

Goals

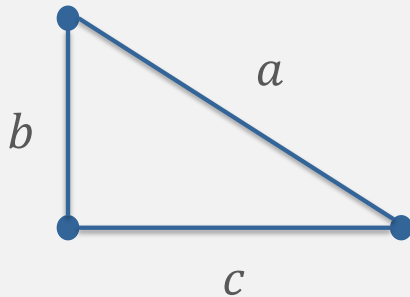
- Calculate event probabilities using trees and conditional probabilities



Probability Questions

- Midd is in a quidditch series against Skidmore. The first team to win 2 games is the champion.
 - Midd has a $\frac{1}{2}$ chance of winning the first game.
 - If Midd won the previous game, we have a $\frac{2}{3}$ chance of winning the next game
 - If Midd lost the previous game, we have a $\frac{1}{3}$ chance of winning the next game
- What is the probability that Midd is the Champion?

Percolation Question

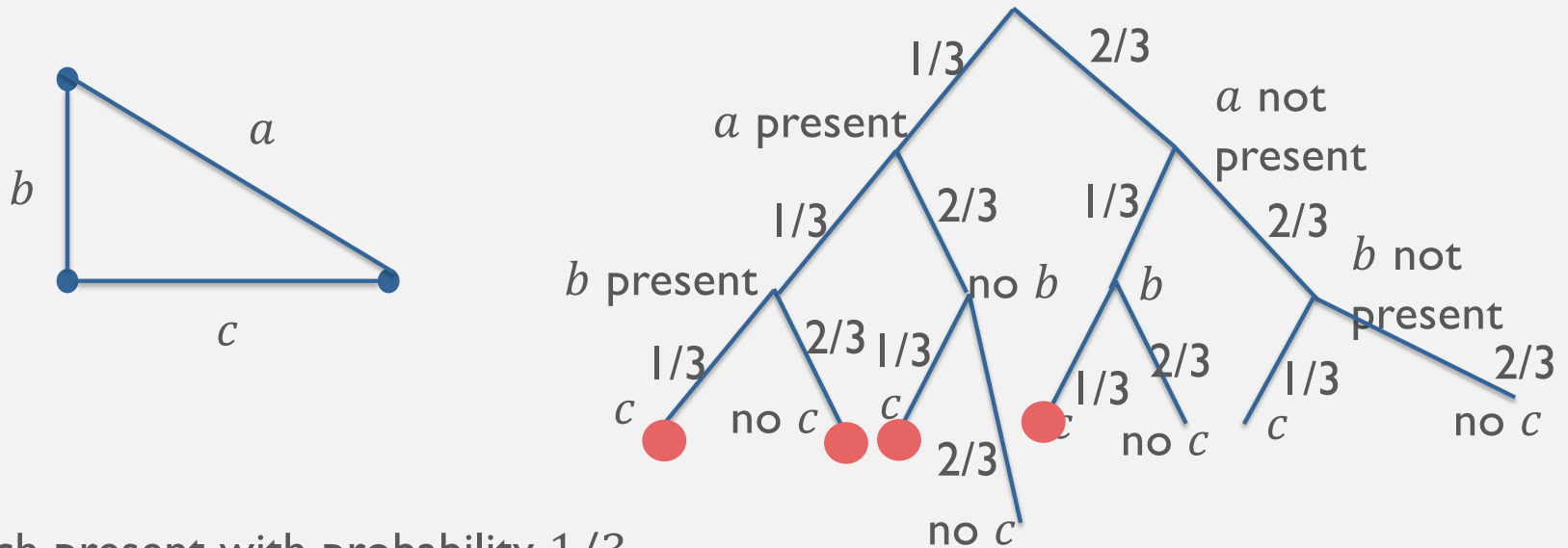


- a, b, c are each present with probability $1/3$.

What is the sample space?

What is the probability of the graph being connected? (A graph is connected if there is an path – not necessarily an edge – between every pair of vertices.) (Use a tree!)

Percolation Question



- a, b, c are each present with probability $1/3$.

● Signifies an element of Event

What is the sample space? $\{\{a, b, c\}, \{a, b\}, \{a, c\}, \{a\}, \{b, c\}, \{b\}, \{c\}, \emptyset\}$

Probability the graph is connected? $\Pr(\{a, b, c\}) + \Pr(\{a, b\}) + \Pr(\{b, c\}) + \Pr(\{a, c\}) =$
 $\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} + \frac{1}{3} \times \frac{1}{3} \times \frac{2}{3} + \frac{2}{3} \times \frac{1}{3} \times \frac{1}{3} + \frac{1}{3} \times \frac{2}{3} \times \frac{1}{3} = 7/27.$

Percolation Question

If we label edges of a graph $1, 2, 3, \dots, M$ and include each edge with probability p . What is the probability that just the edges 1, 2, and 3 are present.

What is the probability that any three edges are present?

