

# Seasonal adjustment

**ESTP-training  
15-17/10/2024**

# 0. Outline

- ESS guidelines
  - Objectives
  - Methods
- Series decomposition
- Overview of seasonal adjustment methods
- Outline of the training
- Final remarks

# 1. ESS Guidelines (2024)

- **Background and basic definitions**

Seasonal adjustment is a fundamental process in the correct interpretation of short-term time series movement to inform policy makers.

Seasonal fluctuations and calendar effects can mask short and long-term movements in a time series and impede a clear understanding of underlying phenomena. Seasonal adjustment filters out usual seasonal fluctuations and typical calendar effects from a time series.

Usual seasonal fluctuations mean those movements which recur with similar intensity in the same season each year and which, based on the past movements of the time series in question and under normal circumstances, can be expected to recur. Calendar effects arise from annual differences in the number of working or trading days in a month or a quarter, or the dates or days of public holidays.

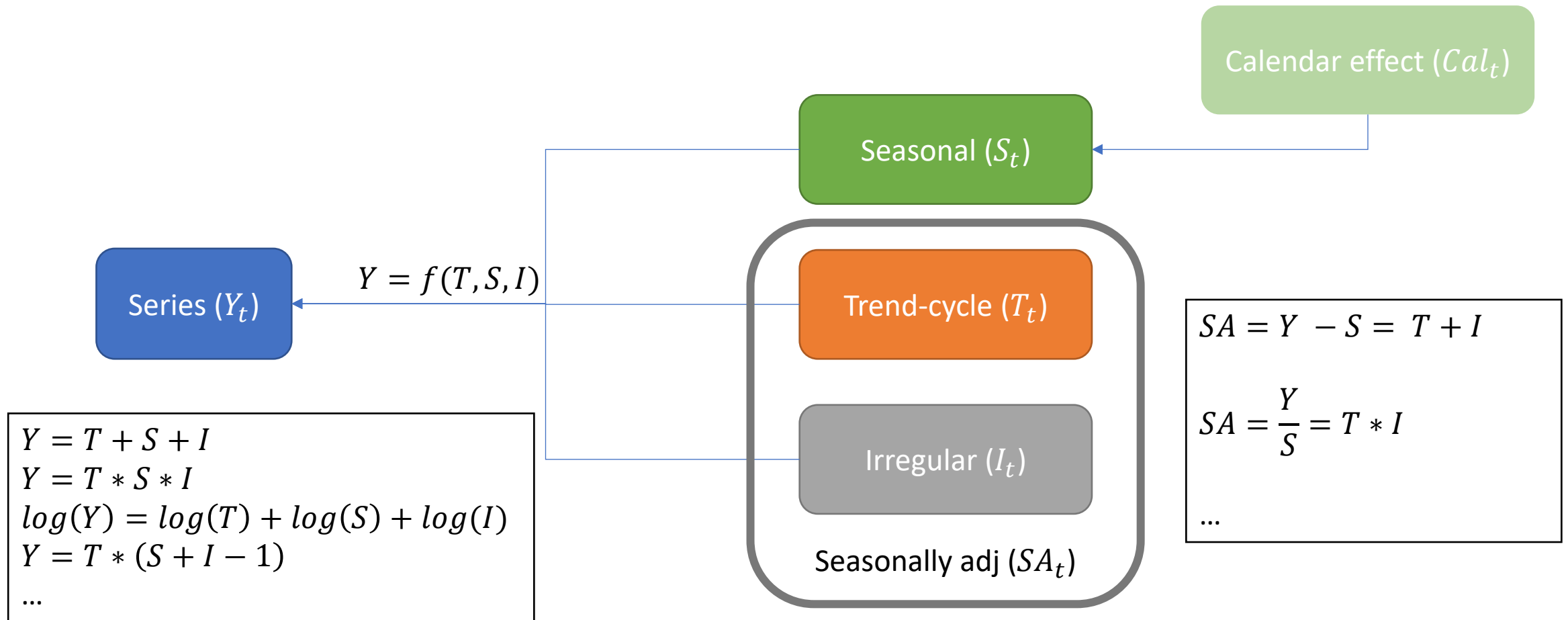
Movements due to exceptionally strong or weak seasonal influences, for example extreme weather conditions or atypical holiday patterns, will continue to be visible in the seasonally adjusted series. Other random disruptions and unusual movements with real-world interpretations, for example strikes or large orders, will also continue to be visible.

