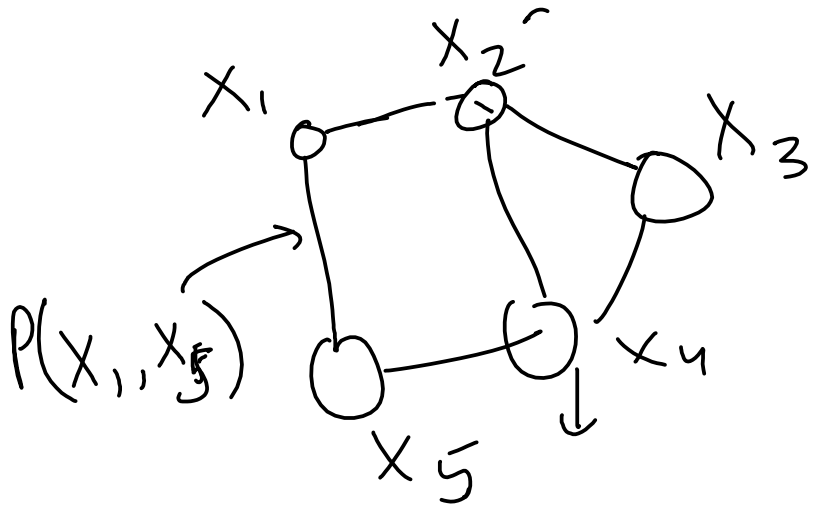
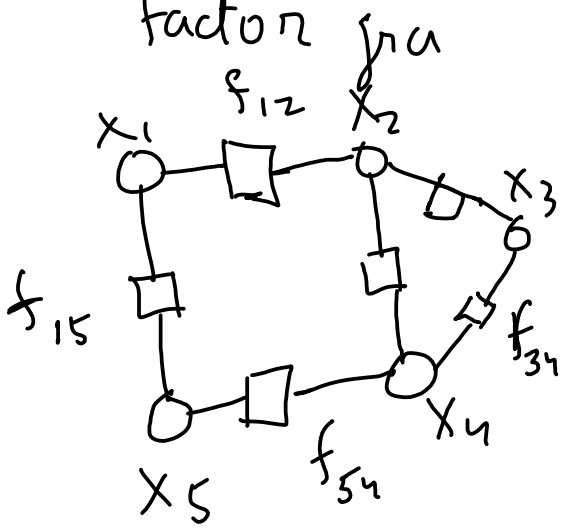
Markov random Field



Factor graph



X_i are Random variables

Main result :

$$P(X_1, X_2, X_3, X_4, X_5)$$

$$= P(X_1, X_2)\, P(X_2 X_3)\, P(X_3, X_4)\, P(X_4, X_2)$$

$$P(X_5, X_4)\; P(X_1 X_5)\; P(Y \mid X_0 = x_0)$$

marginal

$P(X_1) = ?$

Non monte carlo (more efficient)

$P(X_1 \mid X_3 = x_3) = ?$ (forward propagation)

① sub-network distribution
② Unscented kalman filter
③ PGM kind of algorithm