

Graphic Design with ggplot2

Working with Labels and Annotations

Cédric Scherer // rstudio::conf // July 2022

Setup

```
1 library(tidyverse)
2
3 bikes <- readr::read_csv(
4   "https://raw.githubusercontent.com/z3tt/graphic-design-ggplot2/main/data/london-bikes-custom.csv",
5   col_types = "Dcffffillllddddc"
6 )
7
8 #bikes$season <- factor(bikes$season, levels = c("spring", "summer", "autumn", "winter"))
9 bikes$season <- forcats::fct_inorder(bikes$season)
10
11 theme_set(theme_light(base_size = 14, base_family = "Roboto Condensed"))
12
13 theme_update(
14   panel.grid.minor = element_blank(),
15   legend.position = "top"
16 )
```

Labels + theme()

Working with Labels

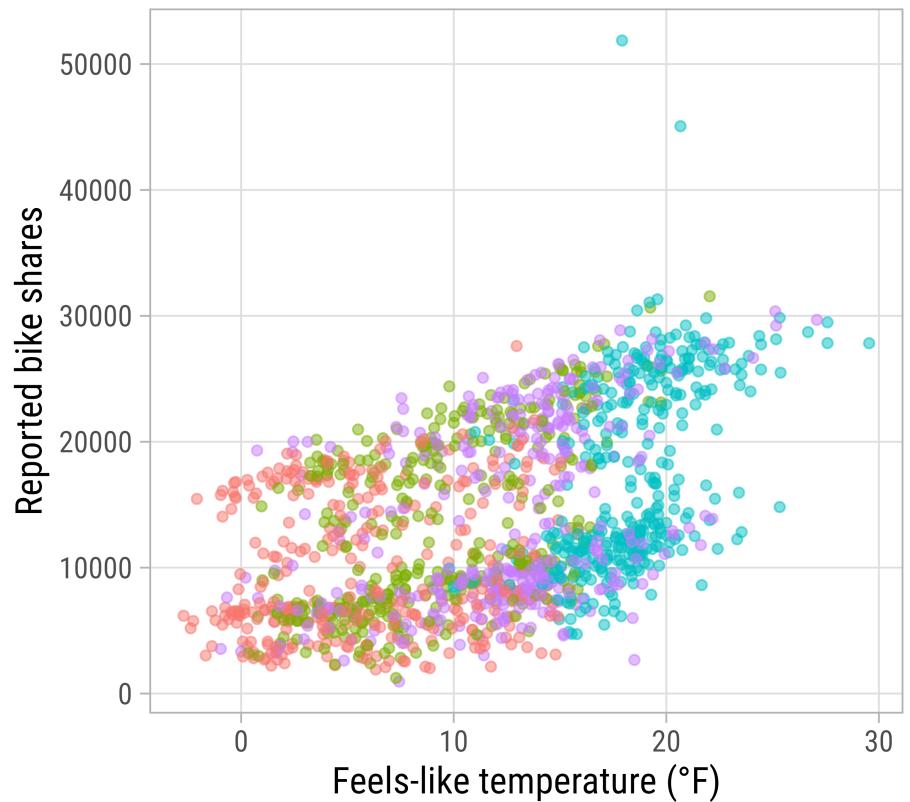
```
1 g <- ggplot(  
2   bikes,  
3   aes(x = temp_feel, y = count,  
4       color = season)  
5 ) +  
6   geom_point(  
7   alpha = .5  
8 ) +  
9   labs(  
10  x = "Feels-like temperature (°F)",  
11  y = "Reported bike shares",  
12  title = "TfL bike sharing trends",  
13  subtitle = "Reported bike rents versus feels-like temperature",  
14  caption = "Data: TfL",  
15  color = "Season:",  
16  tag = "1."  
17 )  
18 g
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London

Season: ● winter ● spring ● summer ● autumn



Data: TfL

Customize Labels via `theme()`

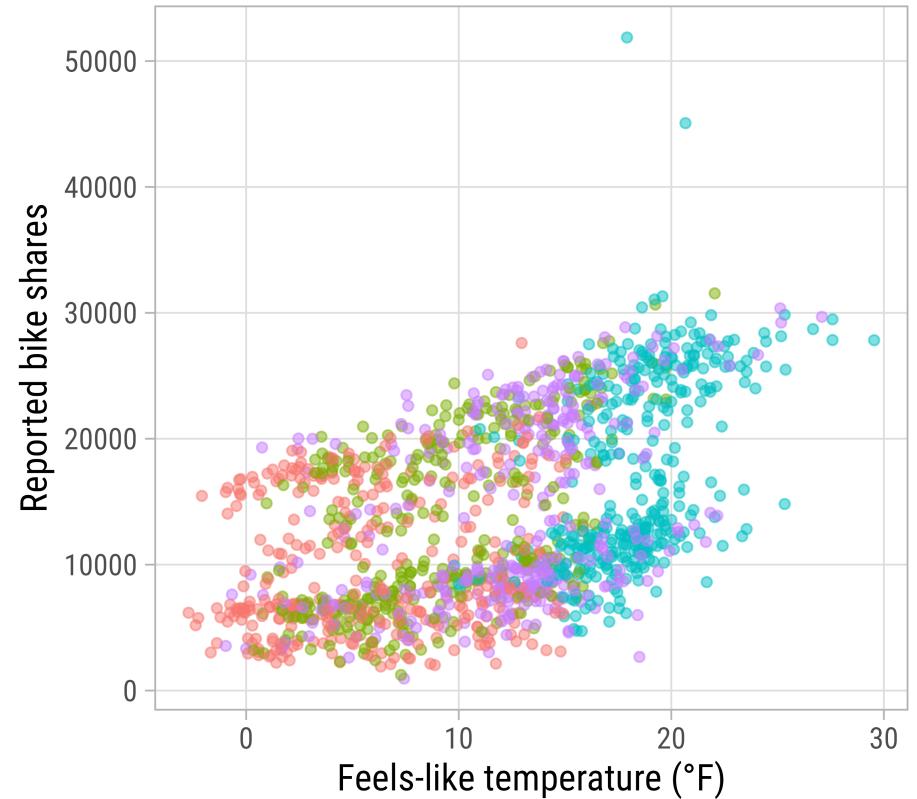
```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot"  
4 )
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London

Season: ● winter ● spring ● summer ● autumn



Data: TfL

Customize Labels via `theme()`

```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot",  
4   axis.text = element_text(  
5     color = "grey40"  
6   )  
7 )
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London



Data: TfL

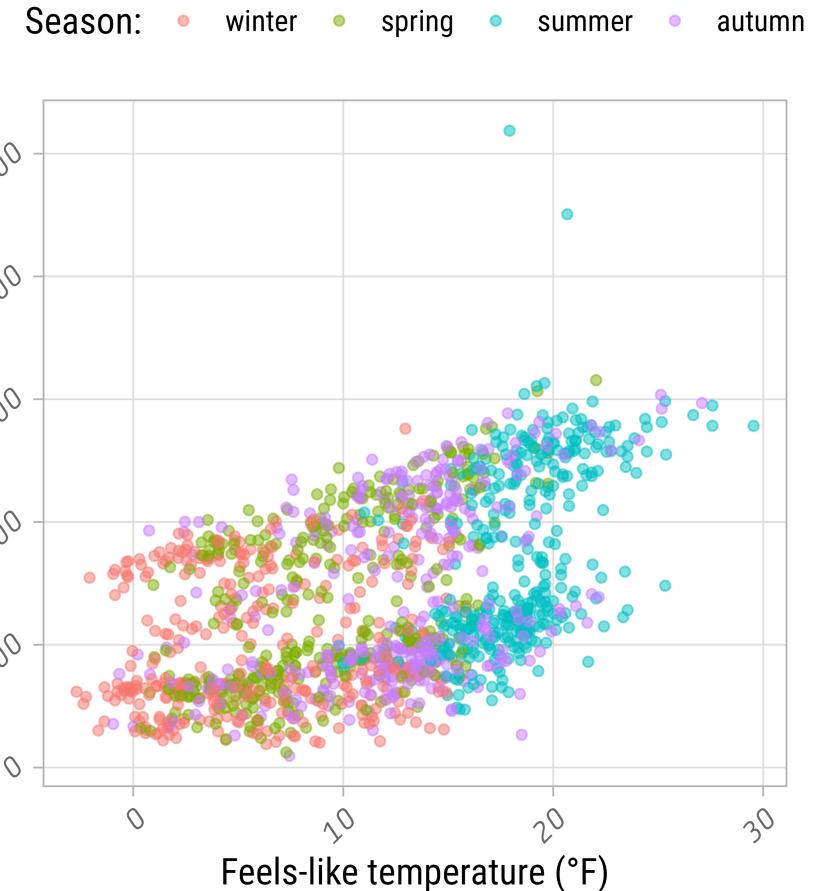
Customize Labels via `theme()`

```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot",  
4   axis.text = element_text(  
5     color = "grey40",  
6     family = "Tabular",  
7     face = "italic",  
8     hjust = 1,  
9     vjust = 0,  
10    angle = 45,  
11    lineheight = 1.3, ## no effect here  
12    margin = margin(10, 0, 20, 0)  
13  )  
14 )
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London



Data: TfL

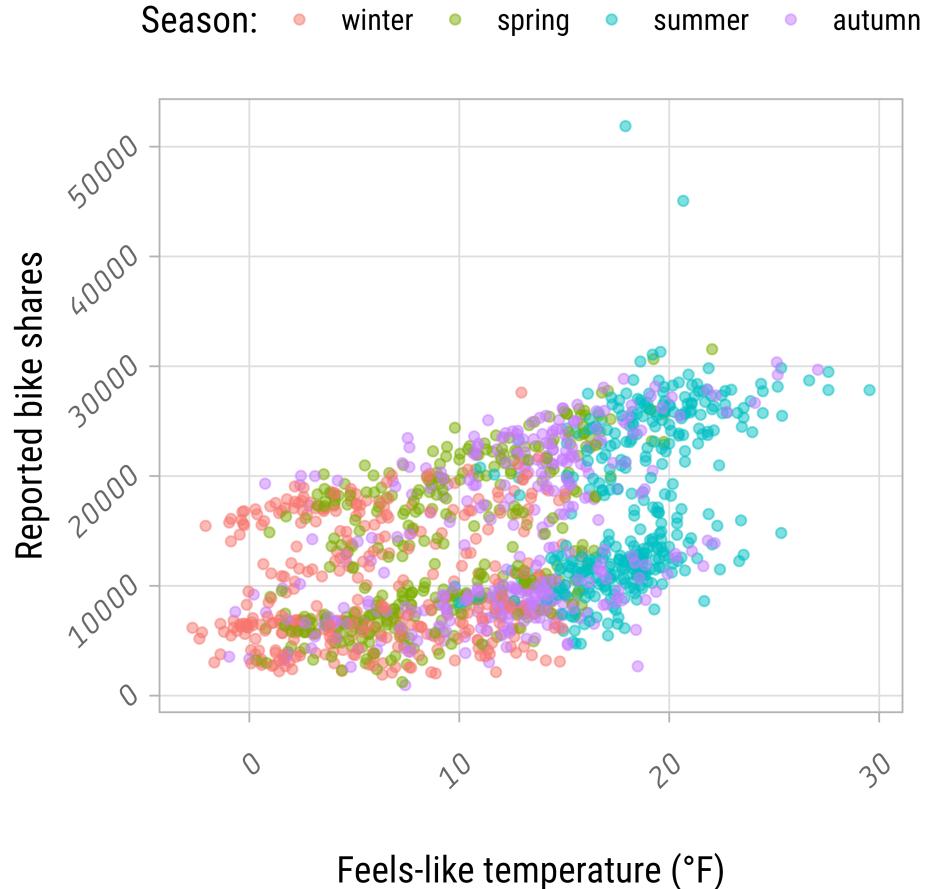
Customize Labels via `theme()`

```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot",  
4   axis.text = element_text(  
5     color = "grey40",  
6     family = "Tabular",  
7     face = "italic",  
8     colour = NULL,  
9     size = NULL,  
10    hjust = 1,  
11    vjust = 0,  
12    angle = 45,  
13    lineheight = 1.3, ## no effect here  
14    margin = margin(10, 0, 20, 0) ## no effect  
15  ),  
16  axis.text.x = element_text(  
17    margin = margin(10, 0, 20, 0) ## trbl  
18 )  
19 )
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London



Data: TfL

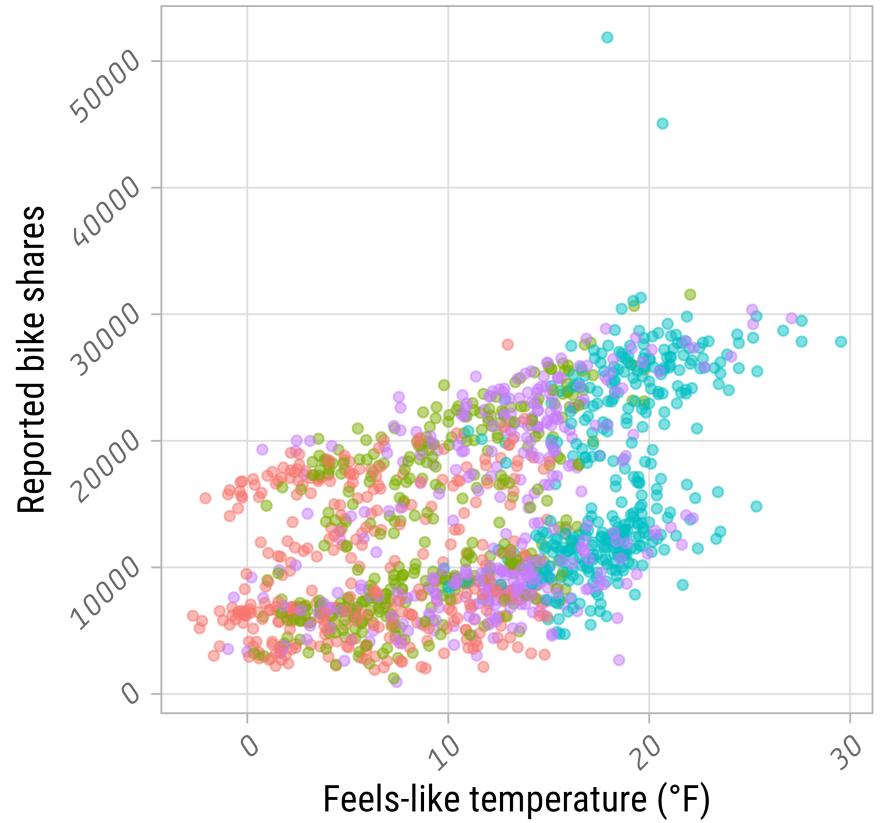
Customize Labels via `theme()`

```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot",  
4   axis.text = element_text(  
5     color = "grey40",  
6     family = "Tabular",  
7     face = "italic",  
8     colour = NULL,  
9     size = NULL,  
10    hjust = 1,  
11    vjust = 0,  
12    angle = 45,  
13    lineheight = 1.3, ## no effect here  
14    margin = margin(10, 0, 20, 0) ## no effect  
15  ),  
16  plot.tag = element_text(  
17    margin = margin(0, 12, -8, 0) ## trbl  
18 )  
19 )
```

1. TfL bike sharing trends

Reported bike rents versus feels-like temperature in London

Season: ● winter ● spring ● summer ● autumn



Data: TfL

Customize Labels via `theme()`

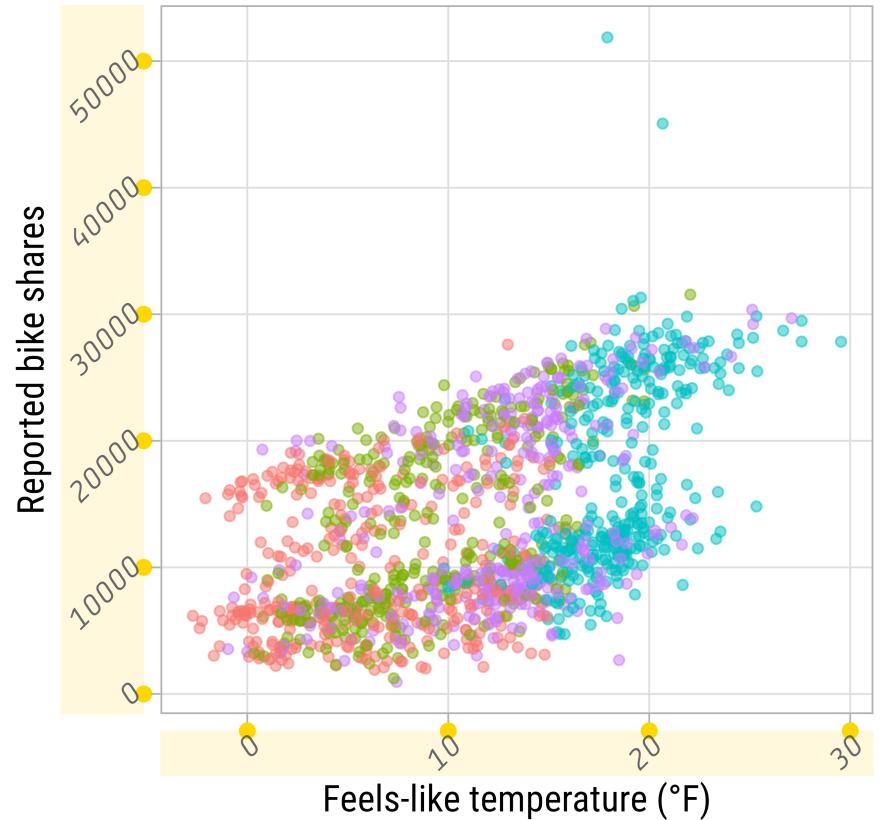
```
1 g + theme(  
2   plot.title = element_text(face = "bold"),  
3   plot.title.position = "plot",  
4   axis.text = element_text(  
5     color = "grey40",  
6     family = "Tabular",  
7     face = "italic",  
8     colour = NULL,  
9     size = NULL,  
10    hjust = 1,  
11    vjust = 0,  
12    angle = 45,  
13    lineheight = 1.3, ## no effect here  
14    margin = margin(10, 0, 20, 0), ## no effect  
15    debug = TRUE  
16  ),  
17  plot.tag = element_text(  
18    margin = margin(0, 12, -8, 0), ## trbl  
19    debug = TRUE  
20 )  
21 )
```

1.

TfL bike sharing trends

Reported bike rents versus feels-like temperature in London

Season: ● winter ● spring ● summer ● autumn



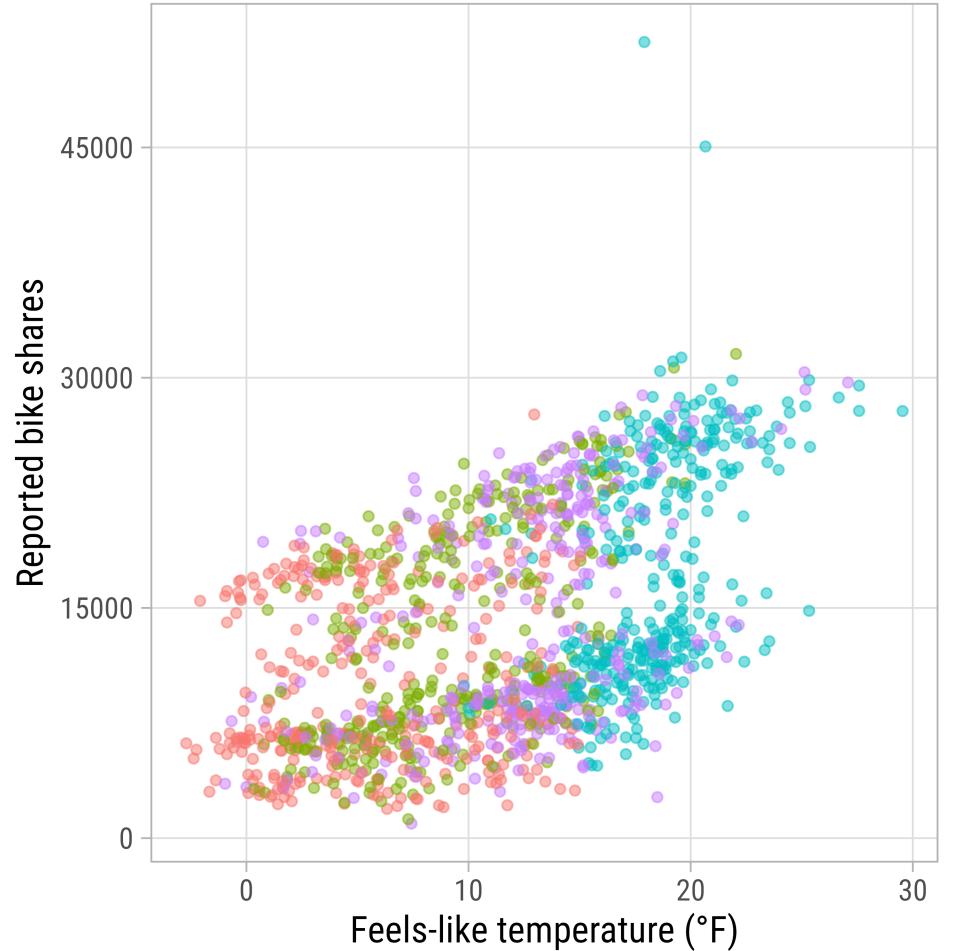
Data: TfL

Labels + `scale_*`()

Format Labels via `scale_*`

```
1 g <- g + labs(title = NULL, subtitle = NULL, ...
2
3 g +
4   scale_y_continuous(
5     breaks = 0:4*15000
6   )
```

Season: ● winter ● spring ● summer ● autumn

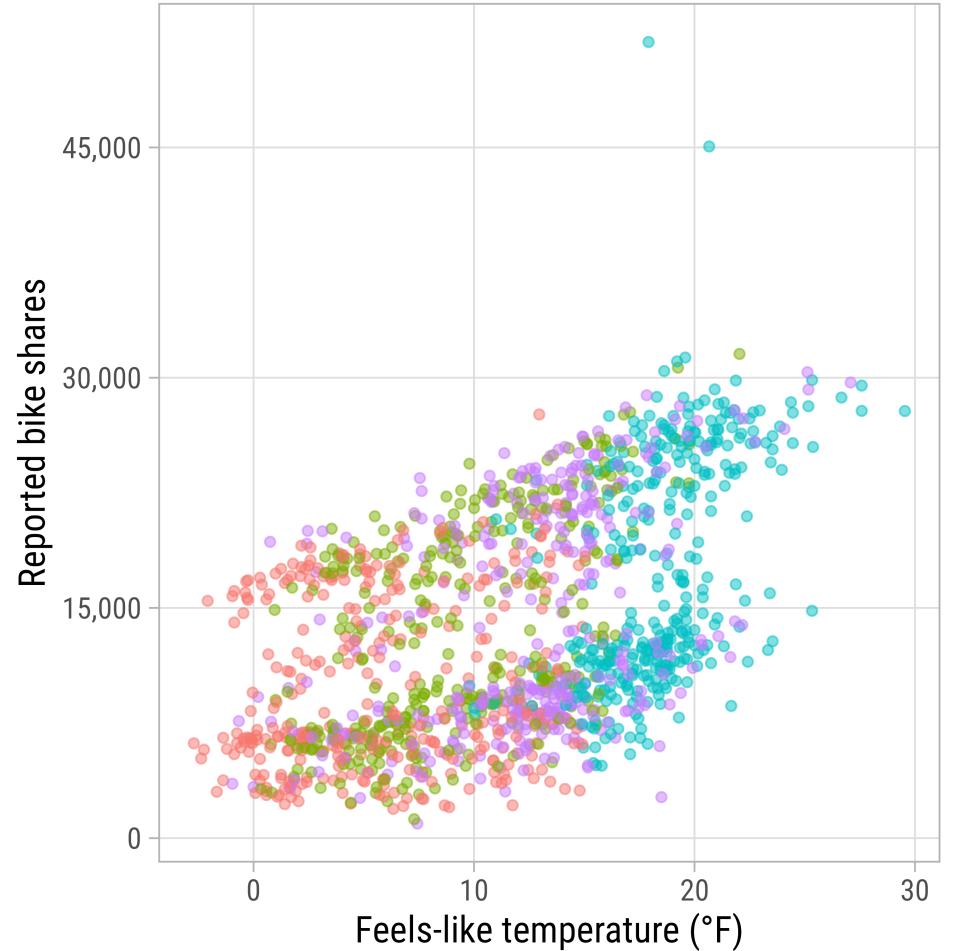


Data: TfL

Format Labels via `scale_*`

