

# Tutorial-06

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## Visualisation in R: Facets and Group Aesthetic Mapping

### Learning Objectives

- Practice using small multiples to visualise your data
- This will involve using `facet_wrap` and `facet_grid`
- Also practice grouping your data by categorical variables for visualisation

### Preparation

- We expect you to be using an R project for all tutorials
- Download the dataset from Moodle, `boston_celtics.csv`, and place it in a folder called `data` within your R Project.

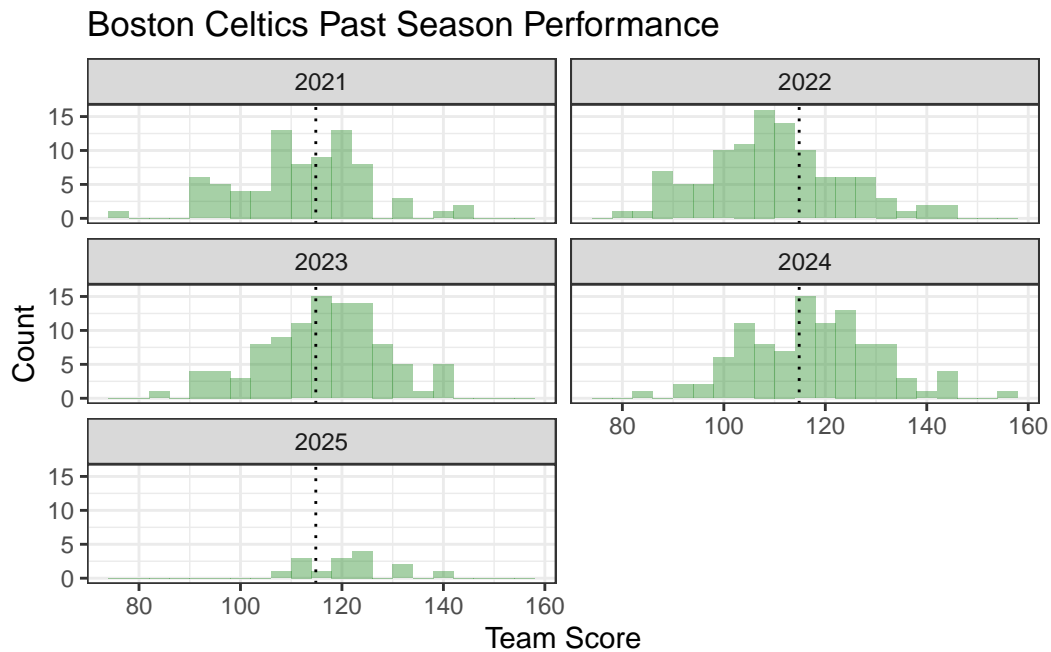
## Tasks

Building on tutorial 4, you will be creating visualisations in `ggplot2` to analyse sporting statistics from the Boston Celtics NBA basketball team.

```
library(tidyverse)
library(here)
boston_celtics <- read_csv(here("data", "boston_celtics.csv"))
```

