

practical

2022-07-07

```
mtcars[order(mtcars$gear,mtcars$mpg),]
```

##		mpg	cyl	disp	hp	drat	wt	qsec	vs	am	gear	carb
##	Cadillac Fleetwood	10.4	8	472.0	205	2.93	5.250	17.98	0	0	3	4
##	Lincoln Continental	10.4	8	460.0	215	3.00	5.424	17.82	0	0	3	4
##	Camaro Z28	13.3	8	350.0	245	3.73	3.840	15.41	0	0	3	4
##	Duster 360	14.3	8	360.0	245	3.21	3.570	15.84	0	0	3	4
##	Chrysler Imperial	14.7	8	440.0	230	3.23	5.345	17.42	0	0	3	4
##	Merc 450SLC	15.2	8	275.8	180	3.07	3.780	18.00	0	0	3	3
##	AMC Javelin	15.2	8	304.0	150	3.15	3.435	17.30	0	0	3	2
##	Dodge Challenger	15.5	8	318.0	150	2.76	3.520	16.87	0	0	3	2
##	Merc 450SE	16.4	8	275.8	180	3.07	4.070	17.40	0	0	3	3
##	Merc 450SL	17.3	8	275.8	180	3.07	3.730	17.60	0	0	3	3
##	Valiant	18.1	6	225.0	105	2.76	3.460	20.22	1	0	3	1
##	Hornet Sportabout	18.7	8	360.0	175	3.15	3.440	17.02	0	0	3	2
##	Pontiac Firebird	19.2	8	400.0	175	3.08	3.845	17.05	0	0	3	2
##	Hornet 4 Drive	21.4	6	258.0	110	3.08	3.215	19.44	1	0	3	1
##	Toyota Corona	21.5	4	120.1	97	3.70	2.465	20.01	1	0	3	1
##	Merc 280C	17.8	6	167.6	123	3.92	3.440	18.90	1	0	4	4
##	Merc 280	19.2	6	167.6	123	3.92	3.440	18.30	1	0	4	4
##	Mazda RX4	21.0	6	160.0	110	3.90	2.620	16.46	0	1	4	4
##	Mazda RX4 Wag	21.0	6	160.0	110	3.90	2.875	17.02	0	1	4	4
##	Volvo 142E	21.4	4	121.0	109	4.11	2.780	18.60	1	1	4	2
##	Datsun 710	22.8	4	108.0	93	3.85	2.320	18.61	1	1	4	1
##	Merc 230	22.8	4	140.8	95	3.92	3.150	22.90	1	0	4	2
##	Merc 240D	24.4	4	146.7	62	3.69	3.190	20.00	1	0	4	2
##	Fiat X1-9	27.3	4	79.0	66	4.08	1.935	18.90	1	1	4	1
##	Honda Civic	30.4	4	75.7	52	4.93	1.615	18.52	1	1	4	2
##	Fiat 128	32.4	4	78.7	66	4.08	2.200	19.47	1	1	4	1
##	Toyota Corolla	33.9	4	71.1	65	4.22	1.835	19.90	1	1	4	1
##	Maserati Bora	15.0	8	301.0	335	3.54	3.570	14.60	0	1	5	8
##	Ford Pantera L	15.8	8	351.0	264	4.22	3.170	14.50	0	1	5	4
##	Ferrari Dino	19.7	6	145.0	175	3.62	2.770	15.50	0	1	5	6
##	Porsche 914-2	26.0	4	120.3	91	4.43	2.140	16.70	0	1	5	2
##	Lotus Europa	30.4	4	95.1	113	3.77	1.513	16.90	1	1	5	2

```
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
```

```
arrange(.data=mtcars,mtcars$gear,mtcars$mpg)
```

