# Seifert Van Kampen 定理

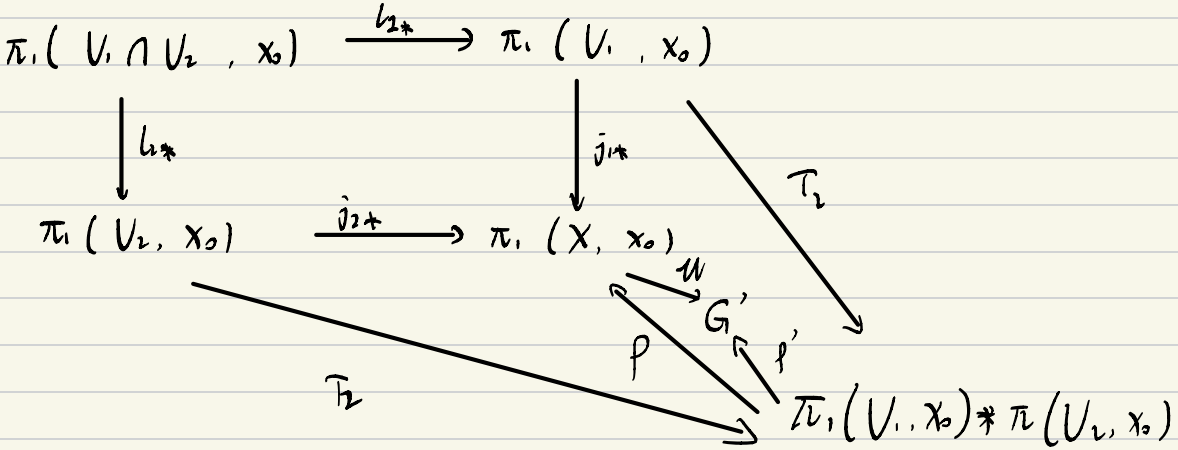
$X = U_1 \cup U_2$ ,

$U_1, U_2$ open , 道路连通

$U_1 \cap U_2$ 非空且道路连通

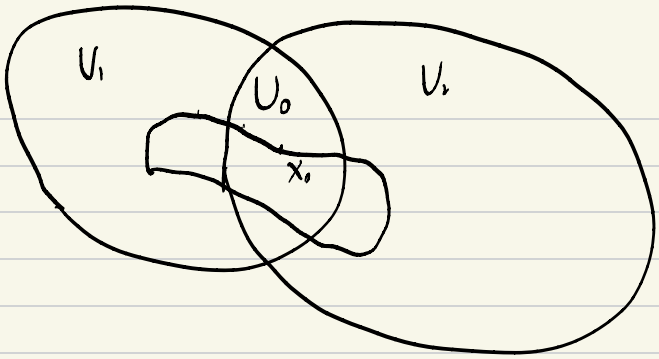
(I) $\rho : \pi_1(U_1, x_0) * \pi_1(U_2, x_0) \to \pi_1(X, x_0)$ 满同态

(II) $\ker(\rho) = \langle i_{1*}(\gamma) \cdot i_{2*}(\gamma^{-1}) : \gamma \in \pi_1(U_1 \cap U_2, x_0) \rangle$




in conclution :

$$\pi_1(X, x_0) \cong \pi_1(U_1, x_0) *_{\pi_1(U_0, x_0)} \pi_1(U_2, x_0)$$




$U_0 = U_1 \cap U_2$