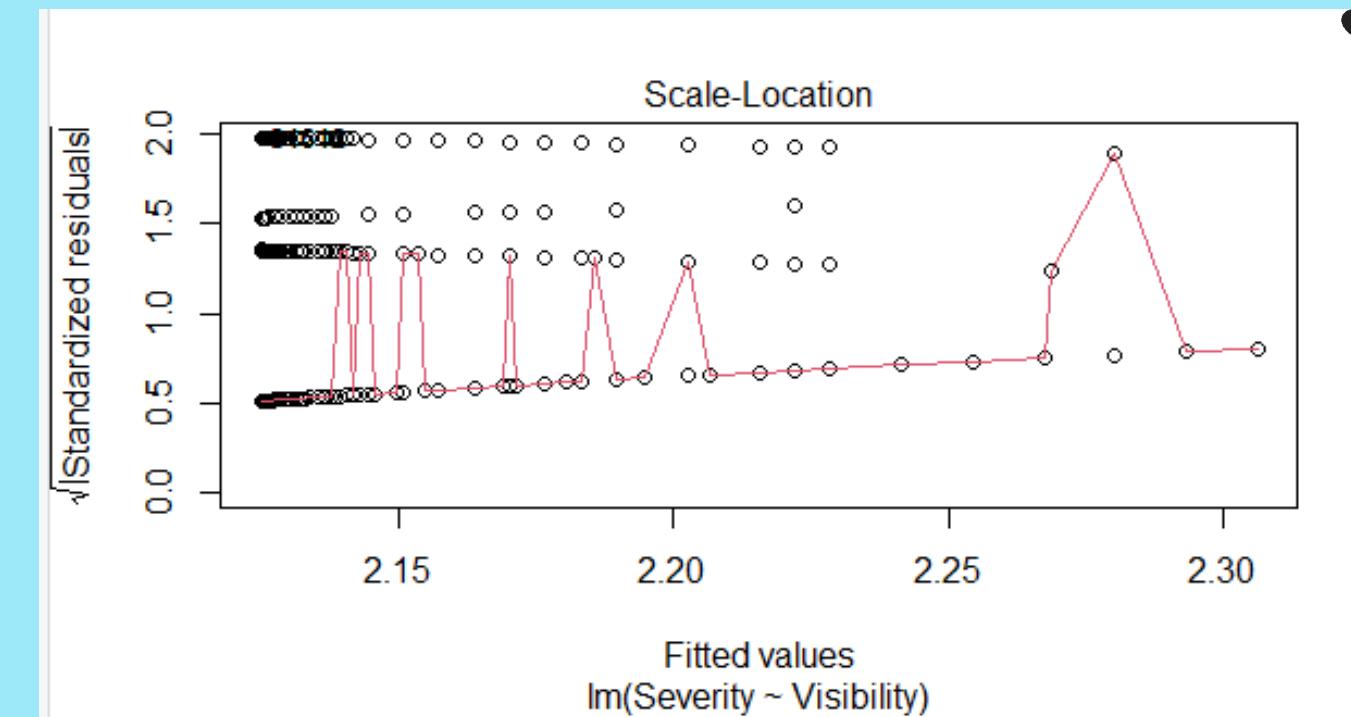
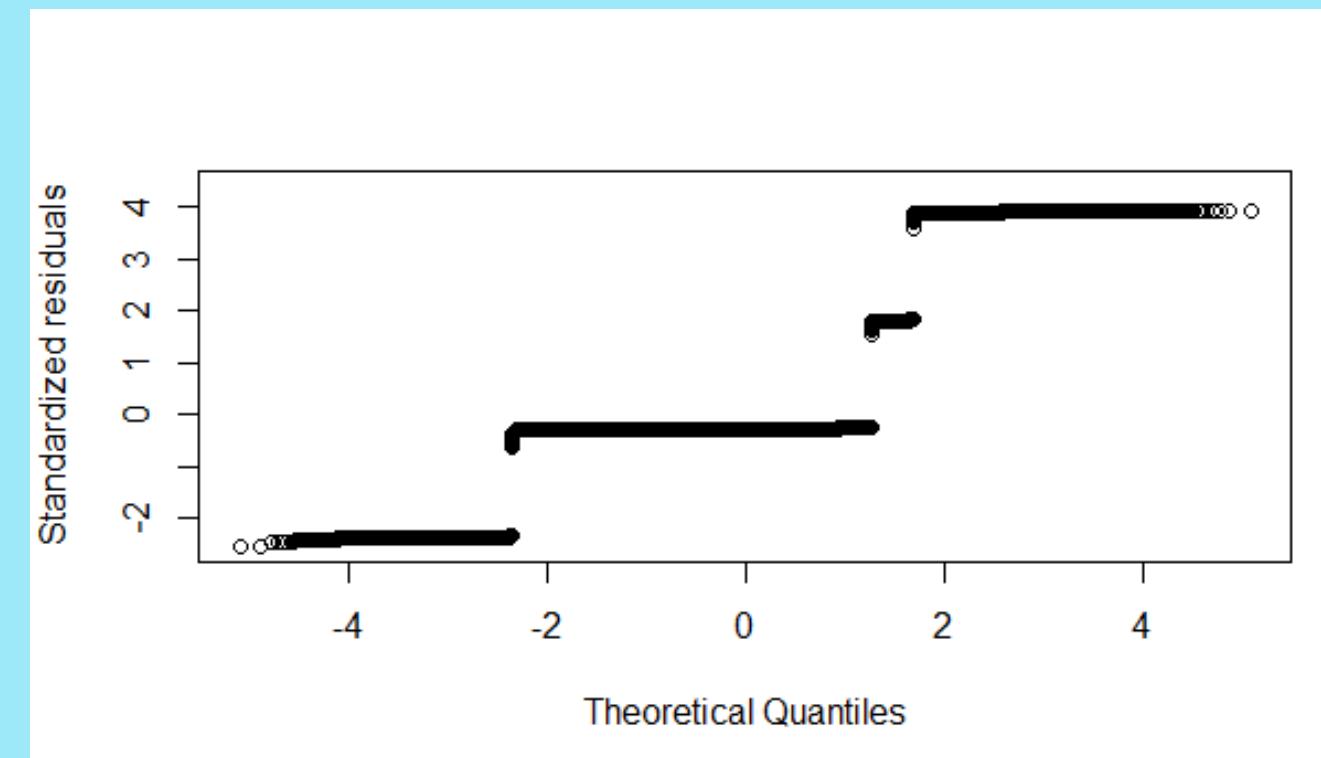
signif. codes:	0 ‘***’	0.001 ‘**’	0.01 ‘*’	0.05 ‘.’	0.1 ‘ ’	1