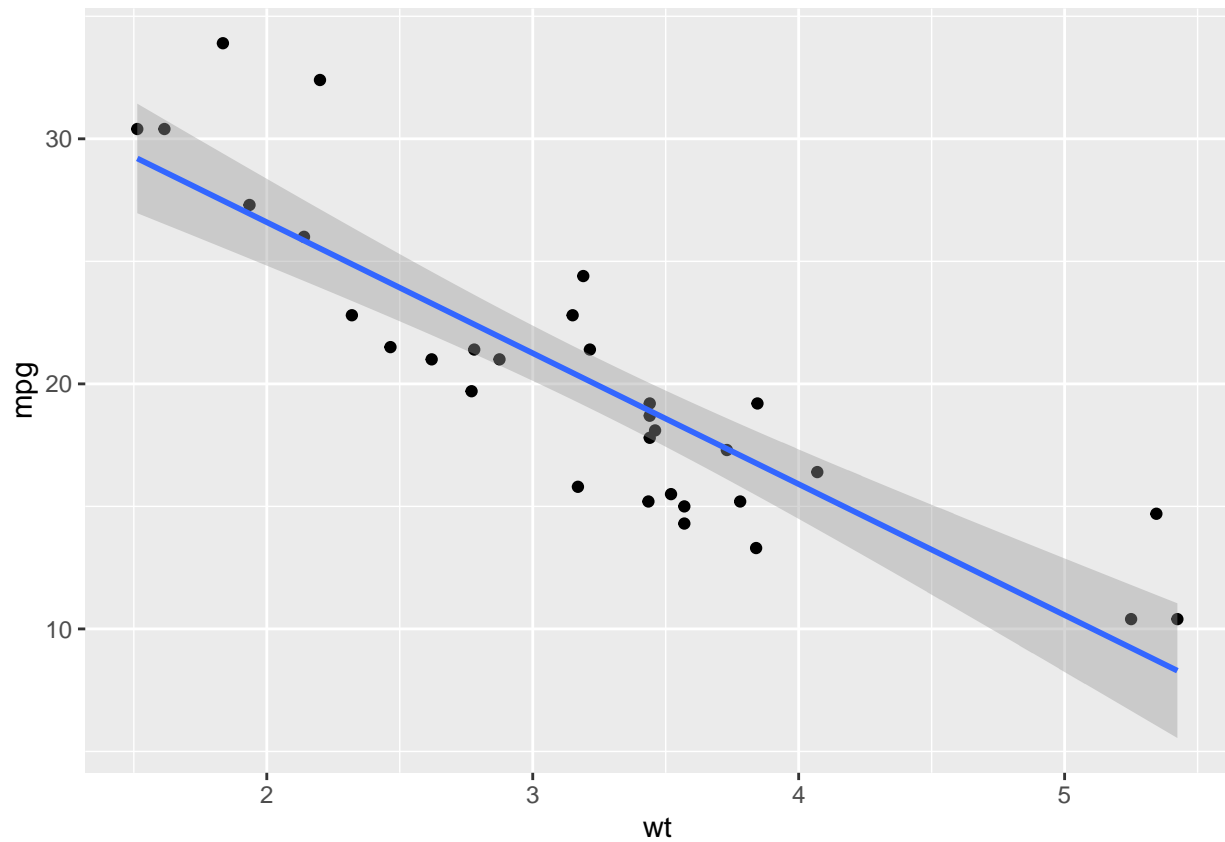
```
##      mpg  cyl  disp  hp drat    wt  qsec vs  am gear carb
## Cadillac Fleetwood 10.4   8  472.0 205 2.93 5.250 17.98 0  0   3   4
## Lincoln Continental 10.4   8  460.0 215 3.00 5.424 17.82 0  0   3   4
## Camaro Z28         13.3   8  350.0 245 3.73 3.840 15.41 0  0   3   4
## Duster 360         14.3   8  360.0 245 3.21 3.570 15.84 0  0   3   4
## Chrysler Imperial  14.7   8  440.0 230 3.23 5.345 17.42 0  0   3   4
## Merc 450SLC        15.2   8  275.8 180 3.07 3.780 18.00 0  0   3   3
## AMC Javelin        15.2   8  304.0 150 3.15 3.435 17.30 0  0   3   2
## Dodge Challenger   15.5   8  318.0 150 2.76 3.520 16.87 0  0   3   2
## Merc 450SE         16.4   8  275.8 180 3.07 4.070 17.40 0  0   3   3
## Merc 450SL         17.3   8  275.8 180 3.07 3.730 17.60 0  0   3   3
## Valiant            18.1   6  225.0 105 2.76 3.460 20.22 1  0   3   1
## Hornet Sportabout  18.7   8  360.0 175 3.15 3.440 17.02 0  0   3   2
## Pontiac Firebird   19.2   8  400.0 175 3.08 3.845 17.05 0  0   3   2
## Hornet 4 Drive     21.4   6  258.0 110 3.08 3.215 19.44 1  0   3   1
## Toyota Corona      21.5   4  120.1  97 3.70 2.465 20.01 1  0   3   1
## Merc 280C          17.8   6  167.6 123 3.92 3.440 18.90 1  0   4   4
## Merc 280           19.2   6  167.6 123 3.92 3.440 18.30 1  0   4   4
## Mazda RX4          21.0   6  160.0 110 3.90 2.620 16.46 0  1   4   4
## Mazda RX4 Wag      21.0   6  160.0 110 3.90 2.875 17.02 0  1   4   4
## Volvo 142E         21.4   4  121.0 109 4.11 2.780 18.60 1  1   4   2
## Datsun 710         22.8   4  108.0  93 3.85 2.320 18.61 1  1   4   1
## Merc 230           22.8   4  140.8  95 3.92 3.150 22.90 1  0   4   2
## Merc 240D          24.4   4  146.7  62 3.69 3.190 20.00 1  0   4   2
## Fiat X1-9          27.3   4   79.0  66 4.08 1.935 18.90 1  1   4   1
## Honda Civic        30.4   4   75.7  52 4.93 1.615 18.52 1  1   4   2
## Fiat 128           32.4   4   78.7  66 4.08 2.200 19.47 1  1   4   1
## Toyota Corolla     33.9   4   71.1  65 4.22 1.835 19.90 1  1   4   1
## Maserati Bora      15.0   8  301.0 335 3.54 3.570 14.60 0  1   5   8
## Ford Pantera L     15.8   8  351.0 264 4.22 3.170 14.50 0  1   5   4
## Ferrari Dino       19.7   6  145.0 175 3.62 2.770 15.50 0  1   5   6
## Porsche 914-2      26.0   4  120.3  91 4.43 2.140 16.70 0  1   5   2
## Lotus Europa       30.4   4   95.1 113 3.77 1.513 16.90 1  1   5   2
```

```
small_mtcars <-
mtcars %>%
  arrange(gear) %>%
  slice(1:10)
small_mtcars
```

```
