Project #2

- Goals for this project
  - » Load user programs into memory
  - » Implement simple user program traps
  - » Allow multiple user programs to run at once
  - » Write a simple shell to execute programs
- What you'll need:
  - » Latest version of dlxos.tgz (including usertraps.s)
  - » Your synchronization code from Project #1
    - – Can be done with semaphores, but it's harder!
  - » Simple knowledge of Makefiles

Design Hints

- Loading user programs into memory
  - » Sample code reads programs in and prints the data out
  - » Store data in memory rather than printing it out
- User traps
  - » Look at sample code in usertraps.s
  - » Implement traps for Putchar() and Getchar()
    - – Use a producer/consumer buffer for Putchar
  - » Compile programs separately from OS
  - » Use traps & loading into memory for a basic test *before* implementing the shell
- Shell
  - » Implement traps for user-level Fork and Wait
  - » Use traps & simple (!) code to build a shell

Gotchas

- Be careful not to compile OS & user programs together
  - » Makefile should explicitly compile each separately
  - » Look at sample Makefile for help
- Make sure you're using the DLX assembler for your assembly files
- Do the project in stages
- Use source code control system to track your changes
  - » Learn to use RCS
  - » Use it to recover from changes that didn't work….
  - » RCS tutorial available at: `http://www.csc.calpoly.edu/~dbutler/tutorials/winter96/rcs/`
- ***Start early!***
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