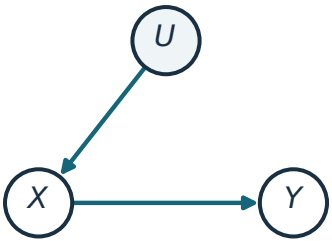
Same observations, different interventions

$U \sim \text{Bernoulli}(1/2)$ in both models

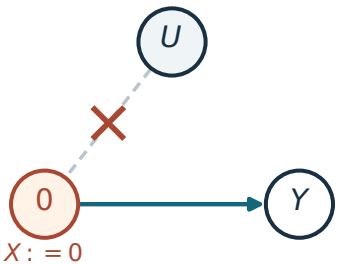
MODEL A

$X = U, \quad Y = X$



$\Pr((X, Y) = (0, 0)) = \Pr((X, Y) = (1, 1)) = \frac{1}{2}$

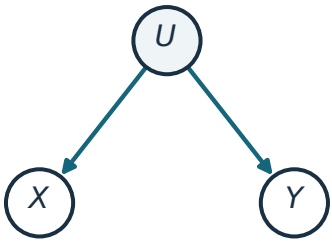
Intervention: remove the input to X



$\Pr(Y = 1 \mid \text{do}(X = 0)) = 0$

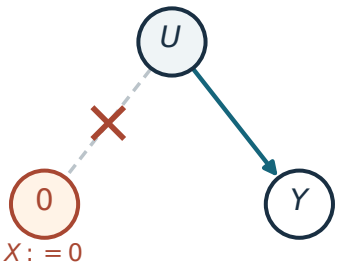
MODEL B

$X = U, \quad Y = U$



$\Pr((X, Y) = (0, 0)) = \Pr((X, Y) = (1, 1)) = \frac{1}{2}$

Intervention: remove the input to X



$\Pr(Y = 1 \mid \text{do}(X = 0)) = \frac{1}{2}$

Dashed crossed edge: removed structural dependence. The law of U is unchanged.