

# Exercise 1: Beautiful Tables with knitr::kable()

Beamer Presentation Practice - SOLUTIONS

Solution Guide

# Introduction

# Exercise Overview

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- Create a professional Beamer presentation
- Format tables using `knitr::kable()` and `kableExtra`
- Apply incremental reveals and pauses
- Use multiple column layouts
- Add callout blocks and formatting

# Dataset

We'll use the `mtcars` dataset to demonstrate various table formatting techniques.



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We'll use the `mtcars` dataset to demonstrate various table formatting techniques.

**Task:** Load the necessary packages and prepare the data.

```
# Load required packages
library(knitr)
library(kableExtra)
library(dplyr)

# Preview the data
head(mtcars, 3)
```

|               | mpg  | cyl | disp | hp  | drat | wt    | qsec  | vs | am | gear |
|---------------|------|-----|------|-----|------|-------|-------|----|----|------|
| Mazda RX4     | 21.0 | 6   | 160  | 110 | 3.90 | 2.620 | 16.46 | 0  | 1  | 4    |
| Mazda RX4 Wag | 21.0 | 6   | 160  | 110 | 3.90 | 2.875 | 17.02 | 0  | 1  | 4    |
| Datsun 710    | 22.8 | 4   | 108  | 93  | 3.85 | 2.320 | 18.61 | 1  | 1  | 4    |

## Basic Tables

## Task 1: Simple Table - Solution

Create a basic table showing the first 6 rows of `mtcars` with only these columns: `mpg`, `cyl`, `disp`, `hp`.

Table 1: Motor Trend Car Road Tests

|                   | mpg  | cyl | disp | hp  |
|-------------------|------|-----|------|-----|
| Mazda RX4         | 21.0 | 6   | 160  | 110 |
| Mazda RX4 Wag     | 21.0 | 6   | 160  | 110 |
| Datsun 710        | 22.8 | 4   | 108  | 93  |
| Hornet 4 Drive    | 21.4 | 6   | 258  | 110 |
| Hornet Sportabout | 18.7 | 8   | 360  | 175 |
| Valiant           | 18.1 | 6   | 225  | 105 |

## Task 2: Formatted Column Names - Solution

Improve the table from Task 1 with better column names and formatting:

Table 2: Motor Trend Car Road Tests

|                   | Miles/gallon | Cylinders | Displacement | Horsepower |
|-------------------|--------------|-----------|--------------|------------|
| Mazda RX4         | 21.0         | 6         | 160          | 110        |
| Mazda RX4 Wag     | 21.0         | 6         | 160          | 110        |
| Datsun 710        | 22.8         | 4         | 108          | 93         |
| Hornet 4 Drive    | 21.4         | 6         | 258          | 110        |
| Hornet Sportabout | 18.7         | 8         | 360          | 175        |
| Valiant           | 18.1         | 6         | 225          | 105        |

## Advanced Formatting

## Task 3: Grouped Data Summary - Solution

Create a summary table showing average mpg by cylinders:

Table 3: Fuel Efficiency by Cylinder Count

| Cylinders | Count | Avg MPG | SD   |
|-----------|-------|---------|------|
| 4         | 11    | 26.66   | 4.51 |
| 6         | 7     | 19.74   | 1.45 |
| 8         | 14    | 15.10   | 2.56 |

## Task 4: Conditional Formatting - Solution

Create a table with conditional formatting:

Table 4: Cars with Conditional Highlighting

|                   | MPG  | Horsepower | Weight |
|-------------------|------|------------|--------|
| Mazda RX4         | 21.0 | 110        | 2.6    |
| Mazda RX4 Wag     | 21.0 | 110        | 2.9    |
| Datsun 710        | 22.8 | 93         | 2.3    |
| Hornet 4 Drive    | 21.4 | 110        | 3.2    |
| Hornet Sportabout | 18.7 | 175        | 3.4    |
| Valiant           | 18.1 | 105        | 3.5    |
| Duster 360        | 14.3 | 245        | 3.6    |
| Merc 240D         | 24.4 | 62         | 3.2    |