```
1 g +
2   scale_y_continuous(
3     breaks = 0:4*15000,
4     labels = scales::comma_format()
5   )
```

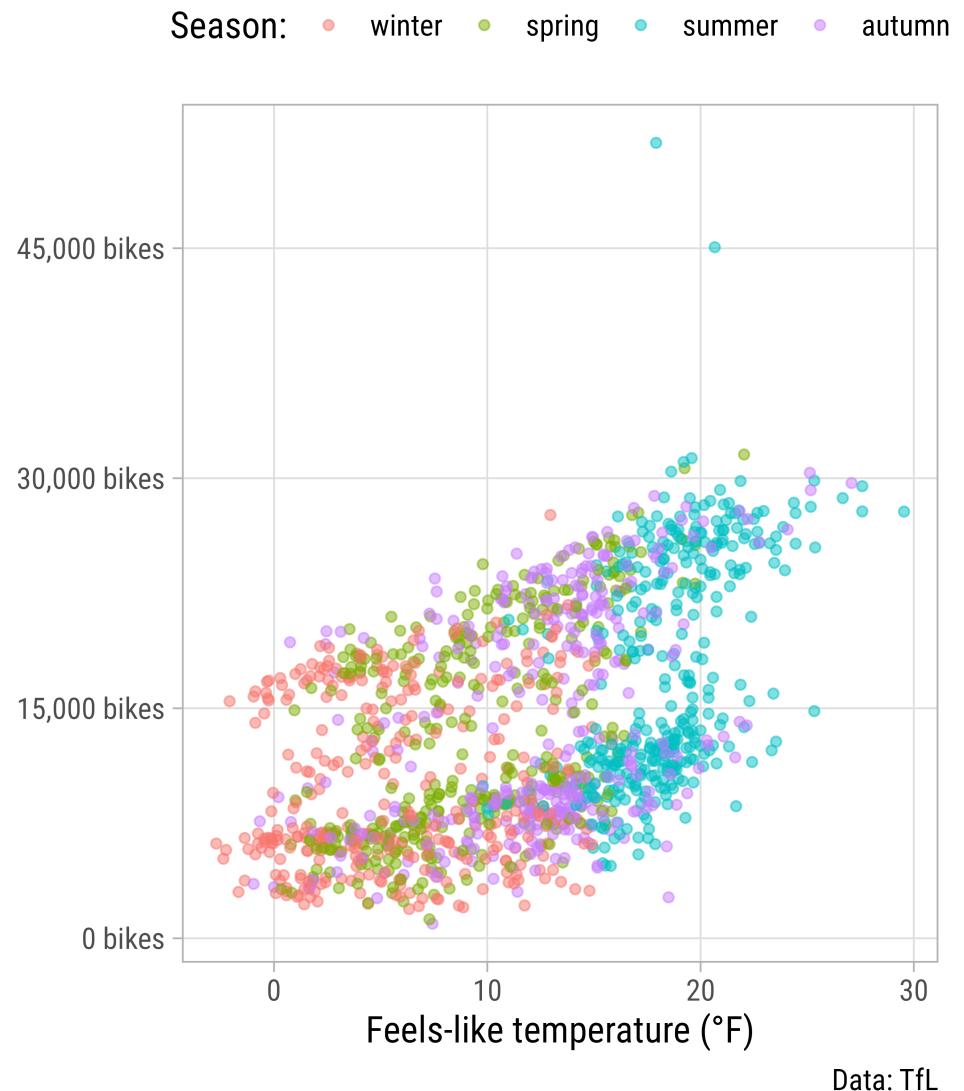
Season: ● winter ● spring ● summer ● autumn



Data: TfL

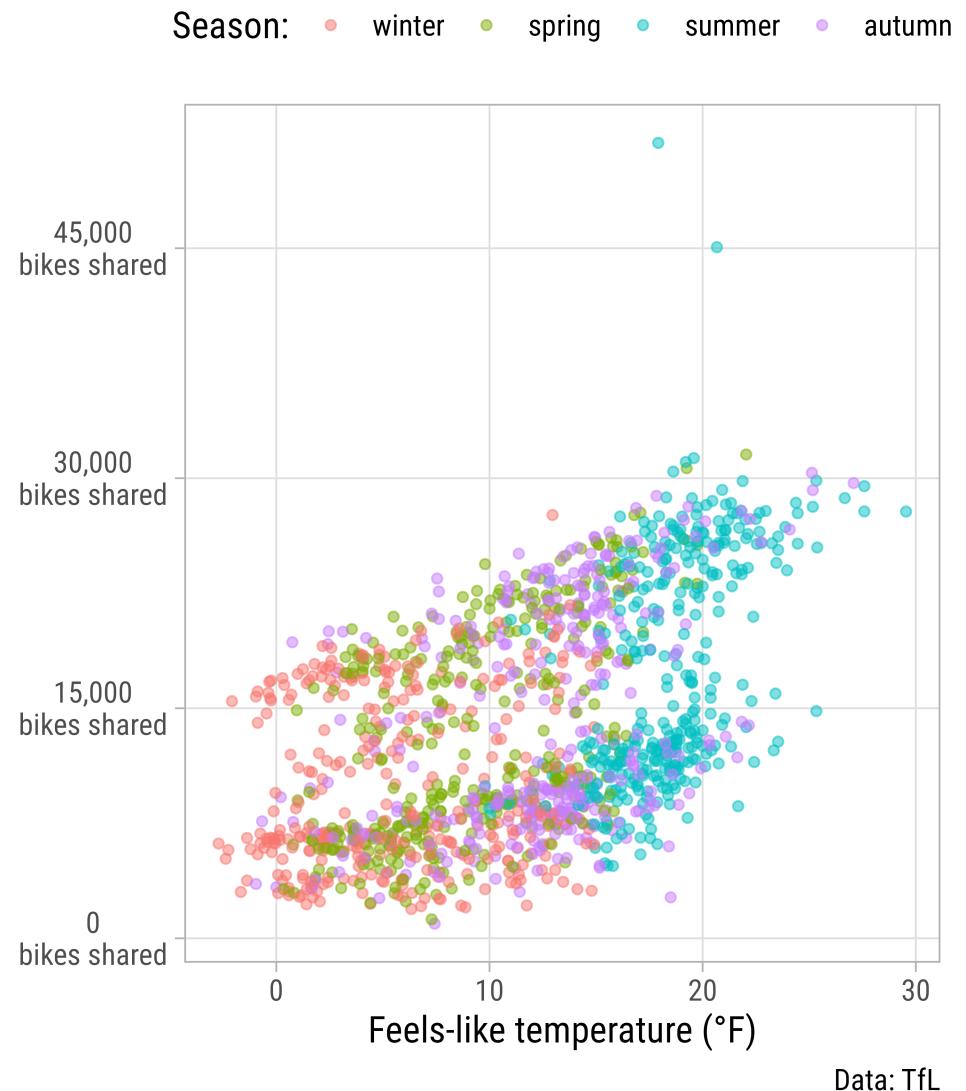
Format Labels via `scale_*`

```
1 g +
2   scale_y_continuous(
3     breaks = 0:4*15000,
4     labels = scales::comma_format(
5       suffix = " bikes"
6     ),
7     name = NULL
8   )
```



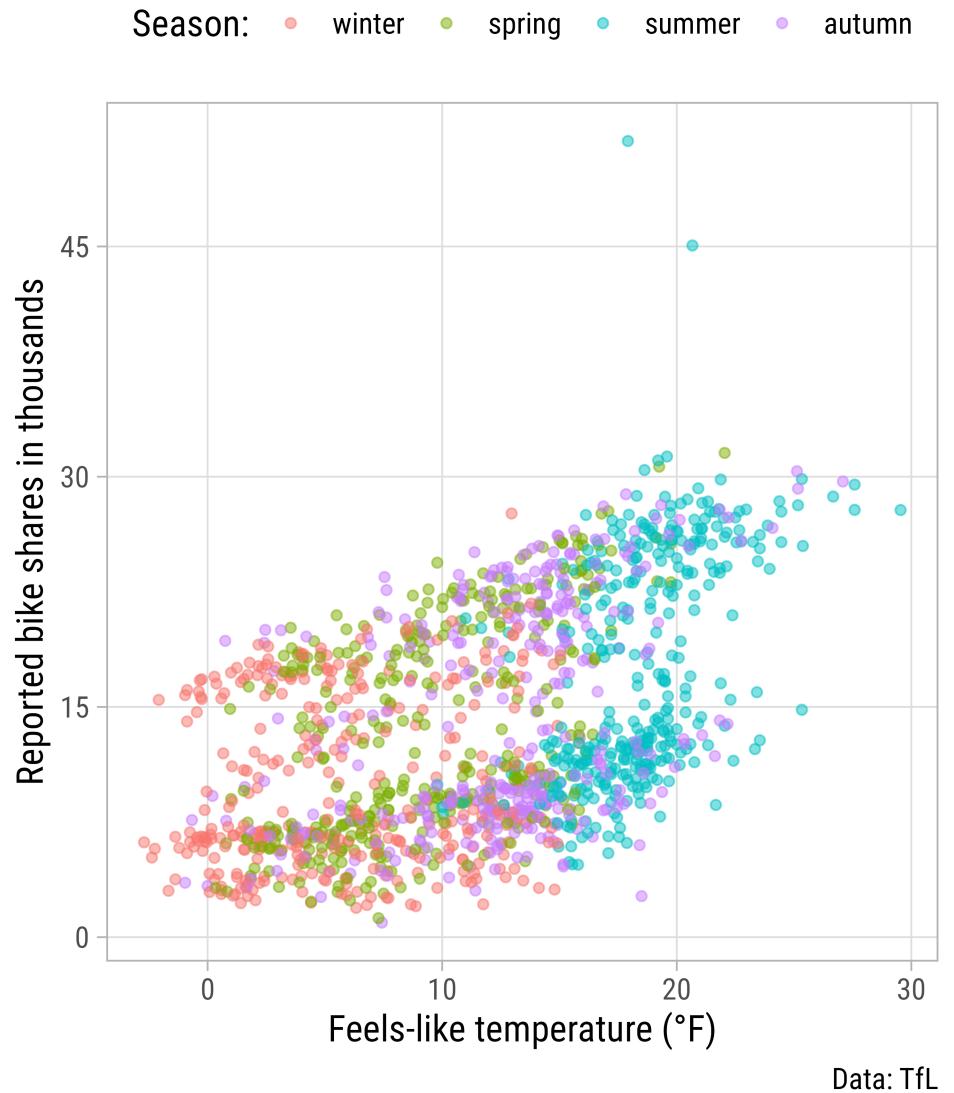
Format Labels via `scale_*`

```
1 g +
2   scale_y_continuous(
3     breaks = 0:4*15000,
4     labels = scales::comma_format(
5       suffix = "\nbikes shared"
6     ),
7     name = NULL
8   ) +
9   theme(
10   axis.text.y = element_text(
11     hjust = .5
12   )
13 )
```



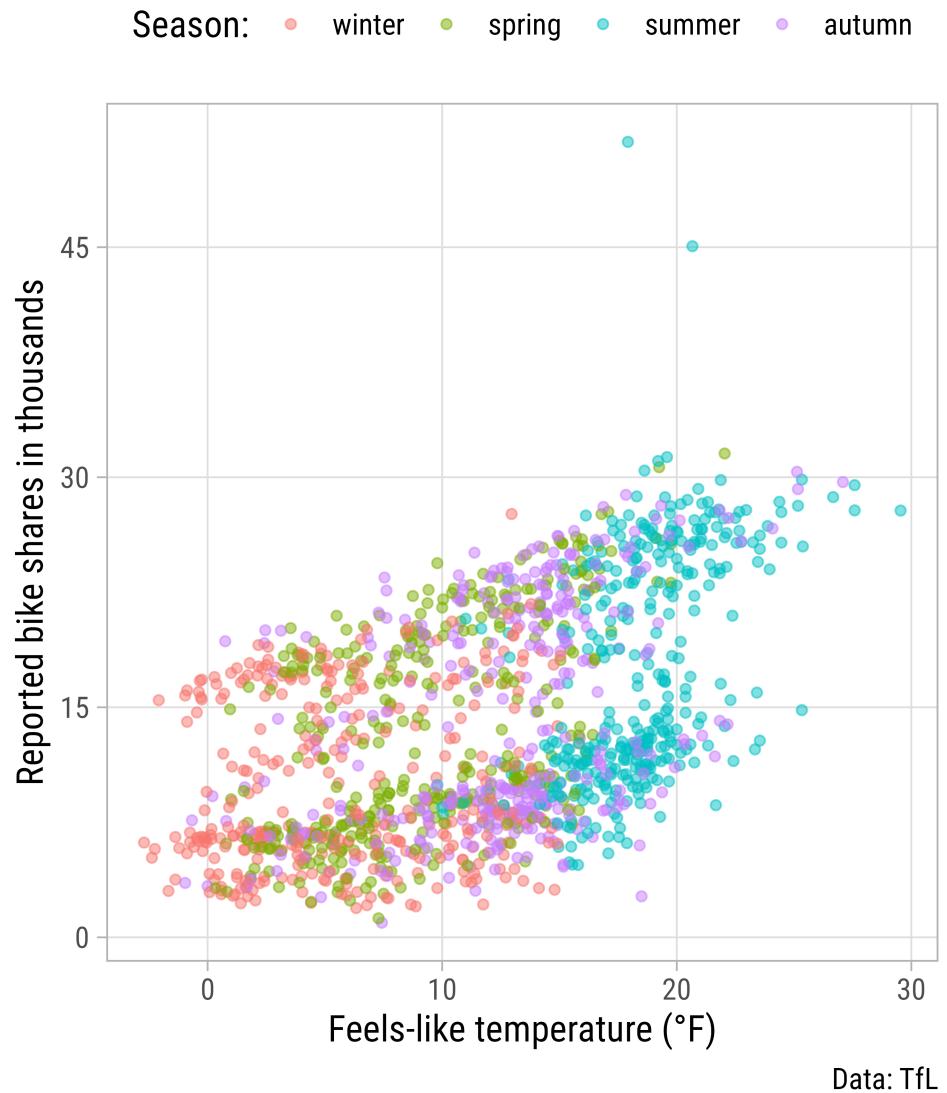
Format Labels via `scale_*`

```
1 g +
2   scale_y_continuous(
3     breaks = 0:4*15000,
4     labels = scales::comma_format(
5       scale = .001
6     ),
7     name = "Reported bike shares in thousands"
8   )
```



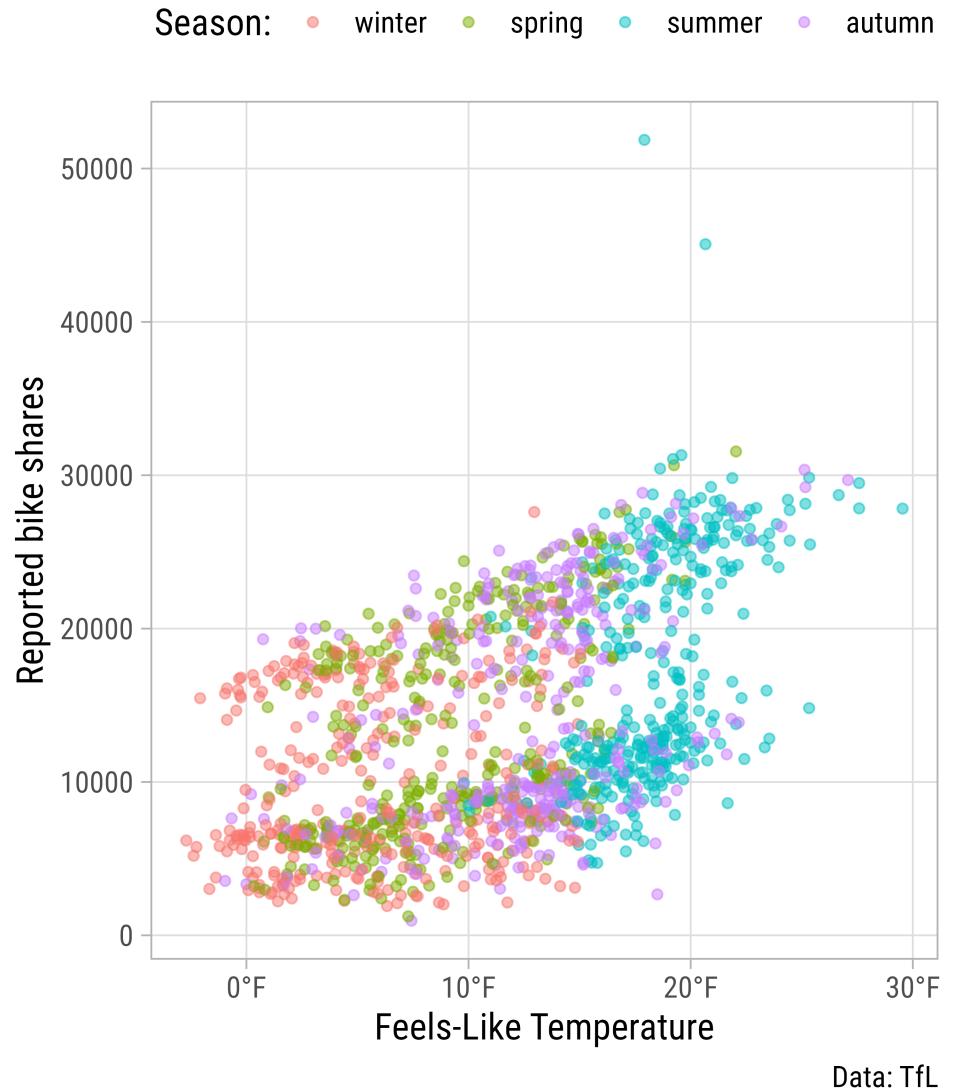
Format Labels via `scale_*`

```
1 g +
2   scale_y_continuous(
3     breaks = 0:4*15000,
4     labels = function(y) y / 1000,
5     name = "Reported bike shares in thousands"
6   )
```



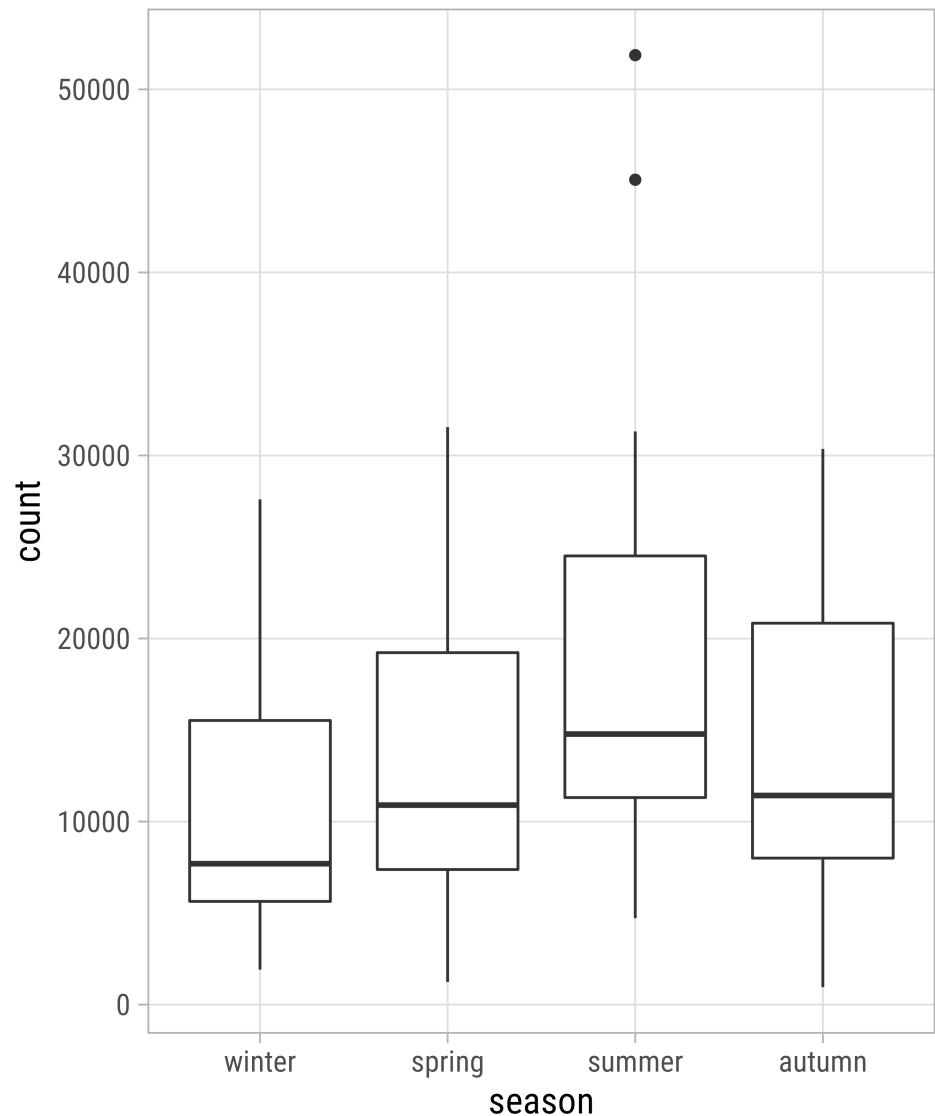
Format Labels via `scale_*`

```
1 g +
2   scale_x_continuous(
3     labels = function(y) paste0(y, "°F"),
4     name = "Feels-Like Temperature"
5   )
```



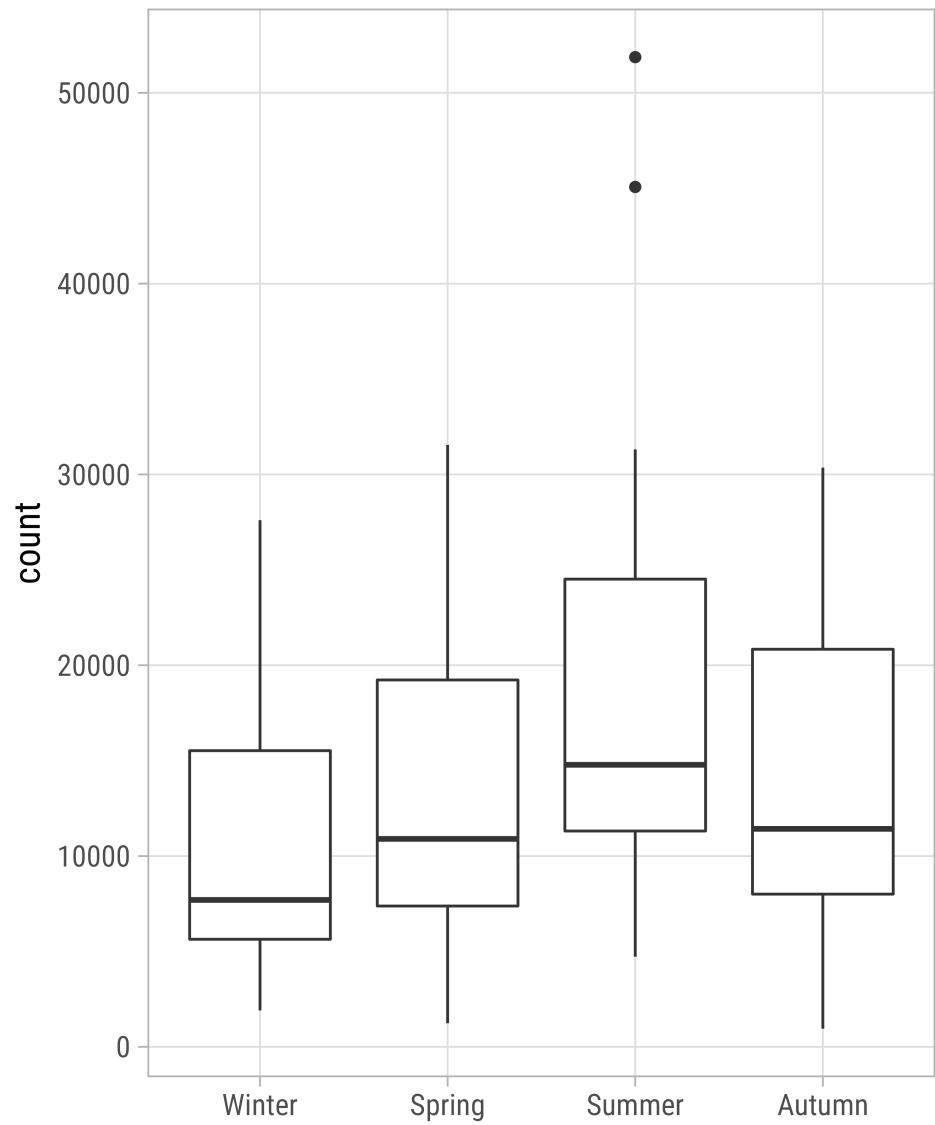
Format Labels via `scale_*`

```
1 ggplot(  
2   bikes,  
3   aes(x = season, y = count))  
4 ) +  
5 geom_boxplot() +  
6 scale_x_discrete()
```



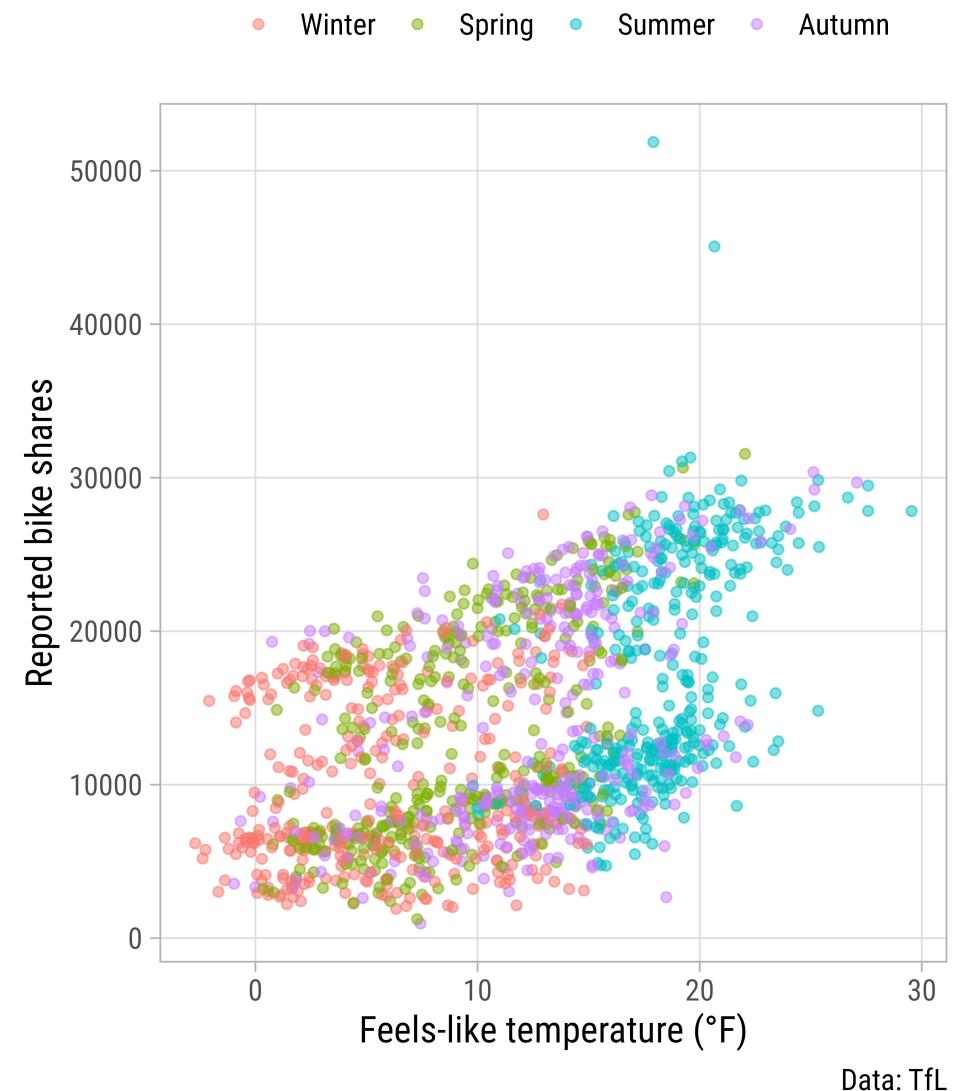
Format Labels via `scale_*`

