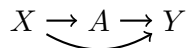


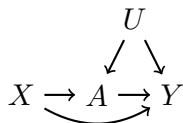
Practice with sufficient adjustment sets

# DAG 1

$$X \rightarrow A \rightarrow Y$$


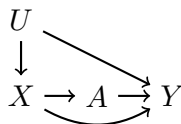
- ▶ write down all backdoor paths between  $A$  and  $Y$ 
  - ▶ recall a backdoor path has the form  
 $A \leftarrow \text{possibly other nodes and edges} \rightarrow Y$
- ▶ suppose we condition on nothing
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?
- ▶ suppose we condition on  $X$ 
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?

## DAG 2



- ▶ write down all backdoor paths between  $A$  and  $Y$ 
  - ▶ recall a backdoor path has the form  
 $A \leftarrow \text{possibly other nodes and edges} \rightarrow Y$
- ▶ suppose we condition on nothing
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?
- ▶ suppose we condition on  $X$ 
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?

## DAG 3



- ▶ write down all backdoor paths between  $A$  and  $Y$ 
  - ▶ recall a backdoor path has the form  
 $A \leftarrow \text{possibly other nodes and edges} \rightarrow Y$
- ▶ suppose we condition on nothing
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?
- ▶ suppose we condition on  $X$ 
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?

## DAG 4



- ▶ write down all backdoor paths between  $A$  and  $Y$ 
  - ▶ recall a backdoor path has the form  
 $A \leftarrow \text{possibly other nodes and edges} \rightarrow Y$
- ▶ suppose we condition on nothing
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?
- ▶ suppose we condition on  $X$ 
  - ▶ which backdoor paths are unblocked, if any?
  - ▶ is the causal effect of  $A$  on  $Y$  identified?