1. OS is software between hardware and application software.
2. Hardware plus OS implements the process abstraction.
3. OS performs coordination and allocation of resources.
The beautiful interface is
- CPU(s) (Instruction Set Architecture from real hardware) limited to user-mode instructions (including traps for system calls)
- plus a Virtual Memory, containing program instructions and data.

It’s most beautiful seen in C.
Introduction to the Process

The MOST IMPORTANT ABSTRACTION for OS
A PROCESS is (1) One Virtual Memory together with (2) One (or more for multithreading) Virtual CPU(s) that together are CURRENTLY implementing ONE instance of a program in execution and (3) some allocated resources (files, network connections, ... )

In other words, a process is
One virtual machine that is currently holding one running instance of one program.
Today’s systems (all but the smallest) provide multiprogramming.

Multi-...
Multiprogramming is many processes in a system at once.
Multiprocessing is multiprogramming with multiple CPUs so several processes can run truly in parallel, i.e., actually at the same time.
i386 Basic Execution Environment

Figure 3-1. IA-32 Basic Execution Environment for Non-64-bit Modes
Virtual Memory Contents Simplified

Running C Program’s and Other Processes’ Abstraction of Memory