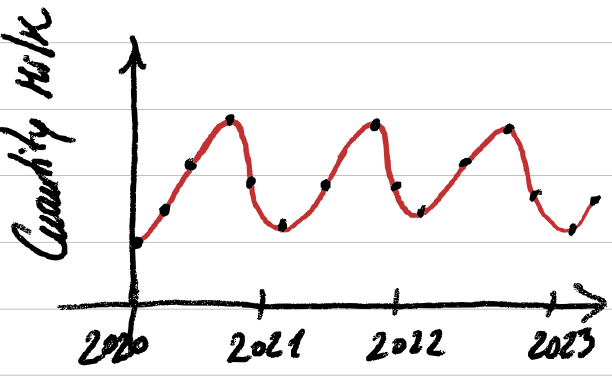
Autoregressive Model (AR)

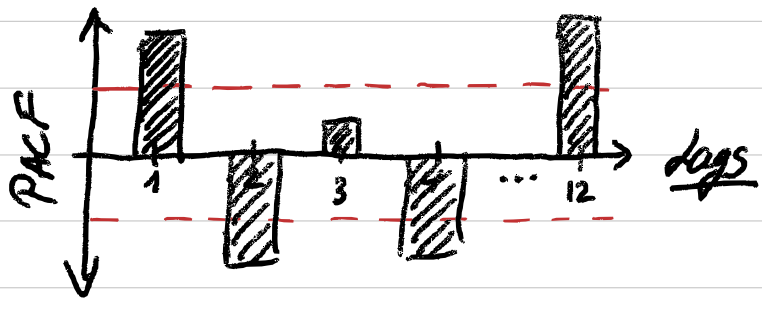
The autoregression intuitive idea is so simple, we'll try to predict something based on past values.



$M_t \equiv$ Quantity of milk that was demanded this month

$M_{t-1} \equiv$ " " " " last month

Let's draw the PACF chart:



Remember that PACF graph denote directs correlations with the today's quantity. For example: PACF for $t=3$ indicates the direct correlation of the quantity of milk demanded 3 month ago on the quantity of milk today. Removing the effects of the intermediate (In this case M_{t-2} and M_{t-1})

$$M_{t-3} \longrightarrow M_t$$

*So a good model would be:

→ It is natural to maintain on the model the lags that are high (positive or negative) because if that directs effects are zero or statistically very close to zero they are not interesting for us.

So if we go back to our PACF chart we would select 1, 2, 4 and 12th lags

$$M_t = \beta_0 + \beta_1 \cdot M_{t-1} + \beta_2 \cdot M_{t-2} + \beta_4 \cdot M_{t-4} + \beta_{12} \cdot M_{t-12} + \varepsilon_t$$