

Forecasting in R

Webinar

Bahman Rostami-Tabar



Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?

Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?

Instructor: Bahman Rostami-Tabar

- Senior lecturer of Management Science, Cardiff University



Find me at ...

 @Bahman R T

 Bahman Rostami-Tabar

 bahmanrt.com

 rostami-tabarb@cardiff.ac.uk

Instructor: Ivan Svetunkov

- Lecturer, Department of Management Science,
Lancaster University



Find me at ...

 @iSvetunkov

 Ivan Svetunkov

 forecasting.svetunkov.ru/en

 i.svetunkov@lancaster.ac.uk

Tutor: Dr. Tahseen Jilani

- Data Sciences Research Scientist, University of Nottingham



Find me at ...

🏠 nottingham.ac.uk

✉ Tah-

seen.Jilani1@nottingham.ac.uk

Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?

Poll: How experienced are you in forecasting and R

Please complete the pools:

- 1 How experienced are you in forecasting
- 2 How experienced are you in R

Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?

Approximate outline

| Day | Topic |
|-----|---|
| 1.1 | Forecasting and decision making |
| 1.2 | Prepare data |
| 1.3 | Time series patterns and graphics |
| 1.4 | Forecaster's toolbox |
| 1.5 | Forecaster's toolbox: modeling accuracy |
| 1.6 | Exponential smoothing models |
| 2.1 | ARIMA models |
| 2.2 | Regression |
| 2.3 | Special events |
| 2.4 | Forecasting by aggregation |
| 2.5 | Forecasting by combination |
| 2.6 | Forecasting many time series |

Key reference

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

Key reference

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

[OTexts.org/fpp3/](https://otexts.org/fpp3/)

Key reference

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

[OTexts.org/fpp3/](https://otexts.org/fpp3/)

■ Recommended

- ▶ Profit From Your Forecasting Software
- ▶ Principles of Business Forecasting

Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?

Install required packages

Please bring your own laptop and install the latest version of R and Rstudio

Install fpp3 package

```
# please install the fpp3 package before the w  
library(fpp3)
```

Practice tidyverse

- Manipulate data with dplyr functions
- Visualise data with ggplot2
- Work with data/time object using lubridate

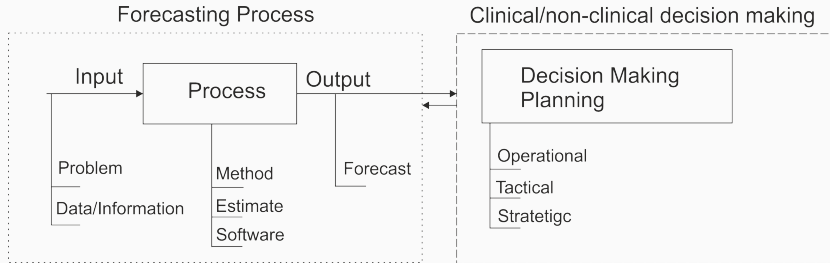
Outline

- 1 Team
- 2 Your experience in R and forecasting
- 3 Outline of the workshop
- 4 Requirements for the workshop
- 5 Who is using forecasts?**

Why do organisations need forecasting?

| Forecasting required in many situation | Forecast |
|--|----------|
| Whether to build a new hospital in next 10 years? | ? |
| How many staff does an A&E need next week? | ? |
| How many units of bandages is required next month? | ? |

Forecasting and decision making



Different type of decisions that may require forecast

- Short-term

- ▶ e.g. Scheduling of personnel

- Medium-term

- ▶ e.g. Determining future resource requirements

- Long-term

- ▶ e.g. Strategic planning, investment

Assignment 1

- Think about your organisation and various situations where you make decisions about the future that requires an estimation of the future.
- Describe at least one situation/task.
- Finally, provide details of what you need to forecast to support that particular task:
 - ▶ List the possible predictor variables that might be useful
 - ▶ For how long you need that forecast? e.g. 7 days, 1 week, 3 months,...

Assignment 1: submission

Deadline to complete the assignment: Thursday 20th of February

You can complete the Google Doc. or create a similar Microsoft Word document and send it to rostami-tabarb@cardiff.ac.uk

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)