



FAKULTÄT FÜR
INFORMATIK

Applied Discrete Modelling

DTMC Examples

Gamblers Ruin – A Random Walk

Two gamblers own a combined fortune of 200€

- Initially each gambler owns 100€

They throw a coin, betting 50€ every time

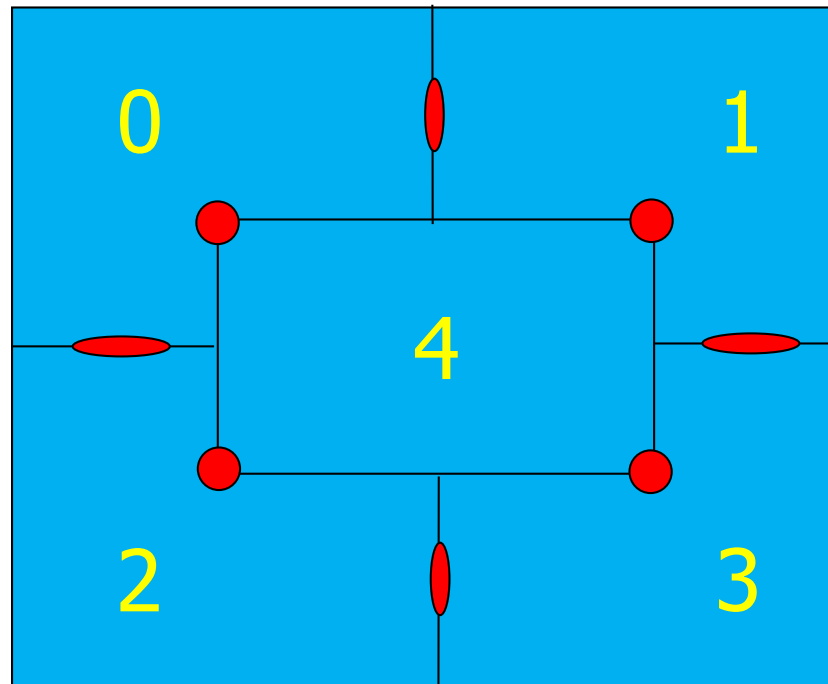
- Heads – Gambler A wins 50€ from gambler B
- Tails – Gambler B wins 50€ from gambler A

The game ends when either of the gamblers is broke!

Possible questions

- Who will win the game most likely?
- What happens if the coin is not fair?

Five Rooms



Machine Production Example

A machine produces 2 items per day

The probability that an item is non-defective is 0.8

Defective items are thrown away instantly

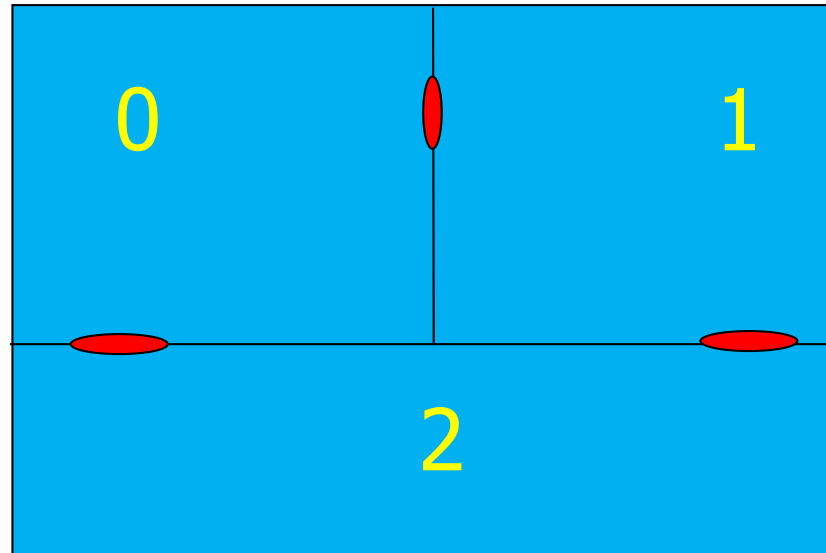
The demand is one item per day and any demand that cannot be satisfied immediately is lost.

The storage limit is 4 items

If storage is full, nothing is produced

Get that Mouse!

A cat chases a mouse...



$P(\text{Cat stays in the same room}) = 0.2;$

$P(\text{Cat changes room}) = 0.4$

$P(\text{Mouse stays in the same room}) = 0.4;$

$P(\text{Mouse changes room}) = 0.3$