Hence, the seasonally adjusted results do not show “normal” and repeating events but do show the “news” in the time series, for example latest movements of the trend, the business cycle or the irregular components as well as the occurrence of turning points.

The downside of seasonal adjustment is that seasonality cannot be precisely defined and different approaches – such as the signal extraction approach (Burman, 1980; Gomez and Maravall, 1996) and the semi-parametric approach based on a set of predefined moving (Shiskin et al., 1967; Findley et al., 1998) – may result in different outcomes.

The expertise of an analyst will also impact on the quality of seasonal adjustment, although the primary drivers are the quality of the unadjusted time series and the production timetable.

## 2. Series decomposition

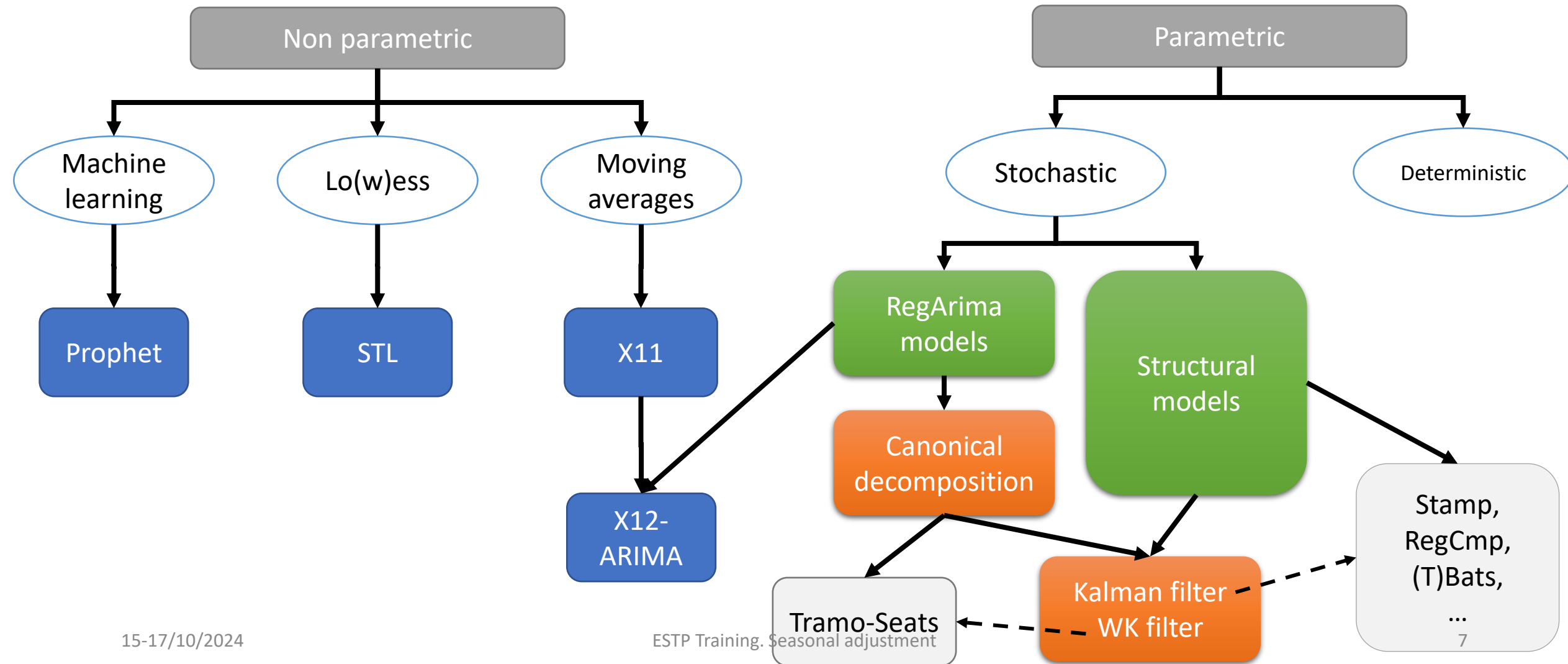


## 2. Series decomposition

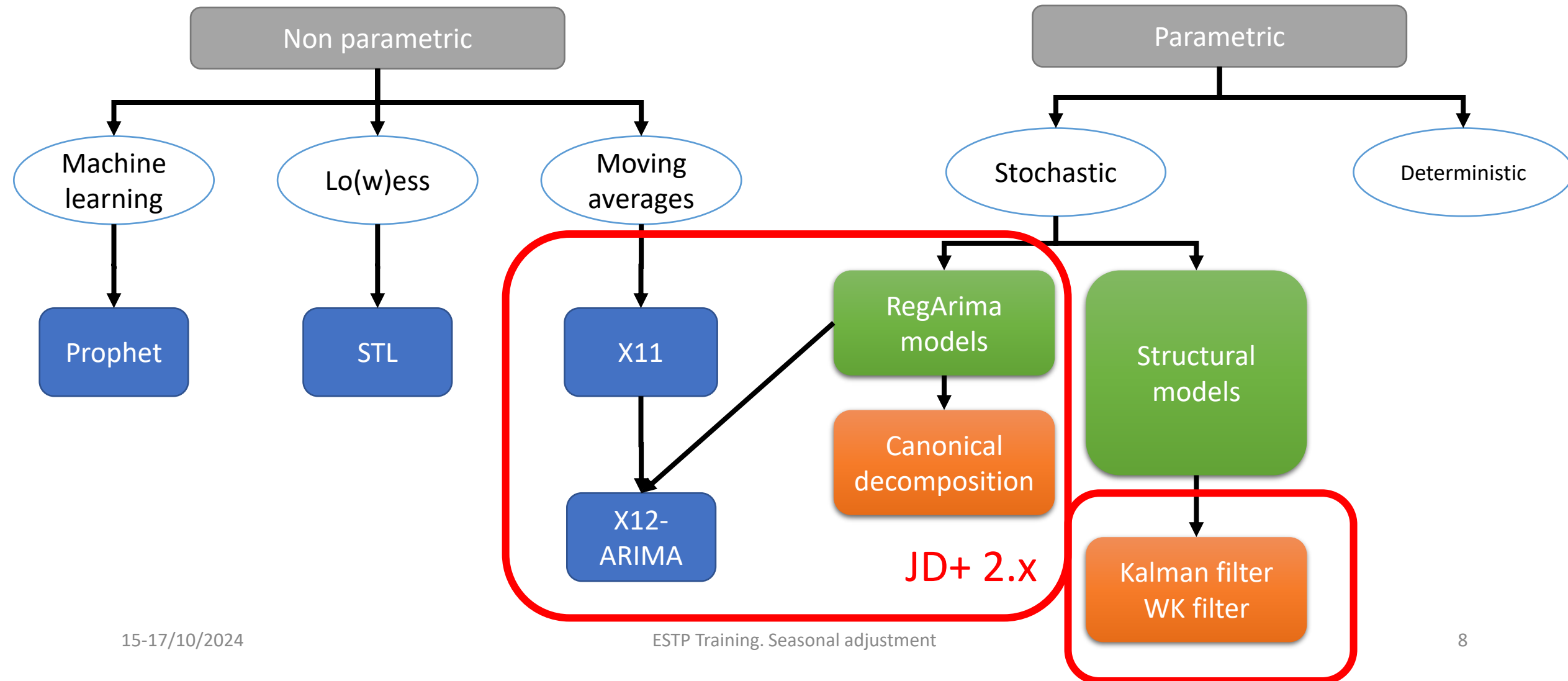
- Trend-cycle
  - Smooth (?)
  - Around the series
- Seasonal
  - Periodic, with slow changes (?)
  - Nearly 0 or 1 in average during 1 cycle (year)
- Irregular
  - Residual
  - Around 0 or 1

No actual definition of the components  $\Rightarrow$  Methods/software give different results

