STAT 539 Graph tricks with Pstricks
...and a word about Beamer

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What is Pstricks?

- pstricks is a very powerful, versatile package for including graphics in \LaTeX documents
- usage `\usepackage{pstricks}` or `\usepackage{pstcol,pst-node}` (color, matrices only)

- Drawback: you must provide absolute coordinates
- Remedy: the package `pst-rel-points` lets you provide relative coordinates

- The part that I found more useful is `pst-node` the matrix drawing package
  - simple syntax
  - aligns “nodes” in rows and columns automatically (no need to calculate coordinates)
  - with connectors and node labels you can draw many useful “pictures” easily

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\(^1\)I’ll return to matrices in a few slides
Example - a DAG drawn with \texttt{pspicture}

\begin{pspicture}(-1,-2)(21,14)
\rput(1.5,1){\ovalnode{X}{X-ray}}
\rput(12.5,1){\ovalnode{D}{Dyspnoea}}
\rput(3,7){\ovalnode{T}{Tuberculosis}}
\rput(8,7){\ovalnode{L}{Lung cancer}}
\rput(8,11.5){\ovalnode{S}{Smoker}}
\rput(3,11.5){\ovalnode{A}{Asia}}
\rput(13,7){\ovalnode{B}{Bronchitis}}
\ncline{->}{A}{T}
\ncline{->}{S}{L}
\ncline{->}{T}{X}
\ncline{->}{L}{X}
\ncline{->}{T}{D}
\ncline{->}{L}{D}
\ncline{->}{B}{D}
\end{pspicture}
Same DAG drawn with \texttt{pst-node}

\begin{psmatrix}
  \[mnode=oval, colsep=.3cm, rowsep=.3cm\]
  \[name=A\] Asia & \[name=S\] Smoker \\
  \[name=T\] T & \[name=L\] L & \[name=B\] B
\end{psmatrix}

- alignment is done automatically
- using the optional node labels allows for moving the nodes around
Same DAG drawn with \texttt{pst-node}, no node labels

\begin{psmatrix}[mnode=oval, colsep=.3cm, rowsep=.3cm]
\psset{linewidth=1pt, arcangle=-30}
\begin{psmatrix}
\text{Asia} & \text{Smoker} \\
\text{T} & \text{L} & \text{B} & \text{X} & \text{D}
\end{psmatrix}
\ncline{->}{1,1}{2,1}
\ncline{->}{1,2}{2,2}
\ncline{->}{2,2}{3,1}
\ncline{->}{2,1}{3,4}
\ncline{->}{2,2}{3,4}
\ncline{->}{2,3}{3,4}
\end{psmatrix}

with no node labels, one needs to provide absolute matrix coordinates
Adding colors, changing line styles, arcs

\psset{linewidth=1pt,arcangle=-30}
\begin{psmatrix}[mnode=oval,colsep=.3cm, rowsep=.7cm]
  [name=A]Asia & [name=S,fillstyle=solid,fillcolor=red]Smoker\\
  [name=T]T & [name=L]L & [name=B]B\\
  [name=X,fillcolor=blue,fillstyle=solid]X & [name=D]D
\ncline{->}{A}{T}
ncline{->}{S}{L}
ncline{->}{T}{X}
ncline{->}{L}{X}
ncline{->}{T}{D}
ncline{->}{L}{D}
ncline{->}{B}{D}
\psset{linestyle=dotted,linecolor=green}
ncline{-}{T}{L}
ncline[linestyle=blue]{-}{B}{L}
\ncarc{-}{T}{B}
\end{psmatrix}
Why Beamer? (or why not?)

Why use Beamer to make slides?

- looks professional
- makes reusable slides/notes/handouts/papers
- allows the usage of other latex tools
  - toc
  - index
  - bib files
- powerful
  - overlays
  - hyperlinks
  - multimedia (?)
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Why NOT use Beamer?
  - making talks is SLOW