Assignment 1

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```
knitr::opts_chunk$set(echo = TRUE, warning = FALSE, message = FALSE)

# Change working dir in RMarkdown cell
knitr::opts_knit$set(root.dir =
'C:/Users/AC069015/kumc_applied_stats/data_824_data_viz_and_acquisition/1_intro_to_ggplot2'
)

library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

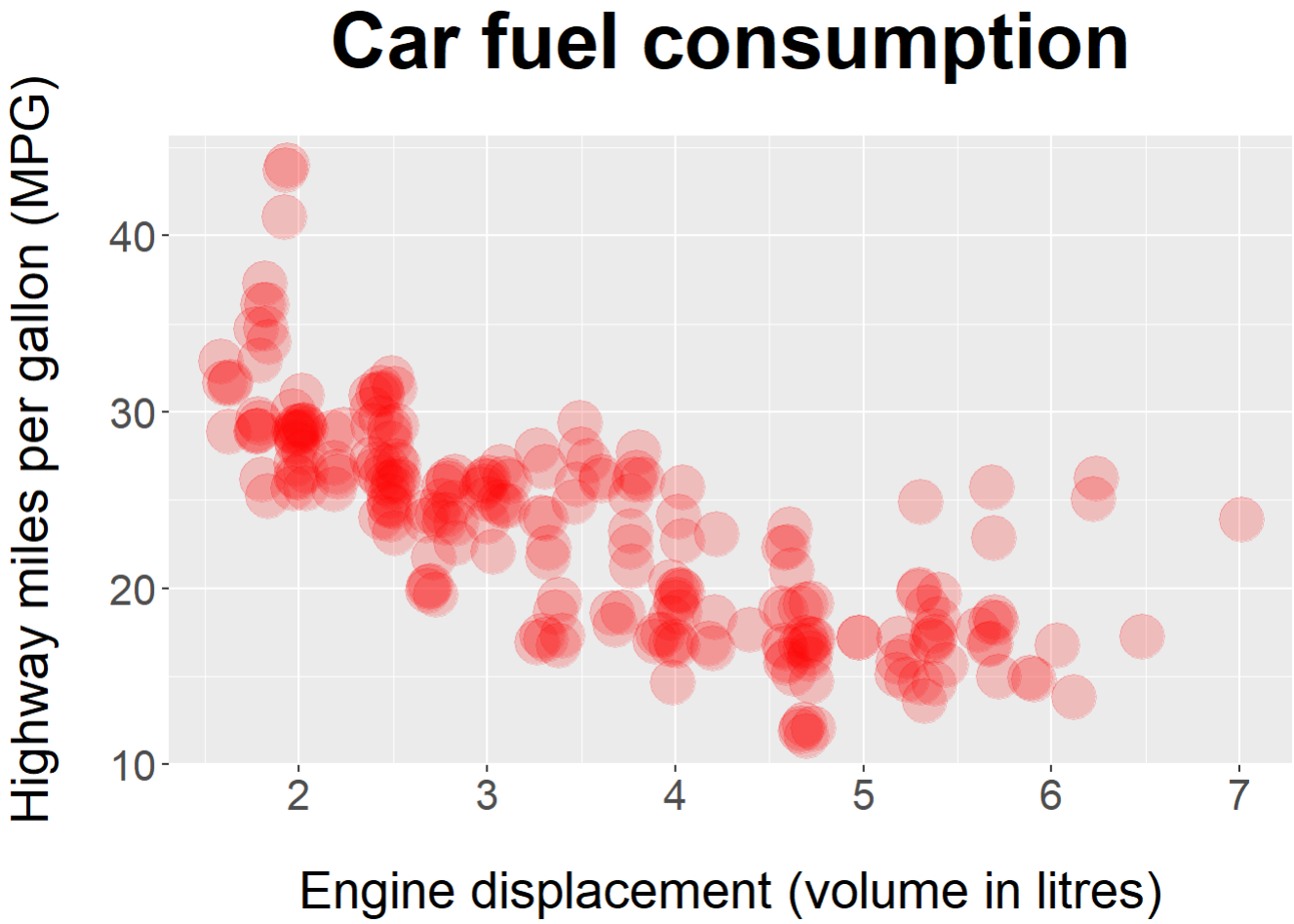
```
library(ggplot2)

# assign cars fuel economy data to data frame
df <- ggplot2::mpg
```

