Message-Passing Thought Exercise

Traffic Modelling

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Traffic flow

- we want to predict traffic flow

  – to look for effects such as congestion

  - build a computer model
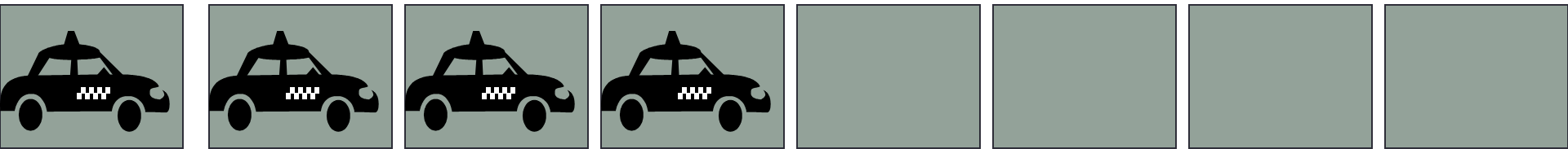
Simple traffic model

- divide road into a series of cells
  - either occupied or unoccupied

- perform a number of steps
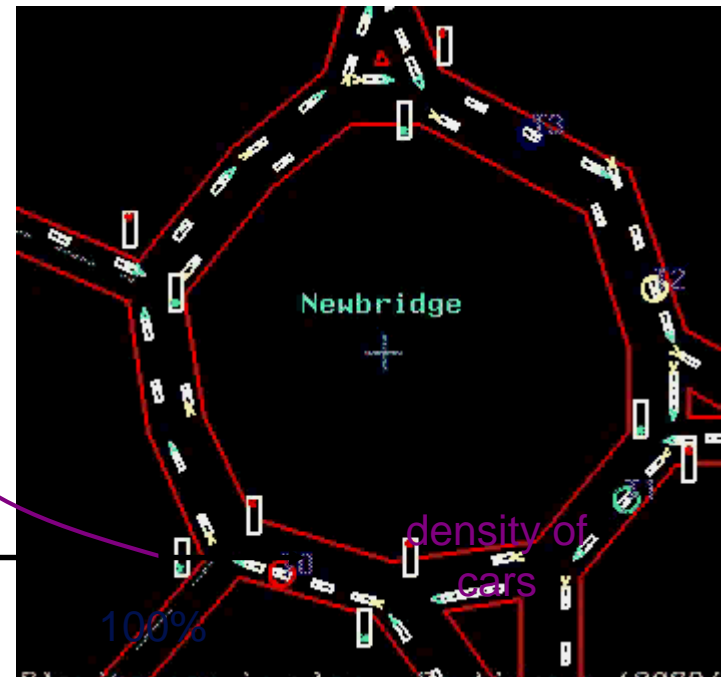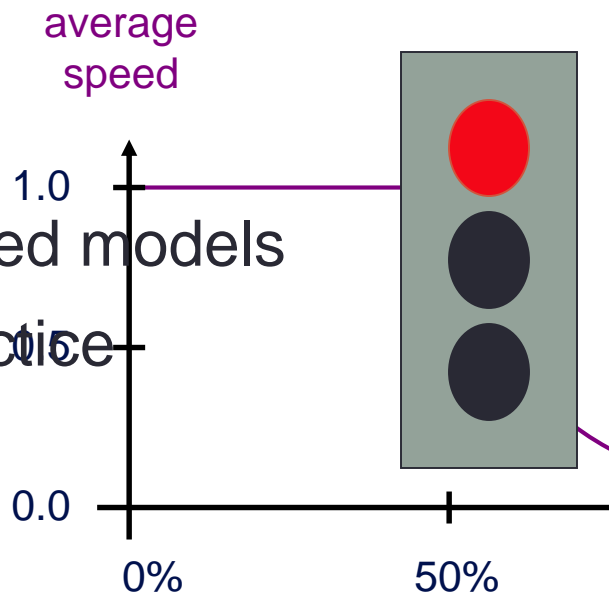 - each step, cars move forward if space ahead is empty