Residual standard error: 0.4775 on 2774794 degrees of freedom
(70546 observations deleted due to missingness)

Multiple R-squared: 5.434e-05, Adjusted R-squared: 5.398e-05
F-statistic: 150.8 on 1 and 2774794 DF, p-value: < 2.2e-16



Plot model Visibility





ลำดับ

ตัวแปรอื่นๆ

ค่าที่มีผลกับ Severity (Adjusted R Square)

1

Visibility

5.40E-05

2

State

0.08019

3

Period Time

0.0004222

4

Weather Condition

0.06567

5

Wind Direction

0.04661

6

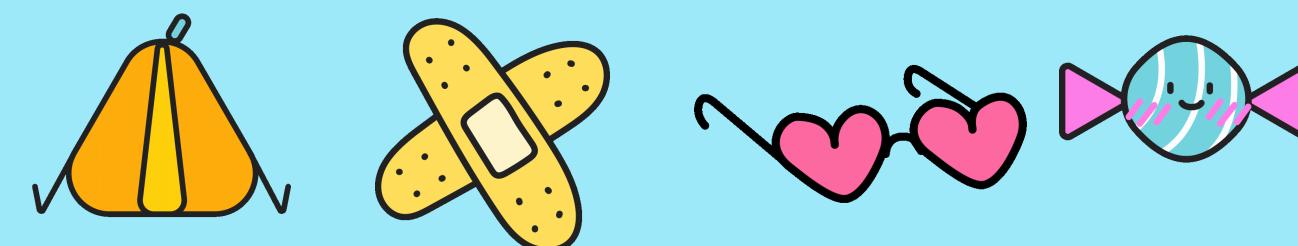
Humidity

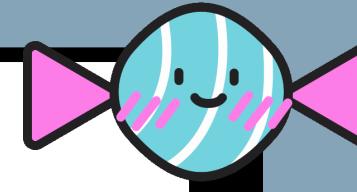
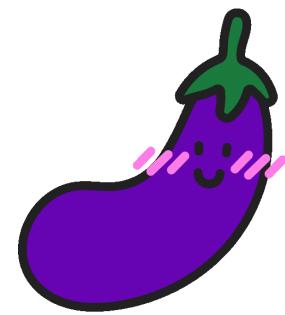
0.001429

7

Temperature

0.002055





Group Member

นายณัฐรศ ลุวรรณพงษ์

63070501017

นายสราวุฒิ บุชารด

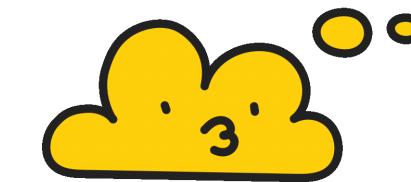
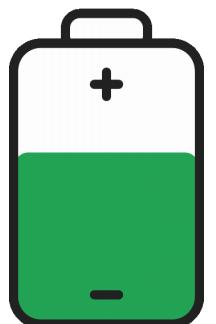
63070501068

นายสัมชนัญ พรเมจรรย์

63070501069

นายอุกฤษพงษ์ ปัญญาดี

63070501077



**ขอบคุณ
สำหรับการฟัง!**

