MONASH University

MONASH BUSINESS SCHOOL

# Tidy Time Series & Forecasting in R


robjhyndman.com/workshop2020

# Resources

- Slides
- Exercises
- Textbook
- Useful links

**robjhyndman.com/workshop2020**

# Brief bio

- Professor of Statistics, Monash University
- Head of Department of Econometrics & Business Statistics, Monash University
- Editor-in-Chief, *International Journal of Forecasting*, 2005–2018

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## How my forecasting methodology is used:

- Pharmaceutical Benefits Scheme
- Cancer incidence and mortality
- Electricity demand
- Ageing population
- Fertilizer sales

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# Assumptions

- This is not an introduction to R. I assume you are broadly comfortable with R code and the RStudio environment.
- This is not a statistics course. I assume you are familiar with concepts such as the mean, standard deviation, quantiles, regression, normal distribution, likelihood, etc.
- This is not a theory course. I am not going to derive anything. I will teach you forecasting tools, when to use them and how to use them most effectively.

# Key reference

**Hyndman, R. J. & Athanasopoulos, G. (2020) *Forecasting: principles and practice*, 3rd ed.**

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**OTexts.org/fpp3/**

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- Free and online
- Data sets in associated R package
- R code for examples

# Poll: How experienced are you in forecasting

1. Guru: I wrote the book, done it for decades, now I do the conference circuit.
2. Expert: It has been my full time job for more than a decade.
3. Skilled: I have been doing it for years.
4. Comfortable: I understand it and have done it.
5. Learner: I am still learning.
6. Beginner: I have heard of it and would like to learn more.
7. Unknown: What is forecasting? Is that what the weather people do?

# Poll: How proficient are you in using R?

1. Guru: The R core team come to me for advice.
2. Expert: I have written several packages on CRAN.
3. Skilled: I use it regularly and it is an important part of my job.
4. Comfortable: I use it often and am comfortable with the tool.
5. User: I use it sometimes, but I am often searching around for the right function.
6. Learner: I have used it a few times.
7. Beginner: I've managed to download and install it.
8. Unknown: Why are you speaking like a pirate?

# Install required packages

```
install.packages("fpp3", dependencies=TRUE)
```

# Approximate outline

| Day | Topic | Chapter |
|---|---|---|
| 1 | Introduction to tsibbles | 2 |
| 2 | Time series graphics | 2 |
| 3 | Transformations | 3 |
| 4 | Seasonality and trends | 7 |
| 5 | Time series features | – |
| 6 | Introduction to forecasting | 1,3 |
| 7 | Exponential smoothing | 8 |
| 8 | ARIMA models | 9 |
| 9 | Dynamic regression | 10 |
| 10 | Hierarchical forecasting | 11 |