### Task 1

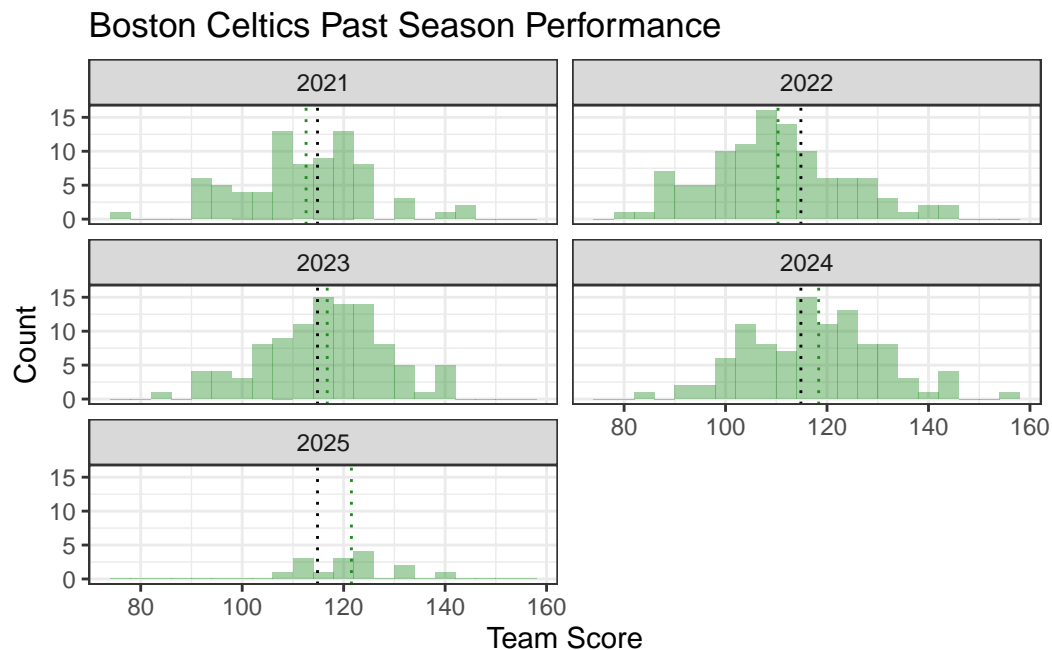
Using `facet_wrap` recreate the following plot:



## Solutions

```
season_summary = boston_celtics |>
  group_by(season) |>
  summarise(season_mean = mean(team_score)) |>
  ungroup()

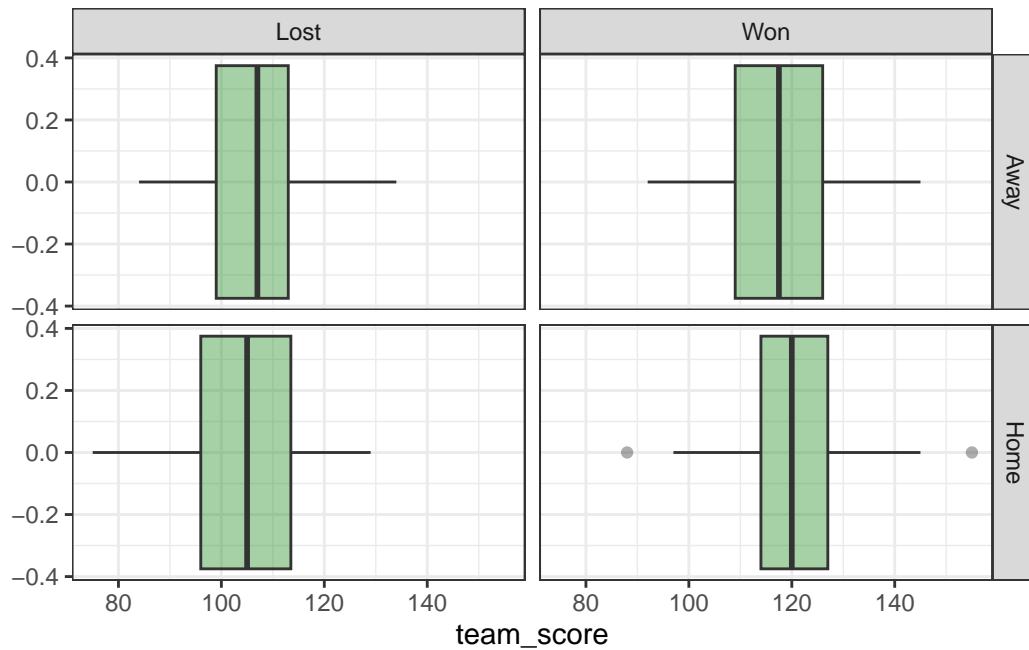
ggplot(data = boston_celtics) +
  geom_histogram(aes(x = team_score),
                 fill = "forestgreen", alpha = 0.4, binwidth = 4) +
  geom_vline(aes(xintercept = mean(team_score)), linetype = "dotted") +
  geom_vline(data = season_summary,
             aes(xintercept = season_mean), linetype = "dotted", col = "forestgreen") +
  facet_wrap(~season, ncol = 2) +
  theme_bw() +
  xlab("Team Score") +
  ylab("Count") +
  ggtitle("Boston Celtics Past Season Performance")
```



**Hint:** Look up `geom_vline()` to add the average team score. You may like to challenge yourself to also add the average team score for each season as well.