```
1 ggplot(  
2   bikes,  
3   aes(x = season, y = count))  
4 ) +  
5 geom_boxplot() +  
6 scale_x_discrete(  
7   name = NULL,  
8   labels = stringr::str_to_title  
9 )
```



Format Labels via `scale_*`

```
1 g +
2   scale_color_discrete(
3     name = NULL,
4     labels = stringr::str_to_title
5   )
```



Labels +

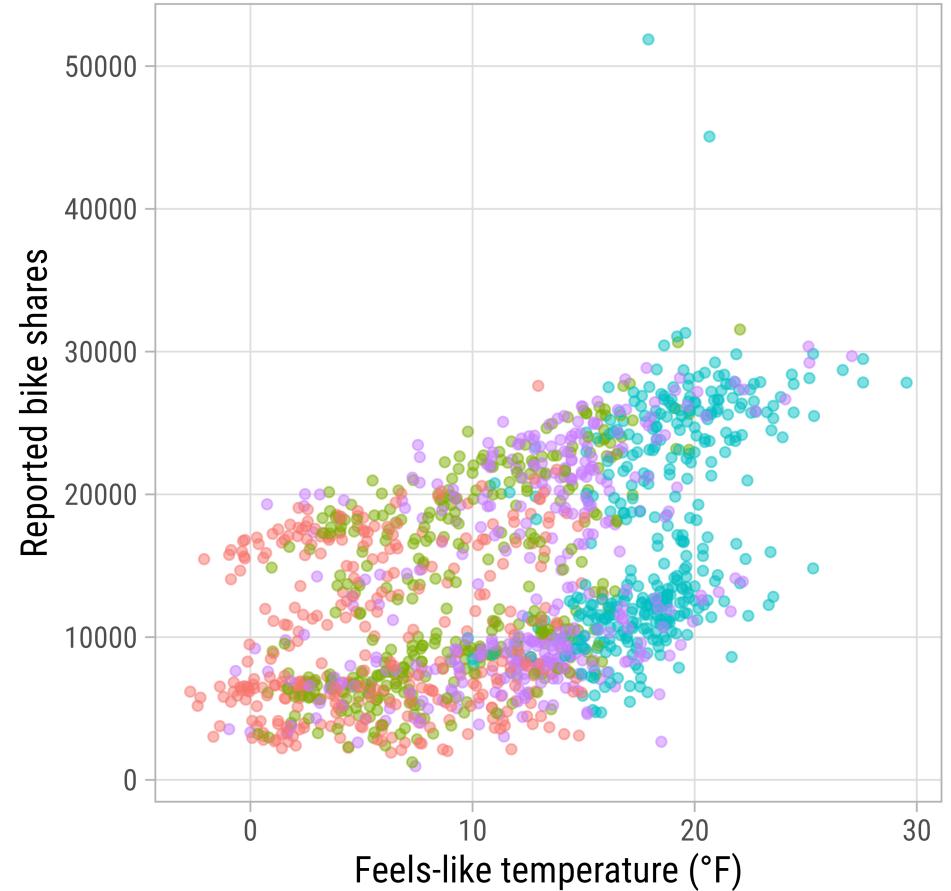
`ggtext::element_markdown`

Styling Labels with {ggtext}

```
1 g +  
2   ggttitle("TfL bike sharing trends by _season_")
```

TfL bike sharing trends by _season_

Season: ● winter ● spring ● summer ● autumn



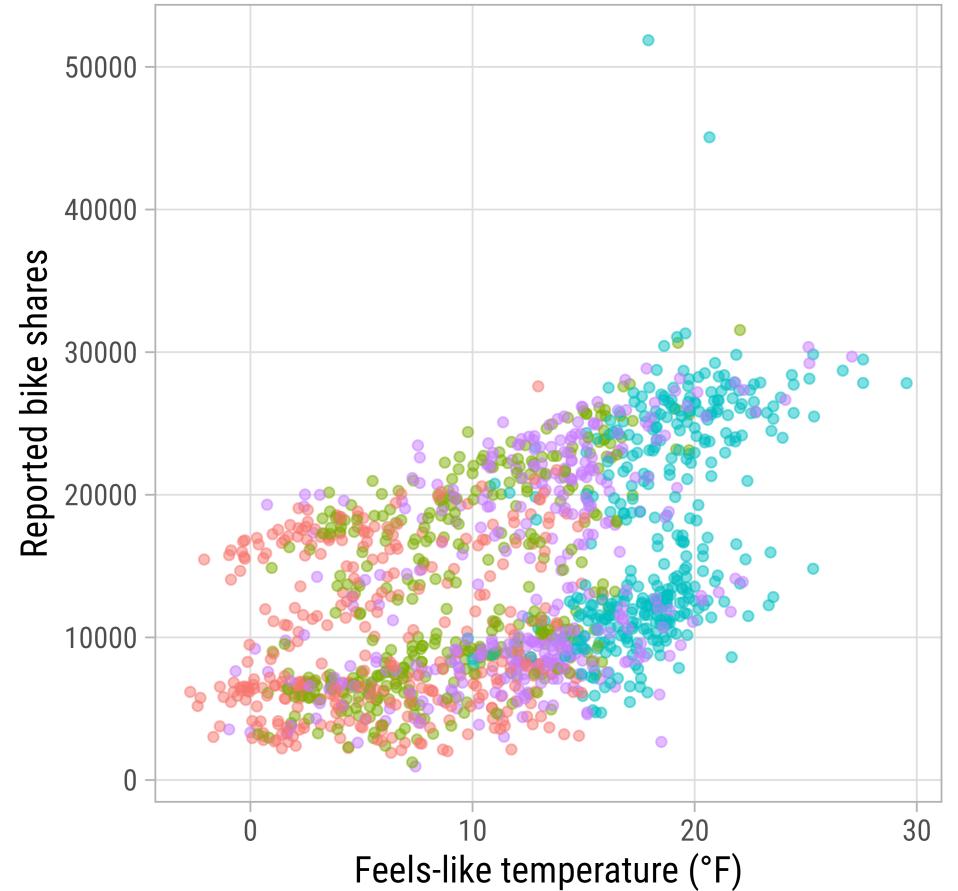
Data: TfL

Styling Labels with {ggtext}

```
1 # install.packages("ggtext")
2
3 g +
4   ggtitle("**TfL bike sharing trends by _season")
5   theme(
6     plot.title = ggtext::element_markdown()
7   )
```

TfL bike sharing trends by season

Season: ● winter ● spring ● summer ● autumn



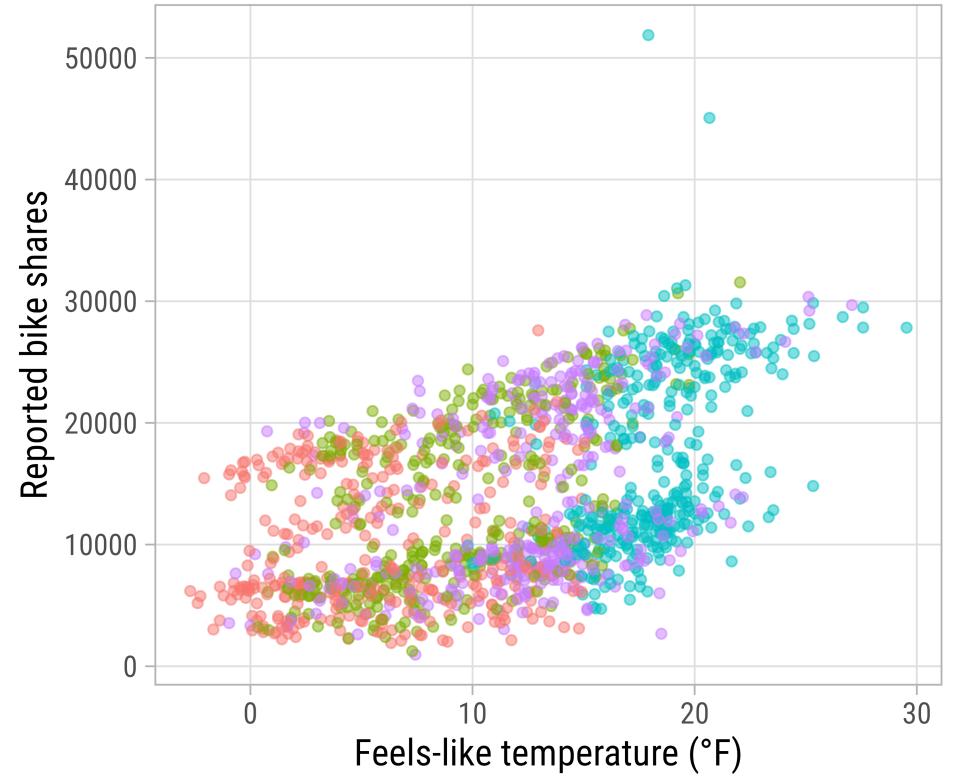
Data: TfL

Styling Labels with {ggtext}

```
1 # install.packages("ggtext")
2
3 g +
4   ggtitle("<b style='font-family:tabular; font-size:25pt'>TfL</b> bike sharing trends by <i style='color:#28a87d;'>season</i>")
5   theme(
6     plot.title = ggtext::element_markdown()
7   )
```

TfL bike sharing trends by *season*

Season: ● winter ● spring ● summer ● autumn



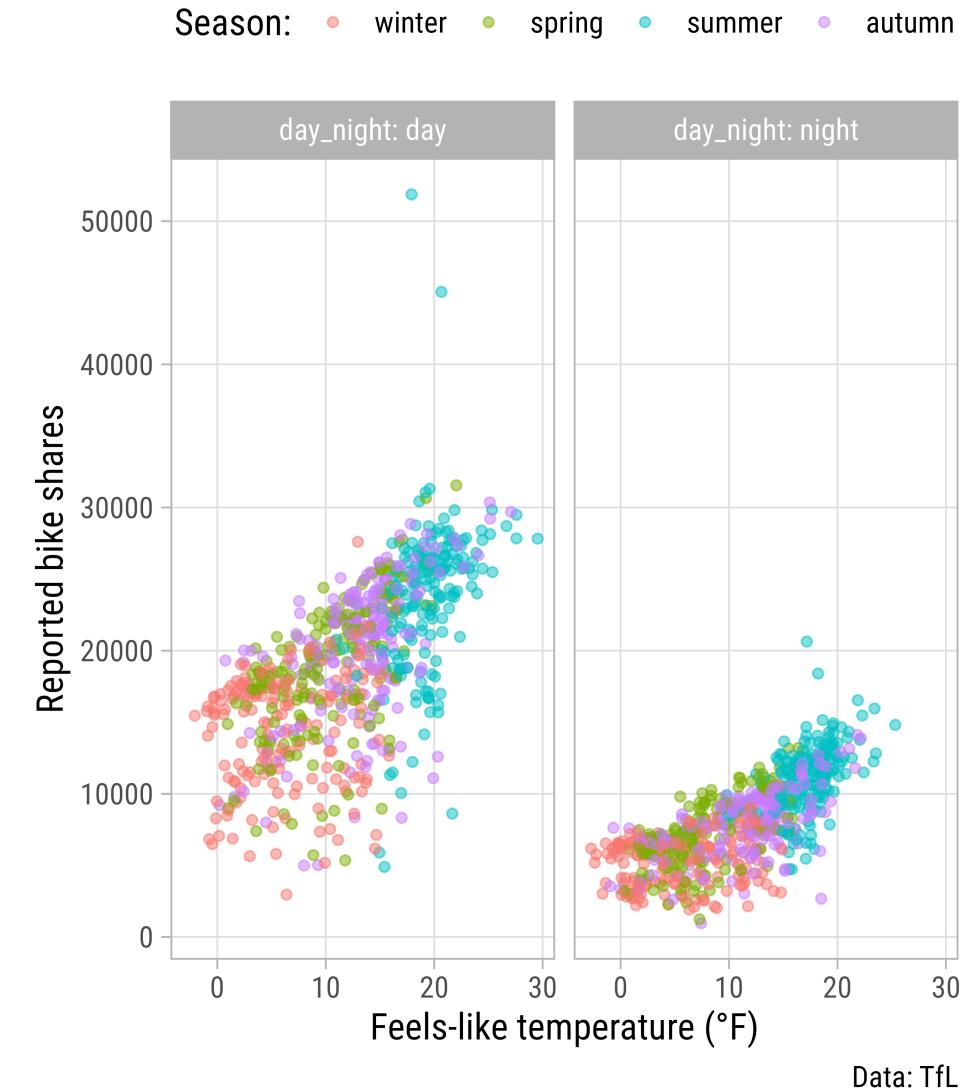
Data: TfL

<b style='font-family:tabular; font-size:25pt'>TfL bike sharing trends by <i style='color:#28a87d;'>season</i>

Labels + `facet_*`()

Facet Labellers

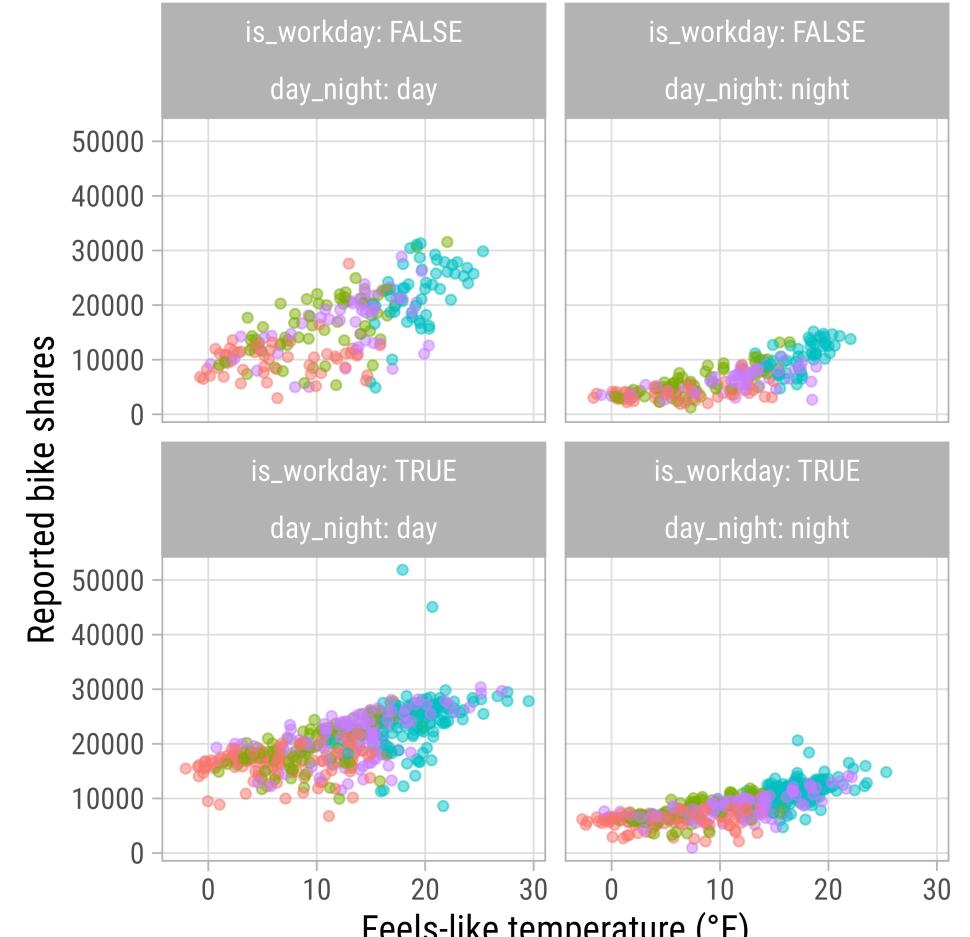
```
1 g +
2   facet_wrap(
3     ~ day_night,
4     labeller = label_both
5   )
```



Facet Labellers

```
1 g +
2   facet_wrap(
3     ~ is_workday + day_night,
4     labeller = label_both
5   )
```

Season: ● winter ● spring ● summer ● autumn

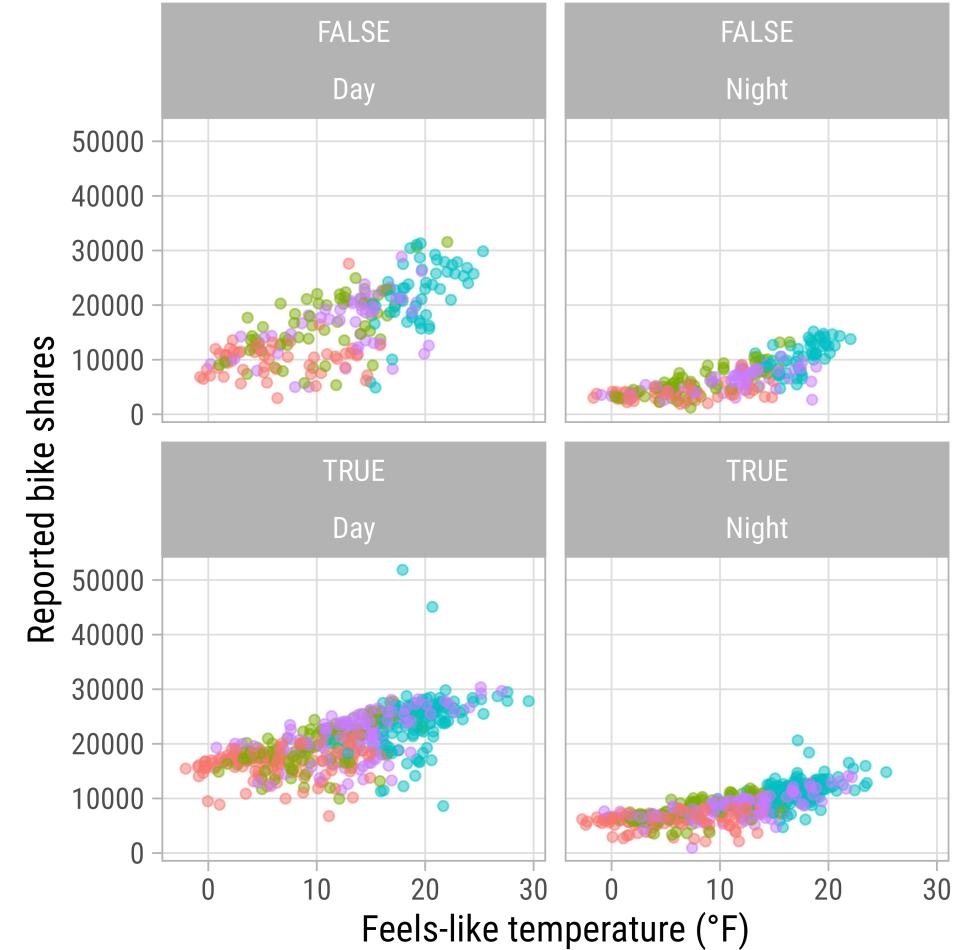


Data: TfL

Facet Labellers

```
1 g +
2   facet_wrap(
3     ~ is_workday + day_night,
4     labeller = labeller(
5       day_night = stringr::str_to_title
6     )
7   )
```

Season: ● winter ● spring ● summer ● autumn

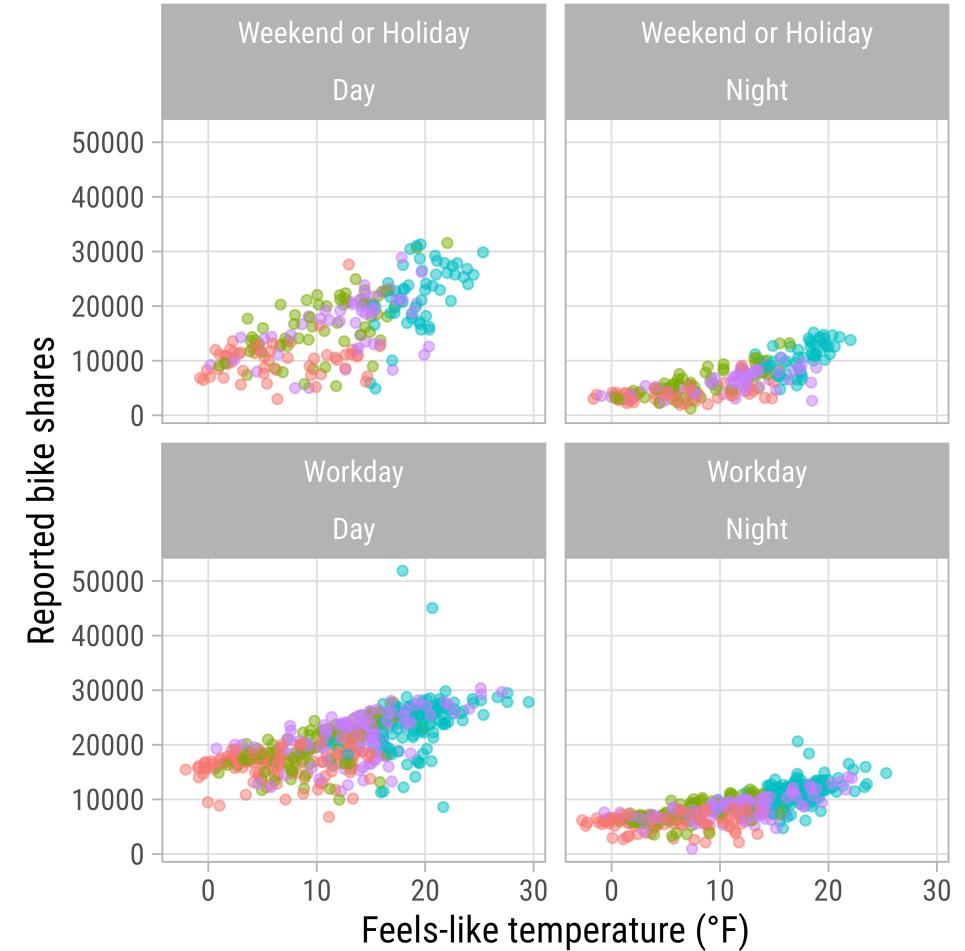


Data: TfL

Facet Labellers

```
1 codes <- c(
2   'TRUE' = "Workday",
3   'FALSE' = "Weekend or Holiday"
4 )
5
6 gg +
7 facet_wrap(
8   ~ is_workday + day_night,
9   labeller = labeller(
10     day_night = stringr::str_to_title,
11     is_workday = codes
12   )
13 )
```

Season: ● winter ● spring ● summer ● autumn

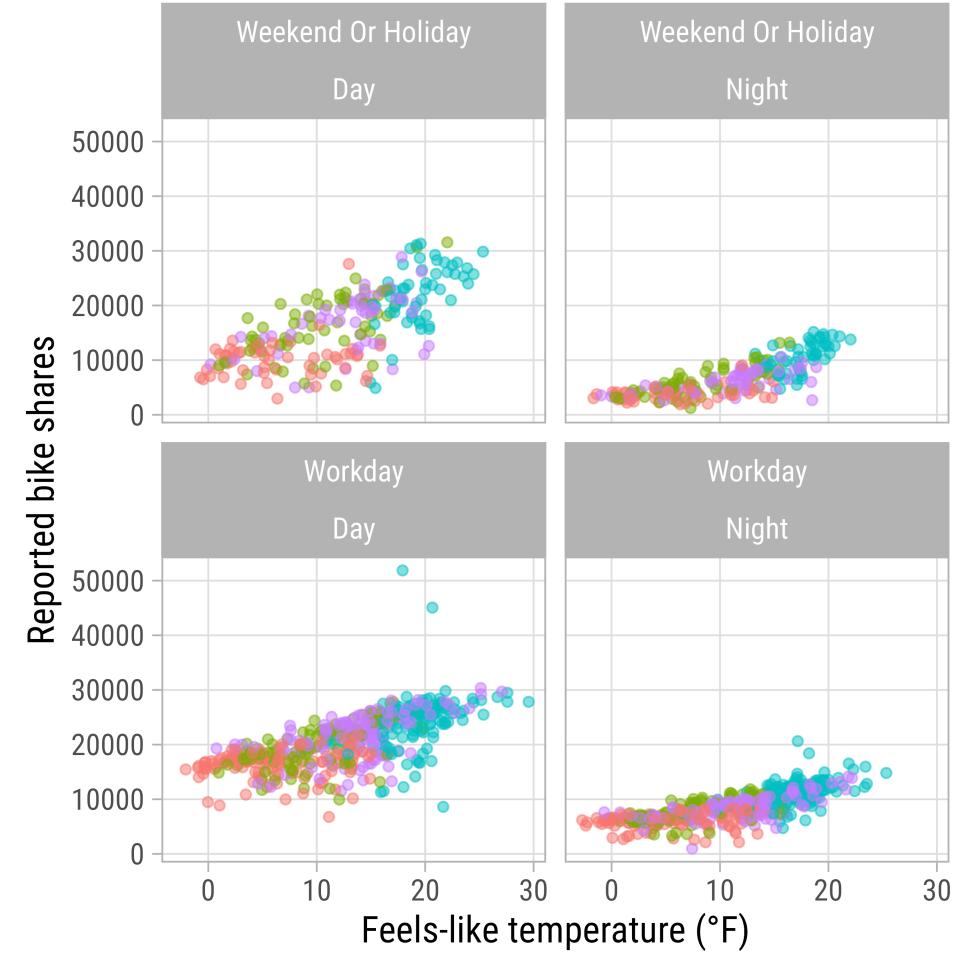


Data: TfL

Facet Labellers