##      mpg  cyl  disp  hp drat    wt  qsec vs  am gear carb
## Hornet 4 Drive     21.4   6  258.0 110 3.08 3.215 19.44 1  0   3   1
## Hornet Sportabout  18.7   8  360.0 175 3.15 3.440 17.02 0  0   3   2
## Valiant            18.1   6  225.0 105 2.76 3.460 20.22 1  0   3   1
## Duster 360         14.3   8  360.0 245 3.21 3.570 15.84 0  0   3   4
## Merc 450SE         16.4   8  275.8 180 3.07 4.070 17.40 0  0   3   3
## Merc 450SL         17.3   8  275.8 180 3.07 3.730 17.60 0  0   3   3
## Merc 450SLC        15.2   8  275.8 180 3.07 3.780 18.00 0  0   3   3
## Cadillac Fleetwood 10.4   8  472.0 205 2.93 5.250 17.98 0  0   3   4
## Lincoln Continental 10.4   8  460.0 215 3.00 5.424 17.82 0  0   3   4
## Chrysler Imperial  14.7   8  440.0 230 3.23 5.345 17.42 0  0   3   4
```

```
library(ggplot2)
ggplot(mtcars, aes(x = wt, y = mpg)) +
  geom_point() +
  geom_smooth(method = lm)
```

```
## `geom_smooth()` using formula 'y ~ x'
```



```
#install.packages("pacman")
library(pacman)
```

```
## Warning: package 'pacman' was built under R version 4.2.1
```

```
p_load(ggplot2, ggthemes, dplyr, readr)
```

```
chilean_exports <- "year,product,export,percentage
2006,copper,4335009500,81
2006,others,1016726518,19
2007,copper,9005361914,86
2007,others,1523085299,14
2008,copper,6907056354,80
2008,others,1762684216,20
2009,copper,10529811075,81
2009,others,2464094241,19
2010,copper,14828284450,85
2010,others,2543015596,15
2011,copper,15291679086,82
2011,others,3447972354,18"
```

```

2012,copper,14630686732,80
2012,others,3583968218,20
2013,copper,15244038840,79
2013,others,4051281128,21
2014,copper,14703374241,78
2014,others,4251484600,22
2015,copper,13155922363,78
2015,others,3667286912,22"
exports_data <- read_csv(chilean_exports)

## Rows: 20 Columns: 4
## -- Column specification -----
## Delimiter: ","
## chr (1): product
## dbl (3): year, export, percentage
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
exports_data

## # A tibble: 20 x 4
##   year product      export percentage
##   <dbl> <chr>      <dbl>      <dbl>
## 1 2006 copper    4335009500      81
## 2 2006 others   1016726518      19
## 3 2007 copper    9005361914      86
## 4 2007 others   1523085299      14
## 5 2008 copper    6907056354      80
## 6 2008 others   1762684216      20
## 7 2009 copper   10529811075      81
## 8 2009 others   2464094241      19
## 9 2010 copper   14828284450      85
## 10 2010 others   2543015596      15
## 11 2011 copper   15291679086      82
## 12 2011 others   3447972354      18
## 13 2012 copper   14630686732      80
## 14 2012 others   3583968218      20
## 15 2013 copper   15244038840      79
## 16 2013 others   4051281128      21
## 17 2014 copper   14703374241      78
## 18 2014 others   4251484600      22
## 19 2015 copper   13155922363      78
## 20 2015 others   3667286912      22

p1 <- ggplot(aes(y = export, x = year, colour = product), data = exports_data) +
  geom_line()
p1

```

