



Complex Systems Beyond the Metaphor: Your Mathematical Toolset

Computing Project Sheet (optional!)

Price-check!

Consider the following situation:

A large suburban supermarket has a number of checkouts. Hundreds of shoppers are potentially entering and leaving the store at peak times. The management obviously don't want to have unnecessary checkouts open at any one time, but the shoppers don't want to wait around either.

What happens?

Model the supermarket check-out situation, using whatever techniques you wish.

1. What questions will your model try to answer?
2. How does complex systems thinking/theory apply to this situation?
3. What are the important events that your model should try to capture?
4. Explicitly state your model and key assumptions;
5. Summarize important results;
6. Suggest some potentially interesting future directions and questions for the model.

Relate your modelling approach to other scenarios (either in the physical or social sciences) that it might apply. How would you have to adapt your model? What assumptions might be different for these related scenarios?

Guidelines

Should you wish to have a go at this problem, please:

1. Form groups of 2-4;
2. Model findings must be presented to other interested participants in the final computing lab (Friday 12:30-13:30) to be eligible for judging;
3. Prizes will be awarded in the following areas:
 - *The Warhol Prize* for model creativity;
 - *The El Farrol Arthur Prize* for human dynamics;
 - *The Eric Weisstein Prize* for geeky appeal.
4. Feel free to talk to other groups about your/their approach;
5. Bounce ideas of Simon if you wish, he can help with thinking through the modelling process.
6. Due to the constraints of our lab, model implementation will have to be done on either `NetLogo` or `Matlab`. If one or both of these are new to you, then why not learn! Simon can help with a crash-course (or more) in either. The chosen modelling platform will have no affect on prize judging.
7. Judging decisions are final!

Enjoy the challenge, but do not miss the program (or sleep) to work on your model!!!! (Labs close at 9pm)