

Last Class

- 1) Quick recap
- 2) ARIMA
- 3) SARIMA
- 4) Data preprocessing and confidence intervals
- 5) Exogenous variables
- 6) SARIMAX model
- 7) Change points

Today's class

- 1) Recap of change points forecasting
- 2) Time Series with linear regression
- 3) FB Prophet

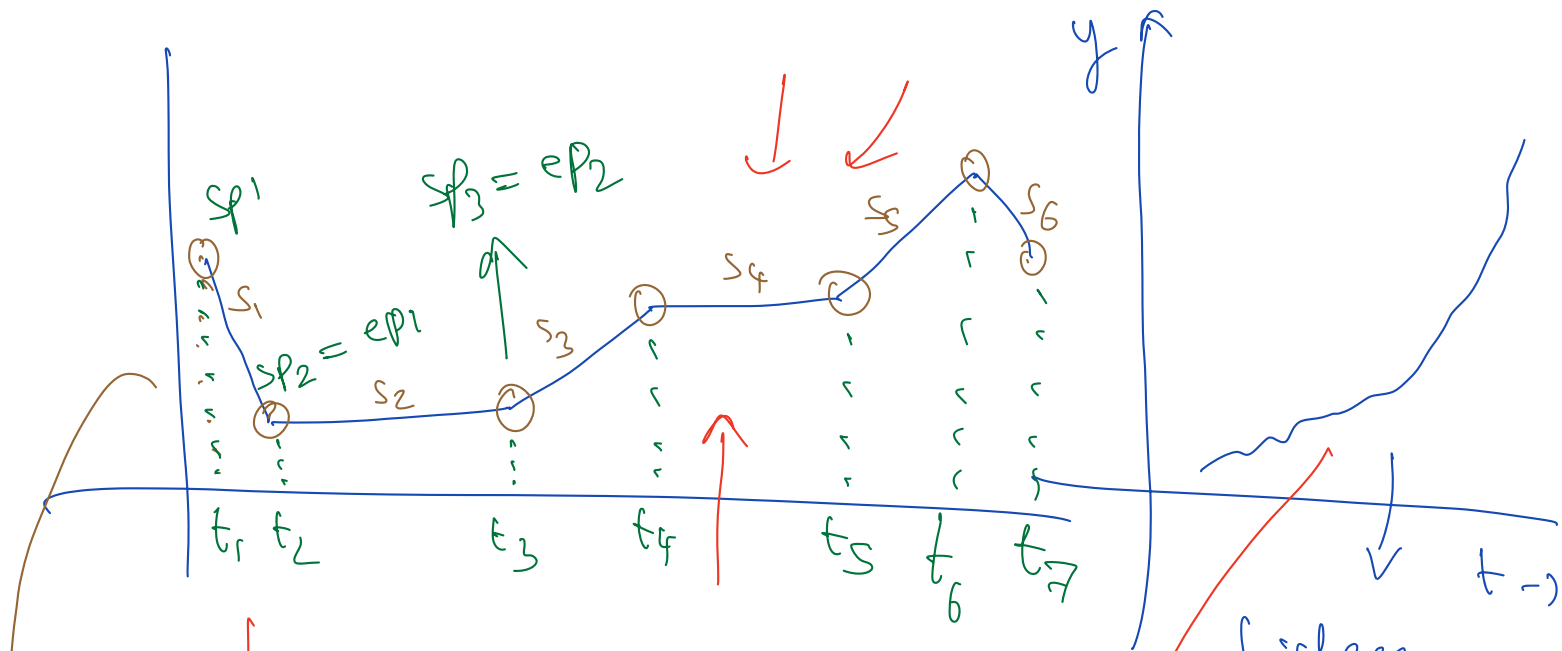
Announcement:

Preference is postpone

But Module test needs to be arranged accordingly.

