

Tidy Time Series & Forecasting in R

Rob J Hyndman

The background of the slide features a wide-angle aerial photograph of the San Francisco skyline during sunset. The city lights are beginning to glow against the warm orange and yellow hues of the setting sun. In the foreground, three hexagonal logos for R packages are overlaid on the image. From left to right: tsibble (orange), feasts (white), and fable (blue).

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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

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- Editor-in-Chief, *International Journal of Forecasting*, 2005–2018



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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/

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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)