

CDMA 3654

GROUP 2

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HW2

Provide a short data manual with the explanations: where the data came from; what is the data set about; what are the variables; what is the meaning of rows/observations (i.e people, cars etc). This should be a pdf document separate from your R script.

Fuel Economy Data

<http://catalog.data.gov/dataset/fuel-economy-data>

vehicles.csv has 35409 rows and 74 columns.

“Fuel economy data are the result of vehicle testing done at the Environmental Protection Agency's National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, and by vehicle manufacturers with oversight by EPA. The Find a Car vehicle table contains fuel economy information for 1984-current model year vehicles. The data are available for download in CSV and XML formats.”

The variables names (headers)

- [atvtype](#) - type of alternative fuel or advanced technology vehicle
- barrels08 - annual petroleum consumption in barrels for [fuelType1 \(1\)](#)
- barrelsA08 - annual petroleum consumption in barrels for [fuelType2 \(1\)](#)
- charge120 - time to charge an electric vehicle in hours at 120 V
- charge240 - time to charge an electric vehicle in hours at 240 V
- city08 - city MPG for [fuelType1 \(2\)](#)
- city08U - unrounded city MPG for [fuelType1 \(2\)](#), [\(3\)](#)
- cityA08 - city MPG for [fuelType2 \(2\)](#)
- cityA08U - unrounded city MPG for [fuelType2 \(2\)](#), [\(3\)](#)
- cityCD - city gasoline consumption (gallons/100 miles) in charge depleting mode [\(4\)](#)
- cityE - city electricity consumption in kw-hrs/100 miles
- cityUF - EPA city utility factor (share of electricity) for PHEV
- co2 - tailpipe CO2 in grams/mile for [fuelType1 \(5\)](#)
- co2A - tailpipe CO2 in grams/mile for [fuelType2 \(5\)](#)
- co2TailpipeAGpm - tailpipe CO2 in grams/mile for [fuelType2 \(5\)](#)
- co2TailpipeGpm - tailpipe CO2 in grams/mile for [fuelType1 \(5\)](#)
- comb08 - combined MPG for [fuelType1 \(2\)](#)

- comb08U - unrounded combined MPG for [fuelType1 \(2\)](#), [\(3\)](#)
- combA08 - combined MPG for [fuelType2 \(2\)](#)
- combA08U - unrounded combined MPG for [fuelType2 \(2\)](#), [\(3\)](#)
- combE - combined electricity consumption in kw-hrs/100 miles
- combinedCD - combined gasoline consumption (gallons/100 miles) in charge depleting mode [\(4\)](#)
- combinedUF - EPA combined utility factor (share of electricity) for PHEV
- cylinders - engine cylinders
- displ - engine displacement in liters
- [drive](#) - drive axle type
- [emissionsList](#)
- engId - EPA model type index
- eng_dscr - engine descriptor; see <http://www.fueleconomy.gov/feg/findacarhelp.shtml#engine>
- evMotor - electric motor (kw-hrs)
- feScore - EPA Fuel Economy Score (-1 = Not available)
- fuelCost08 - annual fuel cost for [fuelType1 \(\\$\)](#) [\(7\)](#)
- fuelCostA08 - annual fuel cost for [fuelType2 \(\\$\)](#) [\(7\)](#)
- fuelType - fuel type with [fuelType1](#) and [fuelType2](#) (if applicable)
- fuelType1 - fuel type 1. For single fuel vehicles, this will be the only fuel. For dual fuel vehicles, this will be the conventional fuel.
- fuelType2 - fuel type 2. For dual fuel vehicles, this will be the alternative fuel (e.g. E85, Electricity, CNG, LPG). For single fuel vehicles, this field is not used
- ghgScore - EPA GHG score (-1 = Not available)
- ghgScoreA - EPA GHG score for dual fuel vehicle running on the alternative fuel (-1 = Not available)
- guzzler- if G or T, this vehicle is subject to the gas guzzler tax
- highway08 - highway MPG for [fuelType1 \(2\)](#)
- highway08U - unrounded highway MPG for [fuelType1 \(2\)](#), [\(3\)](#)
- highwayA08 - highway MPG for [fuelType2 \(2\)](#)
- highwayA08U - unrounded highway MPG for [fuelType2 \(2\)](#), [\(3\)](#)
- highwayCD - highway gasoline consumption (gallons/100miles) in charge depleting mode [\(4\)](#)
- highwayE - highway electricity consumption in kw-hrs/100 miles
- highwayUF - EPA highway utility factor (share of electricity) for PHEV
- hlv - hatchback luggage volume (cubic feet) [\(8\)](#)
- hpv - hatchback passenger volume (cubic feet) [\(8\)](#)
- id - vehicle record id
- lv2 - 2 door luggage volume (cubic feet) [\(8\)](#)
- lv4 - 4 door luggage volume (cubic feet) [\(8\)](#)
- make - manufacturer (division)
- mfrCode - 3-character manufacturer code
- model - model name (carline)