*Note:*

Green rows indicate  $\text{MPG} > 25$

## Multi-Column Layouts



## Task 5: Side-by-Side Comparison - Solution

Create two tables side by side:

Automatic Transmission

| Count | Avg MPG | Avg HP |
|-------|---------|--------|
| 19    | 17.1    | 160.3  |

Manual Transmission

| Count | Avg MPG | Avg HP |
|-------|---------|--------|
| 13    | 24.4    | 126.8  |

## Challenge Tasks

## Task 6: Complex Table Styling - Solution

Table 7: Vehicle Performance Metrics

|                   | Engine |     |      | Performance |     |      |
|-------------------|--------|-----|------|-------------|-----|------|
|                   | mpg    | cyl | disp | hp          | wt  | qsec |
| Mazda RX4         | 21.0   | 6   | 160  | 110         | 2.6 | 16.5 |
| Mazda RX4 Wag     | 21.0   | 6   | 160  | 110         | 2.9 | 17.0 |
| Datsun 710        | 22.8   | 4   | 108  | 93          | 2.3 | 18.6 |
| Hornet 4 Drive    | 21.4   | 6   | 258  | 110         | 3.2 | 19.4 |
| Hornet Sportabout | 18.7   | 8   | 360  | 175         | 3.4 | 17.0 |

## Task 7: Top Performers Table - Solution

Table 8: Top 5 Most Fuel-Efficient Cars

|                       | Rank     | MPG         | Cyl      | HP        | Weight     |
|-----------------------|----------|-------------|----------|-----------|------------|
| <b>Toyota Corolla</b> | <b>1</b> | <b>33.9</b> | <b>4</b> | <b>65</b> | <b>1.8</b> |
| Fiat 128              | 2        | 32.4        | 4        | 66        | 2.2        |
| Honda Civic           | 3        | 30.4        | 4        | 52        | 1.6        |
| Lotus Europa          | 4        | 30.4        | 4        | 113       | 1.5        |
| Fiat X1-9             | 5        | 27.3        | 4        | 66        | 1.9        |

## Bonus Challenge

## Task 8: Incremental Table - Solution

Table 9: Step 1 - Car Names and MPG

| Car            | mpg  |
|----------------|------|
| Toyota Corolla | 33.9 |
| Fiat 128       | 32.4 |
| Honda Civic    | 30.4 |
| Lotus Europa   | 30.4 |
| Fiat X1-9      | 27.3 |

## Task 8: Incremental Table - Solution

Table 10: Step 2 - Add Performance Metrics

| Car            | mpg  | hp  | qsec |
|----------------|------|-----|------|
| Toyota Corolla | 33.9 | 65  | 19.9 |
| Fiat 128       | 32.4 | 66  | 19.5 |
| Honda Civic    | 30.4 | 52  | 18.5 |
| Lotus Europa   | 30.4 | 113 | 16.9 |
| Fiat X1-9      | 27.3 | 66  | 18.9 |

## Task 8: Incremental Table - Solution

Table 11: Step 3 - Add Weight and Summary Row

| Car            | mpg         | hp          | qsec        | wt         |
|----------------|-------------|-------------|-------------|------------|
| Toyota Corolla | 33.9        | 65.0        | 19.9        | 1.8        |
| Fiat 128       | 32.4        | 66.0        | 19.5        | 2.2        |
| Honda Civic    | 30.4        | 52.0        | 18.5        | 1.6        |
| Lotus Europa   | 30.4        | 113.0       | 16.9        | 1.5        |
| Fiat X1-9      | 27.3        | 66.0        | 18.9        | 1.9        |
| <b>Average</b> | <b>30.9</b> | <b>72.4</b> | <b>18.7</b> | <b>1.8</b> |



Wrap Up

# Summary

Today you practised:

- Basic table creation with `knitr::kable()`
- Advanced formatting with `kableExtra`
- Conditional formatting and styling
- Multi-column table layouts
- Integrating tables into Beamer presentations

# Tips for Success

## Do's

- Keep tables simple and readable
- Use appropriate decimal places
- Add meaningful captions
- Align numbers consistently

## Don'ts

- Avoid cluttered tables
- Don't use too many colours
- Avoid tiny font sizes
- Don't overuse borders