```
1 codes <- c(  
2   'TRUE' = "Workday",  
3   'FALSE' = "Weekend or Holiday"  
4 )  
5  
6 gg +  
7 facet_wrap(  
8   ~ is_workday + day_night,  
9   labeller = labeller(  
10    .default = stringr::str_to_title,  
11    is_workday = codes  
12  )  
13 )
```

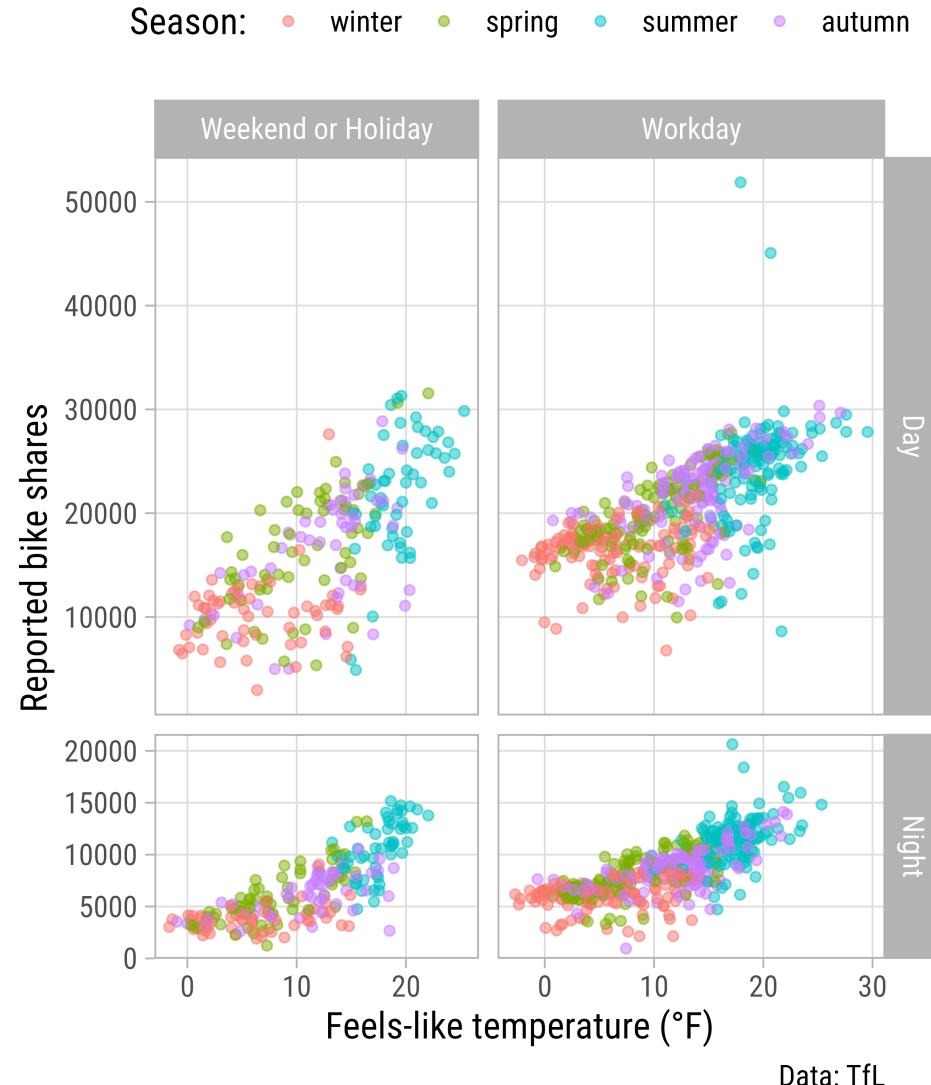
Season: ● winter ● spring ● summer ● autumn



Data: TfL

Facet Labeller

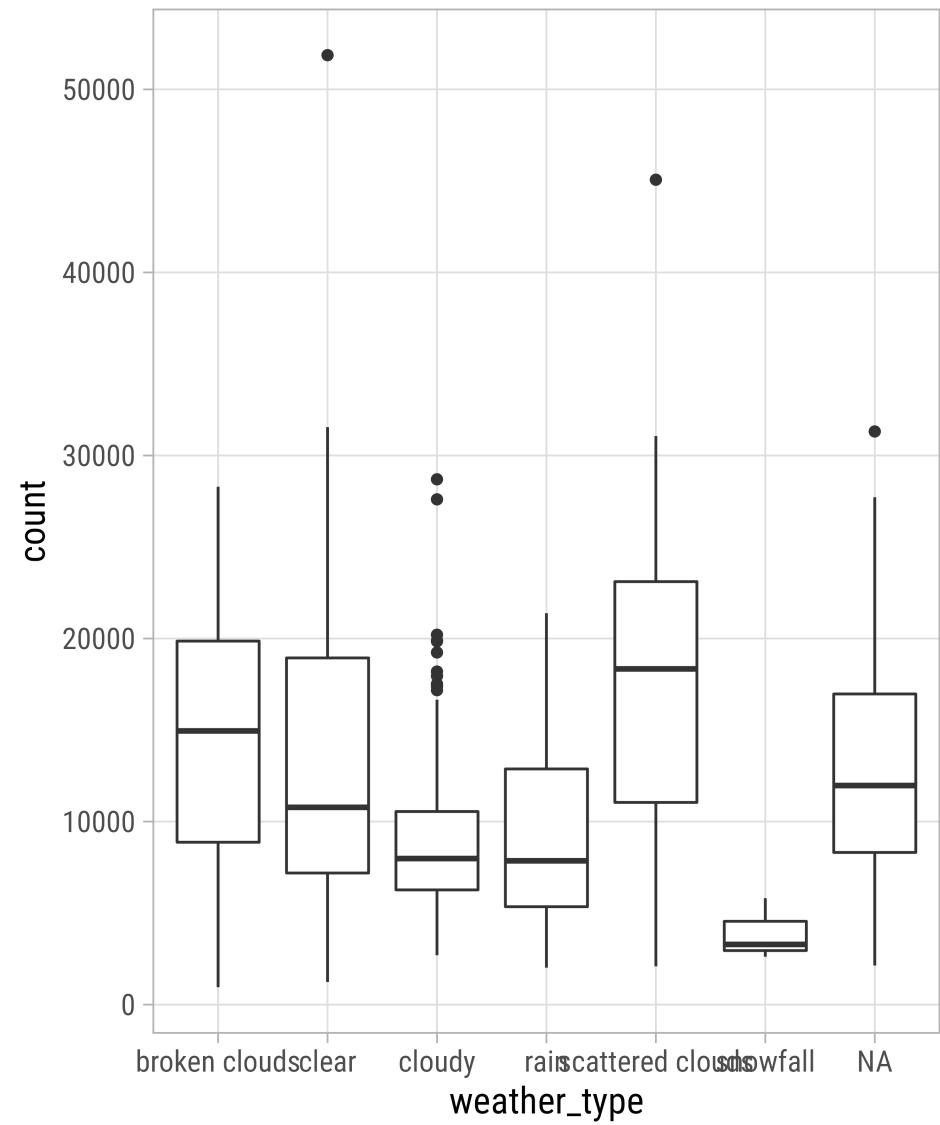
```
1 g +
2   facet_grid(
3     day_night ~ is_workday,
4     scales = "free",
5     space = "free",
6     labeller = labeller(
7       day_night = stringr::str_to_title,
8       is_workday = codes
9     )
10 )
```



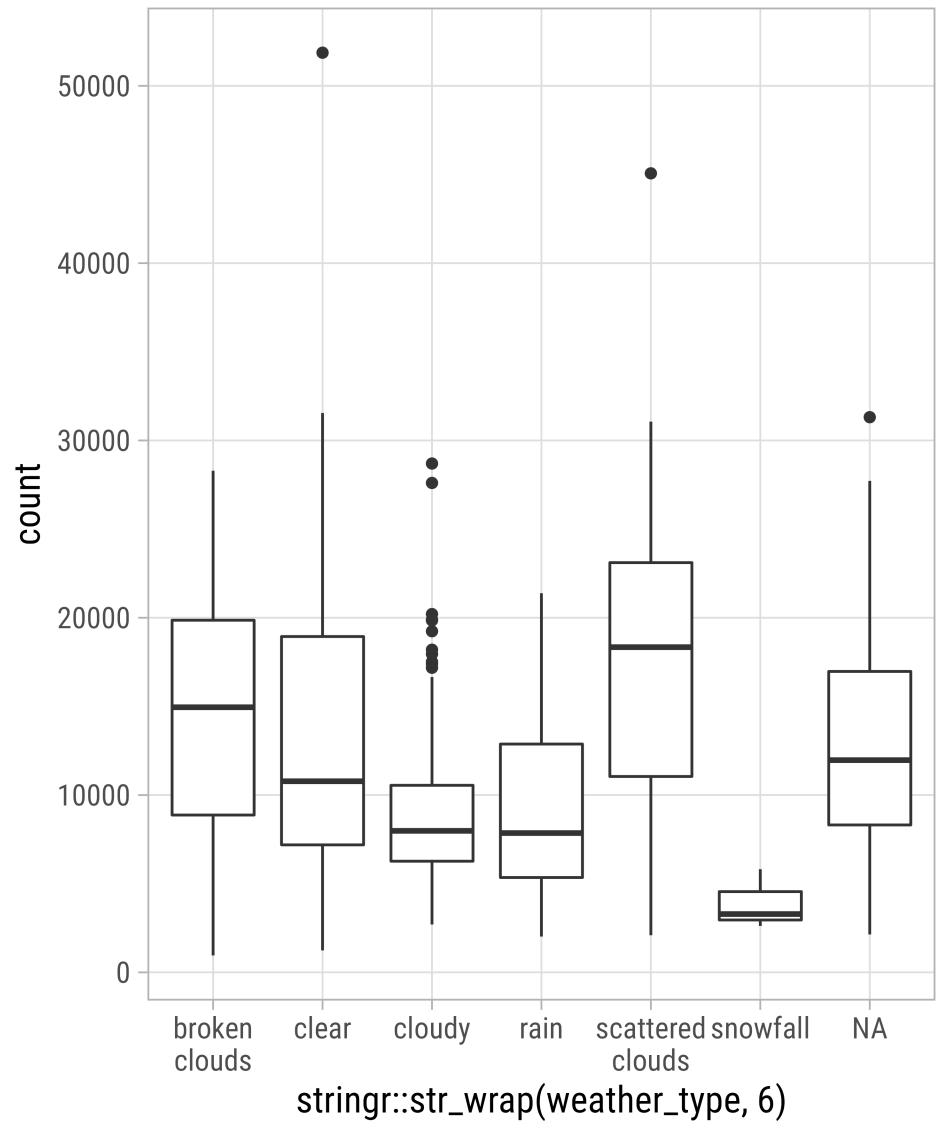
Handling Long Labels

Handling Long Labels with {stringr}

```
1 ggplot(  
2   bikes,  
3   aes(x = weather_type,  
4        y = count)  
5 ) +  
6 geom_boxplot()
```



```
1 ggplot(  
2   bikes,  
3   aes(x = stringr::str_wrap(weather_type, 6),  
4        y = count)  
5 ) +  
6 geom_boxplot()
```

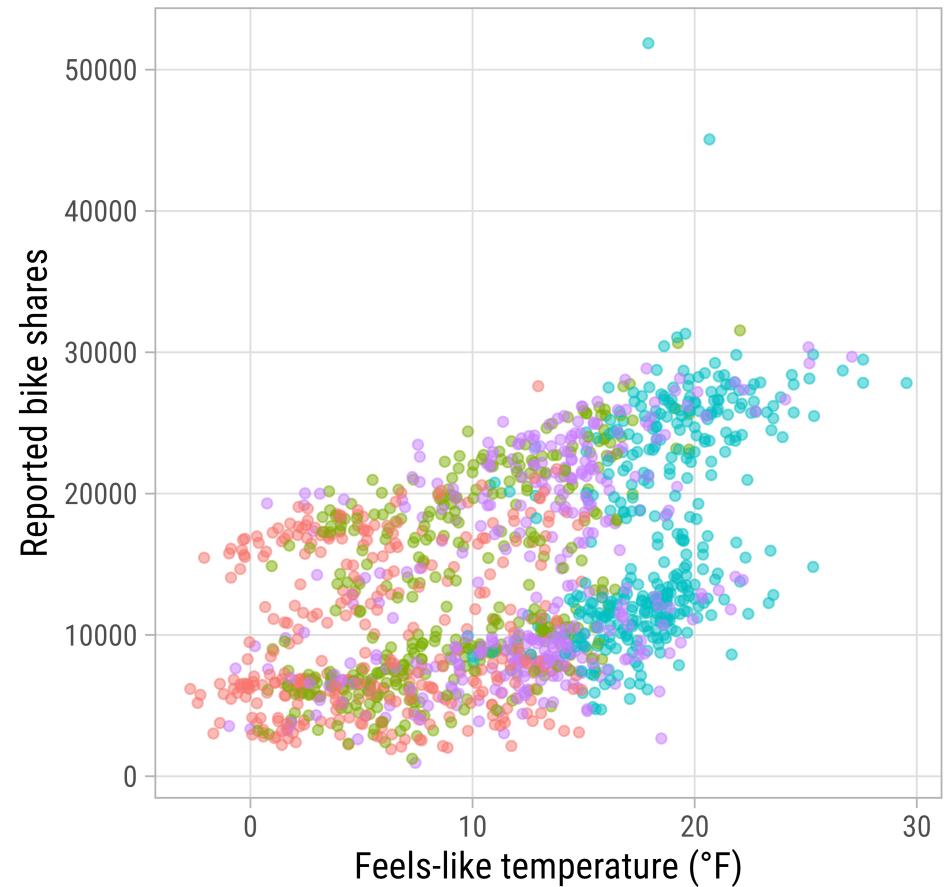


Handling Long Labels with {ggtext}

```
1 g +  
2   ggtitle("TfL bike sharing trends in 2015 and  
3   theme(  
4     plot.title = element_text(size = 20),  
5     plot.title.position = "plot"  
6   )
```

TfL bike sharing trends in 2015 and 2016 by season

Season: ● winter ● spring ● summer ● autumn



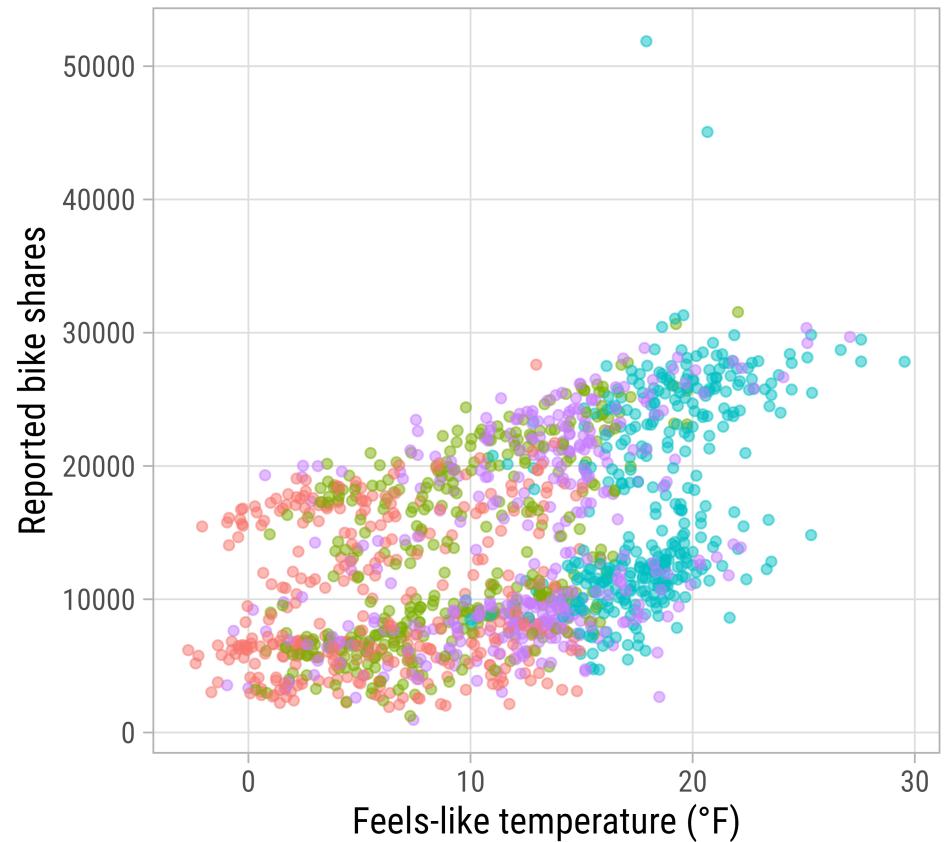
Data: TfL

Handling Long Labels

```
1 g +
2   ggtitle("TfL bike sharing trends in 2015 and
3   theme(
4     plot.title =
5       ggtext::element_textbox_simple(size = 20)
6     plot.title.position = "plot"
7   )
```

TfL bike sharing trends in 2015 and 2016 by season for day and night periods

Season: ● winter ● spring ● summer ● autumn

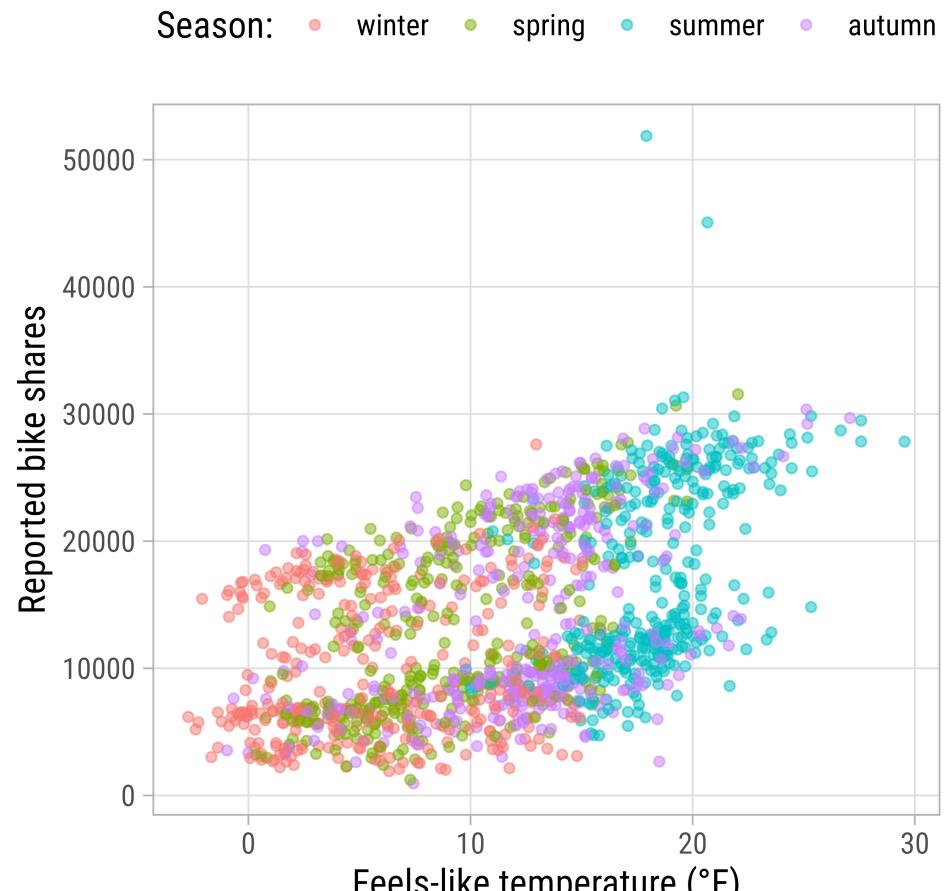


Data: TfL

Handling Long Labels

```
1 g +
2   ggtitle("TfL bike sharing trends in 2015 and
3   theme(
4     plot.title = ggtext::element_textbox_simple(),
5     margin = margin(t = 12, b = 12),
6     lineheight = .9
7   ),
8   plot.title.position = "plot"
9 )
```

TfL bike sharing trends in 2015 and 2016 by season for day and night periods

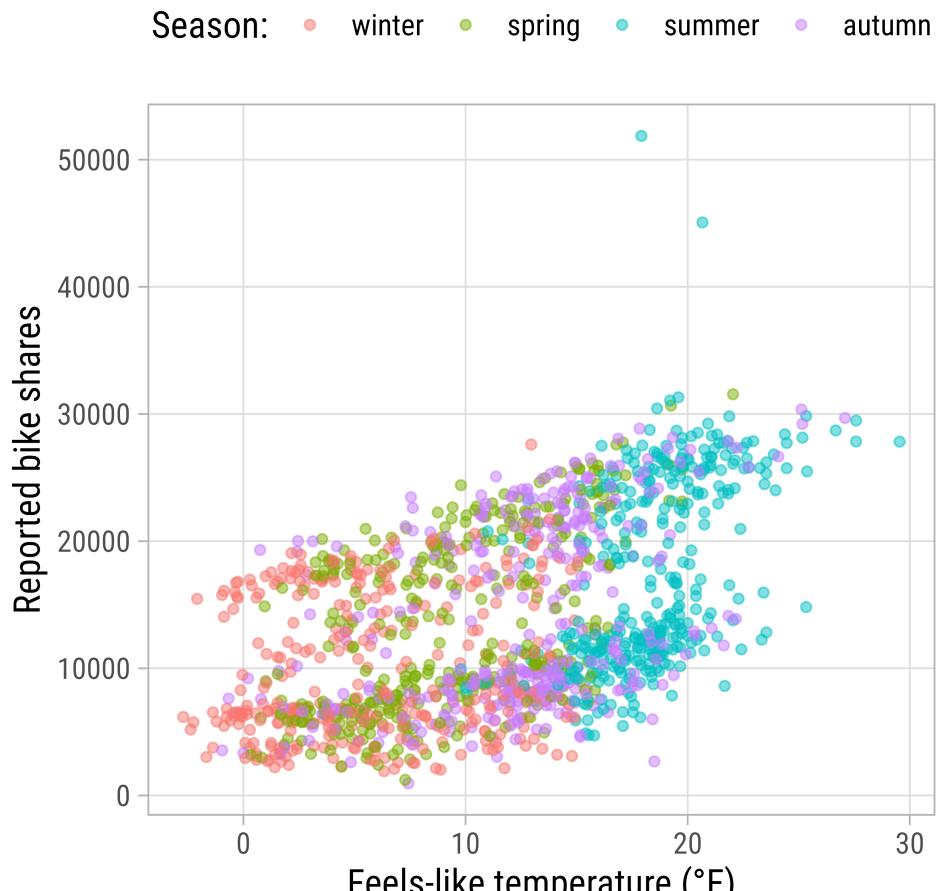


Data: TfL

Handling Long Labels

```
1 g +
2   ggtitle("TfL bike sharing trends in 2015 and
3   theme(
4     plot.title = ggtext::element_textbox_simple(),
5     margin = margin(t = 12, b = 12),
6     fill = "grey90",
7     lineheight = .9
8   ),
9   plot.title.position = "plot"
10 )
```

TfL bike sharing trends in 2015 and 2016 by season
for day and night periods



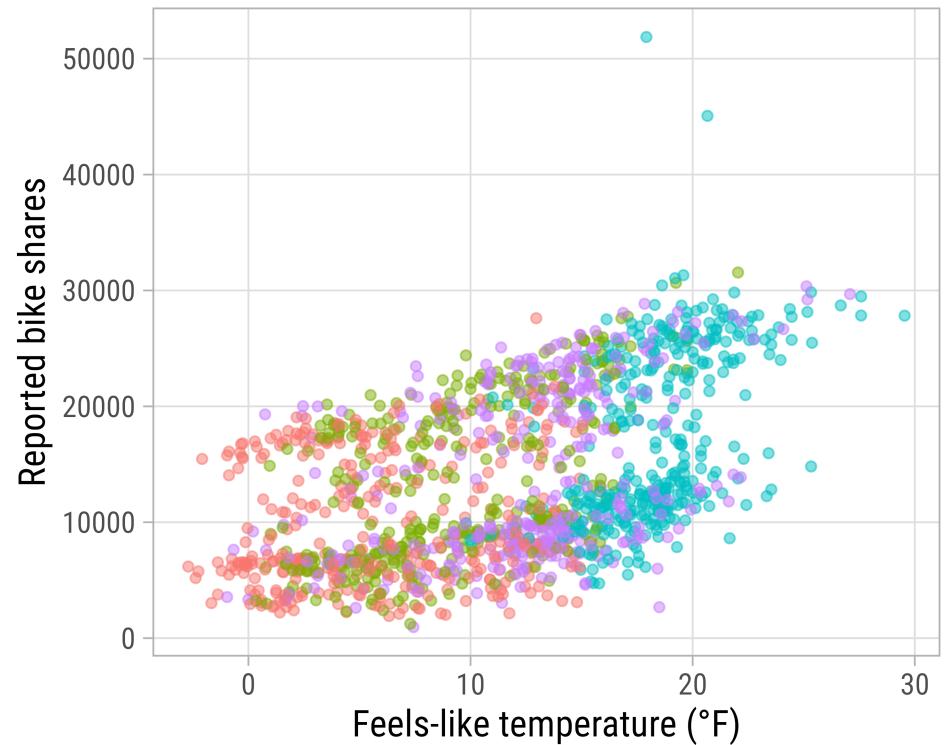
Data: TfL

Handling Long Labels