- mpgData - has My MPG data; see [yourMpgVehicle](#) and [yourMpgDriverVehicle](#)
- phevBlended - if true, this vehicle operates on a blend of gasoline and electricity in charge depleting mode
- pv2 - 2-door passenger volume (cubic feet) [\(8\)](#)
- pv4 - 4-door passenger volume (cubic feet) [\(8\)](#)
- rangeA - EPA range for [fuelType2](#)
- rangeCityA - EPA city range for [fuelType2](#)
- rangeHwyA - EPA highway range for [fuelType2](#)
- trans_dscr - transmission descriptor; see <http://www.fueleconomy.gov/feg/findacarhelp.shtml#trany>
- trany - transmission
- UCity - unadjusted city MPG for [fuelType1](#); see the description of the [EPA test procedures](#)
- UCityA - unadjusted city MPG for [fuelType2](#); see the description of the [EPA test procedures](#)
- UHighway - unadjusted highway MPG for [fuelType1](#); see the description of the [EPA test procedures](#)
- UHighwayA - unadjusted highway MPG for [fuelType2](#); see the description of the [EPA test procedures](#)
- VClass - [EPA vehicle size class](#)
- year - model year
- youSaveSpend - you save/spend over 5 years compared to an average car (\$). Savings are positive; a greater amount spent yields a negative number. For dual fuel vehicles, this is the cost savings for gasoline.
- sCharger - if S, this vehicle is supercharged
- tCharger - if T, this vehicle is turbocharged

emissions

- emissionsList
 - emissionsInfo -
 - efid - engine family ID
 - id - vehicle record ID (links emission data to the vehicle record)
 - [salesArea](#) - EPA sales area code
 - score - EPA 1-10 smog rating for [fuelType1](#)
 - scoreAlt - EPA 1-10 smog rating for [fuelType2](#)
 - [smartwayScore](#) - SmartWay Code
 - [standard](#) - Vehicle Emission Standard Code
 - [stdText](#) - Vehicle Emission Standard

fuel prices

- fuelPrices
 - midgrade - \$ per gallon of midgrade gasoline([9](#))
 - premium - \$ per gallon of premium gasoline([9](#))
 - regular - \$ per gallon of regular gasoline([9](#))
 - cng - \$ per gallon of gasoline equivalent (GGE) of compressed natural gas([10](#))
 - diesel - \$ per gallon of diesel([9](#))
 - e85 - \$ per gallon of E85([10](#))
 - electric - \$ per kw-hr of electricity([10](#))
 - lpg - \$ per gallon of propane([10](#))

yourMpgVehicle - summary of all My MPG data for this vehicle

- avgMpg - harmonic mean of average MPG shared by fueleconomy.gov users
- cityPercent - average % city miles
- highwayPercent - average % highway miles
- maxMpg - maximum user average MPG
- minMpg - minimum user average MPG
- recordCount - number of records for this vehicle
- vehicleId - vehicle record id (links My MPG data to the vehicle record)

yourMpgDriverVehicle - summary of driver data reported for this vehicle

- cityPercent - user average % city miles
- highwayPercent - user average % highway miles
- lastDate - date records were last updated (yyyy-mm-dd)
- mpg - average MPG
- state - state of residence
- vehicleId - vehicle record ID (links My MPG data to the vehicle record)