03 1

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2023-03-16

```
# Load packages -----
library(tidyverse)
library(sf)

# Load the data ------
electricity_station_initial <-
    # read in the dataset

st_read('data_own/alt_fuel_stations.geojson') %>%

# convert an sf object into a pure tibble
as_tibble()
```

```
## Reading layer `alt_fuel_stations' from data source
## `/Users/maxzhang/GU/Data_viz/data_own/alt_fuel_stations.geojson'
## using driver `GeoJSON'
## Simple feature collection with 58698 features and 66 fields
## Geometry type: POINT
## Dimension: XY
## Bounding box: xmin: -164.8489 ymin: 0 xmax: 77.64996 ymax: 64.85247
## Geodetic CRS: WGS 84
```

```
electricity_station <-
 electricity_station_initial %>%
 # filter for the wanted types
 filter(
   # only include public electricity stations but not private ones
   access_code == 'public',
   # only include those are currently available but not planned nor
   # temporarily unavailable
   status_code == 'E',
   # only include those in the US
   country == 'US',
   # only include the charging stations open to the public
   restricted_access == FALSE) %>%
 # select the wanted traits of those electricity charging stations
 select(
   c(access days time, id, open date, owner type code, state,
     ev_pricing, ev_renewable_source, facility_type))
# create the wanted variable
elec new <-
 electricity station %>%
 # create a variable measuring this station charge individuals or not
 mutate(Charge =
          if else(
            str_detect(ev_pricing, 'Free'),
            'Free',
            'Not free')) %>%
 # filter the missing values for the two variables we care
 filter(
   !is.na(Charge),
   !is.na(owner_type_code)) %>%
 # generate new categorical names
```

```
mutate(owner_type_new =
          case_when(
            owner_type_code == 'FG' ~ 'Federal',
            owner_type_code == 'J' ~ 'Jointly',
            owner_type_code == 'LG' ~ 'Local/Municipal',
            owner type code == 'P' ~ 'Privately',
            owner_type_code == 'SG' ~ 'State/Provincial',
            owner_type_code == 'T' ~ 'Utility'))
 # convert the owner type into a factor with specific levels
elec_new$owner_type_new <-
  factor(elec_new$owner_type_new,
        levels = c('Federal',
                   'State/Provincial',
                   'Local/Municipal',
                   'Jointly',
                   'Utility',
                   'Privately'))
p1 <-
 elec new %>%
 ggplot(mapping =
          aes(x = owner_type_new)) +
 geom bar(aes(fill = Charge),
          position = 'dodge') +
 scale x discrete(drop = FALSE) +
 # to use green to represent free while use a diverging color of orange to
 # represent not free
 scale fill manual(values = c('#99d594',
                              '#fc8d59')) +
 labs(title = 'Ownership and charging of electric vehicle charging posts',
      subtitle = paste('Charges for electric vehicle charging stations of',
              'different owners in US'),
      caption = 'Data: afdc.energy.gov',
      x = 'Ownership of EV charging posts',
      y = 'Count (numbers)') +
 theme(
   axis.ticks = element blank(),
   panel.background = element blank())
```