Topics: signals, timers, curses, animation

Approach: Writing a Video Game

Outline

Multi-tasking: Doing several things at once
How does the kernel do it?

Project: write a video game
    outline: what it does
    skills: space, time, multi-task

Multi-Tasking Techniques
    Real world multi-tasking - wait on customers, take calls, move car
    Pong multi-tasking - wait on user input, keep ball moving
    Knowing when to act - block, poll, be signaled
    Our plan: block on user input, use alarms to schedule motion

Screen Management: the curses library
    hello1: simple example
    hello2: programming with curses
    hello3: add a timer
    hello4: add erase for animation

Staring pong: bounce a ball along a line
    b1-sleep1 - erase, move, draw, sleep, repeat
    b1-sleep2 - handle Ctrl-C

Signals
    review of main ideas
    control flow with signals -- magic function calls
    how sleep works: uses signal SIGALRM
    b1-alarm1.c: signals for bounce - alarm and pause

Interaction of signal handlers
    idea: what happens if more than one signal arrives?
    questions: window of opportunity, stackable signals?
        EINTR on slow devices
        advanced control of signals: block, handle, ignore?

Adding User control and Better Timing
    b1-alarm2.c -- user control
    Better timing: usleep, nanosleep, interval timers
    b1-alarm3.c -- set_ticker and more controls

Animation in Two Dimensions
    Extend ideas from bounce1d to two directions of motion
    two sets of state variables:
        horizontal speed, position, and counter
        vertical speed, position, and counter