

Tidy Time Series & Forecasting in R

Rob J Hyndman

A wide-angle aerial photograph of the San Francisco skyline during sunset. The city's iconic buildings, including the Transamerica Pyramid and the Coit Tower, are silhouetted against a bright sky. The Golden Gate Bridge is visible in the distance across the water.

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Wifi: rstudio20 / tidyverse20

Workshop policies

- Identify the exits closest to you in case of emergency
- Please review the `rstudio::conf` code of conduct that applies to all workshops. Issues can be addressed three ways:
 - ▶ In person: contact any `rstudio::conf` staff member or the conference registration desk
 - ▶ By email: send a message to conf@rstudio.com
 - ▶ By phone: call 844-448-1212
- Please do not photograph people wearing red lanyards
- A chill-out room is available for neurologically diverse attendees on the 4th floor of tower 1

Instructor: Rob J Hyndman

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



Find me at ...

 @robjhyndman

 @robjhyndman

 robjhyndman.com

 rob.hyndman@monash.edu

Teaching assistants

Mitchell O'Hara-Wild



Rhian Davies



Phillip Lear



Steven Lawrence



Assumptions

- This is not an introduction to R. I assume you are broadly comfortable with R code, the RStudio environment and the tidyverse.
- 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 time series and 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/](https://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(c(  
  "tidyverse",  
  "fpp3",  
  "GGally",  
  "sugrrants"  
)  
install.packages("fabletools",  
  repos = "https://tidyverts.org")
```

Approximate outline

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

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Sticky notes

Asking for help



I'm stuck



I'm not stuck, but I need help
on my computer



I need help
understanding something
(which likely means others
do too)