Week 3 Begins

• What is the underlying technology of the computer (and software)? (Note - much is not in Baase book)
  – define “technology”
– define “computer”
  • a “general purpose” machine (Jackson)
  • mention Brooks, Hamlet here
– define “software”
  • the static description of a dynamic process to be instantiated at some point in time to solve a computational problem (Turner)
– define “abstraction”
  • reduction of a problem space by removing all details appearing irrelevant to a solution
  • implications?
– define “operating system”
  • roughly: the program that gives basic services to other programs (called “applications”) that offer services to the user…
  • what operating systems are there?
What Problems can Computers Solve?

• Goedel’s incompleteness theorem
  – consider the proposition: “using logic, this statement cannot be proved true”
    • Assume its provable to be true
      – then it’s false
    • Assume it is false (cannot be proved true)
      – then it is true
  – What’s up with that?
• Computers cannot store “real numbers”
  – they count in binary numbers: 0, 1, 10, 11, 100, 
    …
  – “floating point” arithmetic is inaccurate
    • demo java program
  – they estimate results of real-valued problems
• Computers cannot represent “continuous” behavior (“smooth” behavior)
  – when they err, they might err catastrophically
    • interpolation does not help us to see their behavior
  – no “reliability theory” to assist professionals in estimating how good programs might be!
    • Hamlet, Parnas, Leveson, etc.
For Week 4

- Read Petroski Chapters 4 and 5
- Baase assignment review exercise 4.3 and general exercise 4.15.
  - be brief and to-the-point
  - lists are useful before explanations
  - review written exercise information on website