Exercise 1

```
fig <- ggplot(data = df, mapping = aes(x = displ, y = hwy)) +
  geom_point(size = 8, alpha = 1/5, position = "jitter", color = "red") +
  xlab("Engine displacement (volume in litres)") +
  ylab("Highway miles per gallon (MPG)") +
  ggtitle("Car fuel consumption") +
  theme(axis.text = element_text(size = 16),
        axis.title = element_text(size = 20),
        axis.title.y = element_text(margin = margin(t = 0, r = 20, b = 0, l = 0)),
        axis.title.x = element_text(margin = margin(t = 20, r = 0, b = 0, l = 0)),
        plot.title = element_text(size = 30, face = "bold", hjust = 0.5,
                                  margin = margin(t = 0, r = 0, b = 20, l = 0)),
        )

print(fig) # print plot
```



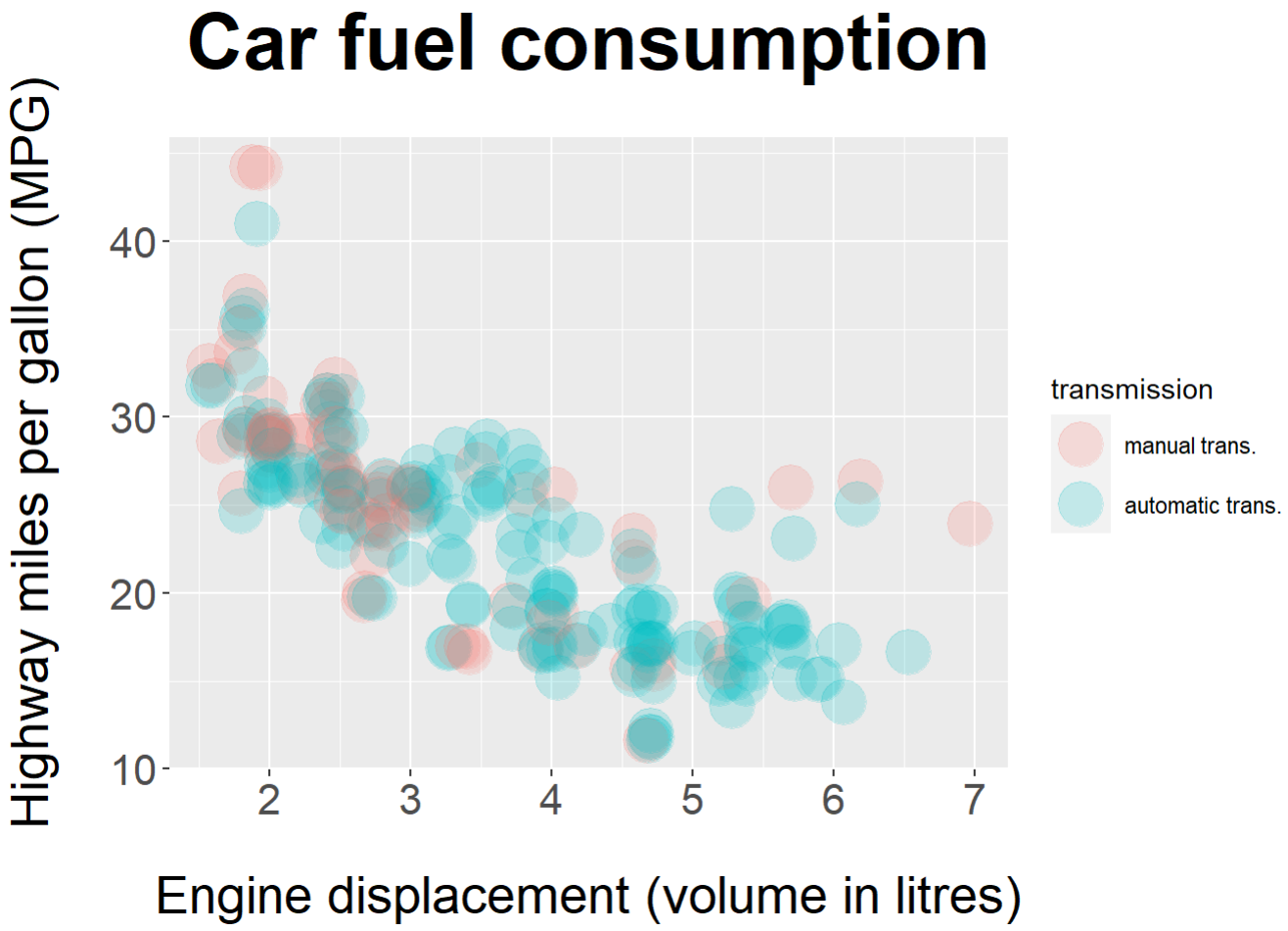

```
ggsave(
    filename = "images/01_assignment_fig1.png",
    units = "cm",
    width = 29.7,
    height = 21,
    dpi = 600
    )
```