```
1 g +
2   ggtitle("TfL bike sharing trends in 2015 and
3   theme(
4     plot.title = ggtext::element_textbox_simple(
5       margin = margin(t = 12, b = 12),
6       padding = margin(rep(12, 4)),
7       fill = "grey90",
8       box.color = "grey40",
9       r = unit(9, "pt"),
10      halign = .5,
11      face = "bold",
12      lineheight = .9
13    ),
14    plot.title.position = "plot"
15  )
```

TfL bike sharing trends in 2015 and 2016 by season for day and night periods

Season: ● winter ● spring ● summer ● autumn

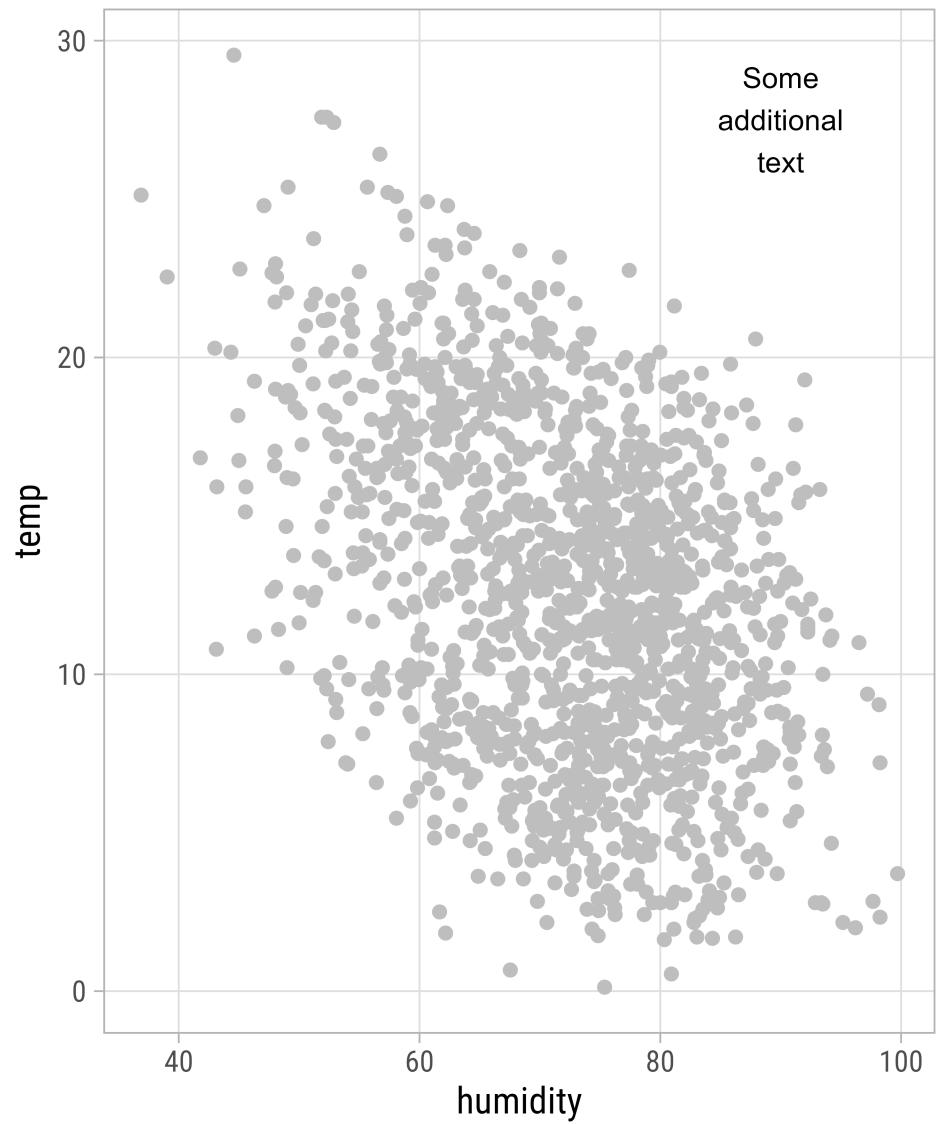


Data: TfL

Annotations with `annotate()`

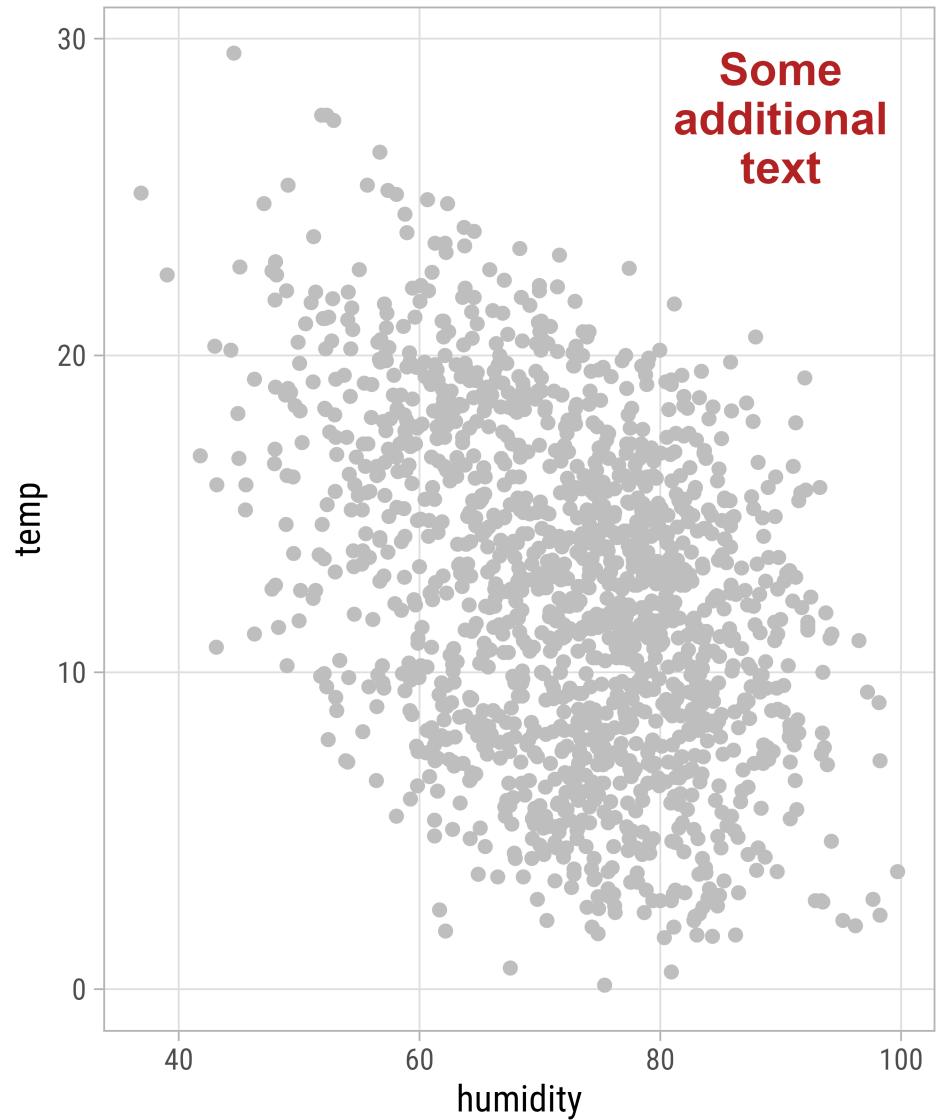
Add Single Text Annotations

```
1 ggplot(bikes, aes(humidity, temp)) +  
2   geom_point(size = 2, color = "grey") +  
3   annotate(  
4     geom = "text",  
5     x = 90,  
6     y = 27.5,  
7     label = "Some\\nadditional\\ntext"  
8   )
```



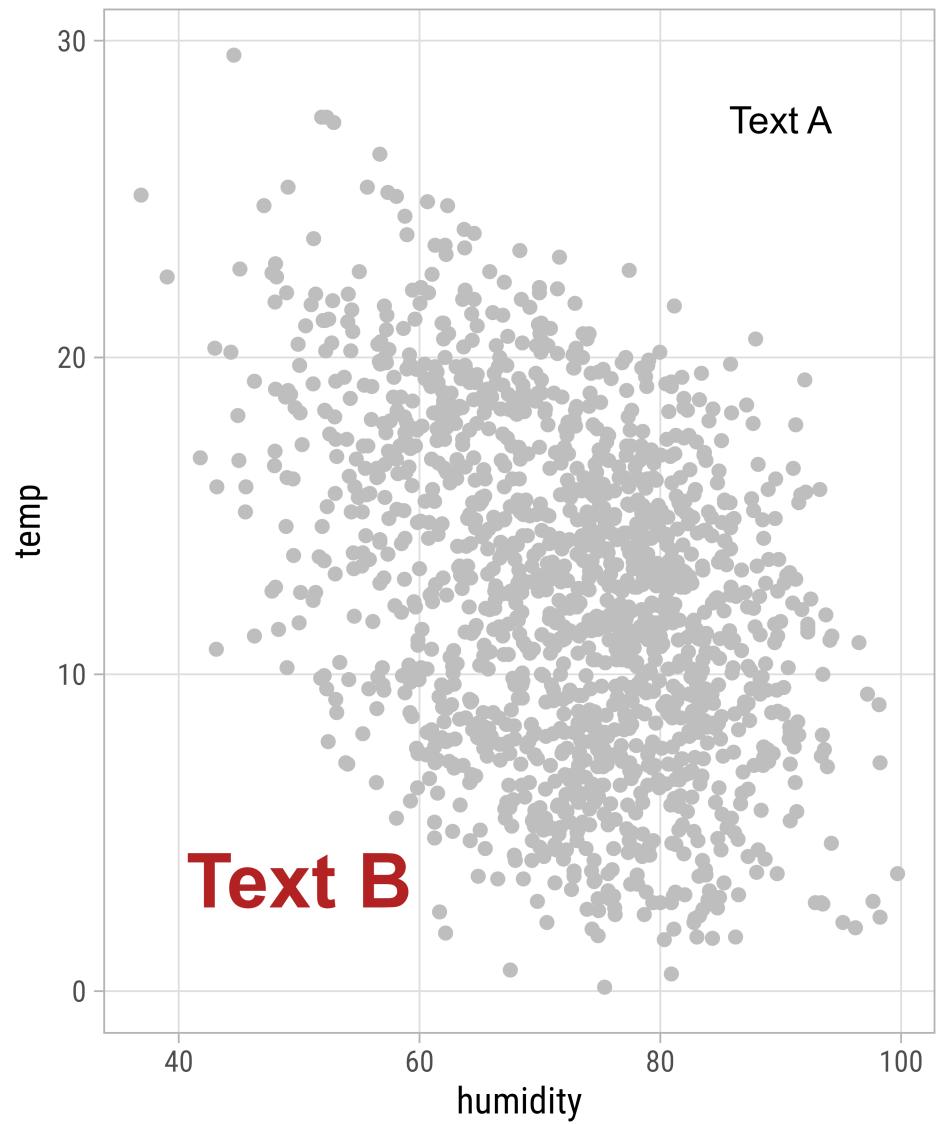
Style Text Annotations

```
1 ggplot(bikes, aes(humidity, temp)) +  
2   geom_point(size = 2, color = "grey") +  
3   annotate(  
4     geom = "text",  
5     x = 90,  
6     y = 27.5,  
7     label = "Some\\nadditional\\ntext",  
8     size = 6,  
9     color = "firebrick",  
10    fontface = "bold",  
11    lineheight = .9  
12  )
```



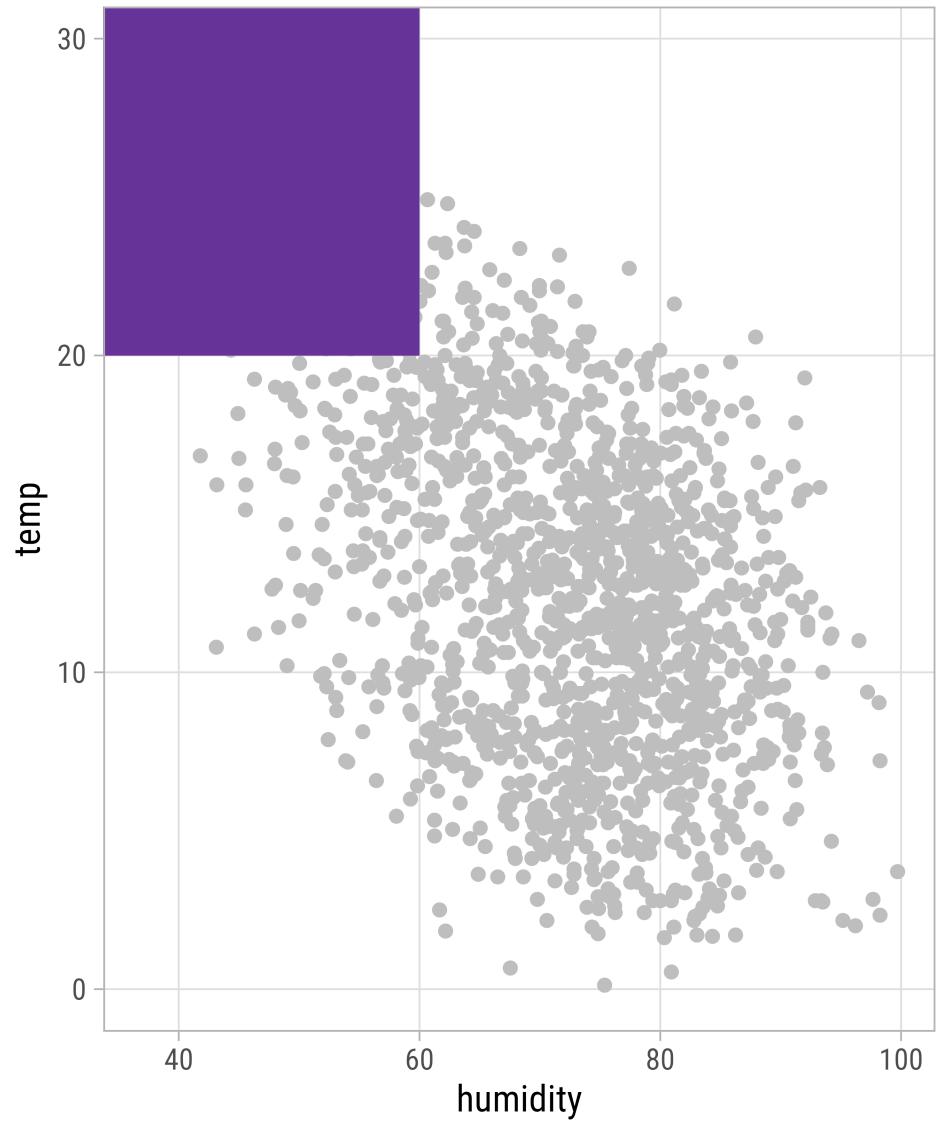
Add Multiple Text Annotations

```
1 ggplot(bikes, aes(humidity, temp)) +  
2   geom_point(size = 2, color = "grey") +  
3   annotate(  
4     geom = "text",  
5     x = c(90, 50),  
6     y = c(27.5, 3.5),  
7     label = c("Text A", "Text B"),  
8     color = c("black", "firebrick"),  
9     size = c(5, 10),  
10    fontface = c("plain", "bold"))  
11 )
```



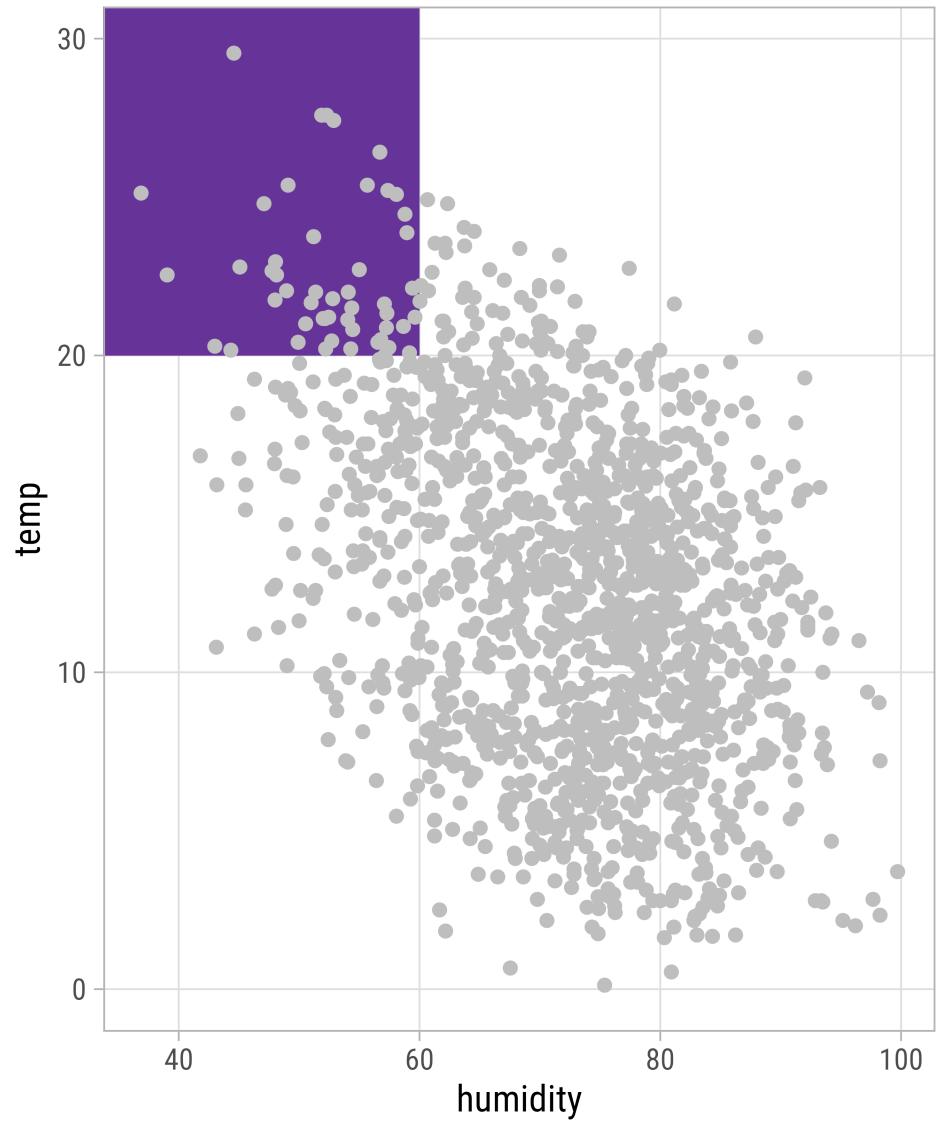
Add Boxes (Rectangles)

```
1 ggplot(bikes, aes(humidity, temp)) +  
2   geom_point(size = 2, color = "grey") +  
3   annotate(  
4     geom = "rect",  
5     xmin = -Inf,  
6     xmax = 60,  
7     ymin = 20,  
8     ymax = Inf,  
9     fill = "#663399"  
10    )
```



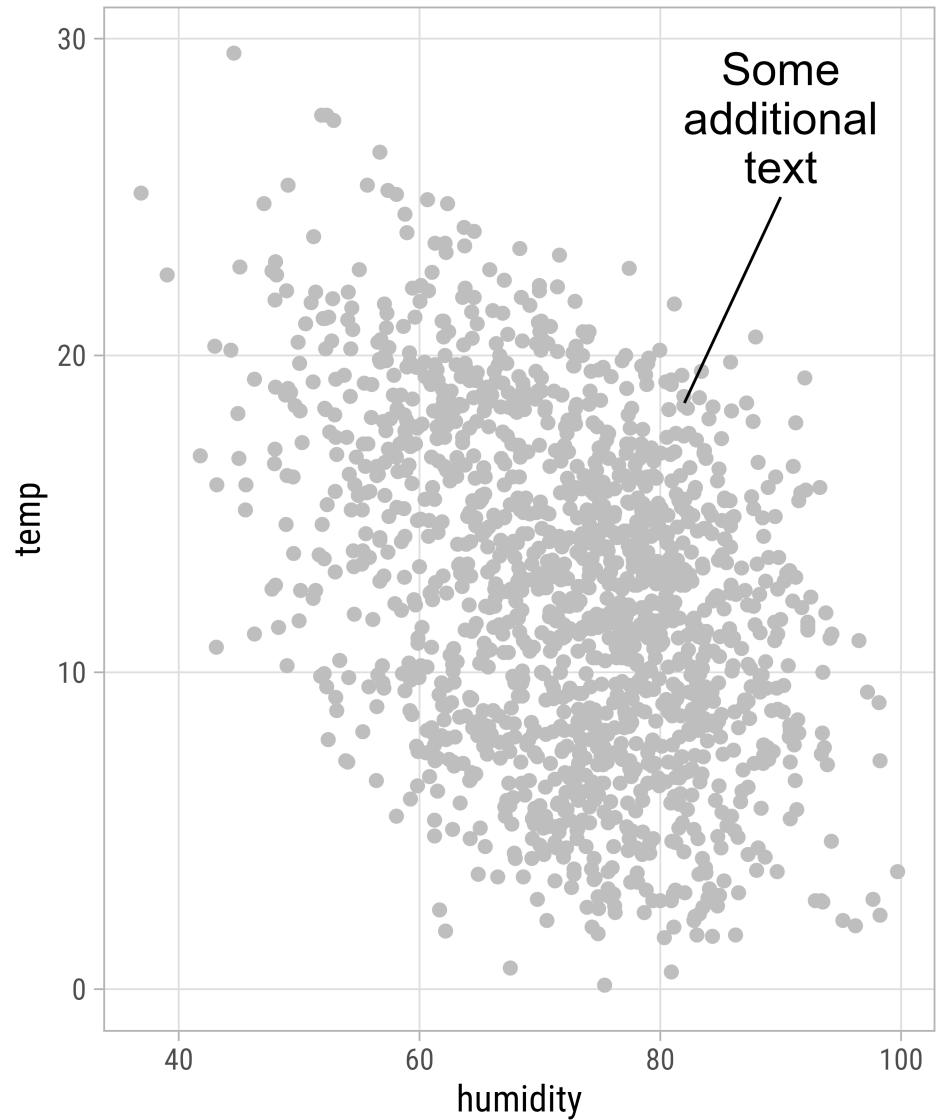
Add Boxes (Rectangles)

```
1 ggplot(bikes, aes(humidity, temp)) +
2   annotate(
3     geom = "rect",
4     xmin = -Inf,
5     xmax = 60,
6     ymin = 20,
7     ymax = Inf,
8     fill = "#663399"
9   ) +
10  geom_point(size = 2, color = "grey")
```



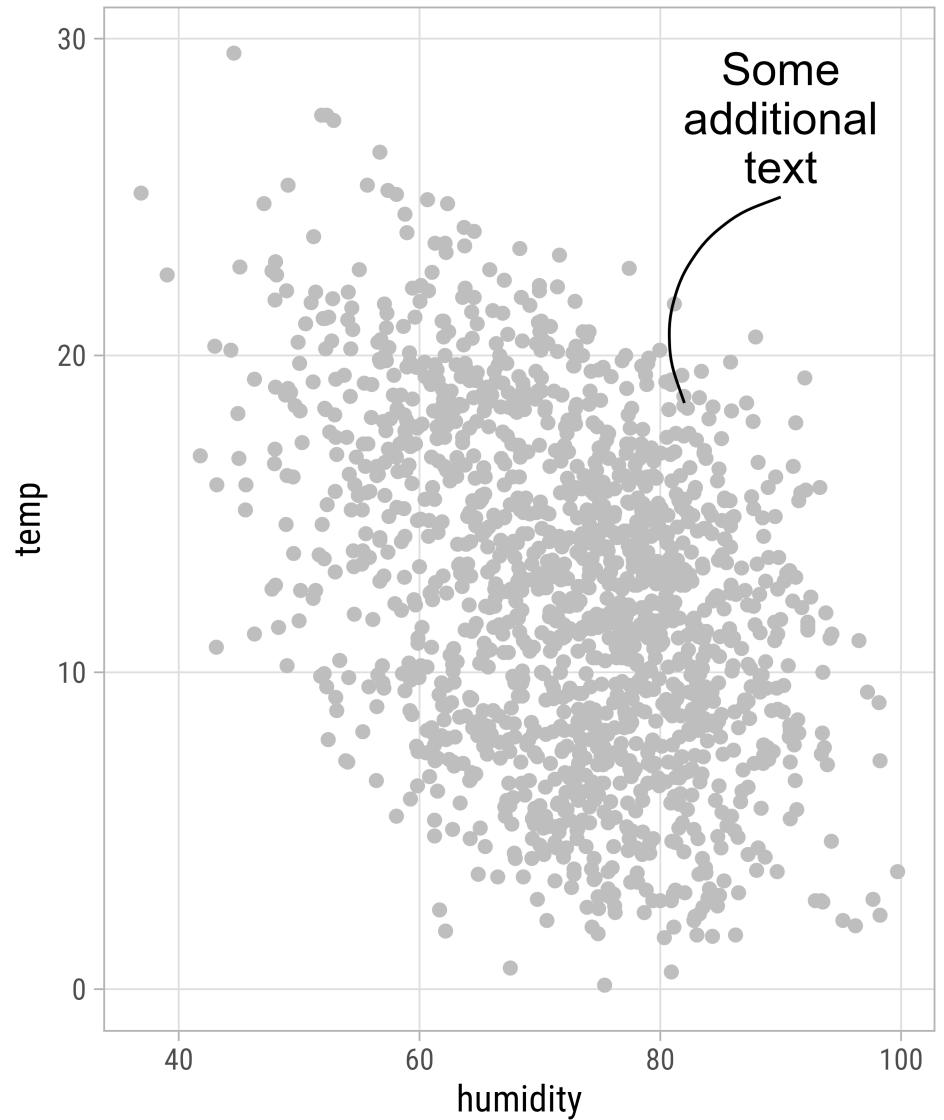
Add Lines (Segments)

