Example R Markdown Documen

Install Tidyverse Package

```r
if (!requireNamespace("tidyverse", quietly = TRUE)) {
  install.packages("tidyverse")
}

library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----------------------- tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

Clear the Environment

```r
rm(list = ls())
```

Set the Working Directory

```r
setwd("~/Projects/eco324_ps1")
```

Load the Data

```r
data <- read.csv("verboven_cars.csv")
```

Summary Statistics

```r
summary(data)
```

```
##       ye               ma                  co             zcode
## Min.   :70.00   Length:11549      Min.   :  1.0   Min.   :  1.0
## 1st Qu.:78.00   Class :character  1st Qu.: 80.0   1st Qu.: 79.0
## Median :86.00   Mode  :character  Median :178.0   Median :194.0
## Mean   :85.43                     Mean   :223.4   Mean   :180.3
## 3rd Qu.:93.00                     3rd Qu.:278.0   3rd Qu.:253.0
## Max.   :99.00                     Max.   :980.0   Max.   :462.0
##
##      brd               type              brand             model
## Length:11549      Length:11549      Length:11549      Length:11549
## Class :character  Class :character  Class :character  Class :character
## Mode  :character  Mode  :character  Mode  :character  Mode  :character
##
##
##
##
##      org               loc               cla              home
## Length:11549      Length:11549      Length:11549      Min.   :0.0000
## Class :character  Class :character  Class :character  1st Qu.:0.0000
## Mode  :character  Mode  :character  Mode  :character  Median :0.0000
##                                                       Mean   :0.1878
```

```
##                                                        3rd Qu.:0.0000
##                                                        Max.   :1.0000
##
##      frm                 qu               cy              hp
##  Length:11549       Min.   :    51   Min.   : 425   Min.   : 13.00
##  Class :character   1st Qu.:  1957   1st Qu.:1118   1st Qu.: 40.00
##  Mode  :character   Median :  6224   Median :1372   Median : 54.50
##                     Mean   : 19813   Mean   :1462   Mean   : 57.14
##                     3rd Qu.: 18617   3rd Qu.:1781   3rd Qu.: 73.00
##                     Max.   :433694   Max.   :4520   Max.   :169.50
##
##       we              pl            do              le
##  Min.   : 520.0   Min.   :2.00   Min.   :2.000   Min.   :250.0
##  1st Qu.: 800.0   1st Qu.:5.00   1st Qu.:3.000   1st Qu.:384.0
##  Median : 950.0   Median :5.00   Median :4.000   Median :421.5
##  Mean   : 978.9   Mean   :4.87   Mean   :3.653   Mean   :415.8
##  3rd Qu.:1140.0   3rd Qu.:5.00   3rd Qu.:4.000   3rd Qu.:451.0
##  Max.   :1910.0   Max.   :7.00   Max.   :5.000   Max.   :506.0
##                                   NA's   :2
##       wi              he             li1             li2
##  Min.   :122.0   Min.   :117.5   Min.   : 3.800   Min.   : 4.000
##  1st Qu.:159.0   1st Qu.:138.0   1st Qu.: 5.500   1st Qu.: 7.100
##  Median :165.5   Median :140.0   Median : 6.400   Median : 8.100
##  Mean   :164.4   Mean   :140.4   Mean   : 6.725   Mean   : 8.391
##  3rd Qu.:170.5   3rd Qu.:142.5   3rd Qu.: 7.500   3rd Qu.: 9.400
##  Max.   :188.0   Max.   :173.5   Max.   :18.600   Max.   :18.600
##
##      li3              li              sp              ac
##  Min.   : 4.000   Min.   : 4.000   Min.   : 95.0   Min.   : 7.50
##  1st Qu.: 7.800   1st Qu.: 6.933   1st Qu.:145.0   1st Qu.:12.00
##  Median : 9.000   Median : 8.000   Median :160.0   Median :14.10
##  Mean   : 9.423   Mean   : 8.180   Mean   :159.9   Mean   :15.24
##  3rd Qu.:10.900   3rd Qu.: 9.167   3rd Qu.:175.0   3rd Qu.:17.00
##  Max.   :22.000   Max.   :18.600   Max.   :247.0   Max.   :50.00
##                                    NA's   :4       NA's   :2317
##       pr              princ            eurpr             exppr
##  Min.   :      498   Min.   :0.2418   Min.   :  830.7   Min.   :1.000e+00
##  1st Qu.:    13249   1st Qu.:0.5380   1st Qu.: 4370.1   1st Qu.:3.000e+02
##  Median :    56000   Median :0.7298   Median : 6944.5   Median :4.253e+03
##  Mean   :  2848104   Mean   :0.8253   Mean   : 8352.5   Mean   :3.401e+11
##  3rd Qu.:   410000   3rd Qu.:1.0075   3rd Qu.:10779.1   3rd Qu.:4.198e+04
##  Max.   :116661000   Max.   :6.4729   Max.   :49580.7   Max.   :1.909e+15
##
##      avexr             avdexr             avcpr            avppr
##  Min.   :   0.000   Min.   :   0.4137   Min.   :      0   Min.   :      0
##  1st Qu.:   2.684   1st Qu.:   2.3237   1st Qu.:     56   1st Qu.:     84
##  Median :   7.886   Median :   7.4667   Median :     90   Median :     96
##  Mean   : 319.428   Mean   : 298.7585   Mean   :   1076   Mean   :   1327
##  3rd Qu.: 243.856   3rd Qu.:  49.4536   3rd Qu.:    109   3rd Qu.:    104
##  Max.   :2529.200   Max.   :2529.1995   Max.   :4751159   Max.   :4733208
##                                                           NA's   :1713
##      avdcpr           avdppr           xexr             tax
##  Min.   : 10.65   Min.   : 15.81   Min.   :0.000e+00   Min.   :0.1300
##  1st Qu.: 54.70   1st Qu.: 79.22   1st Qu.:0.000e+00   1st Qu.:0.1800
```

