# Lesson 2: Descriptive Analytics

Files required: hours.csv, day.csv, Readme.txt within the Bike sharing dataset.

R packages required: tidyverse, ggplot2, openintro (for a lab report).

Objective:

Introduce descriptive analytics techniques using the Bike Sharing Dataset and demonstrate how these techniques can be used to solve business problems. You will work in groups to complete exercises in R using the ggplot2 package.

Aims:

By the end of the lesson, you should be able to:

* Understand the basic concepts and techniques of descriptive analytics.
* Apply descriptive analytics to a real-world dataset using R and ggplot2.
* Interpret and communicate the results of their analyses in a business context.
* Recognize trends and summarize data sets.
* Create data visualizations to effectively communicate findings.

Work in groups of 2-3 to solve the exercises below. Some hints on the R code useful for solving the exercises is provided in Lesson 2: Descriptive Analytics.Rmd.

## Exercise 1 (time trend)

* Business problem: How does bike rental usage developed over time?
* Task: Create a relevant plot
* Discuss: Discuss how understanding of this trend might help in planning resources.

## Exercise 2 (boxplot, means, medians)

* Business problem: How does bike rental usage differ between weekdays and weekends?
* Task: Create a plot/calculate summary that might help to know how bike rental usage differ between weekdays and weekends.
* Discuss: Discuss how understanding these patterns can help in planning resource allocation and bike maintenance schedules.
* Hints:
  + First, load the data.
  + Think what variables in the data are relevant to the business problem (see Readme.txt for the description of variables).
  + What are the types of these variables, numerical or categorical?
  + Think what plot and what summaries are relevant for the business problem.

## Exercise 3 (pie chart)

* Business problem: What proportion of bike rentals occur during different weather conditions?
* Task: Create a plot/calculate summaries that might help to know how bike rental usage differ between weekdays and weekends.
* Discuss: Consider how weather impacts bike rental business and how this information could be used for marketing or operational decisions.

## Exercise 4 (scatterplot)

* Business problem: Is there a relationship between temperature and the number of bike rentals?
* Task: Create a plot that describes the relationship between temperature and the number of bike rentals
* Discuss: Analyze the strength and direction of the relationship and consider the implications for business operations during different temperature ranges.

## Exercise 5 (histogram)

* Business problem: What is the distribution of rental counts throughout the day?
* Task: Create a plot that describes how many bikes were rented in during each hour.
* Discuss: Identify peak usage times and discuss strategies for optimizing bike availability, distribution, and staffing in rental offices, if applicable.

## Exercise 6 (boxplots, but probably a repetition)

* Business Problem: How do rental counts compare between registered and casual users?
* Task: Create boxplots for the rental counts of registered and casual users.
* Discussion: Analyze the differences in behavior between these two user groups and consider strategies to convert casual users to registered ones.

Here some outliers present.