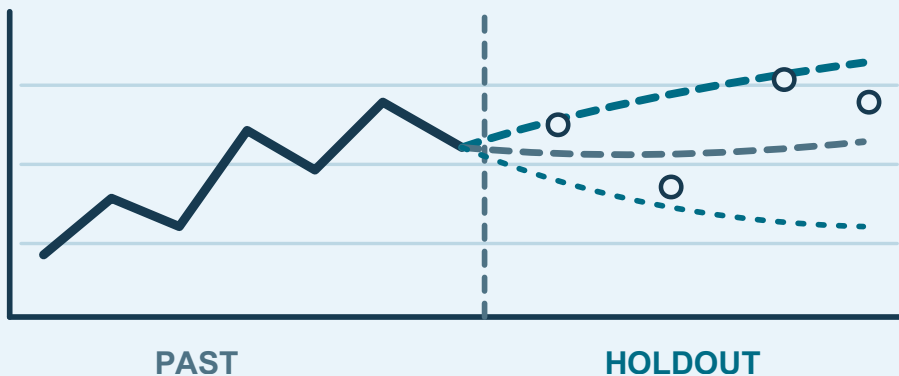




PYTHON AND DATA WORKFLOWS

Build Forecast Baselines You Can Evaluate

Compare simple demand forecasts with rolling origins, visible errors and no future leakage



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FREE SAMPLE / INTRODUCTION + CHAPTER 1 / EDITION 1.0.0

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About this free sample

Build Forecast Baselines You Can Evaluate

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Run examples in a separate working folder using the supplied synthetic data. Review inputs and calculations before adapting the techniques to real operations. Model software, service access, subscriptions, ongoing updates and consulting are not included.

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This free sample contains the introduction and Chapter 1 only. The closing link opens the complete guide. The companion project and worked solutions are supplied with the complete ebook.

Start here

A forecast experiment needs a baseline before it needs a complicated model. Simple methods make information boundaries and error calculations visible. If a sophisticated model cannot outperform an appropriate transparent baseline on a fair evaluation, its extra complexity needs another justification. This book builds the baseline experiment itself so you can inspect what was known, predicted and scored.

The fictional case is Rill Tool Library, which wants a next-day planning estimate for request volume. All observations are invented teaching values. The supplied eight-day series alternates ten and twenty requests to make the calculations easy to verify. That artificial two-day cycle is not a claim about real library demand, a recommended business seasonality or evidence of future forecasting performance.

The companion implements last-value, seasonal-naive and trailing-mean baselines using the Python standard library. It evaluates one-day-ahead forecasts at rolling origins, returns every forecast and actual, and summarizes mean absolute error, root mean squared error and signed bias. It also emits a separate next-day forecast labelled unscored.

```
python main.py --input example-input.json
python -m unittest discover -s tests -v
```

The synthetic seasonal baseline has zero error because the fixture was constructed to repeat exactly. Last value has mean absolute error ten and trailing mean has mean absolute error five. Those results demonstrate the mechanics and assumptions of the example. They do not establish that one method will win on another series or that uncertainty has disappeared.

Read the chapters in order and keep the original fixture. Each exercise changes a boundary such as missing dates, forecast horizon, information availability or error denominator. The worked solutions emphasize what the experiment establishes and which decisions remain outside it. Use real authorized data only after defining a matching operational forecast question.

1. Define the forecast decision

State target, horizon and information

Rill's target is next-day request count, evaluated one day ahead. The forecast is produced after the previous day's observation is available. This timing assumption matters: a method using yesterday's final count is not operationally valid if that count arrives two days late. Define when each input becomes known, not only the date it describes.

The target is requests, not fulfilled loans, stock demand or revenue. If requests are capped by an intake system, observed count may be censored relative to true demand. The companion cannot recover unobserved demand from a count series. Keep the meaning of the measured target separate from the business quantity someone hopes to infer.

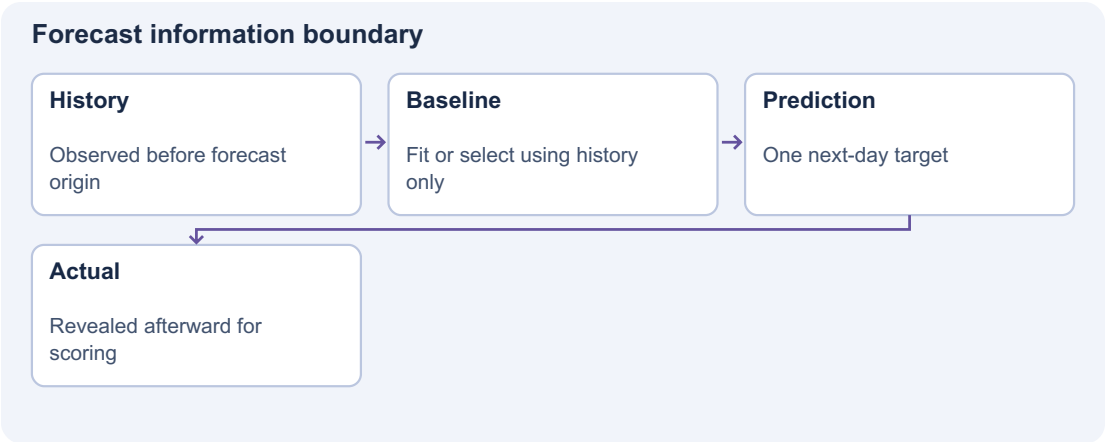


Figure 1. Each prediction uses only history before its target observation.

Experiment item	Teaching contract
Target	Daily request count
Horizon	One next day
Origin	After prior day is observed
Evaluation	Same target dates for all methods

Worked case: changing the horizon

A seven-day planning horizon is not seven repetitions of the one-day evaluation. Some methods need recursive forecasts or a direct multi-step rule, and errors may differ by lead time. The current program intentionally fixes horizon at one. Do not relabel its output as a weekly plan without defining and testing a new forecasting procedure.

Exercise: write the operational clock

Specify when Rill's report is generated, when request counts become available and which date it predicts. Identify a source delay that would invalidate last-value input at that origin. The forecast contract should make such leakage visible before a model is implemented.

Decision worksheet: prediction and action differ

A forecast of fifteen requests does not automatically mean the library should prepare fifteen tools. The action depends on available inventory, substitution, service goals and the cost of different misses. Those decisions are outside the target series. Keep a numeric forecast separate from an operational recommendation, and evaluate any recommendation using its own declared decision policy. This prevents a model score from being presented as evidence of savings or improved service that was never measured.

Also distinguish forecast production time from target date. If a morning report predicts the remainder of the same day, it may legitimately use requests already observed that morning. That is a different horizon and information set from the companion's next-day forecast. Write the cutoff precisely enough that another analyst can reconstruct which observations were available. A date-only source cannot establish within-day availability, so the current example assumes completed daily counts are available before the next origin. If that assumption is false, revise the experiment before comparing methods. A highly accurate retrospective forecast can still be operationally unusable when its inputs arrive too late.

Continue with the full guide

This free sample ends after the introduction and Chapter 1. The complete guide contains nine teaching chapters, worked exercise solutions, primary references and a separate Python companion project. The full PDF, reflowable EPUB and project files are supplied together.

Use the complete guide to work through the remaining exercises and inspect the supplied examples. The companion code and fictional data are separately MIT licensed; the complete ebook has the single-reader terms described on its product page.

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