## Task 2

Using `facet_grid` recreate the following plot:



### Solutions

```
boston_celtics = boston_celtics |>
  mutate(team_winner = as.factor(team_winner)) |>
  mutate(
    team_winner =
      recode(team_winner,
        "TRUE" = "Won", "FALSE" = "Lost"),
    team_home_away =
      recode(team_home_away, "home" = "Home", "away" = "Away"))

ggplot(data = boston_celtics) +
  geom_boxplot(aes(x = team_score),
    fill = "forestgreen", alpha = 0.4, binwidth = 1) +
  facet_grid(team_home_away ~ team_winner) +
  theme_bw()
```

**Hint:** What's tricky here is changing the order (levels) of the categorical variables. The default for how categorical variables are displayed on panels of plots is always alphabetical.

```
boston_celtics = boston_celtics |>
  mutate(
    team_winner =
      factor(team_winner, levels = c("Won", "Lost")),
    team_home_away =
      factor(team_home_away, levels = c("Home", "Away"))
  )
```

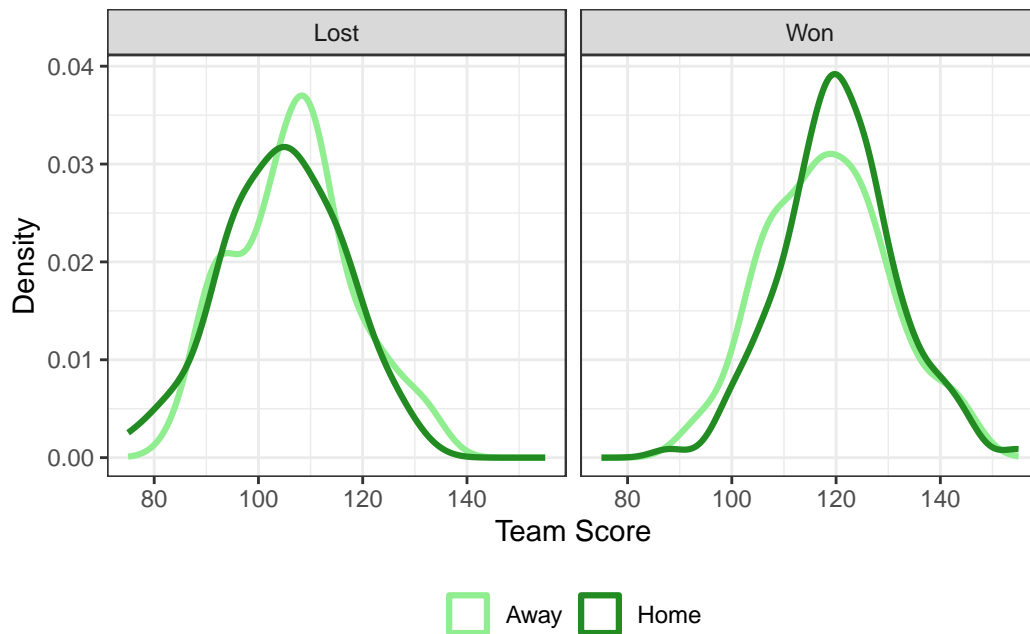
We need to:

- To tell R it's a categorical variable we make it a **factor** type
- Change the order of the levels for plotting using **recode**.

[Here](#) is a cheat sheet on **factors** you can download to help you.

### Task 3

Use the **group** aesthetic mapping and **facet\_wrap** to create the following plot:



## Solutions

```
ggplot(boston_celtics) +  
  geom_density(aes(x = team_score, group = team_home_away, col = team_home_away), linewidth=1) +  
  scale_colour_manual(values = c("Home" = "forestgreen", "Away" = "lightgreen")) +  
  facet_wrap(vars(team_winner)) +  
  theme_bw() +  
  xlab("Team Score") +  
  ylab("Density") +  
  theme(legend.position = "bottom",  
        legend.title = element_blank())
```

**Hint:** You can adapt the colour scale from Tutorial 4 and the `linewidth` is increased from default.

*Note I made a small mistake and the legend names were around the wrong way, so I have updated the figure.*

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