

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'
```