### 3. Rapid overview of the main SA methods

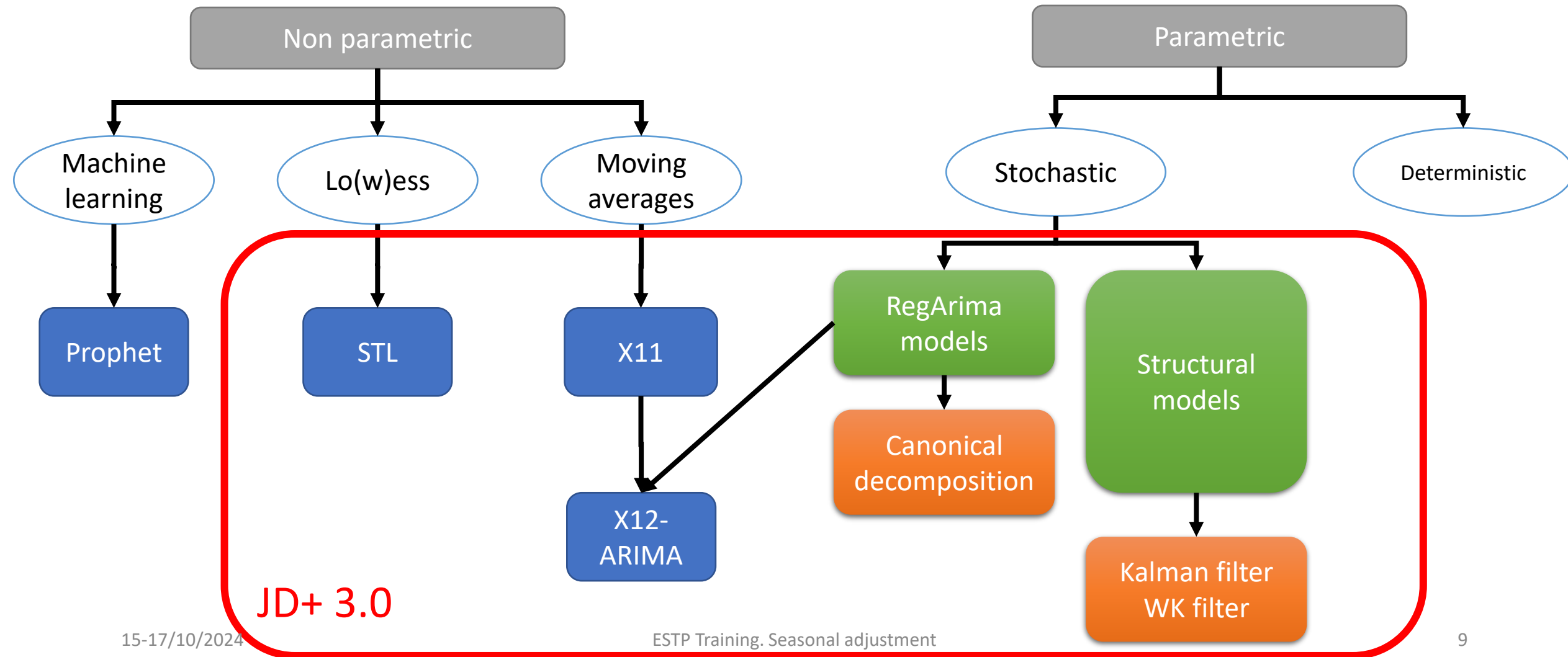


### 3. Rapid overview of the main SA methods





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# 4. Outline of the training (see guidelines)

- Overview of (R)JDemetra+
  - JD+ 3.0, rjdverse, github, documentation...
- Short tutorial on time series
- Pre-treatment
  - Decomposition scheme, outliers, calendar effects, (automatic) model selection
- Decomposition (seasonal adjustment)
  - Seats, X11, STL, STS...
- Revisions
- Quality control
- Routine SA processing
- Specific issues
  - Pre-treatment, decomposition
  - High-frequency

## 5. Final remarks

- Need to understand the principles of the main algorithms (not all the technical details)
  - Software automates many details
- Need for good quality reports
  - Recall: *“seasonally adjusted series should have neither residual seasonality nor residual calendar effects”*
- Need to “industrialize” the seasonal adjustment processing
  - Additional request: *“Seasonal adjustment procedures should generate consistent and robust results”*