CS1007: Object Oriented Design and Programming in Java

Lecture #20
Dec 8
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Outline

- Final class
- Advanced topics
  - Practical java
  - Threads
  - Networks
  - Unsolvable problems
- Review and overview
  - What we covered and how it fits together
  - Requested topics

Announcements

- Will also post sample exams etc
- Open notes/book exam
- Extra credit assignment posted tonight, will be due at final

CPU

- The "Brains" of the operation
- Can only do one thing at a time
- One would like to be able to run many things at once
- Solution ??

Algorithms

- Round robin
- Priority
- Longest wait
- Shortest run

Traditional program

1. Start
2. Compute
3. End

Real programs

- Always on
- Multiple users
- Multiple states
- Shared resources
- Flexibility
- Cost involvement

Parallel programming

- How to program parts?
- How to be able to run on multiple cpu's?
- Issues:
  – Sharing
  – Communicating
  – Saving

threads

- What are they?
- Cost of switching context
  - Threads under single process
  - Cpu support for threads (mini processes)
- How implemented on computer side
- How supported in language

Code examples

- Example of thread class
- Example of runnable interface

Java.util.*

- Stack class
- Timer
- Vector
- Random

Java.lang.*

- Math
- Enum
- Number
- StringBuffer
  - Usage
  - Advantage for optimization

Misc topics

- Sometimes due to native support java performs better/worse at certain tasks
  - Can profile the running program to see what is being called frequently
- Pipelines in CPU
  - Run things at the same time
  - Exceptions, have to undo work
  - Out of order execution of code
  - Multiple CPU's

Final

- Will hold extra office hours next week
- Please contact early for help