COL331-Project Scope

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1 Objective

- Booting JOS as a process on JOS(virtualization)
- Running the host JOS upto lab4 and running the guest JOS upto lab1.

2 Implementation Details

- We will implement guest OS bootstrapping
- We will create environment for the process running guest OS using a new system call.
- We will implement virtual machine monitor which will emulate the instructions executed in the guest OS, so that they can be run on the emulator.
- Create a page table which will translate the virtual address in the guest OS to virtual address in the host OS, and then use page table of host OS to translate to physical address

3 Details of virtual machine monitor

- When the process of the guest OS is scheduled, control goes to VMM
- It then gets initiated, and then control returns back to the guest OS process
- Whenever we execute any privilege level instruction in guest OS, it will trap to virtual machine monitor which then handles this trap and returns back to guest OS (by vmexit and vmentry)

4 Details about page table

- Just making a page table in the virtual machine as specified in the details(2^{nd} section) make things slow because it involves walking the page table 2 times.
- Therefore, we plan to implement shadow page tables, which will store following mapping (virtual address of guest OS $->$ physical memory)
- Therefore, by this, we need to walk the page table only once which make things faster.