Currently Dec 8 - 17 → push this

1) PS done or a TTS, Sun 9pm
↳ optional



$$A \sin\left(\frac{2\pi t}{T} + b\right)$$

password = A, T, b

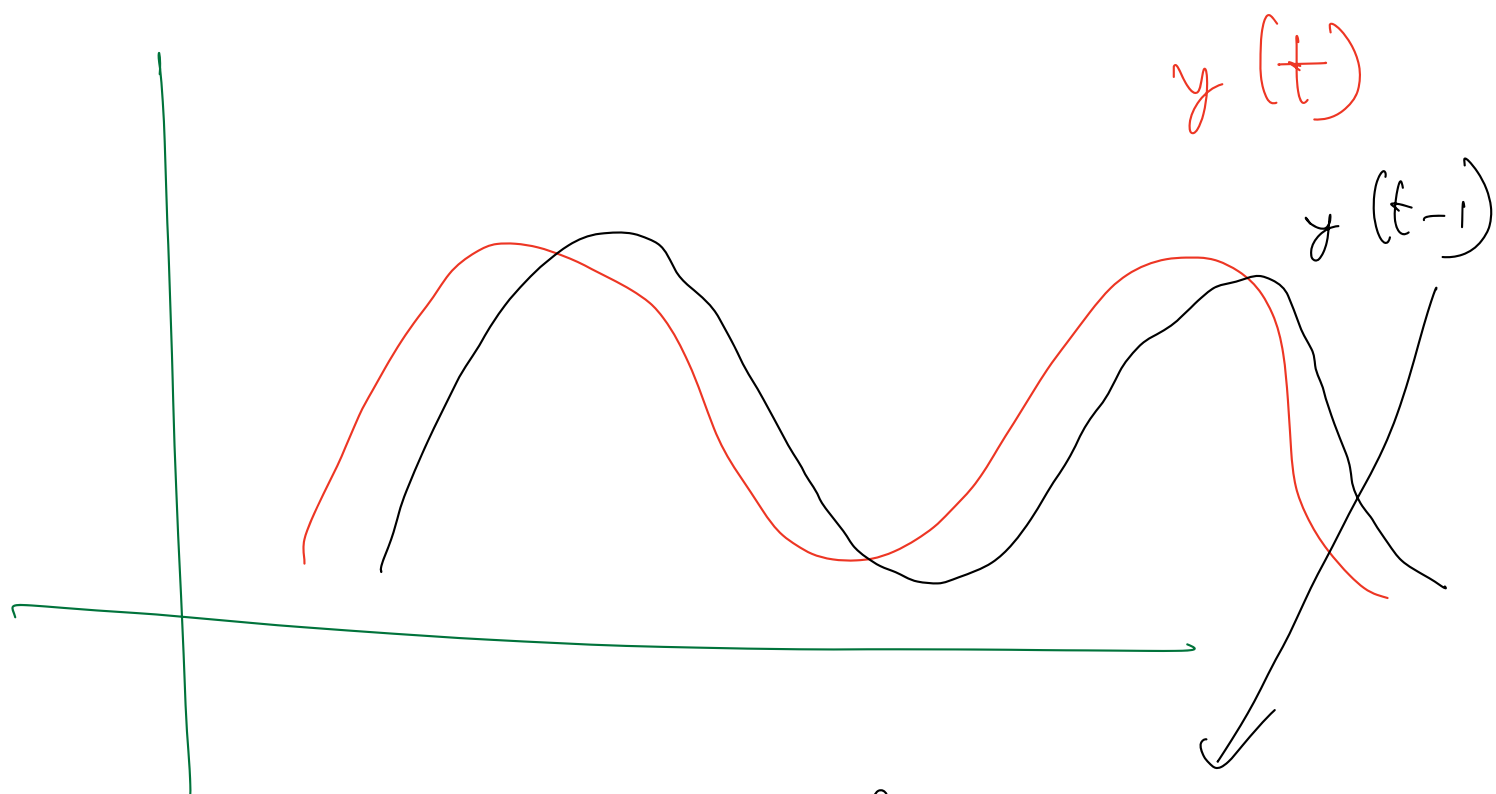
higher
degree
polynomial

$$\text{param} = \alpha_0, \alpha_1, \alpha_2, \alpha_3, \dots$$

$$\alpha_0 + \alpha_1 t + \alpha_2 t^2 + \alpha_3 t^3 + \dots$$

$$t_1 \text{ to } t_2 \rightarrow sp!, ep!$$
$$t_2 \text{ to } t_3 \rightarrow sp_2, ep_2$$
$$\ell_3 \text{ to } \ell_4 \rightarrow sp_3, ep_3$$

piece wise linear line



$y(t) \rightarrow \log 1$

6th Jan 2016
Date weekday

2016-01-06 weekend

2016-01-07 working day

2016-01-08

7th Jan 2016

<u>total</u>	<u>holiday</u>	<u>weekend</u>	<u>log 1</u>
379	0	0	
(420)	1	1	379
382			420

↓
y

rest all x

	Total
2016-01-06 Sunday →	110
01-07 Monday →	207
⋮	
Saturday →	787
2016-01-13 Sunday →	320

$$\begin{aligned} \text{Sunday} &\rightarrow \text{avg} \left(\frac{320 + 110 + \dots}{\dots} \right) \\ \text{Monday} &\rightarrow \text{avg} \left(\frac{207 + \dots}{\dots} \right) \\ &\vdots \end{aligned}$$

df

$$\begin{aligned} &\frac{\text{Sale_wrt_day}}{\dots} \\ &\begin{array}{l} 510 \\ 321 \end{array} \quad \left. \vphantom{\begin{array}{l} 510 \\ 321 \end{array}} \right\} 7 \text{ values} \end{aligned}$$

...

510

321

...

...

...

510

321

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