```
1 ggplot(bikes, aes(humidity, temp)) +
2   geom_point(size = 2, color = "grey") +
3   annotate(
4     geom = "text",
5     x = 90,
6     y = 27.5,
7     label = "Some\nadditional\ntext",
8     size = 6,
9     lineheight = .9
10   ) +
11   annotate(
12     geom = "segment",
13     x = 90, xend = 82,
14     y = 25, yend = 18.5
15   )
```



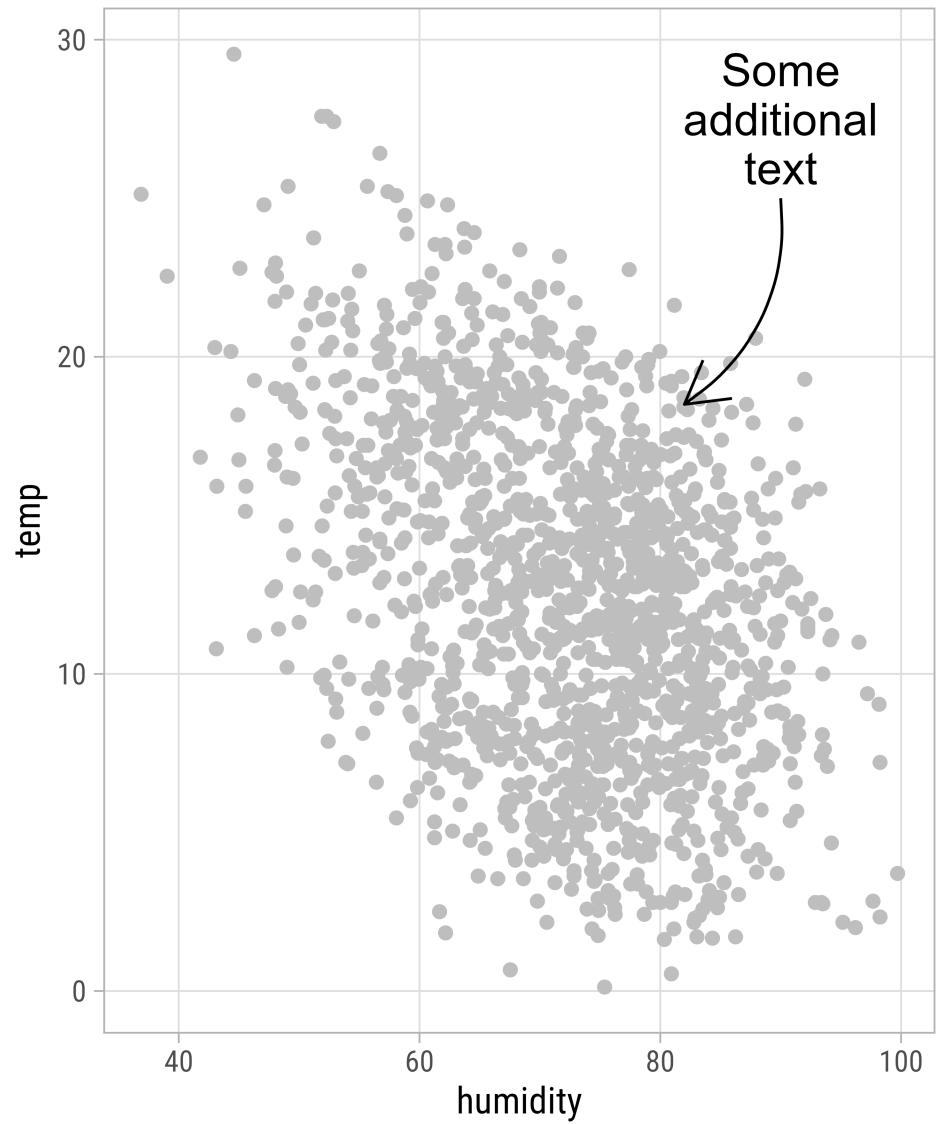
Add Curves

```
1 ggplot(bikes, aes(humidity, temp)) +
2   geom_point(size = 2, color = "grey") +
3   annotate(
4     geom = "text",
5     x = 90,
6     y = 27.5,
7     label = "Some\nadditional\ntext",
8     size = 6,
9     lineheight = .9
10   ) +
11   annotate(
12     geom = "curve",
13     x = 90, xend = 82,
14     y = 25, yend = 18.5
15   )
```



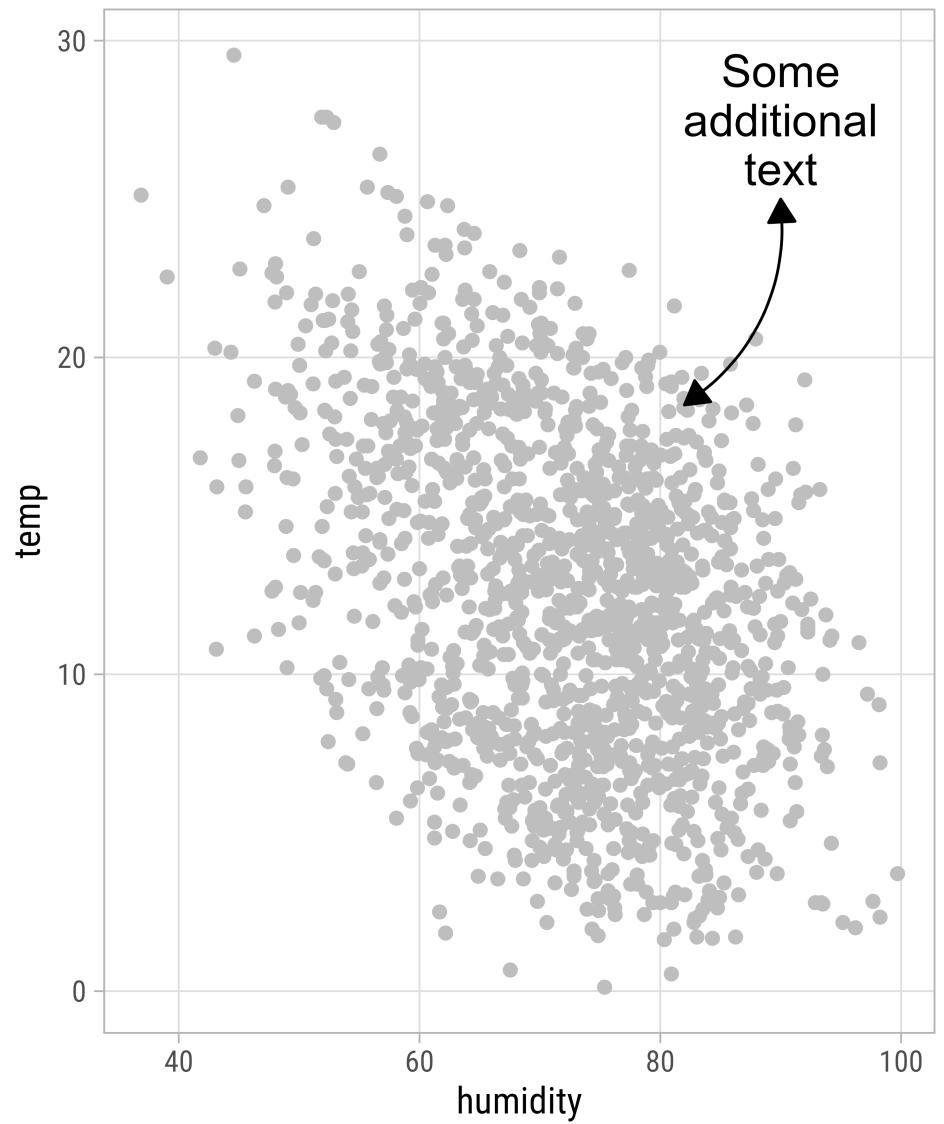
Add Arrows

```
1 ggplot(bikes, aes(humidity, temp)) +
2   geom_point(size = 2, color = "grey") +
3   annotate(
4     geom = "text",
5     x = 90,
6     y = 27.5,
7     label = "Some\nadditional\ntext",
8     size = 6,
9     lineheight = .9
10 ) +
11   annotate(
12     geom = "curve",
13     x = 90, xend = 82,
14     y = 25, yend = 18.5,
15     curvature = -.3,
16     arrow = arrow()
17 )
```



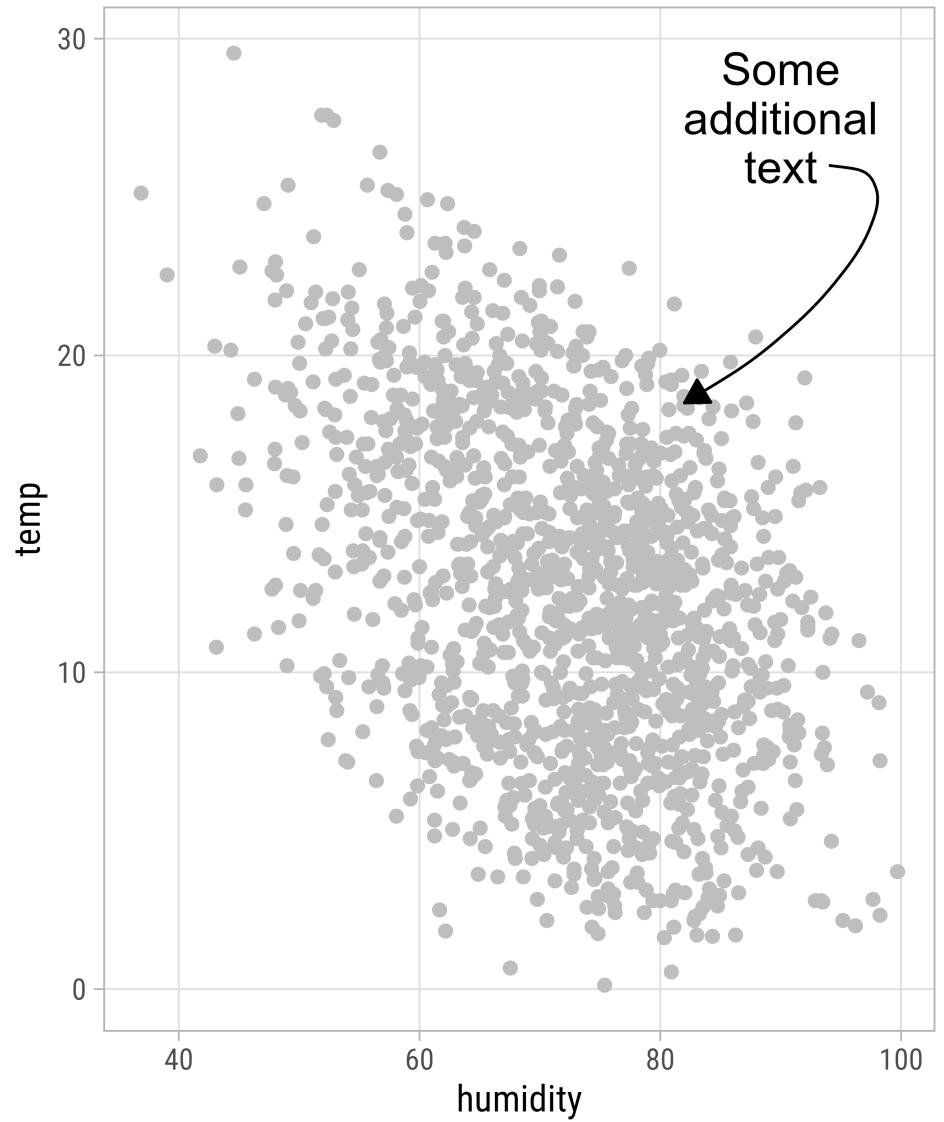
Add Arrows

```
1 ggplot(bikes, aes(humidity, temp)) +
2   geom_point(size = 2, color = "grey") +
3   annotate(
4     geom = "text",
5     x = 90,
6     y = 27.5,
7     label = "Some\nadditional\ntext",
8     size = 6,
9     lineheight = .9
10   ) +
11   annotate(
12     geom = "curve",
13     x = 90, xend = 82,
14     y = 25, yend = 18.5,
15     curvature = -.3,
16     arrow = arrow(
17       length = unit(10, "pt"),
18       type = "closed",
19       ends = "both"
20     )
21   )
```



Add Arrows

```
1 ggplot(bikes, aes(humidity, temp)) +
2   geom_point(size = 2, color = "grey") +
3   annotate(
4     geom = "text",
5     x = 90,
6     y = 27.5,
7     label = "Some\nadditional\ntext",
8     size = 6,
9     lineheight = .9
10   ) +
11   annotate(
12     geom = "curve",
13     x = 94, xend = 82,
14     y = 26, yend = 18.5,
15     curvature = -.8,
16     angle = 140,
17     arrow = arrow(
18       length = unit(10, "pt"),
19       type = "closed"
20     )
21   )
```



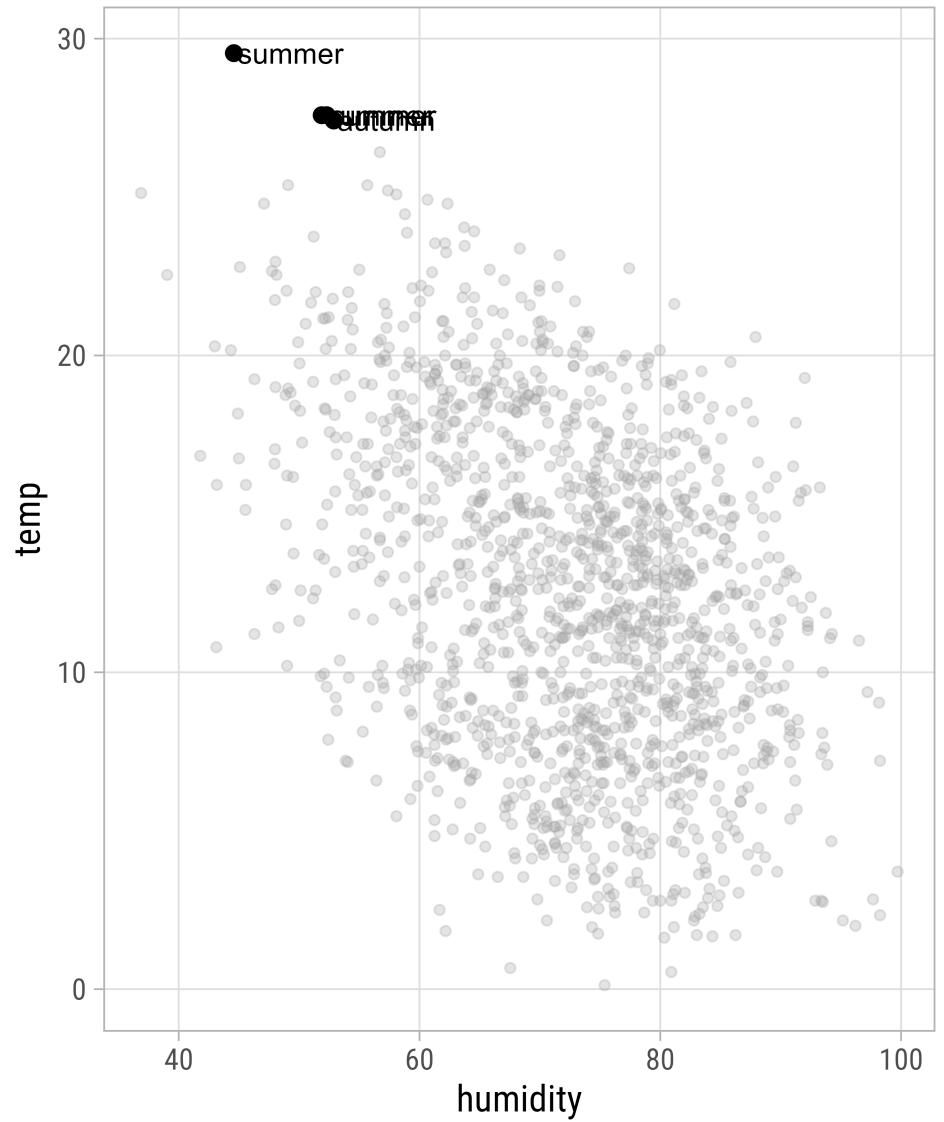
Annotations with geom_*0's

Highlight Hot Periods

```
1 g <- ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp)  
4 ) +  
5 geom_point(  
6   data = bikes,  
7   color = "grey65", alpha = .3  
8 ) +  
9 geom_point(size = 2.5)
```

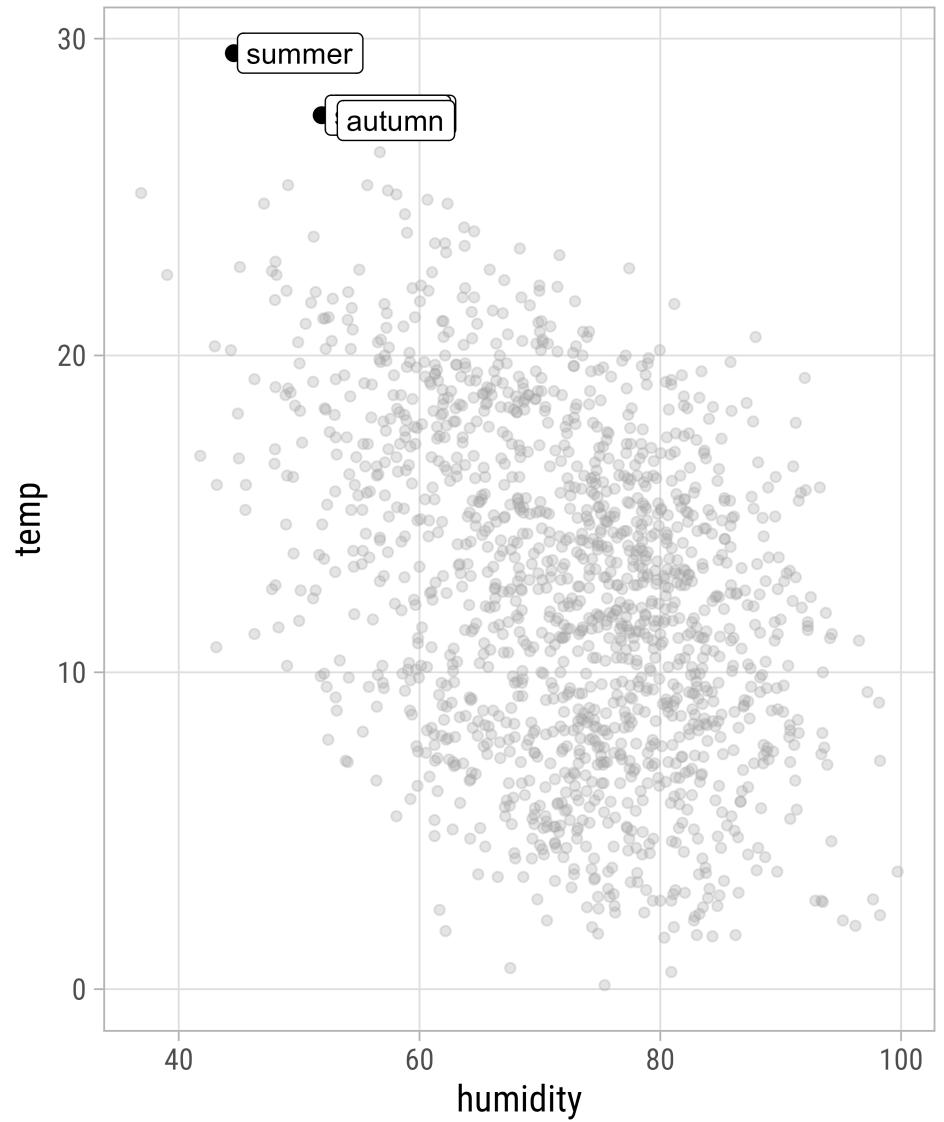
Annotations with `geom_text()`

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp)  
4 ) +  
5   geom_point(  
6     data = bikes,  
7     color = "grey65", alpha = .3  
8 ) +  
9   geom_point(size = 2.5) +  
10  geom_text(  
11    aes(label = season),  
12    nudge_x = .3,  
13    hjust = 0  
14 )
```



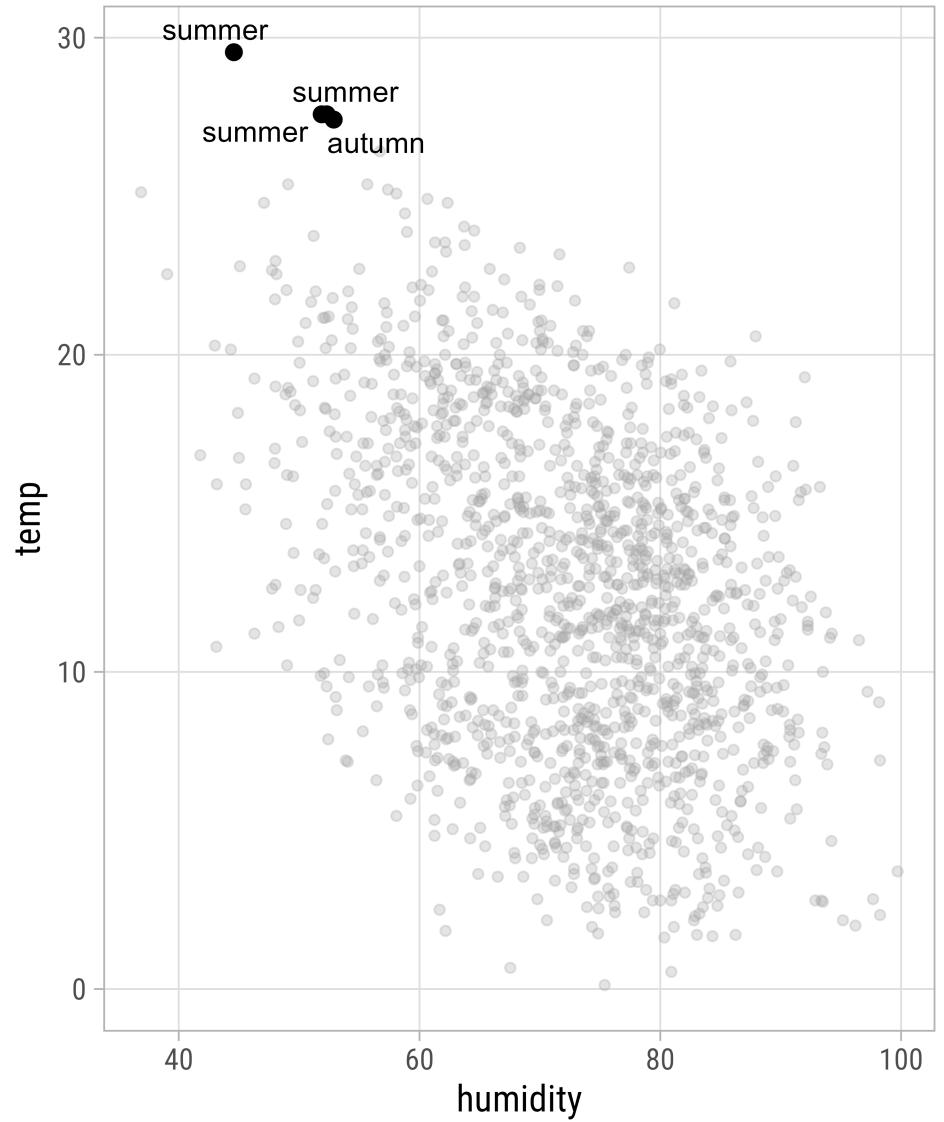
Annotations with `geom_label()``

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp)  
4 ) +  
5   geom_point(  
6     data = bikes,  
7     color = "grey65", alpha = .3  
8 ) +  
9   geom_point(size = 2.5) +  
10  geom_label(  
11    aes(label = season),  
12    nudge_x = .3,  
13    hjust = 0  
14 )
```



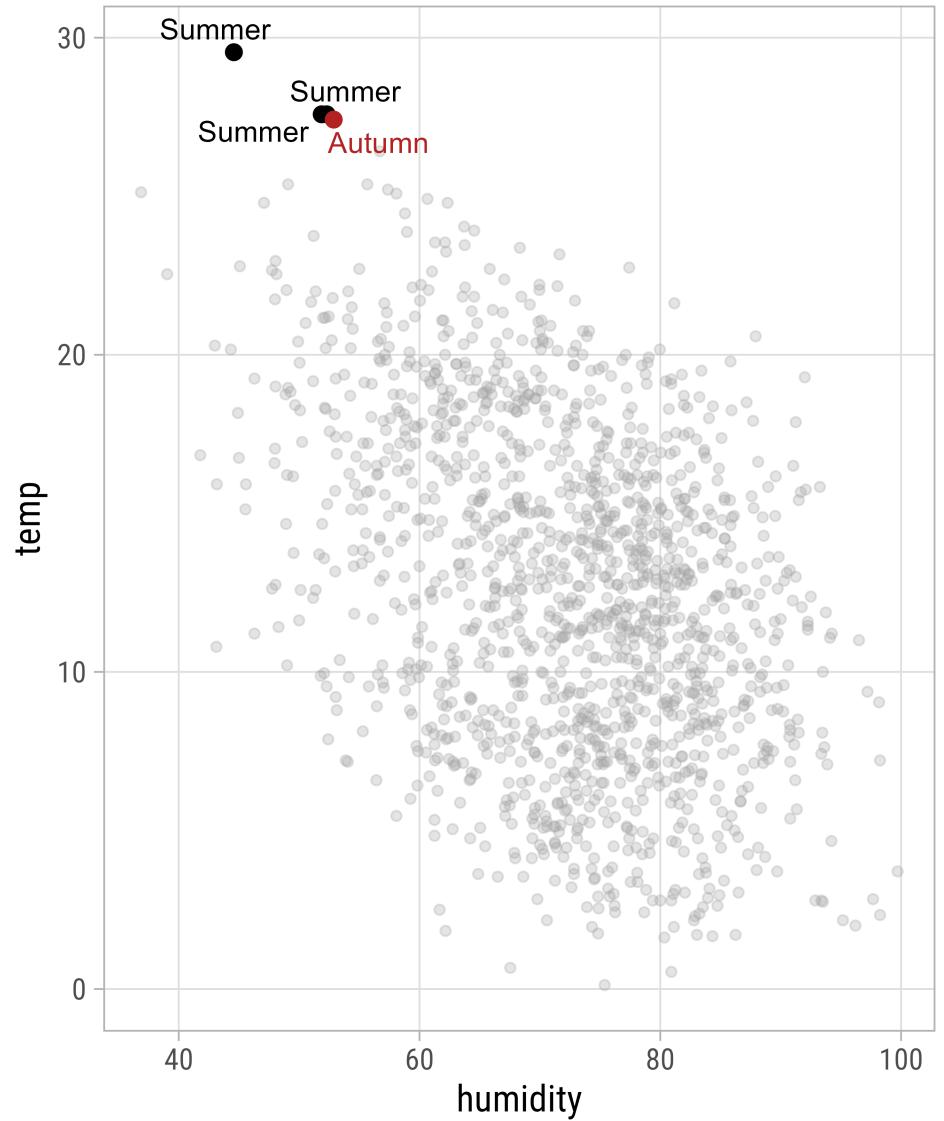
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp)  
4 ) +  
5   geom_point(  
6   data = bikes,  
7   color = "grey65", alpha = .3  
8 ) +  
9   geom_point(size = 2.5) +  
10  ggrepel::geom_text_repel(  
11    aes(label = season)  
12 )
```



