```r
# Assignment 01 original
# Xiyu Zhang

# Load packages ------------------------------------------------------

library(tidyverse)
library(sf)

# Original scatterplot -----------------------------------------------

# Read in the initial dataset

# motor gasoline price for each state, from EIA, in 2021

gasoline_21 <-
    read_csv('data_own/fuel_mg.csv') %>%
    filter(MSN == 'MGACD') %>%
    rename(motor_gasoline = '2021')

# all sector electricity price for each state, from EIA, in 2021

electricity_21 <-
    read_csv('data_own/fuel_es.csv') %>%
    filter(MSN == 'ESTCD') %>%
    rename(electricity = '2021')

# join the two forms into one

price_21 <-
    left_join(gasoline_21,
              electricity_21,
              by = 'State') %>%
    select(State, motor_gasoline, electricity) %>%
    mutate(cheap = ifelse(electricity <= motor_gasoline,
                          T,
                          F))
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37
38  # create an elementary scatterplot
39
40  price_21 %>%
41    ggplot(
42      aes(x = motor_gasoline,
43          y = electricity)) +
44    geom_point(colour = 'blue')
45
46  # It seems there exists an outlier, so descending the electricity price and
47  # remove the outlier, and create the scatterplot again
48
49  price_21 %>%
50    arrange(desc(electricity)) %>%
51    filter(State != 'HI') %>%
52    ggplot(
53      aes(x = motor_gasoline,
54          y = electricity,
55          label = State,
56          color = cheap)) +
57    geom_point(alpha = 0.7,
58               size = 4) +
59    geom_segment(
60      aes(x = 22,
61          y = 22,
62          xend = 36,
63          yend = 36),
64      color = '#238443') +
65    geom_text(hjust = -0.7,
66              vjust = 0.5,
67              size = 2.6,
68              check_overlap = T,
69              color = '#525252') +
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68            check_overlap = T,
69            color = '#525252') +
70    scale_y_continuous(limits = c(20, 60)) +
71    scale_color_manual(values = c('#cccccc', '#74c476')) +
72    labs(title = paste('The cost of driving gasoline and electric cars in the',
73                       'United States'),
74        subtitle = paste('Motor gasoline price and electricity price in each',
75                         'state of US in 2021'),
76        caption = 'Source: U.S. Energy Information Administration',
77        x = 'Motor gasoline price in transportation sector (USD per MMBtu)',
78        y = 'Electricity price in all sector (USD per MMBtu)') +
79    theme_bw() +
80    theme(
81      axis.line = element_line(colour = '#969696'),
82      axis.ticks = element_blank(),
83      panel.border = element_blank(),
84      panel.grid = element_blank())
```