```
##  Median : 88.11   Median : 95.99   Median :1.000e+00   Median :0.2060
##  Mean   : 81.01   Mean   : 89.90   Mean   :1.118e+08   Mean   :0.2142
##  3rd Qu.:109.81   3rd Qu.:102.42   3rd Qu.:7.000e+00   3rd Qu.:0.2500
##  Max.   :140.51   Max.   :127.14   Max.   :6.635e+11   Max.   :0.3300
##                    NA's   :2057
##      pop               ngdp              rgdp              engdp
##  Min.   : 9660000   Min.   :5.177e+10   Min.   :3.498e+11   Min.   :2.580e+10
##  1st Qu.:52130000   1st Qu.:1.121e+12   1st Qu.:1.793e+12   1st Qu.:1.750e+11
##  Median :56510000   Median :3.460e+12   Median :4.948e+12   Median :4.453e+11
##  Mean   :47975881   Mean   :1.752e+14   Mean   :1.922e+14   Mean   :5.200e+11
##  3rd Qu.:58200000   3rd Qu.:7.769e+12   3rd Qu.:6.733e+12   3rd Qu.:7.639e+11
##  Max.   :82060000   Max.   :2.128e+15   Max.   :1.416e+15   Max.   :1.612e+12
##                                         NA's   :550
##     ergdp              engdpc            ergdpc
##  Min.   :7.935e+10   Min.   : 2000   Min.   : 6725
##  1st Qu.:4.624e+11   1st Qu.: 6738   1st Qu.:11193
##  Median :6.941e+11   Median : 9900   Median :13042
##  Mean   :6.375e+11   Mean   :10558   Mean   :13168
##  3rd Qu.:8.343e+11   3rd Qu.:14737   3rd Qu.:15055
##  Max.   :1.356e+12   Max.   :19710   Max.   :22528
##  NA's   :550                          NA's   :550
```

Rename a variable

```r
data <- data %>%
  rename(year = ye,
         country = ma,
         population = pop,
         horsepower = hp,
         fuel = li,
         width = wi,
         height = he,
         weight = we,
         demographic = home,
         quantity = qu)
```

Generate a new variable based on existing variables

```r
data <- data %>%
  mutate(market_size = population/4) %>%
  # calculate market share s_j
  mutate(s_j = quantity/(market_size)) %>%
  # calculate the outside option market share s_0
  # which is 1 - sum(s_j) by year and country
  group_by(year, country) %>%
  mutate(s_0 = 1 - sum(s_j)) %>%
  ungroup() %>%
  # calculate y = log(s_j) - log(s_0)
  mutate(y = log(s_j) - log(s_0))
```

Install the `fixest` package for fixed effects regression

```r
# Install fixest if not already installed
if (!requireNamespace("fixest", quietly = TRUE)) {
  install.packages("fixest")
}
```

```r
library(fixest)
```