The Environment

A world for the agents

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24th January 2014

A world to live in

- We can model individuals as agents
  - detailed, independent models of the inhabitants of a world
- Agents need a world to live in
  - the environment with which to interact
- Agents can interact with other agents
  - but only if they are sufficiently close
  - The environments known who can interact

Example environments

1. 3-D landscape
2. grid (aka. raster) — a chess board
3. geographical map
4. a market place (e.g. stock market) — in an economics model

} SPATIAL

Grids

A simple model gto get started

- A chess board is a world
- $8 \times 8 = 64$ locations, called cells
- each cell contains 0 or 1 *agents*
- Discrete space — distance in integer units
  - you can move to a neighbour cell
  - never move a fraction of a cell
- A raster or grid can have any size

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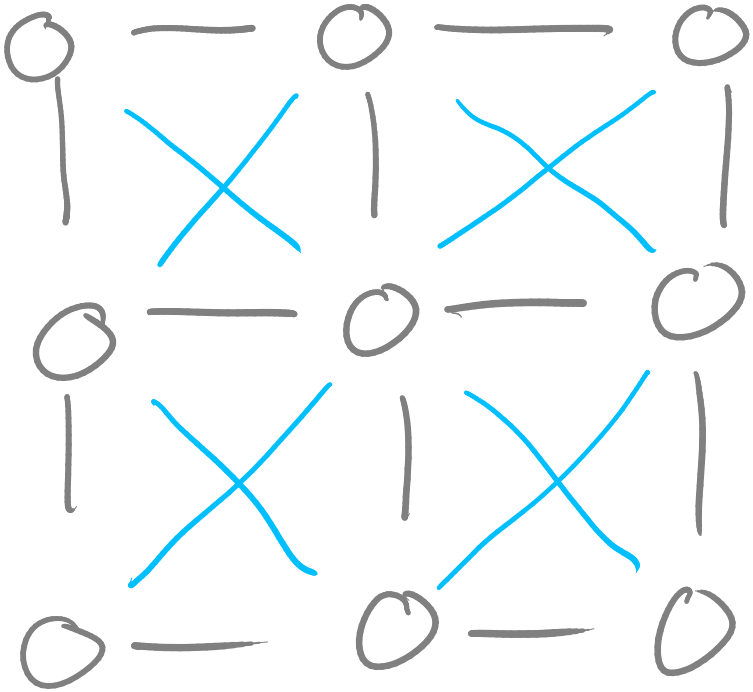
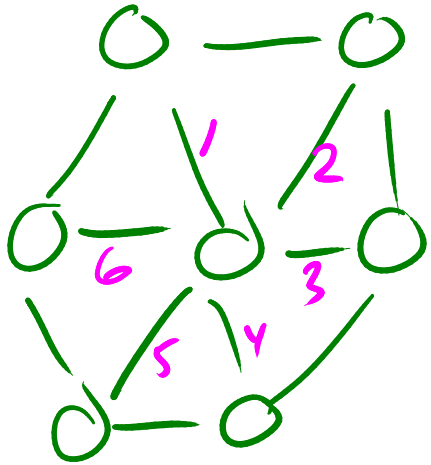
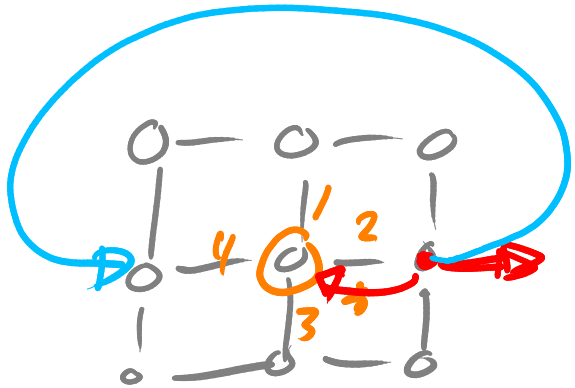
Neighbour cells





Boundary conditions

- What happens at the edge of the grid?
- Periodic (wrap around)
- Reflexive
- Cut-off (special case)
- Sphere?



Summary

- The agents need a world to live in
- Spatial worlds
  1. simple models using rasters/grids
  2. detailled models using 3-D landscapes or geoographical maps
- Non-spatial models
  - market place
- The environment must be implemented
  - agents interact with the environment
  - the environment decides if two given agents can interact directly

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