

hw9 repo

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2025-04-04

Loading libraries and built-in data

```
# Load the tidyverse package  
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  1.9.4      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
```

```
# Preview the dataset  
head(mtcars)
```

```
##           mpg  cyl  disp  hp  drat    wt  qsec vs  am  gear  carb  
## Mazda RX4      21.0   6  160 110 3.90 2.620 16.46 0   1    4    4  
## Mazda RX4 Wag  21.0   6  160 110 3.90 2.875 17.02 0   1    4    4  
## Datsun 710     22.8   4  108  93 3.85 2.320 18.61 1   1    4    1  
## Hornet 4 Drive  21.4   6  258 110 3.08 3.215 19.44 1   0    3    1  
## Hornet Sportabout 18.7   8  360 175 3.15 3.440 17.02 0   0    3    2  
## Valiant        18.1   6  225 105 2.76 3.460 20.22 1   0    3    1
```

Filter

Filtering cars with Miles Per Gallon greater than 20 and arrange them by horsepower.

```
filtered_cars <- mtcars %>%  
  filter(mpg > 20) %>%  
  arrange(desc(hp))
```

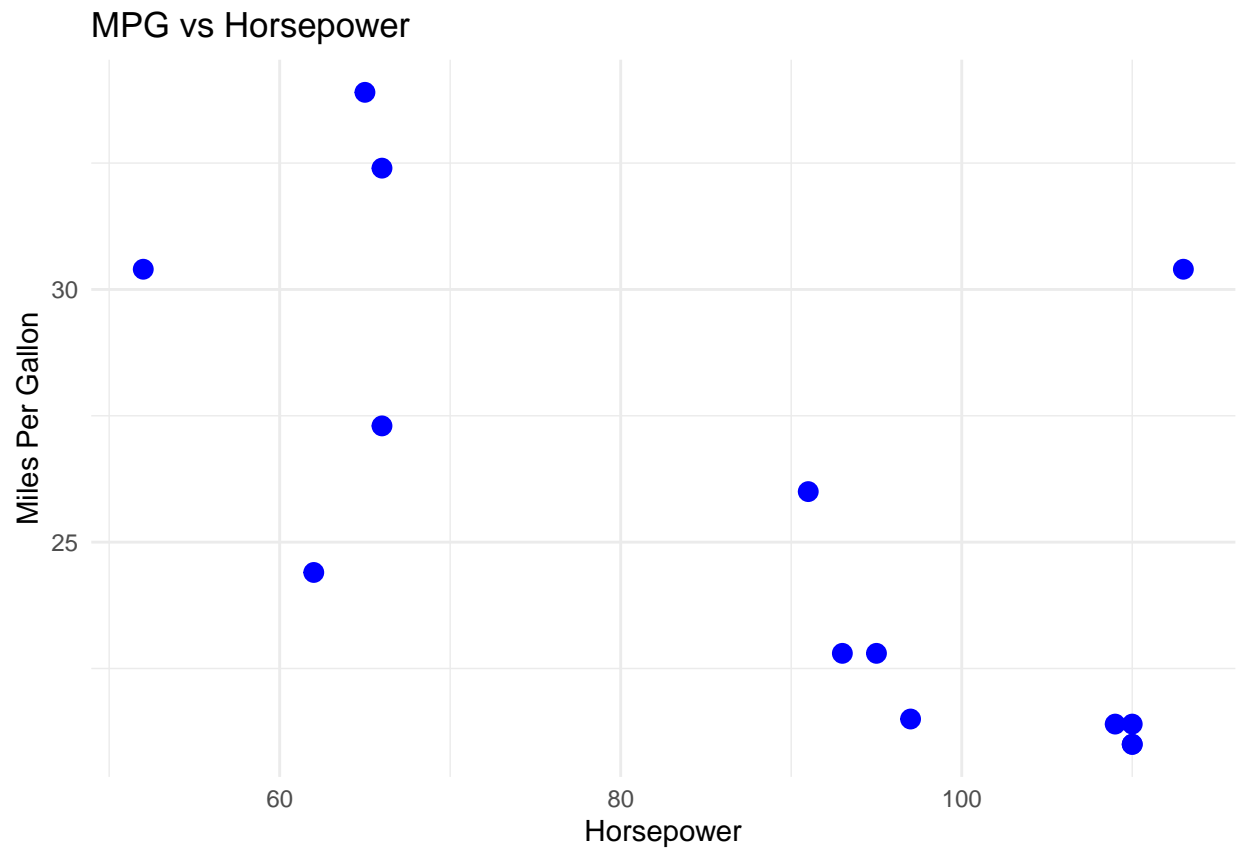
```
filtered_cars
```

| | mpg | cyl | disp | hp | drat | wt | qsec | vs | am | gear | carb |
|-------------------|------|-----|-------|-----|------|-------|-------|----|----|------|------|
| ## Lotus Europa | 30.4 | 4 | 95.1 | 113 | 3.77 | 1.513 | 16.90 | 1 | 1 | 5 | 2 |
| ## 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 |
| ## Hornet 4 Drive | 21.4 | 6 | 258.0 | 110 | 3.08 | 3.215 | 19.44 | 1 | 0 | 3 | 1 |
| ## Volvo 142E | 21.4 | 4 | 121.0 | 109 | 4.11 | 2.780 | 18.60 | 1 | 1 | 4 | 2 |
| ## Toyota Corona | 21.5 | 4 | 120.1 | 97 | 3.70 | 2.465 | 20.01 | 1 | 0 | 3 | 1 |
| ## Merc 230 | 22.8 | 4 | 140.8 | 95 | 3.92 | 3.150 | 22.90 | 1 | 0 | 4 | 2 |
| ## Datsun 710 | 22.8 | 4 | 108.0 | 93 | 3.85 | 2.320 | 18.61 | 1 | 1 | 4 | 1 |
| ## Porsche 914-2 | 26.0 | 4 | 120.3 | 91 | 4.43 | 2.140 | 16.70 | 0 | 1 | 5 | 2 |
| ## Fiat 128 | 32.4 | 4 | 78.7 | 66 | 4.08 | 2.200 | 19.47 | 1 | 1 | 4 | 1 |
| ## Fiat X1-9 | 27.3 | 4 | 79.0 | 66 | 4.08 | 1.935 | 18.90 | 1 | 1 | 4 | 1 |
| ## Toyota Corolla | 33.9 | 4 | 71.1 | 65 | 4.22 | 1.835 | 19.90 | 1 | 1 | 4 | 1 |
| ## Merc 240D | 24.4 | 4 | 146.7 | 62 | 3.69 | 3.190 | 20.00 | 1 | 0 | 4 | 2 |
| ## Honda Civic | 30.4 | 4 | 75.7 | 52 | 4.93 | 1.615 | 18.52 | 1 | 1 | 4 | 2 |

Visualization

Plotted mpg vs hp to see how fuel efficiency relates to engine power.

```
ggplot(filtered_cars, aes(x = hp, y = mpg)) +
  geom_point(color = "blue", size = 3) +
  labs(title = "MPG vs Horsepower",
       x = "Horsepower",
       y = "Miles Per Gallon") +
  theme_minimal()
```



Summary

- Used tidyverse for the filtering, sorting, and plotting.
- From the plot, I have concluded that higher horsepower cars tend to have lower miles per gallon.