Valid and Credible Models

2/5/2009
Opening Discussion

• What did we talk about last class?
• Do you have any questions about the assignment?
• Minute essay comments
  – What are Monte Carlo simulations and how do they compare?
  – Are statistics fun? Can statistics be fun?
  – A friend cuts my hair. Stats aren't part of Java standard libraries as far as I know.
  – An empty line will often reduce utilization.
Verification, Validation, and Credibility

- Verification is determining if the program that was created actually does what the original design intended.
- Validation is determining if the original design mirrors the system in question.
- Credibility is if people believe the simulation results.
- These three don't always go together, but the ideal simulation study should have all three.
Level of Detail

• Models should have the proper level of detail to answer the relevant questions.
• Too much detail increases cost and computation time. Too little won't let you answer the proper questions.
• Subject-matter experts (SMEs) can help to determine what is needed.
• Extra detail sometimes required for credibility.
Verification Techniques

- Do unit testing.
- Code reviews. Pair-programming would work well too.
- Check logical consistency using different inputs.
- Trace the simulation.
- Run a “toy” model.
More Techniques

- View an animation.
- Compare generated random variables to what they should be.
- Use a simulation package.
Code?

• With any time left we might look at the structure of the newer code that I'm writing and discuss it.

• Now that you have more experience with what these should do you might be able to help me design it.
Minute Essay

- How are you going to verify the code for your project?