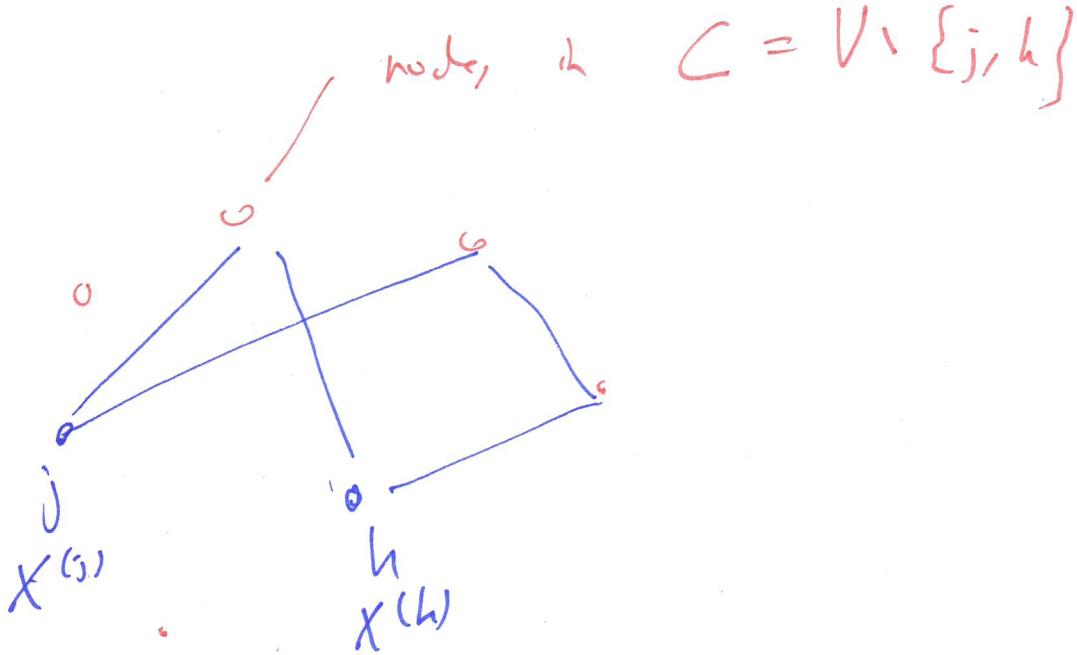
"i.i.d." data structure

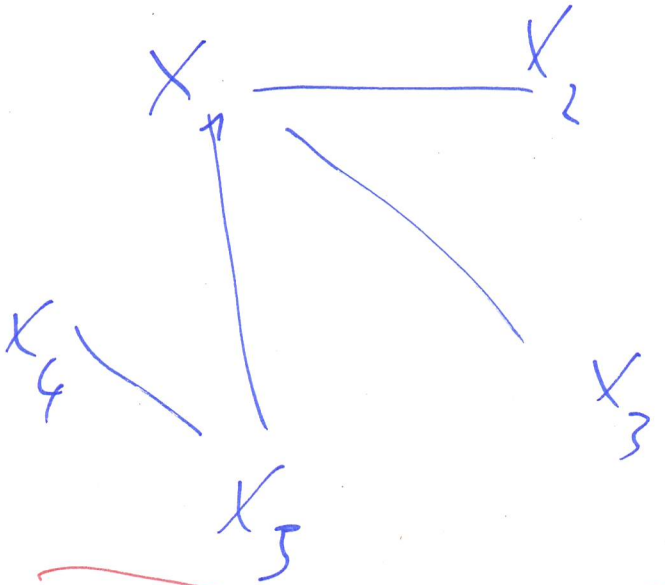
⇝ sample splitting

$p = 4'000$, $n = 200$

$|\hat{S}(I_1)| \leq \min(\lfloor n/2 \rfloor, p) \leq 100$



$(j, k) \notin E$



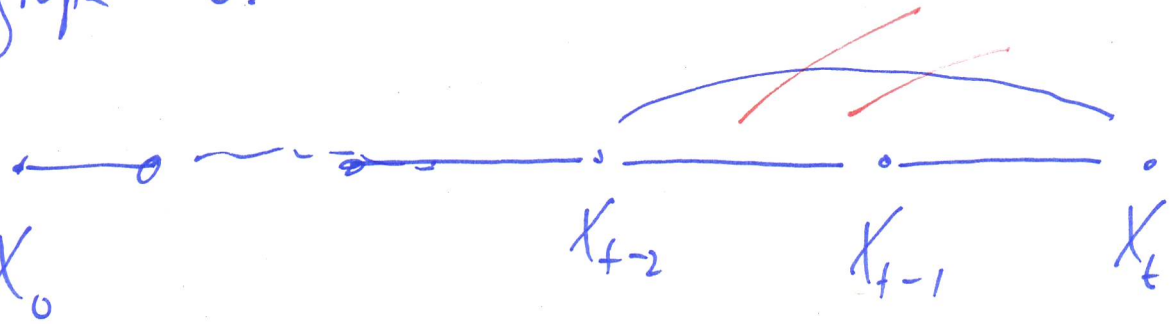
edges $\hat{=}$ ~~some sort of dependence~~

Markov property a stochastic process

$$\{X_t\,;\ t = 0, 1, 2, 3, \dots\}$$

MP: $\mathbb{P}[X_t \mid X_{t-1}, \cancel{X_{t-2}, \dots X_0}] = \mathbb{P}[X_t \mid X_{t-1}]$

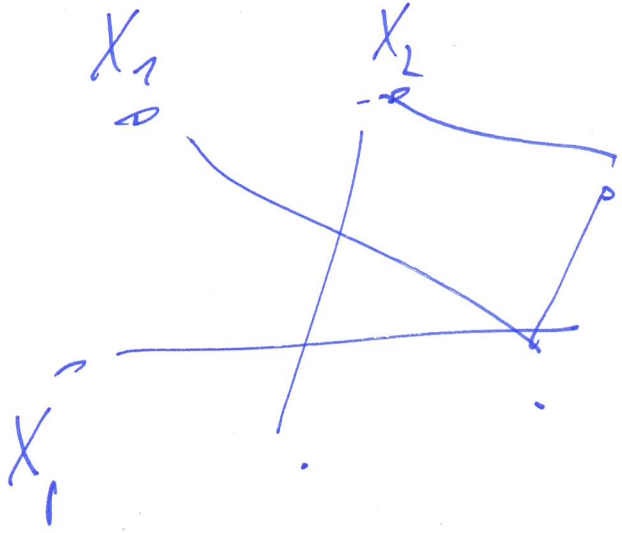
graph G:



MP: $\mathbb{P}[X_t \mid X_{t-2}, \dots X_0] = \underbrace{\mathbb{P}[X_t \mid X_{t-1}]}$

depends only on X_s with edge $s-t$

other graphs



GGM:

$(j,h) \in E \iff X^{(j)} \not\perp X^{(h)} \mid X^{(V \setminus \{j,h\})}$

$\Updownarrow$ Gaussian density

$(\Sigma^{-1})_{j,h} \neq 0$

$\Updownarrow$

$\beta_h^{(j)} \neq 0$ and/or $\beta_j^{(h)} \neq 0$

Comput. complexity of Lasso:

$$O(np \min(n,p))$$

$\rightsquigarrow$ nodewise Lasso: $p \cdot O(np \min(n,p))$