

Time Series Analysis & Forecasting Using R

bit.ly/fable2023

5. Time series features



Outline

STL Features

Strength of seasonality and trend

STL decomposition

$$y_t = T_t + S_t + R_t$$

Seasonal strength

$$\max \left(0, 1 - \frac{\text{Var}(R_t)}{\text{Var}(S_t + R_t)} \right)$$

Trend strength

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- WA has strongest trends.

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Lab Session 9

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- Use `GGally::ggpairs()` to look at the relationships between the STL-based features. You might wish to change `seasonal_peak_year` and `seasonal_trough_year` to factors.
- Which is the peak quarter for holidays in each state?

Feature extraction and statistics

```
tourism |> features(Trips, feat_acf)
```

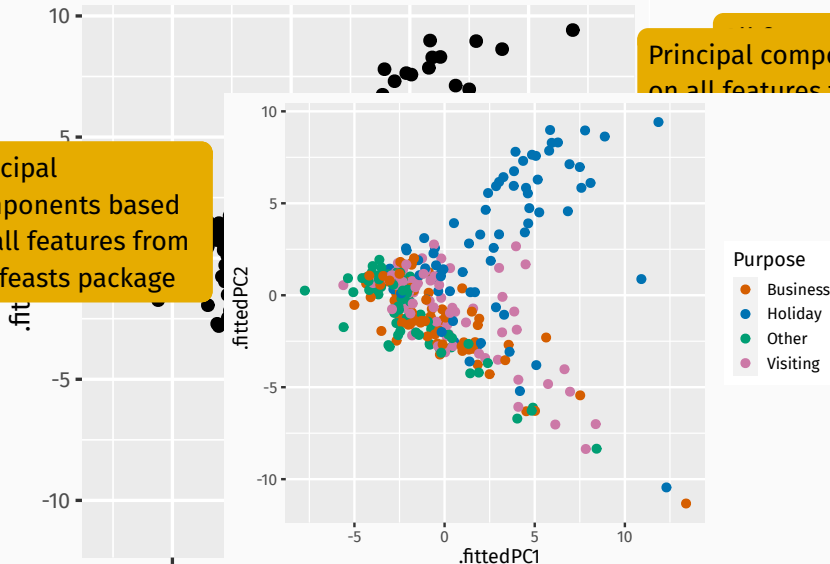
```
# A tibble: 304 x 10
```

	Region	State	Purpose	acf1	acf10	diff1_acf1	diff1_acf10	diff2_acf1	diff2_acf10
	<chr>	<chr>	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
1	Adelaide	SA	Busine~	0.0333	0.131	-0.520	0.463	-	
	0.676				0.741				

Dimension reduction for features

Principal components based on all features from the feasts package

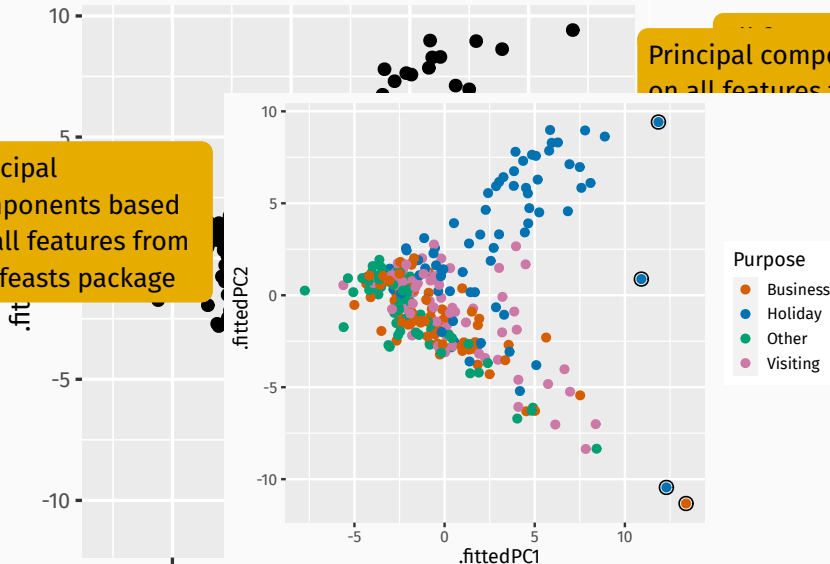
Principal components based on all features from the feasts package



Dimension reduction for features

Principal components based on all features from the feasts package

Principal components based on all features from the feasts package



Lab Session 10

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- Use a feature-based approach to look for outlying series in PBS.
- What is unusual about the series you identify as outliers?