CMPSCI 377: Operating Systems

Discussion 12
Administrivia

- Still missing a few EC2 logins

- Lab 3 due dates
  - Lab due Friday
  - Paper due Monday

- Today’s agenda
  - Virtual machines
  - Lab 3
  - Evaluations
Virtual Machines

- What is virtualization?
  - Presenting the interface of some system on a different system (e.g., Windows on a Mac OS system)

- What is a virtual machine?
  - The simulation of a given system in a virtualized environment (e.g., an instance of Windows running on a Mac)
  - Benefits: VMs are portable and flexible

- In a virtualized system, the hypervisor manages a set of active virtual machines
Hypervisors

- What’s the difference between a **Type 1** and a **Type 2** hypervisor?
- Type 1 ("bare metal") – hypervisor runs directly on the hardware
- Type 2 ("hosted") – hypervisor runs within an OS

![Diagram showing Type 1 and Type 2 hypervisors](image-url)
Is the below code safe? Why or why not?

```java
// client 1
server.buy("Operating System Concepts", 1);
/

// client 2
server.buy("Operating System Concepts", 1);
/

// server
public int buy(String bookTitle, int numCopies) {
    synchronized(bookTitle) {
        // purchase copies, etc.
    }
} 
```