

CMSC 433

final exam topics

Topics (since midterm)

- Java Generics
 - including `Set<? extends Foo>` and `Set<? super Foo>`
- Threads and concurrency
- A note on distributed computing
- Sockets
- Security
- Garbage Collection (but not references)

Concurrency

- basics (creating threads, etc)
- synchronization
- atomicity
- visibility
- wait/notify/notifyAll
- deadlock

Testing concurrency

- using the metronome timer
 - don't need to remember details of API, just be able to design test cases

Concurrency utilities

- `ConcurrentHashMap`
 - how is this different from a synchronized hash map?
- `BlockingQueues`
- `Executors`
- `Futures`
- `Locks and Conditions`

A note on distributed computing

- read it

Sockets and I/O

- Server sockets
- IP addresses
- ports
- Input/Output streams
- Object serialization

Security

- Buffer overflows
- format strings
- Insecure randomness
- SQL injection
- Cross-site scripting

Garbage Collection

- Reachable vs. unreachable data
 - might be used vs. can't be used again
- Roots
- Reference counting
- Mark and sweep
- Copying GC
- generational garbage collection
- pause times

Earlier stuff

- UML
- Design patterns:
 - Abstract and Static Factory
 - Bridge
 - Observer
 - Iterator
 - Decorator
 - Singleton
 - Visitor