Issues in sharing physical memory

Transparency

- A process shouldn't require particular physical memory bits
- A process often require large amounts of contiguous memory (for stack, large data structures, etc.)

Resource exhaustion

- Programmers typically assume machine has "enough" memory
- Sum of sizes of all processes often greater than physical memory

Protection

- How to prevent A from even observing B's memory
- How to prevent process A from corrupting B's memory (whether it is intentional or not)

Virtual Memory Goals

- Provide a convenient abstraction for programming by giving each program its own virtual address space
- Allow programs to see more memory than exists
- Allocate scarce memory resources among competing processes to maximize performance with minimal overhead
- Enforce protection by preventing one process from messing with another's memory