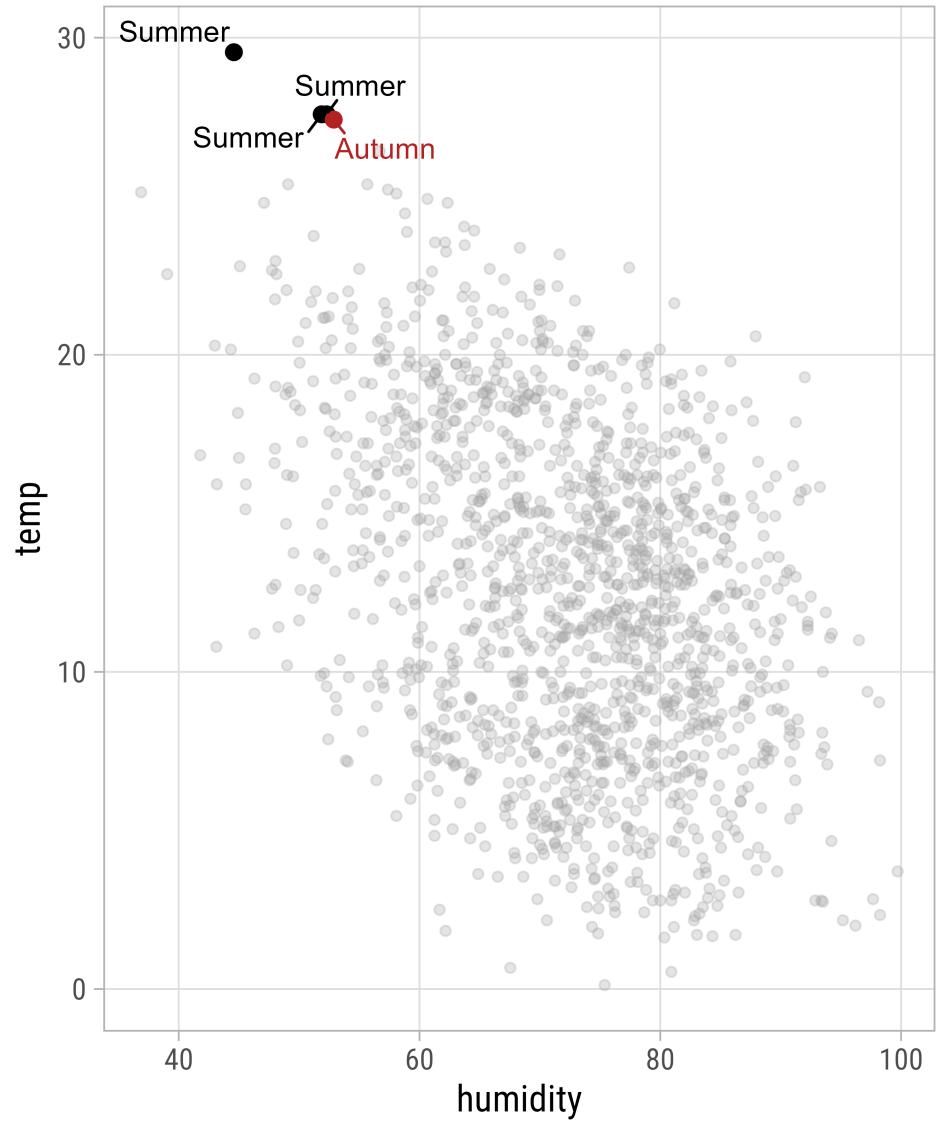
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9 ) +  
10  geom_point(size = 2.5) +  
11  ggrepel::geom_text_repel(  
12    aes(label = str_to_title(season))  
13 ) +  
14  scale_color_manual(  
15    values = c("firebrick", "black"),  
16    guide = "none"  
17 )
```



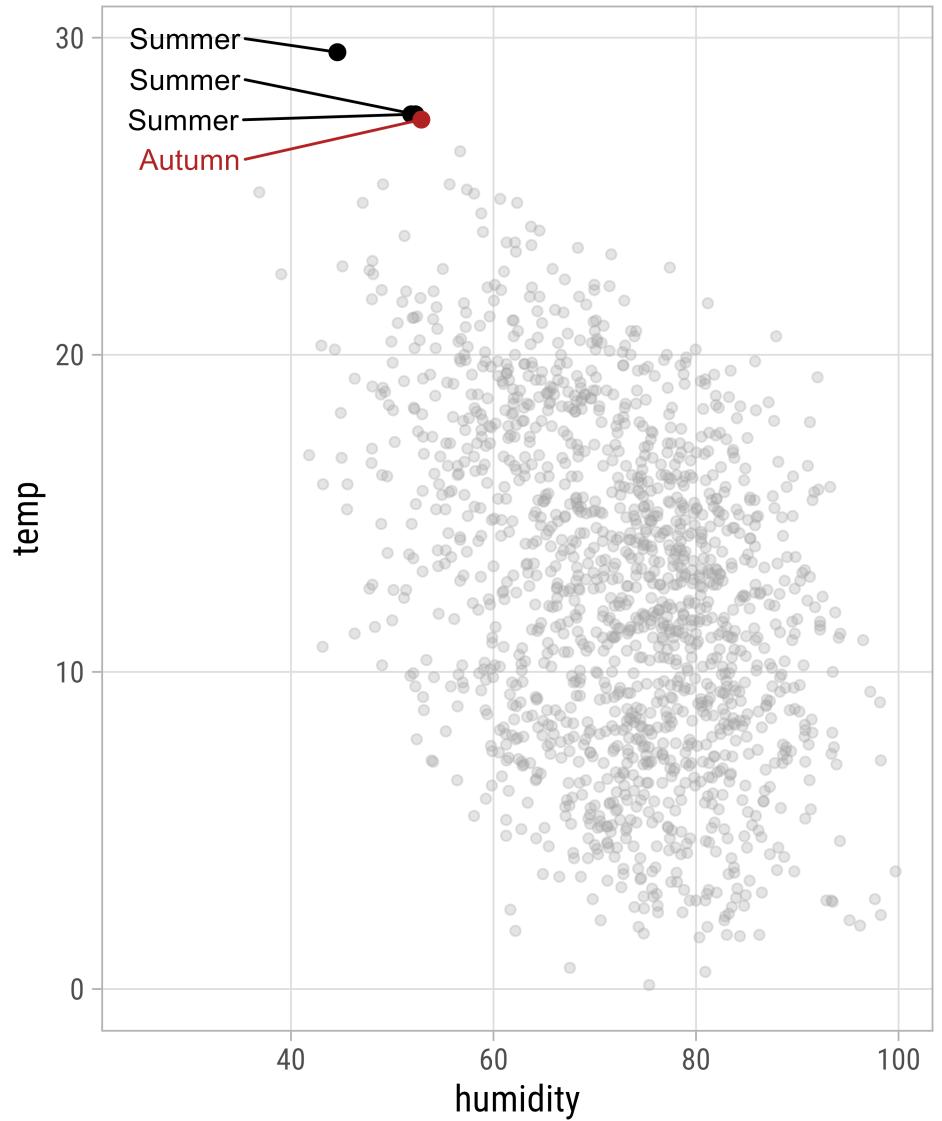
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9 ) +  
10  geom_point(size = 2.5) +  
11  ggrepel::geom_text_repel(  
12    aes(label = str_to_title(season)),  
13    ## space between points + labels  
14    box.padding = .4,  
15    ## always draw segments  
16    min.segment.length = 0  
17 ) +  
18  scale_color_manual(  
19    values = c("firebrick", "black"),  
20    guide = "none"  
21 )
```



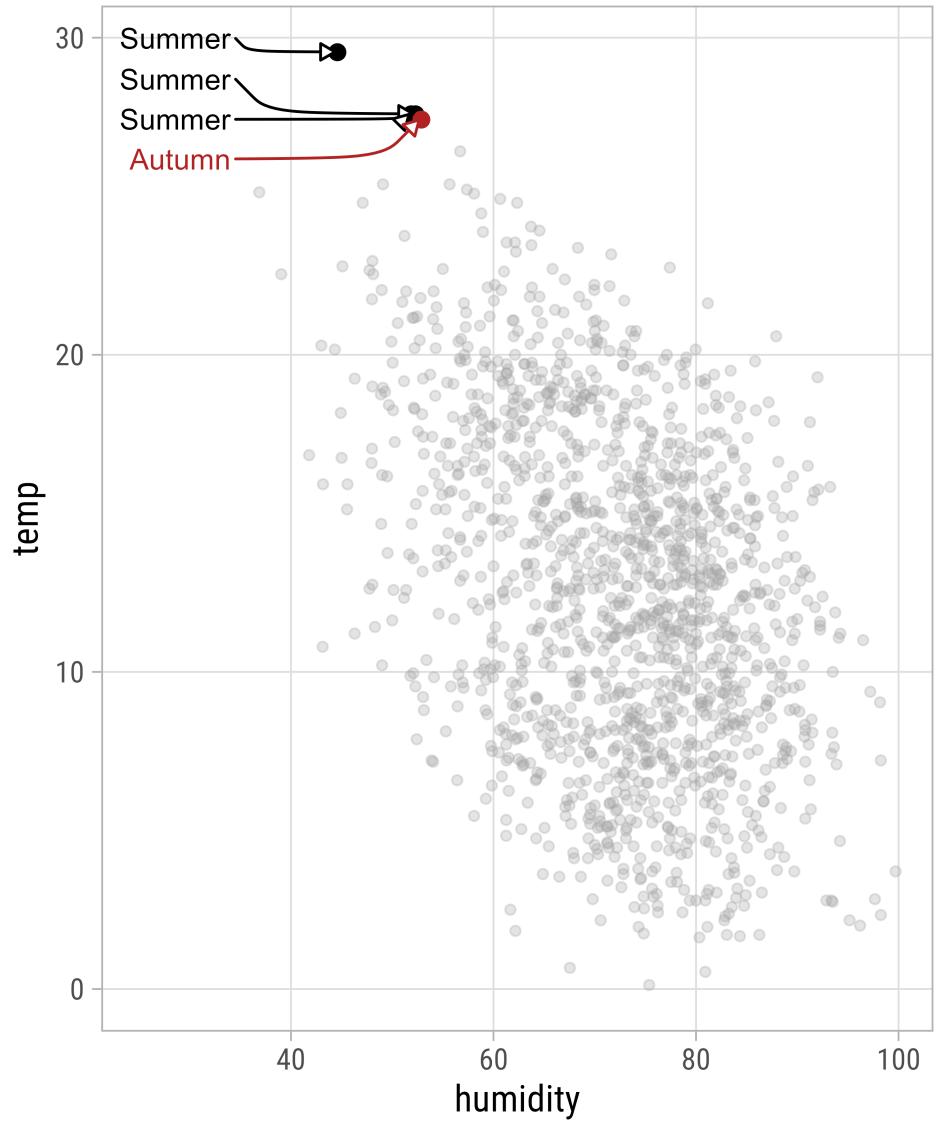
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point(size = 2.5) +  
11  ggrepel::geom_text_repel(  
12    aes(label = str_to_title(season)),  
13    ## force to the right  
14    xlim = c(NA, 35), hjust = 1  
15  ) +  
16  scale_color_manual(  
17    values = c("firebrick", "black"),  
18    guide = "none"  
19  ) +  
20  xlim(25, NA)
```



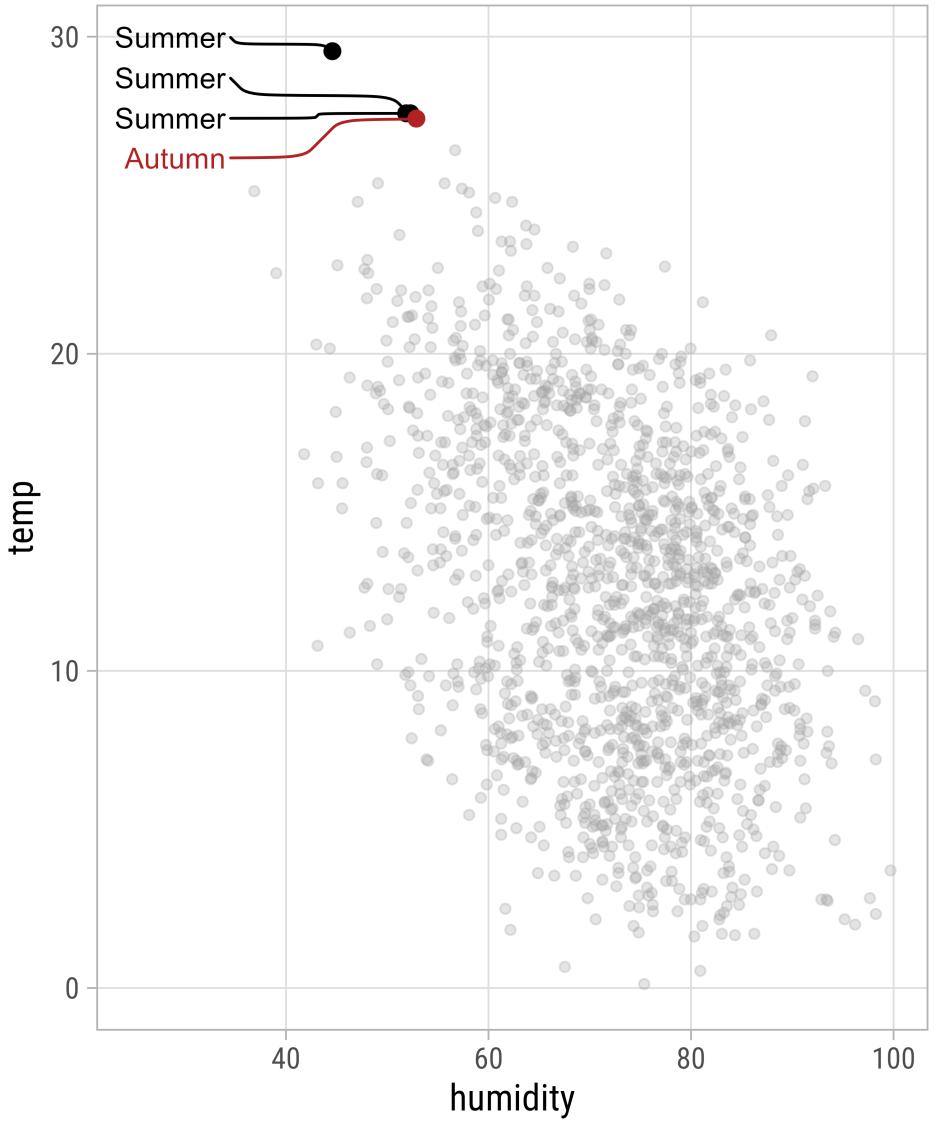
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point(size = 2.5) +  
11  ggrepel::geom_text_repel(  
12    aes(label = str_to_title(season)),  
13    ## force to the right  
14    xlim = c(NA, 35),  
15    ## style segment  
16    segment.curvature = .01,  
17    arrow = arrow(length = unit(.02, "npc"),  
18  ) +  
19  scale_color_manual(  
20    values = c("firebrick", "black"),  
21    guide = "none"  
22  ) +  
23  xlim(25, NA)
```



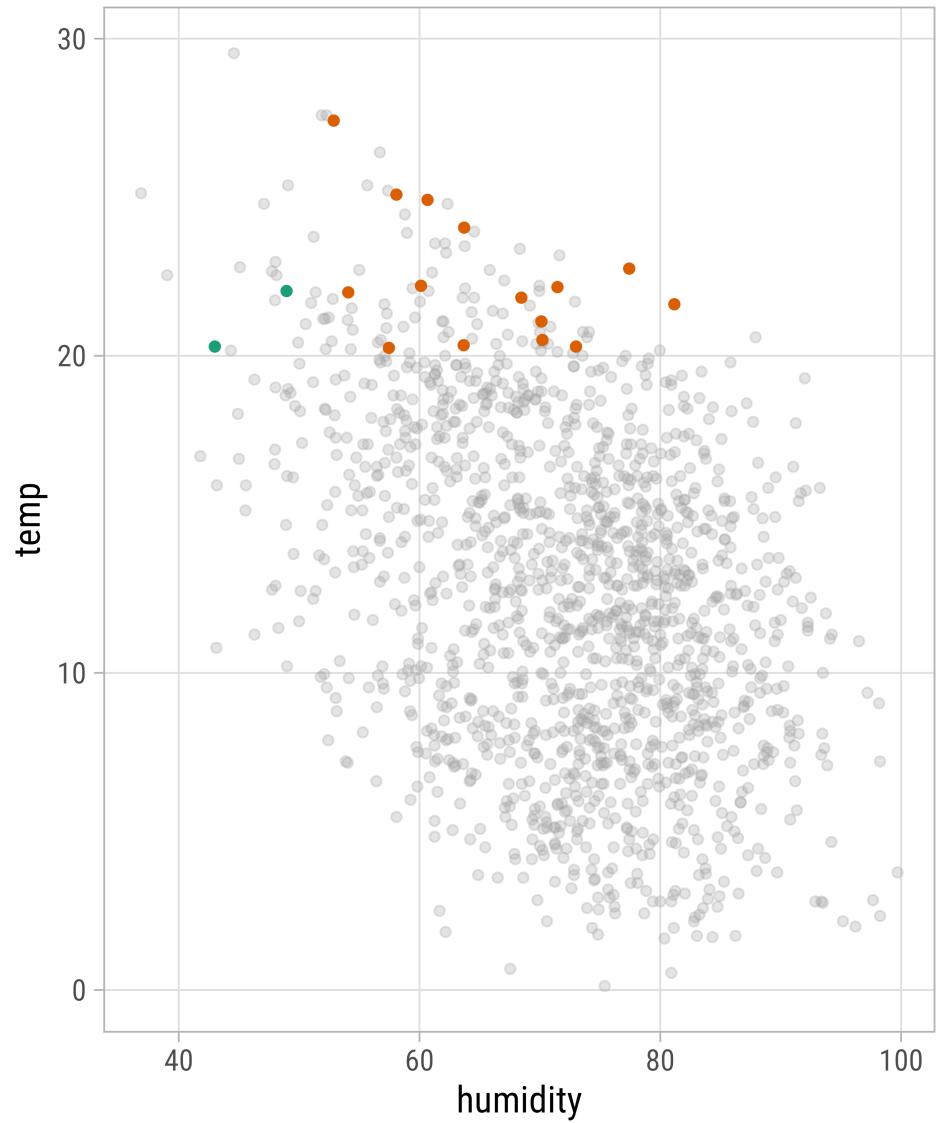
Annotations with {ggrepel}

```
1 ggplot(  
2   filter(bikes, temp >= 27),  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point(size = 2.5) +  
11  ggrepel::geom_text_repel(  
12    aes(label = str_to_title(season)),  
13    ## force to the right  
14    xlim = c(NA, 35),  
15    ## style segment  
16    segment.curvature = .001,  
17    segment.inflect = TRUE  
18  ) +  
19  scale_color_manual(  
20    values = c("firebrick", "black"),  
21    guide = "none"  
22  ) +  
23  xlim(25, NA)
```



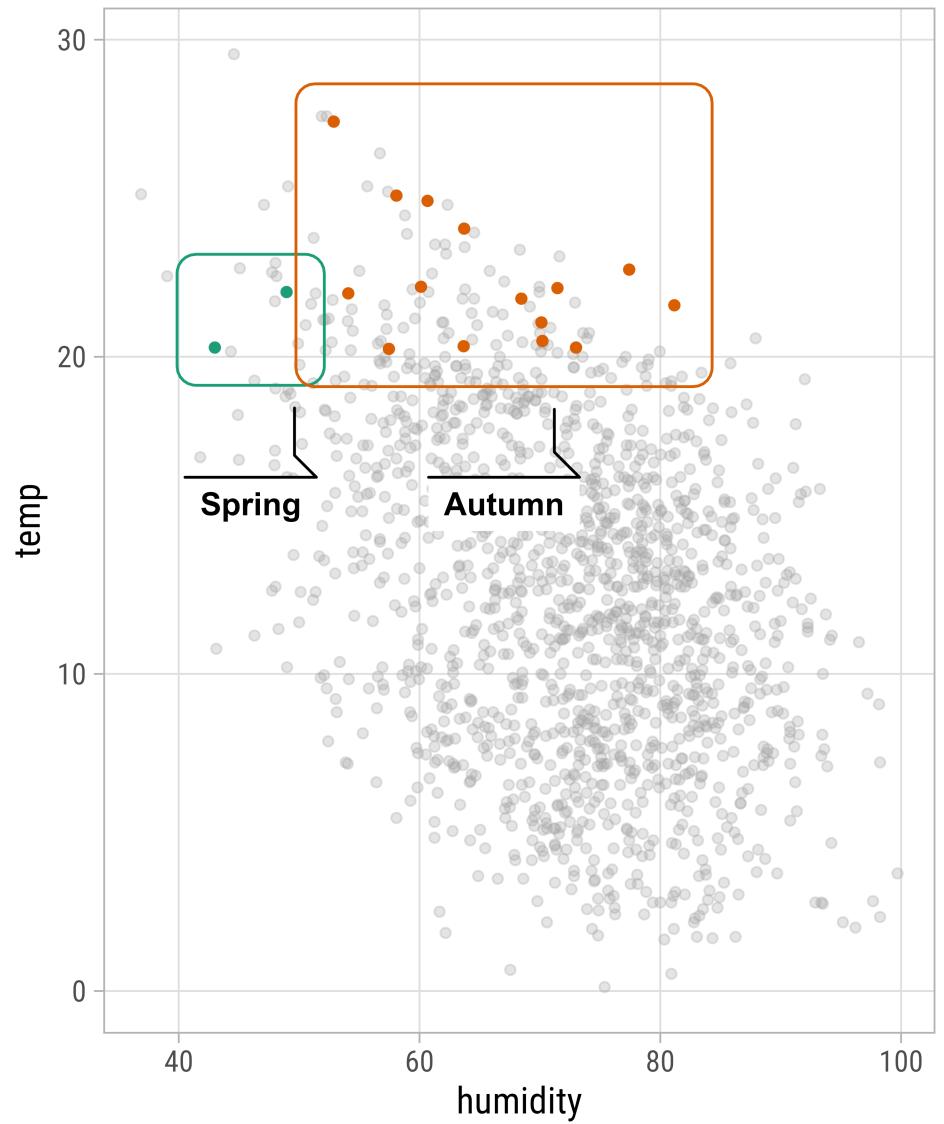
Annotations with {ggforce}

```
1 ggplot(  
2   filter(bikes, temp > 20 & season != "summer")  
3   aes(x = humidity, y = temp,  
4        color = season)  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point() +  
11  scale_color_brewer(  
12    palette = "Dark2",  
13    guide = "none"  
14 )
```



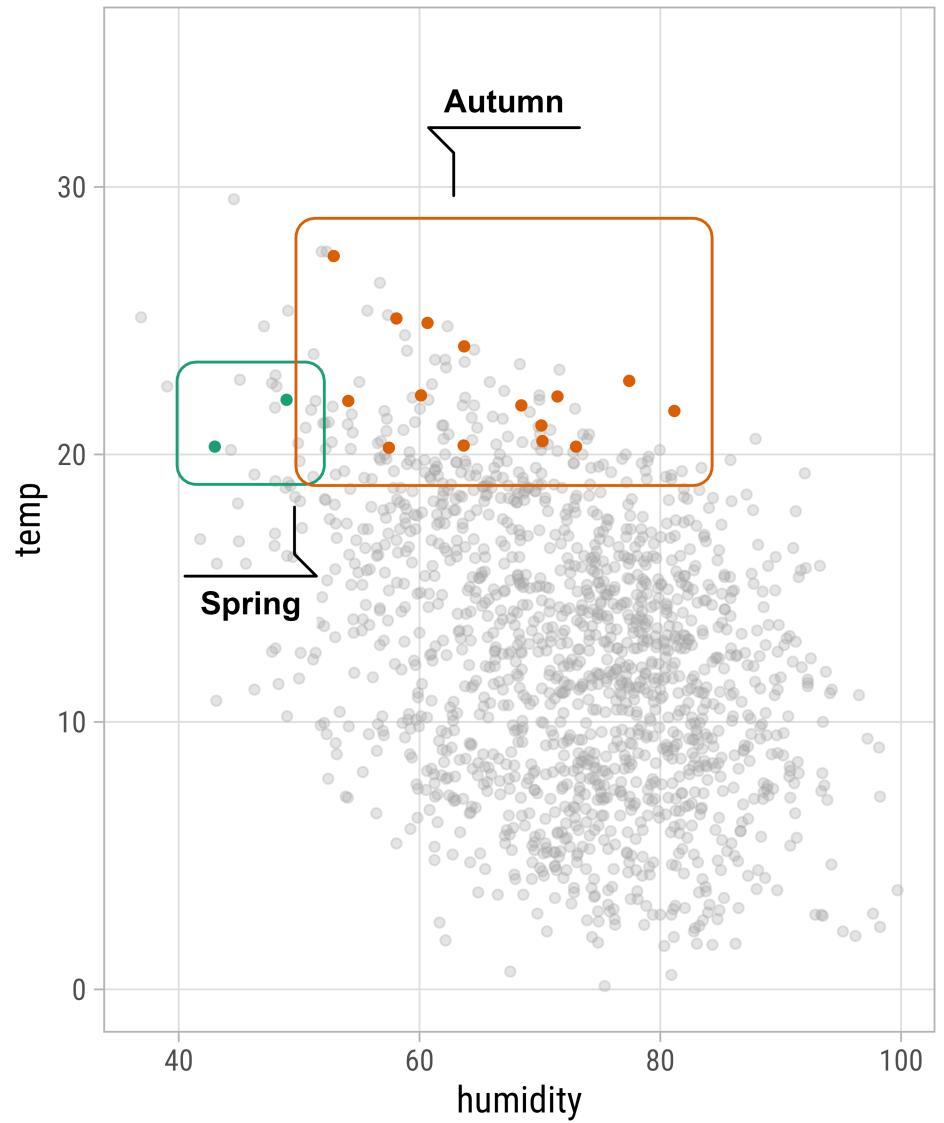
Annotations with {ggforce}

```
1 ggplot(  
2   filter(bikes, temp > 20 & season != "summer")  
3   aes(x = humidity, y = temp,  
4        color = season)  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point() +  
11  ggforce::geom_mark_rect(  
12    aes(label = str_to_title(season))  
13  ) +  
14  scale_color_brewer(  
15    palette = "Dark2",  
16    guide = "none"  
17 )
```