could do this by moving pawns on a chess board

Traffic behaviour

- model predicts a number of interesting features
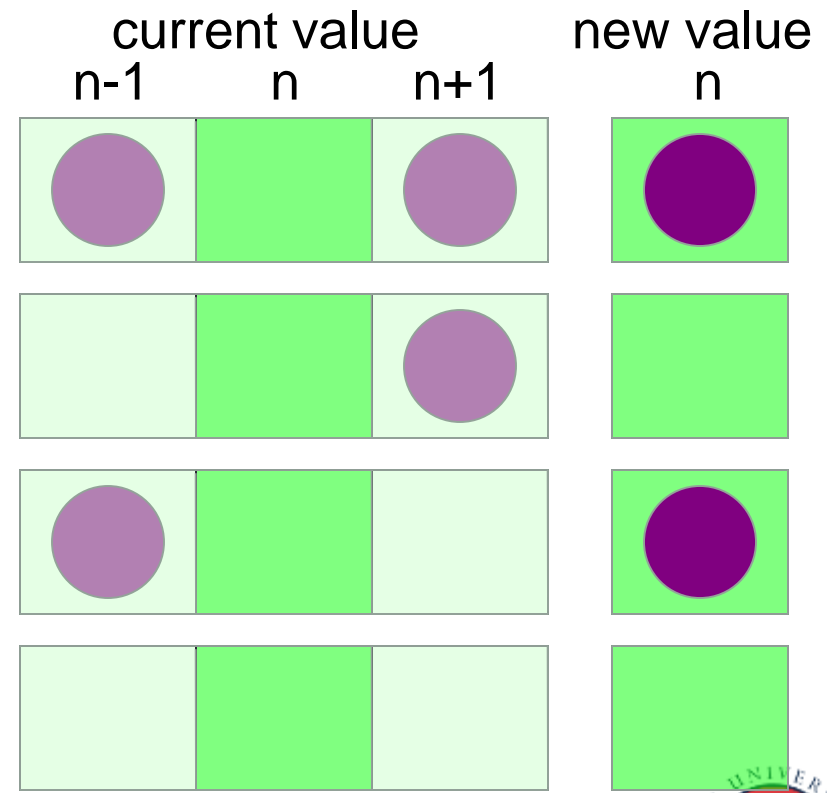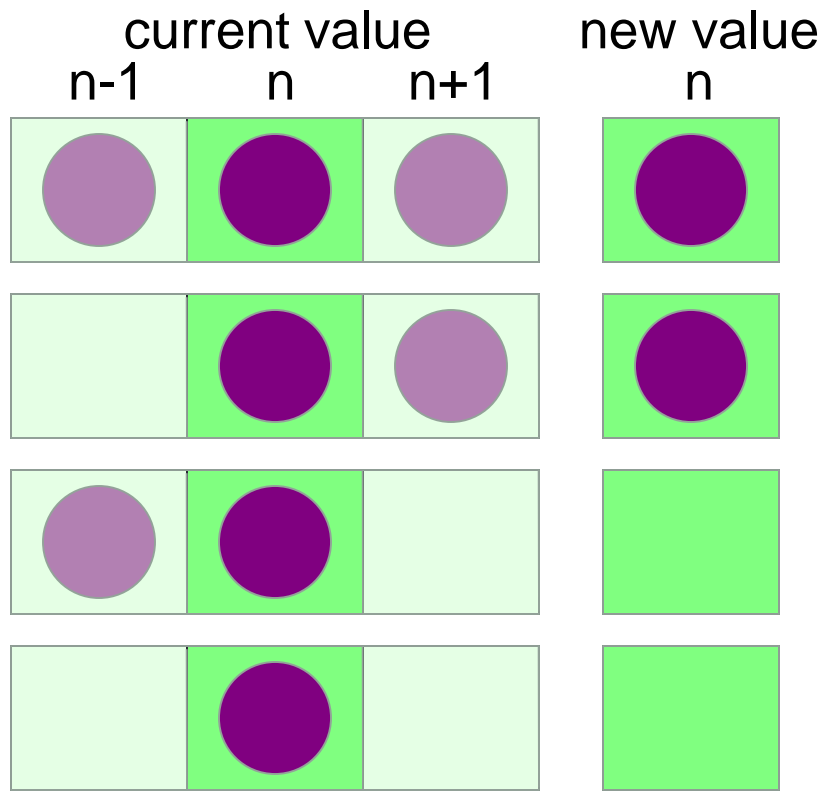
- traffic lights

- congestion

- more complicated models
  are used in practice

average
speed

1.0
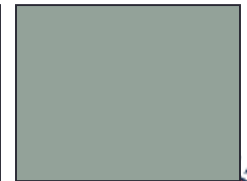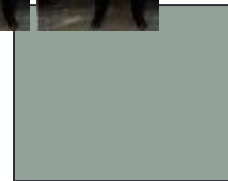
0.5

0.0

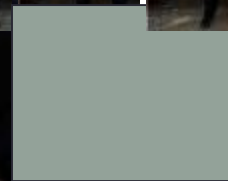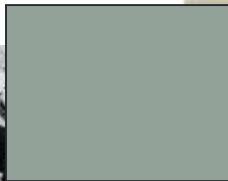0%   50%   100%

Newbridge

density of cars

Traffic simulation

- Update rules depend on:
  - state of cell
  - state of nearest neighbours in both directions

How fast can we run the model?

- measure speed in Car Operations Per second
  – how many COPs?

- around 2 COPs

- but what about three people?

  – can they do six COPs?

Parallel Traffic Modelling

A

B

C