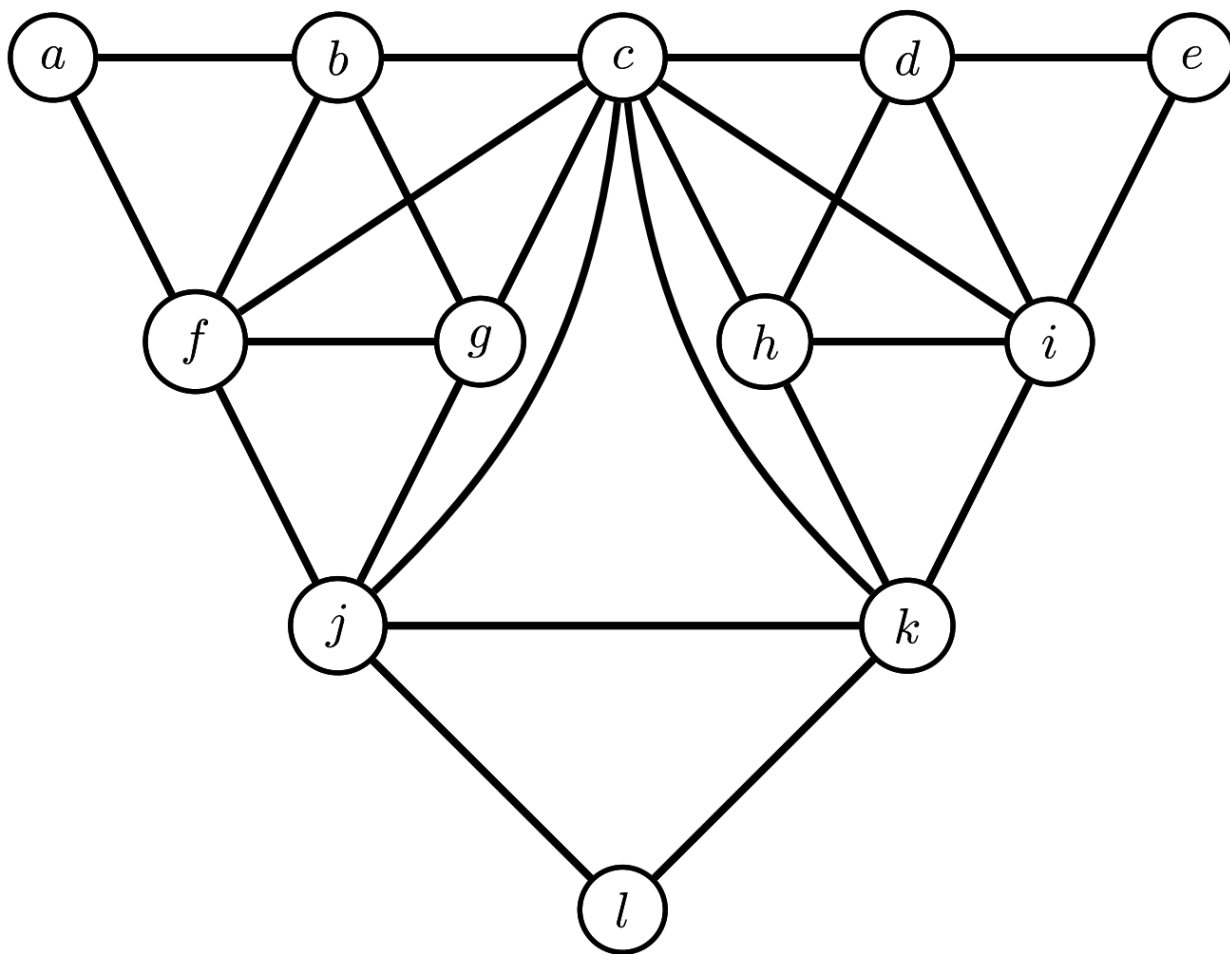


## 1 Junction tree decomposition

Given the following MRF, find its corresponding junction tree decomposition with the minimum max clique size.



## 2 1D sampling

Given a probability distribution :  $p(x) = (1/Z)x^r$  for  $x \in [0, 1]$  and some fixed  $r > 0$ .

1. Determine the value for  $Z$ .
2. Show how to use the inverse CDF method to produce samples from  $p(x)$ . You can assume that you have access to the `random()` function, which produces values from `Uniform(0,1)`.