

**Comp 541 Digital Logic and Computer Design**  
Fall 2014

**Lab Project (PART B): Your demo app!**  
*Issued Wed 11/14/14; Due date (see below)*

You will learn the following in this lab:

- How to handle I/O devices
- Developing hardware controllers (i.e., device drivers in hardware) for the I/O devices you choose, e.g., keyboard, mouse, keypad, joystick, accelerometer, audio amplifier, etc.

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**Part 1: Add I/O devices to your MIPS computer**

Choose your I/O devices as per the needs of your demo app. Every student must use a VGA monitor as an output device. You are welcome to have additional output devices, e.g., audio output, and 7-segment displays. For input devices, choose one from among the list above.

Develop Verilog descriptions of the hardware controllers needed to drive your chosen I/O device(s). Verilog files or templates have been provided for some on the class website. Ask for instructor's help if you are using a mouse, an accelerometer, or an audio amplifier. These I/O devices will be added to your MIPS computer via memory-mapping.

**Part 2: Develop a demo app**

Develop a MIPS application (in assembly, using the MARS simulator) to demonstrate

- Functional MIPS processor
- Functional I/O devices

The complexity of your application must be similar to sample projects shown in class (see video posted on website).

Final due dates for an in-class project demonstration (open to other faculty and students from the CS department) are December 1 and 3, 2014.

More instructions will be available shortly.