## The missionaries and cannibals problem

- ullet N missionaries and N cannibals are at the left bank of a river
- ullet There is a boat that can hold K people
- Find a way to get everyone to the right bank
- So that at any time, at any place (on either bank, or in the boat), #missionaries  $\ge \#$ cannibals or #missionaries =0

## Formulation of the MC problem

- States (M,C,B) where M #missionaries, C #cannibals at the left bank, B=1 indicates the boat is at the left bank
- Actions (m,c) where m #missionaries, c #cannibals on the boat
- Precondition: #missionaries and #cannibals satisfy the constraint
- Effects:  $(M,C,1) \stackrel{(m,c)}{\Rightarrow} (M-m,C-c,0)$  and  $(M,C,0) \stackrel{(m,c)}{\Rightarrow} (M+m,C+c,1)$

## Exercise

Running breadth-first with cycle-checking for  ${\cal M}=3$  and  ${\cal K}=2$