Exercise 2

```
# create new variable transmission from variable trans
df <- df %>%
    mutate(transmission = substr(trans, 1, 1)) %>%
    mutate(transmission = case_when(
        transmission == "a" ~ "automatic trans.",
        transmission == "m" ~ "manual trans.")
        ) %>%
    mutate(transmission = factor(transmission, levels = c("manual trans.", "automatic trans.")))
```

```
fig <- ggplot(data = df, mapping = aes(x = displ, y = hwy, color = transmission)) +
  geom_point(size = 8, alpha = 1/5, position = "jitter") +
  xlab("Engine displacement (volume in litres)") +
  ylab("Highway miles per gallon (MPG)") +
  ggtitle("Car fuel consumption") +
  theme(axis.text = element_text(size = 16),
        axis.title = element_text(size = 20),
        axis.title.y = element_text(margin = margin(t = 0, r = 20, b = 0, l = 0)),
        axis.title.x = element_text(margin = margin(t = 20, r = 0, b = 0, l = 0)),
        plot.title = element_text(size = 30, face = "bold", hjust = 0.5,
                                  margin = margin(t = 0, r = 0, b = 20, l = 0)),
        )

print(fig) # print plot
```

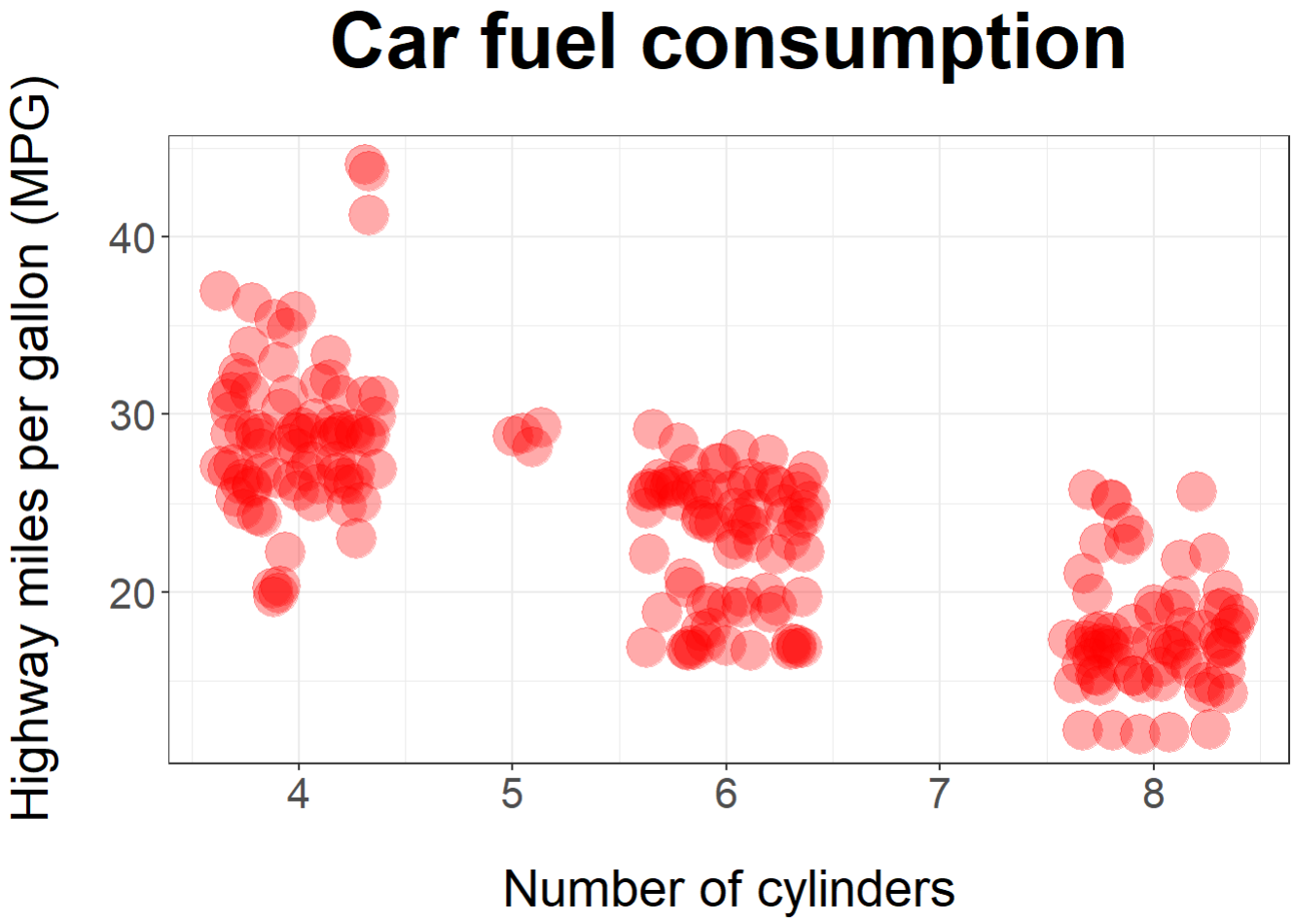



```
ggsave(
    filename = "images/01_assignment_fig2.png",
    units = "cm",
    width = 29.7,
    height = 21,
    dpi = 600
    )
```

Exercise 3

```
fig <- ggplot(data = df, mapping = aes(x = cyl, y = hwy)) +
  geom_point(size = 7, alpha = 1/3, position = "jitter", color = "red") +
  xlab("Number of cylinders") +
  ylab("Highway miles per gallon (MPG)") +
  ggtitle("Car fuel consumption") +
  theme_bw() +
  theme(axis.text = element_text(size = 16),
        axis.title = element_text(size = 20),
        axis.title.y = element_text(margin = margin(t = 0, r = 20, b = 0, l = 0)),
        axis.title.x = element_text(margin = margin(t = 20, r = 0, b = 0, l = 0)),
        plot.title = element_text(size = 30, face = "bold", hjust = 0.5,
                                  margin = margin(t = 0, r = 0, b = 20, l = 0)),
        )

print(fig) # print plot
```