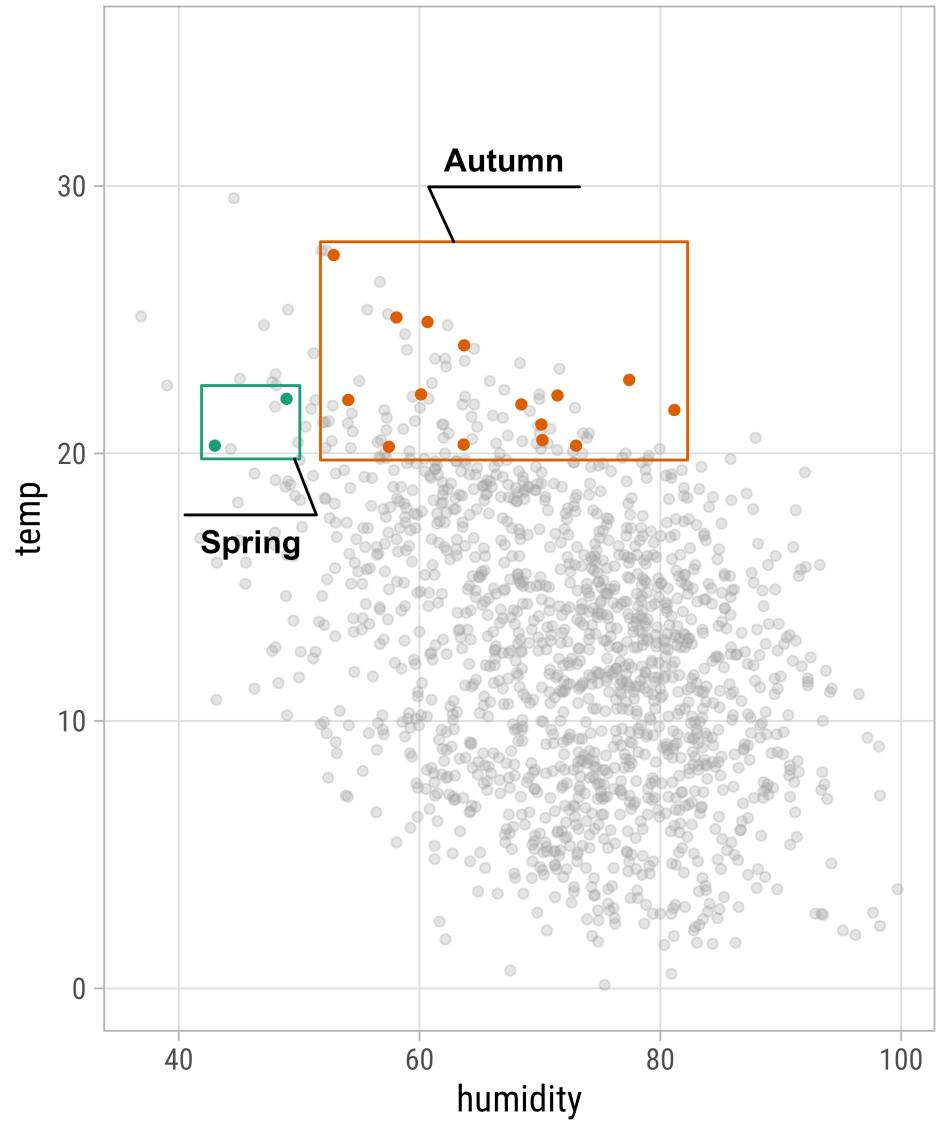
Annotations with {ggforce}

```
1 ggplot(  
2   filter(bikes, temp > 20 & season != "summer")  
3   aes(x = humidity, y = temp,  
4        color = season)  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point() +  
11  ggforce::geom_mark_rect(  
12    aes(label = str_to_title(season)))  
13 ) +  
14  scale_color_brewer(  
15    palette = "Dark2",  
16    guide = "none"  
17 ) +  
18  ylim(NA, 35)
```



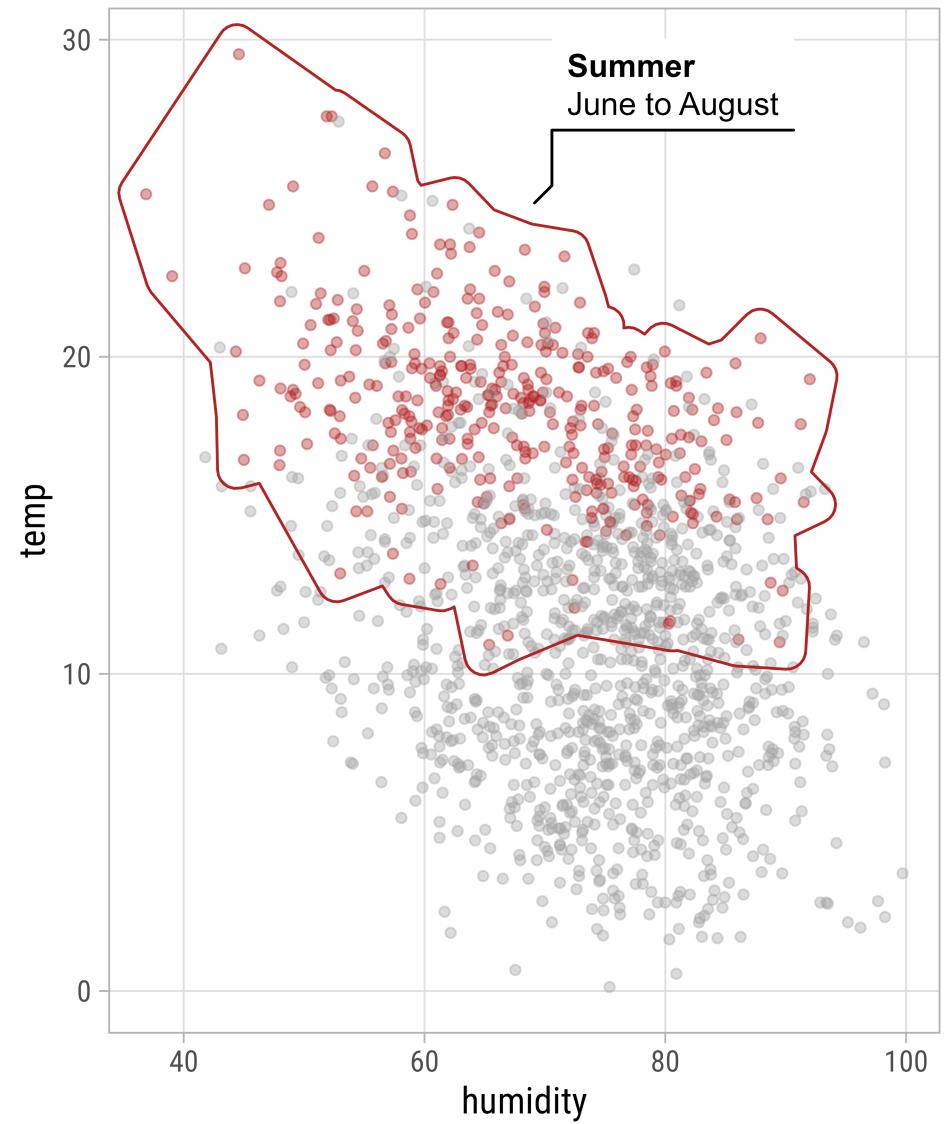
Annotations with {ggforce}

```
1 ggplot(  
2   filter(bikes, temp > 20 & season != "summer")  
3   aes(x = humidity, y = temp,  
4        color = season)  
5 ) +  
6   geom_point(  
7     data = bikes,  
8     color = "grey65", alpha = .3  
9   ) +  
10  geom_point() +  
11  ggforce::geom_mark_rect(  
12    aes(label = str_to_title(season)),  
13    expand = unit(5, "pt"),  
14    radius = unit(0, "pt"),  
15    con.cap = unit(0, "pt"),  
16    label.buffer = unit(15, "pt"),  
17    con.type = "straight",  
18    label.fill = "transparent"  
19 ) +  
20  scale_color_brewer(  
21    palette = "Dark2",  
22    guide = "none"  
23 ) +
```



Annotations with {ggforce}

```
1 ggplot(  
2   bikes,  
3   aes(x = humidity, y = temp,  
4        color = season == "summer")  
5 ) +  
6   geom_point(alpha = .4) +  
7   ggforce::geom_mark_hull(  
8     aes(label = str_to_title(season),  
9       filter = season == "summer",  
10      description = "June to August"),  
11      expand = unit(10, "pt")  
12 ) +  
13   scale_color_manual(  
14     values = c("grey65", "firebrick"),  
15     guide = "none"  
16 )
```



Adding Images

Load and Modify Image

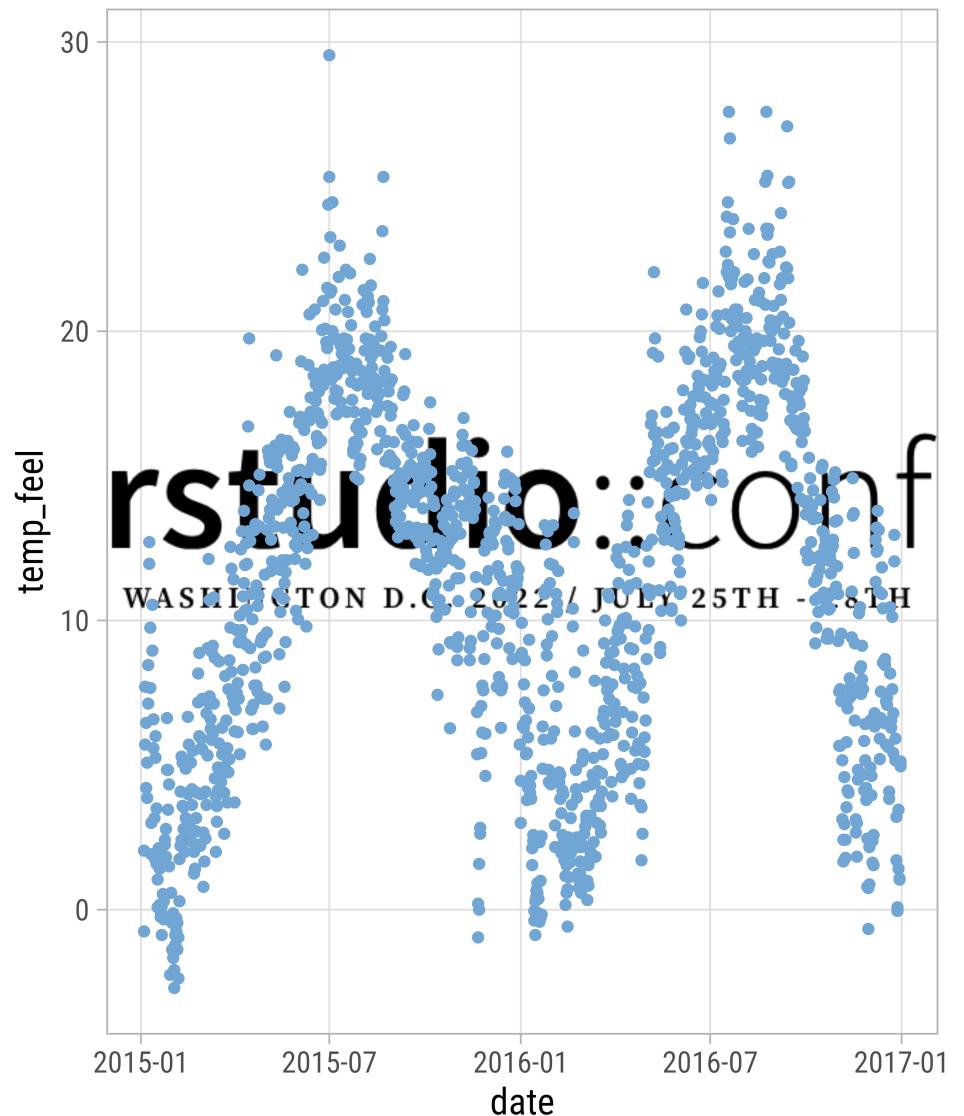
```
1 url <- "https://d33wubrfki0l68.cloudfront.net/dbb07b06a7b3fe056db386fef0b158cc2fd33cb9/8b491/assets/  
2 img <- magick::image_read(url)  
3 img <- magick::image_negate(img)  
4  
5 img
```

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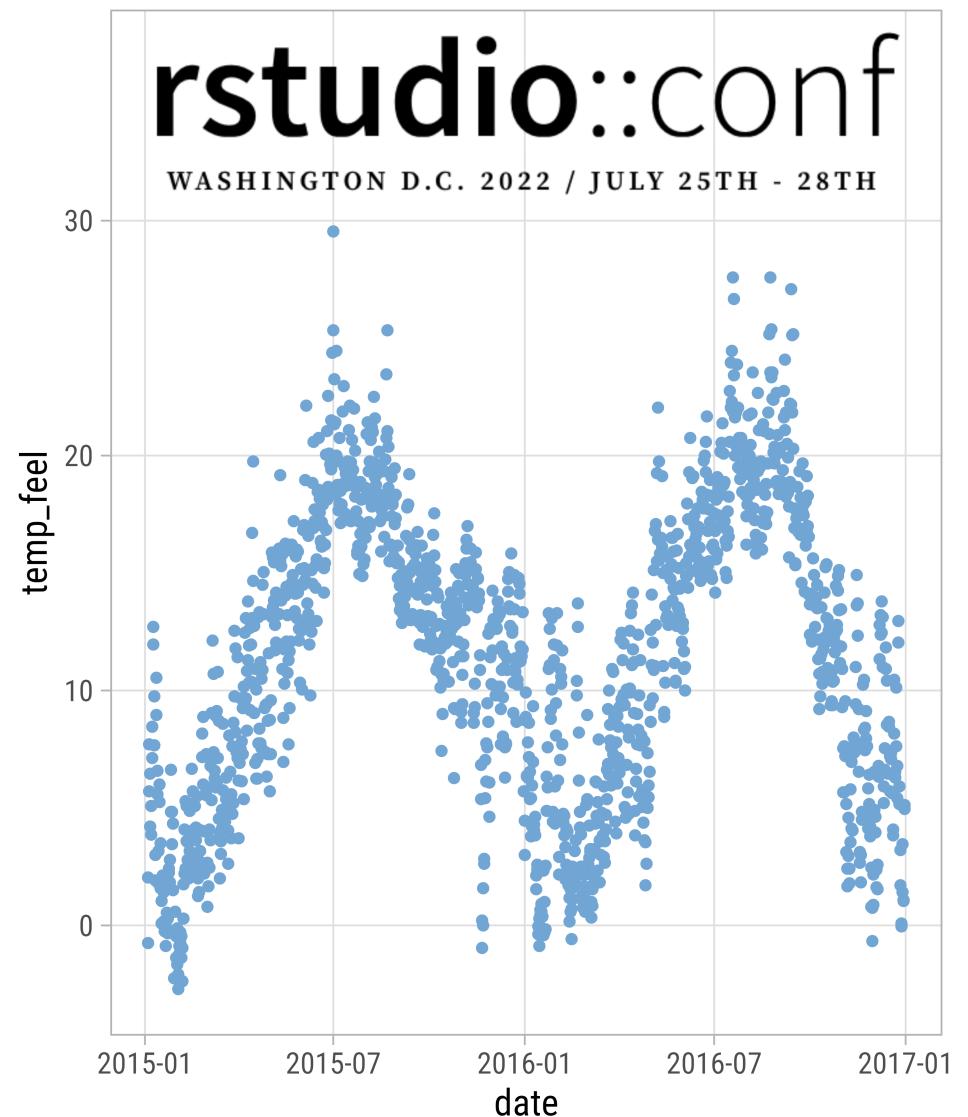
Add Background Image

```
1 ggplot(bikes, aes(date, temp_feel)) +  
2   annotation_custom(  
3     grid::rasterGrob(  
4       image = img  
5     )  
6   ) +  
7   geom_point(color = "#71a5d4")
```



Adjust Position

```
1 ggplot(bikes, aes(date, temp_feel)) +  
2   annotation_custom(  
3     grid::rasterGrob(  
4       image = img,  
5       x = .5,  
6       y = .9,  
7       width = .9  
8     )  
9   ) +  
10  geom_point(color = "#71a5d4") +  
11  ylim(NA, 37)
```

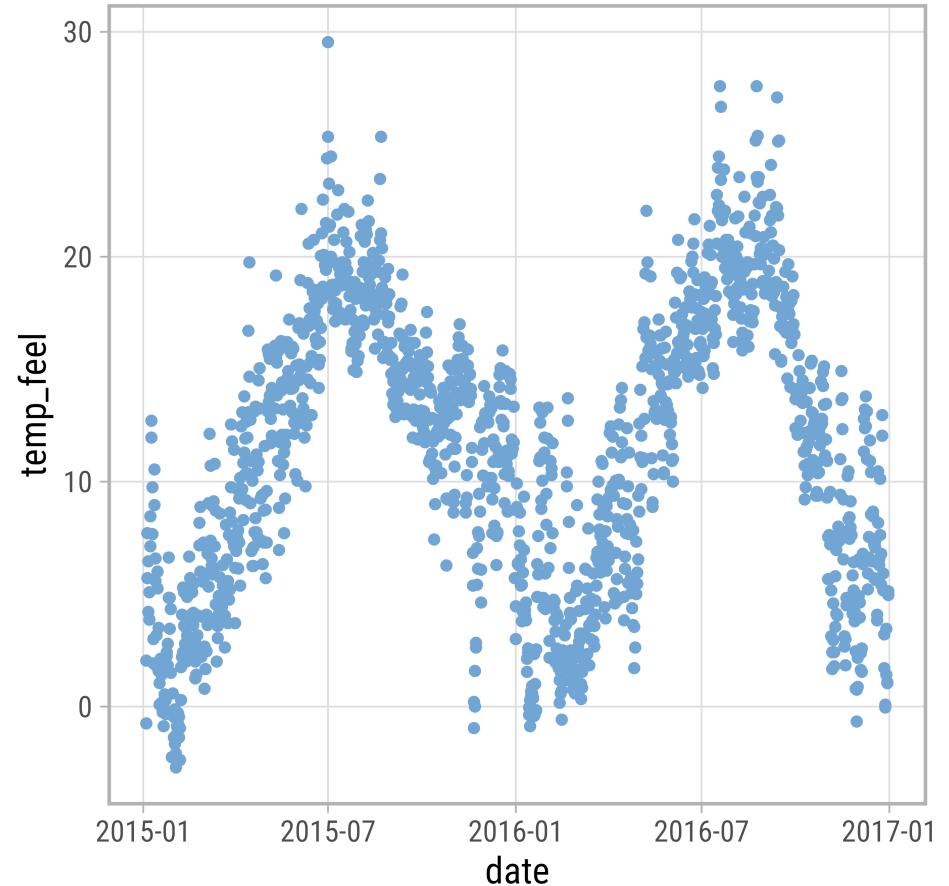


Place Image Outside

```
1 ggplot(bikes, aes(date, temp_feel)) +  
2   annotation_custom(  
3     grid::rasterGrob(  
4       image = img,  
5       x = .47,  
6       y = 1.15,  
7       width = .9  
8     )  
9   ) +  
10  geom_point(color = "#71a5d4") +  
11  coord_cartesian(clip = "off") +  
12  theme(  
13    plot.margin = margin(90, 10, 10, 10)  
14  )
```

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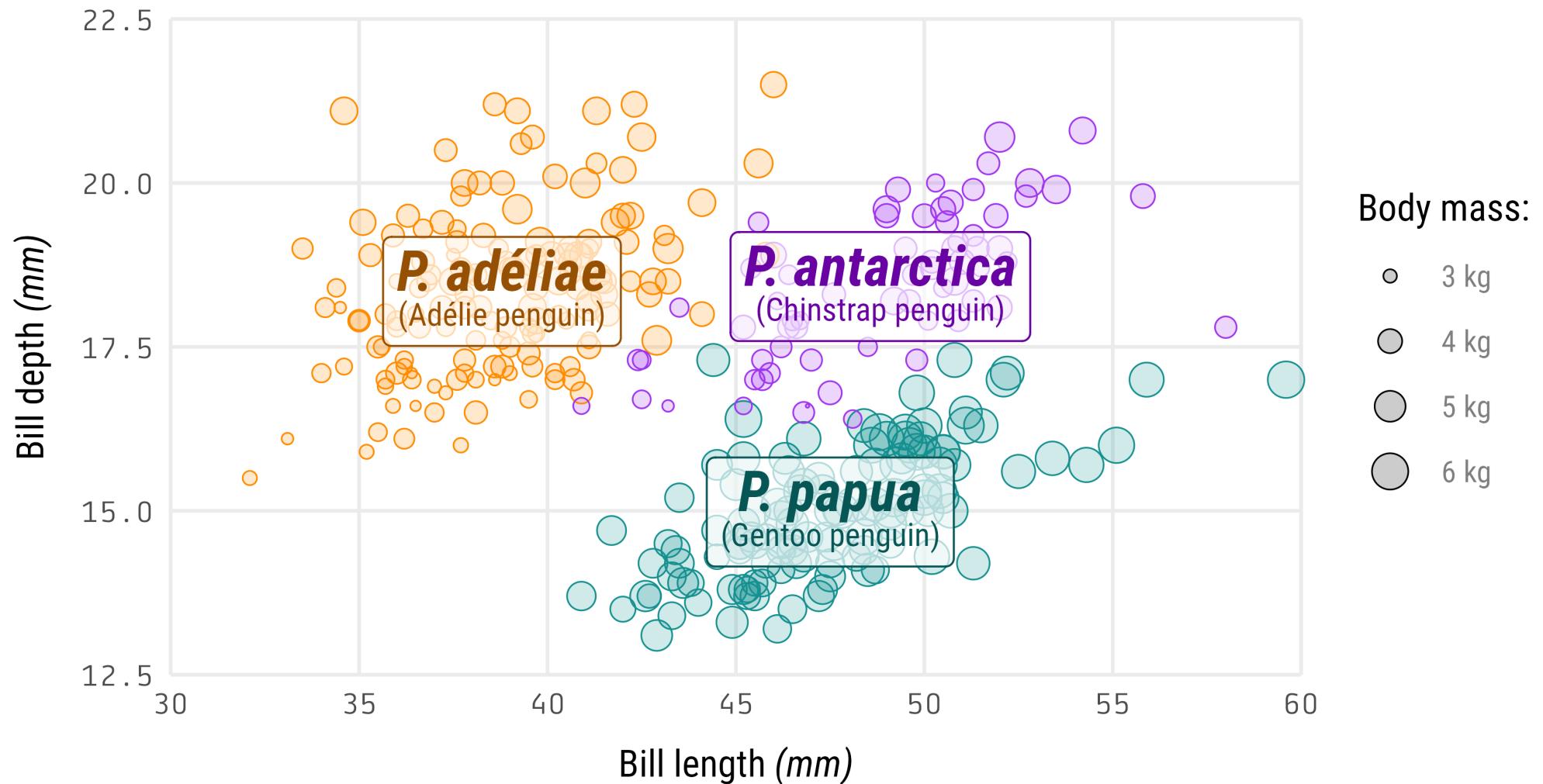


Exercises

Exercise 1

- `{ggtext}` also comes with some new geom's. Explore those and other options on the package webpage: wilkelab.rg/ggtext.
- **Create the following visualization, as close as possible, with the `penguins` dataset which is provided by the `{palmerpenguins}` package.**
 - For the species labels, you likely have to create a summary data set.
 - Use the `{ggtext}` geometries and theme elements to format the labels.
 - Also, make use of the other components such as scales, original theme, and theme customization.

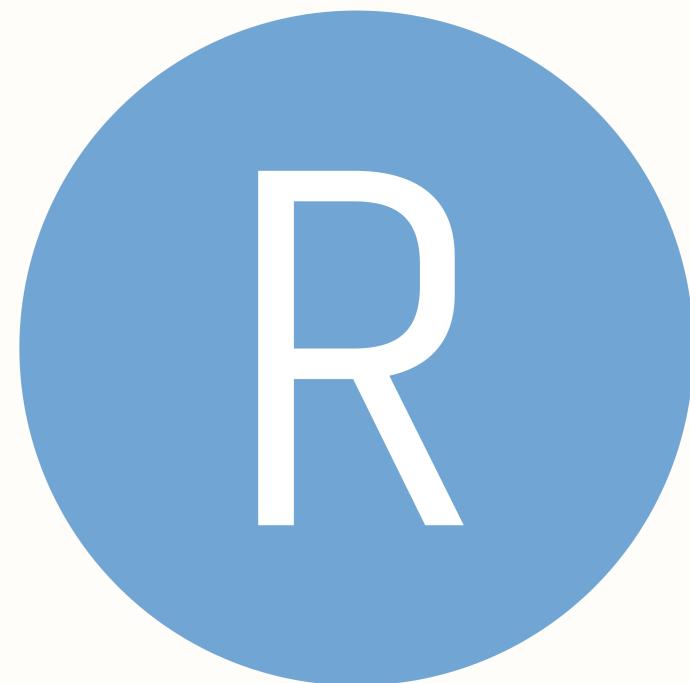
Bill dimensions of brush-tailed penguins *Pygoscelis* spec.



Horst AM, Hill AP, Gorman KB (2020). palmerpenguins R package version 0.1.0

Exercise 2

- Create this logo with the image file `exercises/`:



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Cédric Scherer // rstudio::conf // July 2022