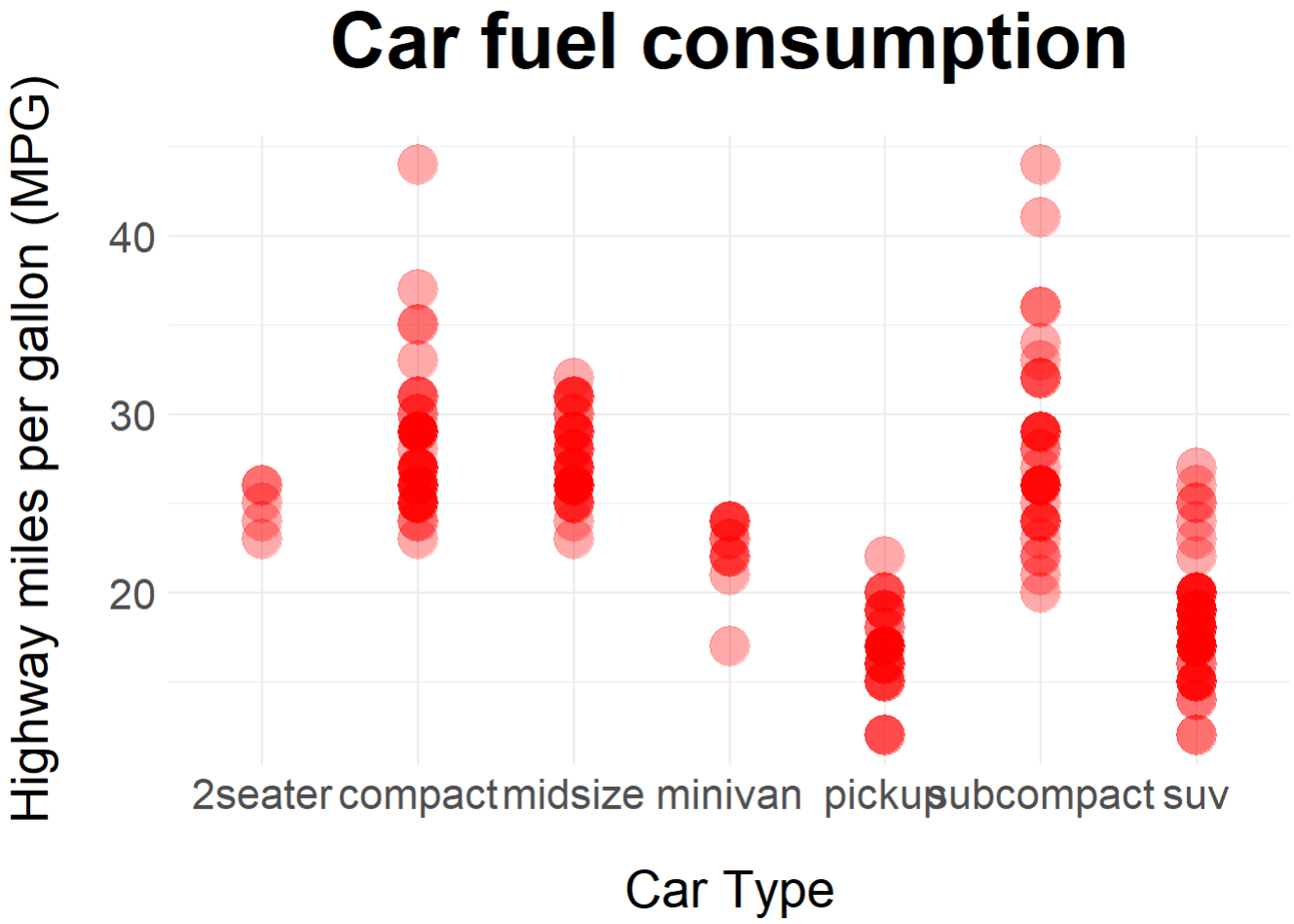



```
ggsave(
    filename = "images/01_assignment_fig3.png",
    units = "cm",
    width = 29.7,
    height = 21,
    dpi = 600
    )
```

Exercise 4

```
fig <- ggplot(data = df, mapping = aes(x = class, y = hwy)) +
  geom_point(size = 7, alpha = 1/3, position = "nudge", color = "red") +
  xlab("Car Type") +
  ylab("Highway miles per gallon (MPG)") +
  ggtitle("Car fuel consumption") +
  theme_minimal() +
  theme(axis.text = element_text(size = 16),
        axis.title = element_text(size = 20),
        axis.title.y = element_text(margin = margin(t = 0, r = 20, b = 0, l = 0)),
        axis.title.x = element_text(margin = margin(t = 20, r = 0, b = 0, l = 0)),
        plot.title = element_text(size = 30, face = "bold", hjust = 0.5,
                                  margin = margin(t = 0, r = 0, b = 20, l = 0)),
        )

print(fig) # print plot
```



```
ggsave(
    filename = "images/01_assignment_fig4.png",
    units = "cm",
    width = 29.7,
    height = 21,
    dpi = 600
    )
```